

# **OCT6100 API**

## **(Application Programming Interface)**

### **Specification**

#### **Revision 3.8**

The OCT6100 API provides a layer of software for integrating the OCT6100 Echo Cancellation device into customer designs. It provides a flexible architecture that will integrate easily into several different target OS models. The API allows the user to access all the flexibility and features of the OCT6100 device from device initialization to configuring and controlling voice streams.

<b>1</b>	<b>Introduction.....</b>	<b>5</b>
1.1	OCT6100 Product family.....	5
<b>2</b>	<b>System Architecture .....</b>	<b>6</b>
<b>3</b>	<b>Software Architecture .....</b>	<b>7</b>
3.1	API Architecture .....	7
3.1.1	Instance Structure.....	7
3.1.2	Function Structures and Default Functions .....	7
3.1.3	Serialization .....	8
3.1.4	Multi-Process System .....	8
3.1.5	Sample Code .....	9
3.2	Interrupts .....	16
3.2.1	Chip Configuration .....	16
3.2.2	Interrupt Service Routine .....	16
3.2.3	Interrupt-Driven System.....	16
3.2.4	Interrupt Polling-Driven System .....	17
<b>4</b>	<b>Using the OCT6100 API .....</b>	<b>18</b>
4.1	Definitions.....	18
4.2	Documentation and Coding Conventions .....	18
4.2.1	Return Values .....	18
4.2.2	Code Header Files .....	19
<b>5</b>	<b>API Functions Description .....</b>	<b>20</b>
5.1	Chip Initialization Functions .....	21
5.1.1	Oct6100ChipOpen .....	21
5.1.2	Oct6100ChipClose.....	29
5.1.3	Oct6100ChipGetStats .....	30
5.1.4	Oct6100ChipGetImageInfo .....	33
5.1.5	Oct6100GetInstanceSize .....	39
5.1.6	Oct6100CreateLocalInstance .....	40
5.1.7	Oct6100DestroyLocalInstance.....	42
5.1.8	Oct6100GetHwRevision.....	43
5.1.9	Oct6100ApiGetVersion .....	44
5.1.10	Oct6100FreeResources.....	45
5.1.11	Oct6100ProductionBist .....	46
5.1.12	Oct6100ApiGetCapacityPins .....	48
5.2	Channel Functions.....	50
5.2.1	Oct6100ChannelOpen .....	50
5.2.2	Oct6100ChannelClose.....	69
5.2.3	Oct6100ChannelModify .....	70
5.2.4	Oct6100ChannelCreateBiDir .....	83
5.2.5	Oct6100ChannelDestroyBiDir.....	85
5.2.6	Oct6100ChannelBroadcastTsstAdd .....	86
5.2.7	Oct6100ChannelBroadcastTsstRemove .....	88
5.2.8	Oct6100ChannelMute .....	90
5.2.9	Oct6100ChannelUnMute .....	91
5.2.10	Oct6100ChannelGetStats.....	92
5.3	Conference Bridge Functions.....	103
5.3.1	Oct6100ConfBridgeOpen .....	104
5.3.2	Oct6100ConfBridgeClose .....	105
5.3.3	Oct6100ConfBridgeChanAdd .....	106

5.3.4	Oct6100ConfBridgeChanRemove .....	108
5.3.5	Oct6100ConfBridgeChanMute.....	109
5.3.6	Oct6100ConfBridgeChanUnMute.....	110
5.3.7	Oct6100ConfBridgeDominantSpeakerSet.....	111
5.3.8	Oct6100ConfBridgeMaskChange .....	113
5.3.9	Oct6100ConfBridgeGetStats .....	114
<b>5.4</b>	<b>Phasing TSST Functions.....</b>	<b>115</b>
5.4.1	Oct6100PhasingTsstOpen.....	115
5.4.2	Oct6100PhasingTsstClose .....	117
<b>5.5</b>	<b>Tone Detection Functions .....</b>	<b>118</b>
5.5.1	Oct6100ToneDetectionEnable.....	119
5.5.2	Oct6100ToneDetectionDisable.....	120
<b>5.6</b>	<b>Buffer Payout Functions .....</b>	<b>121</b>
5.6.1	Oct6100BufferPayoutLoad.....	121
5.6.2	Oct6100BufferPayoutLoadBlockInit.....	123
5.6.3	Oct6100BufferPayoutLoadBlock.....	124
5.6.4	Oct6100BufferPayoutUnload .....	126
5.6.5	Oct6100BufferPayoutAdd .....	127
5.6.6	Oct6100BufferPayoutStart .....	129
5.6.7	Oct6100BufferPayoutStop .....	131
<b>5.7</b>	<b>Caller ID Functions .....</b>	<b>133</b>
5.7.1	Oct6100CallerIdInit .....	133
5.7.2	Oct6100CallerIdTerminate.....	135
5.7.3	Oct6100CallerIdTransmit.....	136
5.7.4	Oct6100CallerIdTransmitAs.....	139
5.7.5	Oct6100CallerIdAbort .....	141
<b>5.8</b>	<b>Event functions .....</b>	<b>142</b>
5.8.1	Oct6100EventGetTone .....	142
5.8.2	Oct6100BufferPayoutGetEvent.....	145
<b>5.9</b>	<b>TSI Connection Functions.....</b>	<b>148</b>
5.9.1	Oct6100TsiCnctOpen .....	148
5.9.2	Oct6100TsiCnctClose .....	150
<b>5.10</b>	<b>ADPCM Channel Functions.....</b>	<b>151</b>
5.10.1	Oct6100AdpcmChanOpen.....	151
5.10.2	Oct6100AdpcmChanClose .....	155
<b>5.11</b>	<b>Interrupt Functions.....</b>	<b>156</b>
5.11.1	Oct6100InterruptServiceRoutine .....	157
5.11.2	Oct6100InterruptMask .....	160
5.11.3	Oct6100InterruptConfigure .....	161
<b>5.12</b>	<b>Remote Debugging.....</b>	<b>164</b>
5.12.1	Oct6100RemoteDebug .....	165
<b>5.13</b>	<b>Monitoring Functions.....</b>	<b>167</b>
5.13.1	Oct6100DebugSelectChannel .....	168
5.13.2	Oct6100DebugGetData .....	169
<b>6</b>	<b>User Supplied Functions Description .....</b>	<b>174</b>
<b>6.1</b>	<b>Serialization Functions.....</b>	<b>174</b>
6.1.1	Oct6100UserCreateSerializeObject.....	174
6.1.2	Oct6100UserDestroySerializeObject.....	175
6.1.3	Oct6100UserSeizeSerializeObject .....	176
6.1.4	Oct6100UserReleaseSerializeObject .....	177

---

<b>6.2</b>	<b>Write Functions .....</b>	<b>178</b>
6.2.1	Oct6100UserDriverWriteApi, Oct6100UserDriverWriteOs .....	178
6.2.2	Oct6100UserDriverWriteSmearApi, Oct6100UserDriverWriteSmearOs .....	179
6.2.3	Oct6100UserDriverWriteBurstApi, Oct6100UserDriverWriteBurstOs .....	181
<b>6.3</b>	<b>Read Functions .....</b>	<b>183</b>
6.3.1	Oct6100UserDriverReadApi, Oct6100UserDriverReadOs .....	183
6.3.2	Oct6100UserDriverReadBurstApi, Oct6100UserDriverReadBurstOs .....	184
<b>6.4</b>	<b>Time Functions.....</b>	<b>186</b>
6.4.1	Oct6100UserGetTime .....	186
<b>6.5</b>	<b>Memory Functions .....</b>	<b>187</b>
6.5.1	Oct6100UserMemSet .....	187
6.5.2	Oct6100UserMemCopy .....	188
<b>7</b>	<b>Echo Operation Mode .....</b>	<b>189</b>
<b>8</b>	<b>API access count per function.....</b>	<b>191</b>
<b>9</b>	<b>TSST to Timeslot Mapping .....</b>	<b>192</b>
<b>10</b>	<b>TSST Formats .....</b>	<b>193</b>
<b>10.1</b>	<b>Input TSST Formats .....</b>	<b>193</b>
10.1.1	One TSST Format.....	193
10.1.2	Two TSST Format.....	194
<b>10.2</b>	<b>Output TSST Formats .....</b>	<b>195</b>
10.2.1	One TSST Format.....	195
10.2.2	Two TSST Format.....	196
<b>11</b>	<b>Revision History .....</b>	<b>197</b>

# 1 Introduction

This document defines the C-language application programming interface (API) designed to control the OCT6100 Echo Cancellation device. The API, provided by Octasic, enables the user to quickly exploit the features offered by the OCT6100.

## 1.1 OCT6100 Product family

The OCT6100 represents a family of full-featured 128 ms tail G.168 (2004) compliant voice processing devices with varying features and capacities. For an overview of all features, and for a listing of specific devices and included features see appendix A of the HW specification.

Some of the available telephony functions performed by OCT6100 devices include: ADPCM compression/decompression, Automatic Level Control (ALC), Adaptive Noise Reduction (ANR), buffer play-out, tone detection, conferencing and echo cancellation on up to 672 channels. All channels can be individually configured in either electric echo cancellation or acoustic echo suppression modes.

This document describes the software API that allows integration of the OCT612x family of devices. The OCT612x is the most complete line of voice processing device and provides echo cancellation (Acoustic or Line), Automatic Level Control and Noise reduction. Furthermore, it provides advanced voice processing gateway features such as buffer play-out for announcements and tones, extensive signaling tone detection, conferencing and ADPCM compression/decompression.

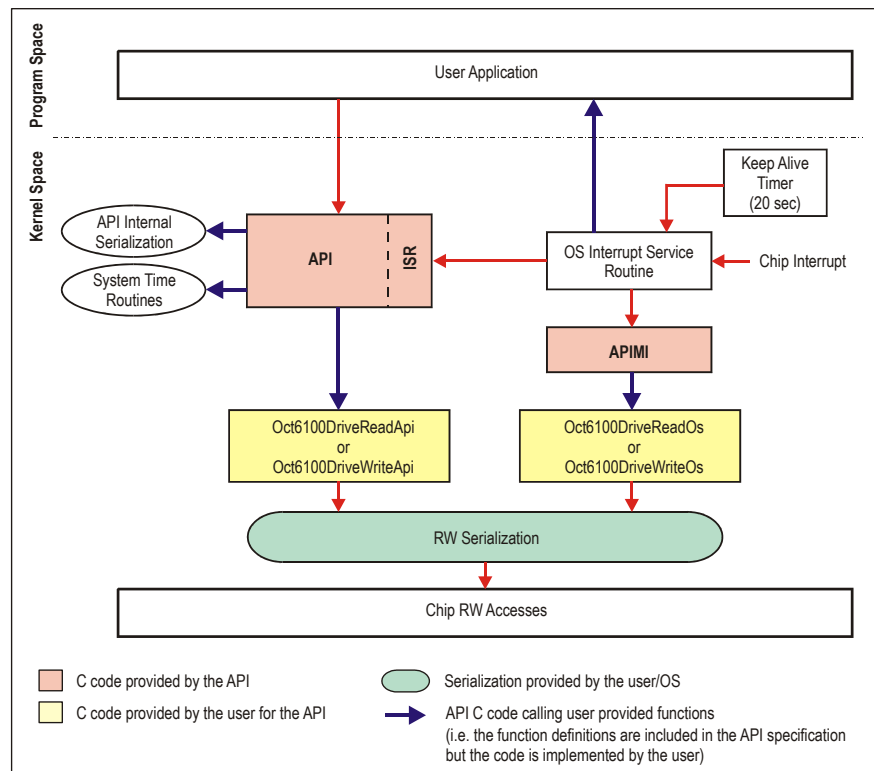
## 2 System Architecture

The API code is designed stateless to allow one set of code to manage multiple devices. All information regarding a chip serviced by the API is kept in a contiguous block of shared memory allocated by the user. This shared memory is referred to as the chip's instance structure. This permits the API code to service multiple chips within the host system. The instance structure has a one-to-one correspondence with a chip, and thus a pointer to it is the first parameter for all function calls provided by the API.

To allow the API to identify a chip to the user software, the user provides a unique value to the **Oct6100ChipOpen** function (parameter **ulUserChipId**). This value is the identifier of the chip within the user's system. The value is not directly used or interpreted by the API: it is stored within the chip's instance structure. When an I/O access must be performed, the API provides the chip ID as a parameter to the I/O routine. This allows the user's I/O driver to access the proper device.

The figure below depicts an example of an interrupt driven system architecture servicing multiple chips. The interrupts do not use deferred procedure calls. All API functions are contained in the API block, with the exception of one function (**Oct6100InterruptMask**).

Because the masking of the chip's interrupt pin is typically carried out at a priority level higher than the call of the API's ISR, the **Oct6100InterruptMask** function is contained in an independent code block labeled APIMI. The user must write separate R/W user functions for APIMI block.



**System Architecture without Deferred Interrupt Procedure Call**

In a Deferred Interrupt implementation with multiple OCT6100 devices, the user may choose to use the chip ID as an index. The pointer to the instance structure of each chip can be kept in a global array indexed by chip ID. The host application can thus refer to a chip as an index, and use that index to obtain the instance structure when an API function must be called.

## 3 Software Architecture

This section presents the API software architecture as well as how it interacts with the host system, and in particular, how interrupts are handled by the API.

### 3.1 API Architecture

The API architecture section is broken down into five parts:

- Instance Structure
- Default Functions and Function Structures
- Serialization
- Multi-Process System
- Example code

Each part is described in the sections below.

#### 3.1.1 Instance Structure

The API code is stateless. This allows the same code to service multiple chips in the host system. All information regarding the state of a chip serviced by the API is kept in an instance structure.

The instance structure is a block of contiguous memory allocated by the user. When the chip is configured via the **OCT6100ChipOpen** API function, the instance structure is initialized.

A pointer to the instance structure's memory is passed to each API function as a parameter. As API functions are called to open and close voice streams, the instance structure is updated to reflect the current state of the chip.

This structure is managed entirely by the API. It is not intended to be interpreted by the user.

#### 3.1.2 Function Structures and Default Functions

Each API function is associated with a parameter structure and default function. The parameter structure contains all user parameters needed by an API function to perform the required task. Both the function and the default function have a pointer to this structure as an argument.

These parameter structures are a vehicle used to pass parameters to the API. These structures can be created locally and then destroyed after an API call completes.

The default functions allow for forward-compatibility of enhanced functionality, and offers default settings for most parameters.

The names of the function, default function and structure respect a standard convention within the API. For a function called "Example" the identifiers would be:

- API function: *Oct6100ExampleFunction*
- Associated default function *Oct6100ExampleFunctionDef*
- Associated function structure *tOCT6100\_EXAMPLE\_FUNCTION*

To demonstrate the use of the default functions, refer to the example provided in the **Sample Code** section.

---

NOTE: The use of the default functions is not necessary but is strongly recommended to ensure backward compatibility of user code with future releases of an API.

---

### 3.1.3 Serialization

Serialization is required for I/O accesses to the chip, and must be provided by the user's I/O driver. Serialization is needed because the chip's internal registers and memories are accessed via indirection registers. All I/O routines provided by the user must use a common serialization object to ensure that API and APIMI R/W operations to the chip are atomic.

### 3.1.4 Multi-Process System

The user must indicate to the API if the host system is a multi-process one or not, via the **fMultiProcessSystem** flag. For a single-process system all serialization object handles are created by the API **Oct6100OpenChip** function and kept internal to the API instance. There is no need for the user to create a local instance structure.

For a multi-process system the main process must perform the following steps:

- The **Oct6100ChipOpenDef** function is called and the structure is modified to obtain the desired chip configuration. At this point, the **fMultiProcessSystem** flag should be set to TRUE.
- The size needed for the API instance is obtained via the **Oct6100GetInstanceSize** function.
- A shared memory block (pApilnstShared) of the returned size is allocated using the tPOCT6100\_INSTANCE\_API type and stored in an area such that all processes can share and access it.
- A local tOCT6100\_INSTANCE\_API structure (ApilnstLocal) is created and kept in the user's process space. This structure is of the same type as the shared instance structure memory just allocated, but not the same size. The structure will contain the portion of the API that is process specific (such as serialization object handles). This structure is small enough to be kept on the stack. It does not have to be allocated dynamically.
- The API function **Oct6100CreateLocalInstance** is called. This will initialize all process specific portions of the local API instance structure (ApilnstLocal). Also, a pointer to the shared portion of the API instance (pApilnstShared) will be stored in the local structure.



- The function **Oct6100ChipOpen** is called with the local API instance structure (ApilnstLocal) as its first argument.
- All other API function calls will have the local instance structure as the first parameter.

For every subsequent process which will access the chip:

- A local tOCT6100\_INSTANCE\_API structure (ApilnstLocal) is created and kept in the user's process space. The user's process is responsible for connecting to the shared memory allocated by the main process (pApilnstShared).
- The API function **Oct6100CreateLocalInstance** is called. This will initialize all process specific portions of the local API instance structure (ApilnstLocal). Also, a pointer to the shared portion of the API instance (pApilnstShared) will be stored in the local structure.
- All API function calls are performed with the local instance structure (ApilnstLocal) as the first argument.

Example code demonstrating these steps is contained in the next section.

### 3.1.5 Sample Code

The typical usage of functions respects the following sequence:

- A parameter structure is allocated.
- The Default function is called. Default configuration functions are identified by the "Def" suffix at the end of the function name.
- The user changes the appropriate parameters in the structure as required.
- The actual function is called.

The example below illustrates the chip initialization sequence in a single-process system:

```
#include "oct6100_api.h"
void main( )
{
    tPOCT6100_INSTANCE_API      pApilInstance;
    tOCT6100_CHIP_OPEN          ChipOpen;
    tOCT6100_GET_INSTANCE_SIZE  InstanceSize;
    UINT32                      ulResult;

    /* Inserting default values into structure configuration parameters. */
    Oct6100ChipOpenDef ( &ChipOpen );

    /* Change default parameters as needed (e.g. changing the clock frequency). */
    ChipOpen.ulUpclkFreq = cOCT6100_UPCLK_FREQ_33_33_MHZ;

    /* Inserting default values into tOCT6100_GET_INSTANCE_SIZE structure parameters. */
    Oct6100GetInstanceSizeDef ( &ChipOpen, &InstanceSize);

    /* Get the size of the OCT6100 instance structure. */
    ulResult = Oct6100GetInstanceSize ( &ChipOpen, &InstanceSize );
    if (ulResult != cOCT6100_ERR_OK)
    {
        /* Error handling. */
    }

    /* Allocate memory for the API Instance structure */
    pApilInstance = (tPOCT6100_INSTANCE_API) malloc(InstanceSize.ulApilInstanceSize);
    if ( pApilInstance == NULL )
    {
        /* Error handling. */
    }

    /* Perform the actual configuration of the chip. */
    ulResult = Oct6100ChipOpen ( pApilInstance, &ChipOpen );
    if (ulResult != cOCT6100_ERR_OK)
    {
        /* Error handling. */
    }
}
```

The next example code demonstrates the chip initialization sequence in a multi-process system. Here is the code that would initialize the primary/master process:

```
#include "oct6100_api.h"

int main( int argc, char *argv[ ] )
{
    unsigned char * pbyFileData = NULL;
    FILE* pFile;
    int iRes;
    int iLen;
    int fWhileCondition = TRUE;

    UINT32 ulResult;

    tOCT6100_CHIP_OPEN                OpenChip;
    tOCT6100_GET_INSTANCE_SIZE        GetInstanceSizeParams;
    tPOCT6100_INSTANCE_API            pApiInstanceShared;
    tOCT6100_CHIP_STATS               ChipStats;
    tOCT6100_CREATE_LOCAL_INSTANCE    CreateLocal;
    tOCT6100_DESTROY_LOCAL_INSTANCE   DestroyLocal;
    tOCT6100_CHIP_CLOSE               CloseChip;
    tOCT6100_INSTANCE_API             ApiInstLocal;

    /* First set default values of OpenChip. */
    Oct6100ChipOpenDef( &OpenChip );

    /* Set the general parameters. */
    OpenChip.ulUpclkFreq = cOCT6100_UPCLK_FREQ_33_33_MHZ;
    OpenChip.fEnableMemClkOut = TRUE;
    OpenChip.ulMemClkFreq = cOCT6100_MCLK_FREQ_133_MHZ;
    OpenChip.ulUserChipId = 1;
    OpenChip.ulMemoryType = cOCT6100_MEM_TYPE_DDR;
    OpenChip.ulNumMemoryChips = 2;
    OpenChip.ulMemoryChipSize = cOCT6100_MEMORY_CHIP_SIZE_32MB;

    /* Set the MULTI-PROCESS flag. */
    OpenChip.fMultiProcessSystem = TRUE;

    /* Load the image file */
    /* Open the file.*/
    pFile = fopen( "oct6100.ima", "rb" );
    if ( pFile == NULL )
    {
        printf( "fopen\n" );
        exit( EXIT_FAILURE );
    }

    /* Get the file length.*/
    fseek( pFile, 0L, SEEK_END );
    iLen = ftell( pFile );
    fseek( pFile, 0L, SEEK_SET );

    /* Allocate enough memory to store the file content.*/
    pbyFileData = (unsigned char *)malloc( iLen );
    if ( pbyFileData == NULL )
    {
        fclose( pFile );
        printf( "malloc\n" );
        exit( EXIT_FAILURE );
    }

    /* Read the content of the file.*/
    fread( pbyFileData, 1, iLen, pFile );

    /* The content of the file should now be in the pbyFileData memory, we can */
    /* close the file and return to the calling function.*/
    fclose( pFile );

    /* Assign the image file.*/
```

```
OpenChip.pbylImageFile = pbyFileData;
OpenChip.ulImageSize = iLen;

/* Get the instance size. */
Oct6100GetInstanceSizeDef( &GetInstanceSizeParms );

ulResult = Oct6100GetInstanceSize( &OpenChip, &GetInstanceSizeParms );

if ( cOCT6100_ERR_OK != ulResult )
{
    printf( "Oct6100GetInstanceSize\n" );
    exit( EXIT_FAILURE );
}

/* Allocate instance memory. */
/* The main process is responsible for allocating the shared memory. */
/* Replace the following function call with your OS specific shared memory */
/* "allocation" function. */

pApiInstanceShared = (tPOCT6100_INSTANCE_API)OsSpecificSharedMemoryAlloc(
    "SHARED_MEM_OCT6100",
    GetInstanceSizeParms.ulApiInstanceSize );

if( !pApiInstanceShared )
{
    printf( "OsSpecificSharedMemoryAlloc\n" );
    exit( EXIT_FAILURE );
}

/* Create the local instance portion. */
Oct6100CreateLocalInstanceDef( &CreateLocal );

CreateLocal.pApiInstShared = pApiInstanceShared;
CreateLocal.pApiInstLocal = &ApiInstLocal;
CreateLocal.pProcessContext = USER_DEFINED_PRIMARY_IDENTIFIER;
CreateLocal.ulUserChipId = OpenChip.ulUserChipId;

ulResult = Oct6100CreateLocalInstance( &CreateLocal );
if ( cOCT6100_ERR_OK != ulResult )
{
    printf( "Oct6100CreateLocalInstance\n" );
    exit( EXIT_FAILURE );
}

/* Perform actual open of chip */
ulResult = Oct6100ChipOpen( &ApiInstLocal, &OpenChip );
if ( cOCT6100_ERR_OK != ulResult )
{
    printf( "Oct6100ChipOpen\n" );
    exit( EXIT_FAILURE );
}

/* Done with the firmware memory. */
free( pbyFileData );
pbyFileData = NULL;

/* The chip is running.. Enter the main loop.. */

/* For this example, nothing much is done except getting chip stats while */
/* waiting for the child process to connect. */

printf( "Chip is running -- Waiting for child process to connect... \n" );

Oct6100ChipGetStatsDef ( &ChipStats );
ChipStats.fResetChipStats = FALSE;

while ( fWhileCondition == TRUE )
{
    ulResult = Oct6100ChipGetStats( &ApiInstLocal, &ChipStats );
    if ( cOCT6100_ERR_OK != ulResult )
    {

```

```
        printf( "Oct6100ChipGetStats\n" );
        exit( EXIT_FAILURE );
    }

    printf( "Current number of opened channels is %d\r",
                                                    ChipStats.ulNumberChannels );

    /* For demonstration purposes, this loop is only executed once. */
    printf( "\nDone!" );
    break;

    /* In a real multi-process application, we would have to wait for the child */
    /* process to land before carrying on with closing the chip. */
}

/* Close access to the chip, we are done with it. */
Oct6100ChipCloseDef( &CloseChip );

ulResult = Oct6100ChipClose( &ApilnstLocal, &CloseChip );
if ( cOCT6100_ERR_OK != ulResult )
{
    printf( "Oct6100ChipClose\n" );
    exit( EXIT_FAILURE );
}

/* Destroy the local instance after all accesses to the chips are done with. */
Oct6100DestroyLocalInstanceDef( &DestroyLocal );

ulResult = Oct6100DestroyLocalInstance( &ApilnstLocal, &DestroyLocal );
if ( cOCT6100_ERR_OK != ulResult )
{
    printf( "Oct6100DestroyLocalInstance\n" );
    exit( EXIT_FAILURE );
}

/* Unallocate shared memory since this is the main process. */
/* Replace the following function call with your OS specific shared memory */
/* "free" function. */
iRes = OsSpecificSharedMemoryFree(
                                    pApilnstShared );
if( iRes < 0 )
{
    printf( "OsSpecificSharedMemoryFree\n" );
    exit( EXIT_FAILURE );
}

exit( EXIT_SUCCESS );
}
```

Code to initialize the secondary process:

```
#include "oct6100_api.h"

int main( int argc, char *argv[ ] )
{
    tOCT6100_INSTANCE_API      pApiInstanceShared;
    tOCT6100_CREATE_LOCAL_INSTANCE CreateLocal;
    tOCT6100_DESTROY_LOCAL_INSTANCE DestroyLocal;
    tOCT6100_INSTANCE_API      ApiInstLocal;
    tOCT6100_INTERRUPT_FLAGS    IntFlags;

    UINT32 ulResult;
    UINT32 fWhileCondition = TRUE;

    /* Connect to the shared memory allocated by the primary (master) process. */
    /* The main process is responsible for allocating the shared memory. */
    /* Replace the following function call with your OS specific shared memory */
    /* "connect" function. */
    pApiInstanceShared = (tOCT6100_INSTANCE_API)OsSpecificSharedMemoryConnect(
        "SHARED_MEM_OCT6100" );

    /* Create the local instance portion. */
    Oct6100CreateLocalInstanceDef( &CreateLocal );

    CreateLocal.pApiInstShared = pApiInstanceShared;
    CreateLocal.pApiInstLocal = &ApiInstLocal;
    CreateLocal.pProcessContext = USER_DEFINED_SECONDARY_IDENTIFIER;
    CreateLocal.ulUserChipId = 1;

    ulResult = Oct6100CreateLocalInstance( &CreateLocal );
    if ( cOCT6100_ERR_OK != ulResult )
    {
        printf( "Oct6100CreateLocalInstance\n" );
        exit( EXIT_FAILURE );
    }

    /* We are connected to the chip.. Enter the main loop.. */

    /* One could poll for tone events, or retrieve debugging data, etc... */
    printf( "Connected to the 6100API -- Calling ISR in loop... \n" );

    while ( fWhileCondition == TRUE )
    {
        /* Call the ISR */
        Oct6100InterruptServiceRoutineDef( &IntFlags );

        ulResult = Oct6100InterruptServiceRoutine(
            &ApiInstLocal, &IntFlags );
        if ( cOCT6100_ERR_OK != ulResult )
        {
            printf( "Oct6100InterruptServiceRoutine\n" );
            exit( EXIT_FAILURE );
        }

        /* For demonstration purposes, this loop is only executed once. */
        printf( "\nDone!" );
        break;

        /* In a real multi-process application, the child would have to exit */
        /* somehow and let the main/master process know that it is done with */
        /* the shared memory. */
    }

    /* Destroy the local instance */
    Oct6100DestroyLocalInstanceDef( &DestroyLocal );

    ulResult = Oct6100DestroyLocalInstance( &ApiInstLocal, &DestroyLocal );
    if ( cOCT6100_ERR_OK != ulResult )
    {
```

```
        printf( "Oct6100DestroyLocalInstance\n" );
        exit( EXIT_FAILURE );
    }

    /* Disconnect from shared memory. */
    /* Replace the following function call with your OS specific shared memory */
    /* "disconnect" function. */
    OsSpecificSharedMemoryDisconnect( pApilInstanceShared );

    /* The main/master process can "free" the shared memory when required. */

    exit( EXIT_SUCCESS );
}
```

Almost all functions require a pointer to the chip's API instance structure as the first parameter. This instance structure is created by the user before the call to **Oct6100ChipOpen** and is unique to each chip being managed by the software.

The structure keeps the state of an instance of a chip and is required to perform any operations on the chip. See Section 2 - System Architecture.

## 3.2 Interrupts

### 3.2.1 Chip Configuration

The OCT6100 device features an interrupt pin that can be configured to respect a minimum time between successive interrupts.

Each individual event can be further configured to meet the host system's needs and capabilities. Each error or status report that the chip issues can be individually configured to generate an interrupt or not. The interrupts are configured at start-up time (**Oct6100ChipOpen**), and can be reconfigured during the chip operation (**Oct6100InterruptConfigure**).

Each interrupt flag can be configured in one of three ways:

- **Disable the interrupt** - The corresponding Interrupt Enable is cleared and the condition will not generate an interrupt.
- **Enable the interrupt without timeouts** - The corresponding Interrupt Enable is set. If the same interrupt occurs repeatedly, each new event occurrence will cause the interrupt pin to be asserted. This will cause the ISR to be called each time.
- **Enable the interrupt and enforce timeouts** The corresponding Interrupt Enable is set. When an interrupt is generated and the API ISR is called, the API will disable the corresponding Interrupt Enable in the device. The API will only re-enable this Interrupt Enable after the user-specified timeout period. This allows the user to mask Interrupts for long periods of time.

### 3.2.2 Interrupt Service Routine

The API provides an interrupt service routine (ISR), **Oct6100InterruptServiceRoutine**, to service the events reported by the chip's interrupt registers. The ISR updates chip and channel statistics maintained by the API and empties the device's tone event buffer queuing the events in API memory to be read by the user software. The functions performed by the ISR on an interrupt are determined by the current events in the interrupt vector or the elapsed time since last servicing of the resource (e.g. offloading or extending counters). The interrupt service routine can be used in either an interrupt-driven system or a polling-driven system. Note that the **Oct6100ChipOpen** function must be called successfully before the ISR can be used.

### 3.2.3 Interrupt-Driven System

Interrupts can be handled by the host system using one of two methods: with or without deferred procedure calls (DPC). This choice is left to the system designer.

#### 3.2.3.1 Interrupt-Driven System without DPCs

When DPCs are not used, the API's ISR is called by the OS's ISR directly at the interrupt priority level. This means the interrupt is responded to very quickly, however, it will force the OS ISR to include the servicing of the interrupt. An example of an interrupt-driven system implemented without DPC is illustrated in the **System Architecture** section above.

In non-DPC case, calling the **Oct6100InterruptMask** function is optional, as the OCT6100 interrupt will be handled immediately.



### **3.2.3.2 Interrupt-Driven system with DPCs**

When using DPCs, the user causes a DPC to invoke the API's ISR. In this case, the DPC causes the ISR treatment to be delayed to a later time, and typically treated at a lower priority level.

To prevent from flooding the OS with the same interrupt event, the chip's interrupt pin must be masked until the API ISR is called. The API provides the **Oct6100InterruptMask** function to mask the interrupt pin. The mask interrupt routine will mask the interrupt time for a period of 60 ms. Using this masking feature ensures convergence of the system; if the OS does not answer the signaled interrupt, the chip will reactivate its interrupt pin without software intervention. Once it is called, the API's ISR will service all flagged events and immediately re-enable the interrupt pin.

Once the interrupt is signaled to the OS, the OS queues the interrupt request to be treated at a later time. When the host software decides to service the deferred interrupt, the API's **Oct6100InterruptServiceRoutine** function determines which error(s) or event(s) generated the interrupt, and the API then performs the necessary actions to fix the error(s) or service the event(s). Before the API's ISR function exits, the chip's interrupt pin is re-enabled.

### **3.2.4 Interrupt Polling-Driven System**

In the case of an interrupt polling-driven system, the chip's interrupt pin is not used: The API's ISR must be called periodically by the host application. Also, because the API's ISR is responsible for updating the software extension of certain chip statistics, the API's ISR must be called a minimum of every 20 seconds to ensure that the integrity of these statistics is maintained. Failure to do so will not impair the operational call integrity but may cause some statistics to be invalid.

## 4 Using the OCT6100 API

### 4.1 Definitions

<b>Channel</b>	A channel is composed of 2 TDM voice streams.
<b>TSST</b>	A TDM time-slot stream. A specific timeslot on a specific stream of the TDM bus.
<b>Conference Bridge</b>	Resource used to mix multiple voice streams.
<b>Tone Detector</b>	Chip resource used to detect signaling tones on a voice stream.
<b>SIN Port</b>	Hybrid side Send Input connection interface (near-end input).
<b>SOUT Port</b>	Network side Send Output connection interface (far-end output)
<b>RIN Port</b>	Network side Receive Input connection interface (far-end input).
<b>ROUT Port</b>	Hybrid side Receive Output connection interface (near-end output).

### 4.2 Documentation and Coding Conventions

In this document:

- All addresses are byte addresses.
- Numbers are decimal unless otherwise specified.
- A word is 16 bits, and a byte is 8 bits.
- All memory locations are laid-out in the big-endian format.
- When a parameter value is greater than 32 bits, it is stored in an array where the lowest indexed element contains the LSB.

All function parameters are passed in C structures to allow for compatibility of code upgrades. Each parameter is documented here with 3 fields:

- Direction** – Indicates if the parameter is an input (IN), output (OUT), or input and output (IO) of the function. When a parameter is a pointer, the direction is indicated as direction/direction, where the first direction refers to the pointer itself (typically IN) and the second direction (after the slash) refers to the memory pointed to by the pointer. Thus, an IN/OUT pointer direction indicates that the pointer is an input to the function (i.e. the value of the pointer will not be modified), and the memory pointed to by the pointer is used for output.
- Type** – Indicates the C type of the parameter. A UINT32 is an unsigned 32-bit value. Parameters may also be declared as arrays and are documented here as UINT32[x] where x indicates the number of elements. Also used in the API are unsigned characters (8-bit values) indicated as BYTES. As with ULONGs, parameters may also be declared as arrays and are documented here as UINT8[x] where x indicates the number of elements.
- Default** – Indicates the default value to which the parameter is set by an associated function for initializing the structure. All values of OCT6100\_INVALIDXxx means that the Def function will initialize the parameter to a value which indicates invalid for that parameter. The API will return an error if the parameter remains invalid when the structure is passed to a function that uses the parameter as an input.

#### 4.2.1 Return Values

All API functions return the OCT6100\_RC\_OK value when they complete successfully. Generally, functions return non-successful indications when there is an improper usage of the API or device. For example, conflicting parameters or exceeding capacities (e.g. allocating more channels than the device supports).

Some functions may not be successful due to transient conditions in the device. For example, if a tone detection message is requested, but the buffer is empty, an error will be returned. These return values will be indicated in a Return Value section of a function description.

The description for all other return values can be found in the oct6100\_errors.h file of the API release.

Return values within the 0xDE000-0xDFFFF range indicate that the API software has detected an internal fatal error. These errors should be reported to Octasic for resolution.

#### **4.2.2 Code Header Files**

The user must supply C code to the API for OS and hardware specific functions. These functions are described in the User Supplied Functions Description section. The definitions of the structures needed by all user-supplied functions are provided in the oct6100\_apiud.h file. The file is required by the user-supplied functions for the definitions of the structures used.

## 5 API Functions Description

The usage of each function and their related parameters are detailed in this section.

Almost every function has a pointer to the chip's API instance structure as its first parameter. This instance structure is created by the user before the call to **Oct6100ChipOpen** and is unique to each chip being managed by the software. This structure keeps the state of an instance of a chip and is required to perform any operations on the chip. See the System Architecture section for more details.

## 5.1 Chip Initialization Functions

Functions described in this section relate to the global operation of the OCT6100. They allow an application to open, close and monitor a device.

### 5.1.1 Oct6100ChipOpen

This function uses the `tOCT6100_CHIP_OPEN` configuration structure provided to perform all operations necessary to configure the chip and initialize the instance structure.

Note that the **Oct6100ChipOpenDef** and **Oct6100GetInstanceSize** functions are typically called, in their respective order, before this function.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChipOpenDef (
    tPOCT6100_CHIP_OPEN          f_pChipOpen );

UINT32 Oct6100ChipOpen (
    tPOCT6100_INSTANCE_API      f_pApiInstance,
    tPOCT6100_CHIP_OPEN         f_pChipOpen );
```

#### Parameters

<code>f_pApiInstance</code>	Pointer to the chip's API instance structure. This structure will be filled in by this function call. It contains information on the current state and configuration of the chip. Once initialized by <b>Oct6100ChipOpen</b> , this structure is supplied to all subsequent function calls. The structure must be created and kept by the application software until <b>Oct6100ChipClose</b> is called.
<code>f_pChipOpen</code>	Pointer to an initial <code>tOCT6100_CHIP_OPEN</code> configuration structure. The structure's elements are defined below. The user allocates this structure.

#### 5.1.1.1 tOCT6100\_CHIP\_OPEN Structure

<b>ulUserChipId</b>	identifier
---------------------	------------

This number is carried down to the user-supplied read/write routines to distinguish which chip the API is servicing. This can be used as an array index of the chip to be serviced to retrieve the correct instance pointer. If only one chip is being serviced by the API, then this parameter can be ignored (see the **System Architecture** description in the **Overview** section).

Direction: IN	Type: UINT32
Default:	0

<b>fMultiProcessSystem</b>	TRUE / FALSE
----------------------------	--------------

Indicates whether the host system is a multi-process one or not. See the **System Architecture** and **API Function Descriptions** sections for the implications of a multi-process system.

Direction: IN	Type: BOOL
Default:	FALSE

<b>pProcessContext</b>	pointer
<p>In some systems the user-provided functions (read, write, serialization, time, etc) may need a context structure in order to communicate with the host OS. This pointer is passed to all user functions for such situations. However, the parameter may be ignored by the user if it is not needed.</p> <p>This parameter is copied in the instance only if <b>fMultiProcessSystem</b> is set to FALSE in the <b>tOCT6100_OPEN_CHIP</b> structure. If the <b>fMultiProcessSystem</b> flag is set to TRUE, the <b>pProcessContext</b> pointer can be stored in a local API instance by calling the <b>Oct6100CreateLocalInstance</b> function.</p>	
Direction:	IN
Type:	PVOID
Default:	NULL
<b>ulMaxRwAccesses</b>	1 – 1024
<p>The maximum number of device addresses that the API will attempt to read or write in a single call of a user read or write function (e.g. <b>Oct6100DriverWriteBurstApi</b>).</p>	
Direction:	IN
Type:	UINT32
Default:	8
<b>pbylImageFile</b>	pointer
<p>Byte pointer to the image file to be loaded into the OCT6100.</p>	
Direction:	IN
Type:	PUINT8
Default:	NULL
<b>ullImageSize</b>	4096 - 1048576
<p>Size of the image file, in bytes.</p>	
Direction:	IN
Type:	UINT32
Default:	0
<b>ulMaxChannels</b>	1 – 672
<p>Maximum number of channels that this chip instance will open concurrently. This field determines the amount of memory needed by the chip's instance structure of the chip to keep track of all channels, and thus affects the required size of the instance structure.</p>	
Direction:	IN
Type:	UINT32
Default:	672
<b>ulTailDisplacement</b>	0 - 896
<p>This parameter represents the offset of the echo cancellation window, in milliseconds. This type of offset is often referred to as "bulk delay". Note that the actual tail displacement value used in the chip is in 16 ms increments. For example, if the value set in <b>ulTailDisplacement</b> is 511 ms, the actual tail displacement setting will be 496 ms.</p>	
Direction:	IN
Type:	UINT32
Default:	0

**ulMaxBiDirChannels** 0 – 255

Maximum number of bi-directional channels that this chip instance will open concurrently. This field determines the amount of memory needed by the chip's instance structure of the chip to keep track of all channels, and thus affects the required size of the instance structure.

The maximum value for this parameter is also limited by the number of echo cancellation channels because each bi-directional channel requires two normal echo cancellation channels.

Direction: IN                      Type: UINT32  
Default: 0

**ulMaxTsiCncts** 0 – 1530

The maximum number of TSI connections that this chip instance will open concurrently. This field determines the amount of memory needed by the chip's instance structure to keep track of all TSI connections, and thus affects the required size of the instance structure.

Direction: IN                      Type: UINT32  
Default: 0

**ulMaxPlayoutBuffers** 0 – 4678

The maximum number of playout buffer that can be loaded into the chip's external memory. This field determines the amount of memory needed by the chip's instance structure to keep track of all playout buffers, and thus affects the required size of the instance structure.

The maximum number is 1344 if Caller ID is enabled (**fEnableCallerId** flag of the **tOCT6100\_OPEN\_CHIP** structure set to TRUE) and 4678 if it is not.

Direction: IN                      Type: UINT32  
Default: 0

**ulMaxConfBridges** 0 – 672

The maximum number of conference bridges that this chip instance will open concurrently. This field determines the amount of memory needed by the chip's instance structure to keep track of all conference bridges, and thus affects the required size of the instance structure.

Conference bridges can be tapped for lawful interception purposes. Each time the **ulTappedChannelHndl** parameter is used when adding a monitoring participant to a bridge, the API uses 1 extra conference bridge resource. Therefore, the value of **ulMaxConfBridges** includes all conference bridges that are open as well as the number of tapping participants.

Direction: IN                      Type: UINT32  
Default: 0

**ulMaxFlexibleConfParticipants** 0 – 672

The maximum number of flexible conference bridge participants that this chip instance will support concurrently. This field determines the amount of memory needed by the chip's instance structure to keep track of all flexible conference bridge participants, and thus affects the required size of the instance structure. Refer to the conference bridge section in this document for an explanation on flexible conference bridges.

Direction: IN Type: UINT32  
Default: 0

**ulMaxPhasingTssts** 0 – 16

The maximum number of phasing TSSTs that this chip instance will open concurrently. This field determines the amount of memory needed by the chip's instance structure to keep track of all phasing TSSTs, and thus affects the required size of the instance structure.

Direction: IN Type: UINT32  
Default: 0

**ulMaxAdpcmChannels** 0 – 672

Maximum number of ADPCM channels that this chip instance will open concurrently. This field determines the amount of memory needed by the chip's instance structure to keep track of all ADPCM channels, and thus affects the required size of the instance structure.

Direction: IN Type: UINT32  
Default: 0

**ulMemoryType** cOCT6100\_MEM\_TYPE\_SDR  
cOCT6100\_MEM\_TYPE\_DDR

The type of RAM memory used with the chip.

Direction: IN Type: UINT32  
Default: cOCT6100\_MEM\_TYPE\_DDR

**ulMemoryChipSize** cOCT6100\_MEMORY\_CHIP\_SIZE\_8MB  
cOCT6100\_MEMORY\_CHIP\_SIZE\_16MB  
cOCT6100\_MEMORY\_CHIP\_SIZE\_32MB  
cOCT6100\_MEMORY\_CHIP\_SIZE\_64MB  
cOCT6100\_MEMORY\_CHIP\_SIZE\_128MB

Indicates the size of each RAM chip used by the OCT6100. A chip size of 8 Megabytes is not supported when the memory type is set to DDR.

Direction: IN Type: UINT32  
Default: cOCT6100\_MEMORY\_CHIP\_SIZE\_64MB

**ulNumMemoryChips** 1 – 2

Indicates the number of external RAM chips present (each of size ulMemoryChipSize). When using a 32-bit wide SDR memory device, this parameter must be set to 2 and **ulMemoryChipSize** must be set to half the size of the RAM chip.

Direction: IN Type: UINT32  
Default: 1



<b>fEnableMemClkOut</b>	TRUE / FALSE
<p>If <b>ulMemoryType</b> is set to <b>cOCT6100_MEMORY_TYPE_SDR</b> this parameter indicates whether the pins SDRAM_CLK_O[0,1] are to be driven by the chip. If DDR RAM is used it indicates whether pins DDRAM_CK_O, NCK_O, CK_LOCAL_O] are to be driven by the chip. If set to TRUE, then the clock is to be generated internally at the frequency specified by <b>ulMemClkFreq</b>.</p>	
Direction:	IN
Type:	BOOL
Default:	TRUE
<b>ulUpclkFreq</b>	cOCT6100_UPCLK_FREQ_33_33_MHZ
<p>This is the frequency of upclk. The only value allowed is 33.33 MHz. Upclk is used by the chip's CPU interface and CPU registers.</p>	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_UPCLK_FREQ_33_33_MHZ
<b>ulMemClkFreq</b>	133000000
<p>The frequency of the memory interface, in Hz.</p>	
<p>If <b>fEnableMemClkOut</b> is FALSE then this parameter indicates the frequency of the oscillator.</p>	
<p>If <b>fEnableMemClkOut</b> is TRUE, then this parameter indicates the clock frequency that the chip will generate.</p>	
Direction:	IN/OUT
Type:	UINT32
Default:	133000000 (133 MHz)
<b>ulInterruptPolarity</b>	cOCT6100_ACTIVE_LOW_POLARITY cOCT6100_ACTIVE_HIGH_POLARITY
<p>Polarity and active status of the interrupt line. The line can be active high or low and is in tri-state (open collector) when not active.</p>	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_ACTIVE_LOW_POLARITY
<b>InterruptConfig</b>	structure
<p>See tOCT6100_INTERRUPT_CONFIGURE structure.</p>	
Direction:	IN
Type:	tOCT6100_INTERRUPT_CONFIGURE
Default:	see structure description
<b>ulMaxTdmStreams</b>	{4, 8, 16, 32}
<p>The maximum number of H.100 streams that this chip instance will allocate timeslots on concurrently. This parameter is used to allow the chip to operate at lower clock frequencies. When less than 32 streams are specified the most significant streams are removed first. For example, if <b>ulMaxTdmStreams</b> = 8 then only streams ct_d[7:0] can be used by this chip instance.</p>	
Direction:	IN
Type:	UINT32
Default:	32

**aulTdmStreamFreqs[8]**

cOCT6100\_TDM\_STREAM\_FREQ\_2MHZ  
cOCT6100\_TDM\_STREAM\_FREQ\_4MHZ  
cOCT6100\_TDM\_STREAM\_FREQ\_8MHZ

The frequency at which the TDM data lines operate. The streams are organized into quartets. Element 0 of this array indicates the operation frequency the TDM lines ct\_d[0:3], and element 7 lines ct\_d[28:31].

If **fEnableFastH100Mode** is set to TRUE, this parameter is ignored because all available streams must operate at 16 MHz.

Direction: IN

Type: UINT32[8]

Default:

cOCT6100\_TDM\_STREAM\_FREQ\_8MHZ

**fEnableFastH100Mode**

TRUE / FALSE

Controls the state of the H.100 fast mode. If TRUE, the TDM bus operates at 16 MHz. Note that only streams 0 to 15 are available when operating at 16 MHz.

Setting this parameter to TRUE will cause the API to ignore the stream frequency parameter **aulTdmStreamFreqs**.

Direction: IN

Type: BOOL

Default:

FALSE

**ulTdmSampling**

cOCT6100\_TDM\_SAMPLE\_AT\_3\_QUARTERS  
cOCT6100\_TDM\_SAMPLE\_AT\_RISING\_EDGE  
cOCT6100\_TDM\_SAMPLE\_AT\_FALLING\_EDGE

The point from which a bit is sampled from the CT\_D[31:0] lines. The bit can be sampled on the rising edge of the clock, the falling edge of the clock, or on the 3/4ths of the clock cycle.

If the **fH100FastMode** flag is set to TRUE, then only the **cOCT6100\_TDM\_SAMPLE\_AT\_RISING\_EDGE** mode can be used for the TDM sampling.

Direction: IN

Type: UINT32

Default:

cOCT6100\_TDM\_SAMPLE\_AT\_3\_QUARTERS

**ulSoftToneEventsBufSize**

2048 – 65535

Software buffer where the API stores tone events transferred from the chip. This value is in number of events.

Direction: IN

Type: UINT32

Default:

2048

**fEnable2100StopEvent**

TRUE / FALSE

Setting this parameter to TRUE will cause events of the type **cOCT6100\_TONE\_STOP** to be reported for 2100Hz tones.

Direction: IN

Type: BOOL

Default:

FALSE

<b>fEnableExtToneDetection</b>	TRUE / FALSE
Setting this parameter to TRUE enables the extended tone detection mode of the OCT6100 API.	
This tone detection mode allows the user to perform tone detection of a specific tone on the two voice streams of a channel (RIN and SIN). Without this mode enabled, two separate tone detectors are necessary for the two voice streams.	
This parameter should only be set to TRUE when not enough tone detectors are available to cover the desired tone detection configuration. Activating this mode reduces the maximum number of echo cancellation channels to 336.	
Note: All tone detectors used with extended tone detection should be configured by the OCT6100 image to perform detection on the SIN port only.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>ulSoftBufferPlayOutEventsBufSize</b>	128 – 65535
Software buffer where the API stores buffer playout events detected from the chip. This value is in number of events. Buffer playout events are not polled if this value is left to cOCT6100_INVALID_VALUE.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>fEnableCallerId</b>	TRUE / FALSE
Setting this parameter to TRUE enables the caller ID module of the OCT6100 API.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fEnableAcousticEcho</b>	TRUE / FALSE
Activates acoustic echo cancellation in the chip. If TRUE, enabling acoustic echo cancellation will be permitted.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>ulMaxRemoteDebugSessions</b>	0 – 256
The maximum number of remote debugging sessions that can be supported by this instance.	
Direction: IN	Type: UINT32
Default:	1
<b>fEnableChannelRecording</b>	TRUE / FALSE
If TRUE, the API will configure the device to support recording of debug information on a channel.	
If <b>ulMaxChannels</b> is set to 672 and this flag is set to TRUE, the API will reserve one channel for debugging purpose, leaving only 671 channels to perform echo cancellation.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fEnableProductionBist</b>	TRUE / FALSE



### 5.1.2 Oct6100ChipClose

This function closes all channels that may still be open and then puts the chip in soft reset.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChipCloseDef (
    tPOCT6100_CHIP_CLOSE          f_pChipClose );

UINT32 Oct6100ChipClose (
    tPOCT6100_INSTANCE_API        f_pApiInstance,
    tPOCT6100_CHIP_CLOSE          f_pChipClose );
```

#### Parameters

f_pApiInstance	Pointer to the instance structure of the chip.
f_pChipClose	Pointer to a tOCT6100_CHIP_CLOSE structure. The structure's elements are defined below. The user allocates this structure.

#### 5.1.2.1 tOCT6100\_CHIP\_CLOSE Structure

At present, there are no parameters for this structure.

### 5.1.3 Oct6100ChipGetStats

This function fills an OCT6100\_CHIP\_STATS structure with the current statistics for the chip. All statistics returned by this function are initialized (e.g. counters set to 0) by the **Oct6100ChipOpen** function.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChipGetStatsDef (
    tPOCT6100_CHIP_STATS          f_pChipStats );

UINT32 Oct6100ChipGetStats (
    tPOCT6100_INSTANCE_API        f_pApiInstance,
    tPOCT6100_CHIP_STATS          f_pChipStats );
```

#### Parameters

**f\_pApiInstance**      Pointer to the instance structure of the chip.

**f\_pChipStats**        Pointer to a tOCT6100\_CHIP\_STATS structure. The structure's elements are defined below. The user allocates this structure.

#### 5.1.3.1 tOCT6100\_CHIP\_STATS Structure

<b>fResetChipStats</b>	TRUE / FALSE
If TRUE, the API resets all chip statistics counters to zero.	
Direction:	IN                      Type: BOOL
Default:	FALSE
<b>ulNumberChannels</b>	0 – 672
The number of channels currently open.	
Direction:	OUT                      Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulNumberTsiCncts</b>	0 – 1530
The number of TSI connections currently open.	
Direction:	OUT                      Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulNumberConfBridges</b>	0 – 672
The number of conference bridges currently open.	
Direction:	OUT                      Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulNumberPlayoutBuffers</b>	0 – 1344
The number of playout buffers currently loaded in the chip's external memory.	
Direction:	OUT                      Type: UINT32
Default:	cOCT6100_INVALID_STAT

<b>ulPayoutFreeMemSize</b>	0 - total space in external memory for playout
The amount of external memory left, in bytes, that can be used for buffer playout. Note that this value is not necessarily a contiguous memory block.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulNumberPhasingTssts</b>	0 – 16
The number of phasing TSSTs currently open.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulNumberAdpcmChannels</b>	0 – 672
The number of ADPCM channels currently open.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulH100OutOfSynchCount</b>	32 bit counter
A count of the number of times the H.100 slave of the chip lost its framing on the H.100 bus. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulH100ClockABadCount</b>	32 bit counter
A count of the number of times the H.100 clock CT_C8_A was deemed bad. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulH100FrameABadCount</b>	32 bit counter
A count of the number of times the H.100 frame CT_FRAME_A was deemed bad. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulH100ClockBBadCount</b>	32 bit counter
A count of the number of times the H.100 clock CT_C8_B was deemed bad. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT

**ulInternalReadTimeoutCount** 32 bit counter

A count of the number of times that an internal read timeout error was detected. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.

Direction: OUT                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STAT

**ulSdramRefreshTooLateCount** 32 bit counter

A count of the number of times that an SDRAM refresh too late error was detected. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.

Direction: OUT                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STAT

**ulPIIJitterErrorCount** 32 bit counter

A count of the number of times that a PLL jitter error was detected. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register.

Direction: OUT                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STAT

**ulOverflowToneEventsCount** 32 bit counter

A count of the number of times that the hardware tone event buffer has overflowed. The count is an approximation based on the changes from inactive to active state of the corresponding interrupt register. If such overflows occur, the user should call the Interrupt Service Routine more often.

Direction: OUT                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STAT

**ulSoftOverflowToneEventsCount** 32 bit counter

A count of the number of times that the software tone event buffer has overflowed. If such overflows occur, the user should retrieve tone events from the API more often, using the **Oct6100EventGetTone** function.

Direction: OUT                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STAT

**ulSoftOverflowBufferPayoutEventsCount** 32 bit counter

A count of the number of times that the software playout event buffer has overflowed. The count is based on the number of times that buffer playout events could not be copied to the software buffer because it was already full. To correct this, the user should empty the software buffer more frequently using the **Oct6100BufferPayoutGetEvent** procedure.

Alternatively, the **ulSoftBufferPayoutEventsBufSize** parameter may be set to a larger value.

Direction: OUT                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STAT



### 5.1.4 Oct6100ChipGetImageInfo

This function fills an OCT6100\_CHIP\_IMAGE\_INFO structure with the description of the build image loaded into the device.

#### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ChipGetImageInfoDef (  
    tPOCT6100_CHIP_IMAGE_INFO          f_pChipImageInfo );
```

```
UINT32 Oct6100ChipGetImageInfo (  
    tPOCT6100_INSTANCE_API             f_pApiInstance,  
    tPOCT6100_CHIP_IMAGE_INFO          f_pChipImageInfo );
```

#### Parameters

f\_pApiInstance     Pointer to the instance structure of the chip.

f\_pChipImageInfo   Pointer to a tOCT6100\_CHIP\_IMAGE\_INFO structure. The structure's elements are defined below. The user allocates this structure.

#### 5.1.4.1 tOCT6100\_CHIP\_IMAGE\_INFO Structure

**szVersionNumber[ 1016 ]**     String

This string contains the unique image build description of the image loaded into the device.

Direction: OUT     Type: UINT8 [ 1016 ]

Default:     0

**ulBuildId**     32-bit value

This field contains the unique build ID from the image loaded into the device.

Direction: OUT     Type: UINT32

Default:     cOCT6100\_INVALID\_VALUE

**ullImageType**     cOCT6100\_IMAGE\_TYPE\_WIRELINE  
                     cOCT6100\_IMAGE\_TYPE\_COMBINED

This field contains the type of image that has been loaded into the device.

Direction: OUT     Type: UINT32

Default:     cOCT6100\_INVALID\_VALUE

**ulMaxChannels**     16 - 672

This field contains the maximum number of channels supported by the image loaded into the device.

Direction: OUT     Type: UINT32

Default:     cOCT6100\_INVALID\_VALUE

<b>ulMaxTailDisplacement</b>	0 - 896
This field contains the maximum tail displacement supported by the image loaded into the device. A value of 0 indicates that tail displacement is not supported.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>fPerChannelTailDisplacement</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports per channel tail displacement configuration.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fPerChannelTailLength</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports an independent tail length configuration per channel.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>ulMaxTailLength</b>	32 – 128 ms (increment of 4 ms)
This field contains the maximum tail length supported by the image loaded into the device.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>fBufferPayout</b>	TRUE/FALSE
If TRUE, the image loaded into the device supports buffer payout.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fAdaptiveNoiseReduction</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports adaptive noise reduction.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fSoutNoiseBleaching</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports Sout noise bleaching.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fAnrSnrEnhancement</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports configuration of the SOUT adaptive noise reduction. This parameter controls the signal to noise ratio enhancement.	
Direction: OUT	Type: BOOL
Default:	FALSE

<b>fAnrVoiceNoiseSegregation</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports configuration of the SOUT adaptive noise reduction. This parameter controls the voice-noise segregation.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fAutoLevelControl</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports automatic level control.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fHighLevelCompensation</b>	<b>TRUE / FALSE</b>
If TRUE, the image loaded into the device supports high level compensation.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fToneDisablerVqeActiveTime</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports a configurable tone disabler VQE re-activation time.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fSilenceSuppression</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports silence suppression.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fToneRemoval</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports DTMF tone removal. This feature is available on the SIN port only.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fAcousticEcho</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports acoustic echo cancellation.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fAecTailLength</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports a configurable tail length for acoustic echo cancellation.	
Direction: OUT	Type: BOOL
Default:	FALSE

<b>fDefaultErl</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports configurable default ERL.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fNonLinearityBehaviorA</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports configurable non-linearity.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fNonLinearityBehaviorB</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports configurable non-linearity.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fDoubleTalkBehavior</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports configurable double talk behavior.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fListenerEnhancement</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports automatic and natural listener enhancement.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fMusicProtection</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports Octasic's Music Protection feature.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fIdleCodeDetection</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports the idle code detection feature.	
Direction: OUT	Type: BOOL
Default:	TRUE
<b>fSinLevel</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports the SIN level statistics.	
Direction: OUT	Type: BOOL
Default:	TRUE

<b>fConferencing</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports conferencing.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fConferencingNoiseReduction</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports conferencing noise reduction.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fDominantSpeaker</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports Octasic's conferencing dominant speaker feature.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fAdpcm</b>	TRUE / FALSE
If TRUE, the image loaded into the device supports ADPCM compression and decompression.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>ulMaxPlayoutEvents</b>	31, 127
This field contains the maximum number of buffer playout events supported by the image loaded into the device.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulDebugEventSize</b>	32, 256
This field contains the maximum number of debug events that can be recorded in external memory. An event is generated every 512 milliseconds. Images that support 32 events can record 16 seconds of data. Images that support 256 events can record over 2 minutes of data.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulToneProfileNumber</b>	32-bits value
This field represents the tone profile number built in the image.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulNumTonesAvailable</b>	0 - 56
This field represents the number of tone available in the image. It also represents the number of valid entries within the <b>aToneInfo</b> array.	
Direction: OUT	Type: UINT32
Default:	0

<b>aToneInfo[ 56 ]</b>	array of structure
Description of the tones supported for tone detection based on the image loaded into the device.	
Direction: OUT	Type: tOCT6100_CHIP_TONE_INFO[ 56 ]
Default:	see structure definition

#### 5.1.4.2 tOCT6100\_CHIP\_TONE\_INFO Structure

<b>aszToneName[ 64 ]</b>	String
This field contains a unique string used to identify the tone.	
Direction: OUT	Type: UINT8 [ 64 ]
Default:	0
<b>ulDetectionPort</b>	cOCT6100_CHANNEL_PORT_SIN cOCT6100_CHANNEL_PORT_ROUT cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT_SOUT
Port on which this tone can be detected.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_PORT
<b>ulToneID</b>	32-bits value
Unique numerical value used to identify this tone.	
This is the value required when enabling or disabling tone detection on a channel. It is also the value returned upon detection of this tone in the tOCT6100_EVENT_TONE structure. Please refer to the section on tone detection for more details.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE

## 5.1.5 Oct6100GetInstanceSize

This function uses the tOCT6100\_CHIP\_OPEN configuration structure to calculate the amount of memory required for the tOCT6100\_INSTANCE\_API structure of the chip. A tOCT6100\_INSTANCE\_API structure must be allocated and a pointer created by the user before calling the **Oct6100ChipOpen** function; the pointer must point to a block of contiguous memory which size is determined by this function.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100GetInstanceSizeDef (
    tPOCT6100_GET_INSTANCE_SIZE      f_pInstanceSize );

UINT32 Oct6100GetInstanceSize (
    tPOCT6100_CHIP_OPEN              f_pChipOpen,
    tPOCT6100_GET_INSTANCE_SIZE      f_pInstanceSize );
```

### Parameters

f_pChipOpen	Pointer to an initial tOCT6100_CHIP_OPEN configuration structure. The definition of the structure is provided in Section 5 - Configuration Parameters. See <b>Oct6100ChipOpenDef</b> for a default configuration of the chip. The user allocates this structure.
f_pInstanceSize	Pointer to a tOCT6100_GET_INSTANCE_SIZE structure. The structure's elements are defined below. The user allocates this structure.

### 5.1.5.1 tOCT6100\_GET\_INSTANCE\_SIZE Structure

#### ulApilInstanceSize

This value is returned by the function and indicates the minimum size, in bytes, of the tOCT6100\_INSTANCE\_API memory block that must be allocated to support the supplied configuration.

Direction: Out                      Type: UINT32

Default: *NOT MODIFIED*

## 5.1.6 Oct6100CreateLocalInstance

This function is used only if the API is run on a multi-process system. The function initializes a local API instance structure kept by each process communicating with a given shared instance. The local structure contains all portions of the API instance which are process specific (such as serialization object handles).

Two categories of processes call this function: the main process and other processes. For example, this might occur in a system with a main process performing the channel management and a secondary thread collecting statistics.

The main process performs the configuration of the chip. In this process, this function must be called after the shared portion of the API instance is allocated but before the **Oct6100ChipOpen** function is called (see the **System Architecture** and **API Function Descriptions**).

Other processes simply connect to the chip and its shared instance once the chip is configured. This function serves as the connection function and must be called before all other API function calls (see the **System Architecture** and **API Function Descriptions**).

If the host system uses a single process then this function is not necessary, and must not be called.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100CreateLocalInstance (
    tPOCT6100_CREATE_LOCAL_INSTANCE    f_pCreateLocalInst );
```

### Parameters

**f\_pCreateLocalInst**      pointer to a tOCT6100\_CREATE\_LOCAL\_INSTANCE structure. The definitions of the structure's elements are listed below. The user allocates this structure and keeps it as long as the chip is in operation.

### 5.1.6.1 tOCT6100\_CREATE\_LOCAL\_INSTANCE Structure

<b>pApilnstShared</b>	pointer
Pointer to the shared portion of the API instance (created by the main process). This pointer will be stored within the local instance structure ( <b>pApilnstLocal</b> ).	
Direction: IN	Type: tPOCT6100_INSTANCE_API
Default:	NULL
<b>pApilnstLocal</b>	pointer
Pointer to the process-specific portion of the API instance (created by all processes on their local stack). This pointer will be used to all subsequent API function calls.	
Direction: IN	Type: tPOCT6100_INSTANCE_API
Default:	NULL



**pProcessContext**

pointer

In some systems the user-provided functions (read, write, serialization, time, etc) may need a context structure in order to communicate with the host OS. The API passes this pointer to all user functions allowing the user function to retrieve the correct context. This parameter may be ignored by the user if it is not needed.

Direction: IN

Type: PVOID

Default:

NULL

**ulUserChipId**

identifier

This value is passed to create the unique semaphore names that are associated to a single API instance.

Direction: IN

Type: UINT32

Default:

0

## 5.1.7 Oct6100DestroyLocalInstance

This function should only be called in a multi-process or multi-thread environment. This function will destroy any resources reserved by a call to Oct6100CreateLocalInstance.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100DestroyLocalInstanceDef (
    tPOCT6100_DESTROY_LOCAL_INSTANCE    f_pDestroyLocalInst );

UINT32 Oct6100DestroyLocalInstance (
    tPOCT6100_INSTANCE_API              f_pApiInstance,
    tPOCT6100_DESTROY_LOCAL_INSTANCE    f_pDestroyLocalInst );
```

### Parameters

**f\_pDestroyLocalInst**     pointer to a tOCT6100\_DESTROY\_LOCAL\_INSTANCE structure. The definitions of the structure's elements are listed below. The user allocates this structure and keeps it as long as the chip is in operation.

### 5.1.7.1 tOCT6100\_DESTROY\_LOCAL\_INSTANCE Structure

<b>ulDummy</b>	32 bit value
The API does not use this structure member. It exists only to preserve the OCT6100 API functions format.	
Direction: IN	Type: UINT32
Default:	0

## 5.1.8 Oct6100GetHwRevision

This routine returns the hardware revision number of the OCT6100. The revision number is contained in a register of the device. This function may be called before the device is open and only requires upclk to be present on the device.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100GetHwRevision (  
    tPOCT6100_GET_HW_REVISION          f_pRevision );
```

### Parameters

**f\_pRevision**                      pointer to a tOCT6100\_GET\_HW\_REVISION structure. The definitions of the structure's elements are listed below. The user allocates this structure.

### 5.1.8.1 tOCT6100\_GET\_HW\_REVISION Structure

**ulUserChipId**                      identifier

This value is passed to the user-supplied read/write routines to distinguish which chip the API is servicing. This can be used as an array index of the chip to be serviced to retrieve the correct instance pointer. If only one chip is being serviced by the API this parameter can be ignored. See section **1.3 System Architecture**.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_CHIP\_ID

**pProcessContext**                      pointer

In some systems the user-provided functions (read, write, serialization, time, etc) may need a context structure in order to communicate with the host OS. This pointer is passed to all user functions for such situations. However, the parameter may be ignored by the user if it is not needed.

Direction: IN

Type: PVOID

Default:

NULL

**ulRevisionNum**

This value is returned by the function and indicates the revision of the device.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

## 5.1.9 Oct6100ApiGetVersion

This routine returns the version of the API as a null-terminated string. The user can call this function even if the chip is not open. This function does not require the tOCT6100\_INSTANCE\_API structure.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ApiGetVersionDef (
    tPOCT6100_API_GET_VERSION          f_pApiGetVersion );

UINT32 Oct6100ApiGetVersion (
    tPOCT6100_API_GET_VERSION          f_pApiGetVersion );
```

### Parameters

f\_pApiGetVersion      pointer to a tOCT6100\_API\_GET\_VERSION structure. The definitions of the structure's elements are listed below. The user allocates this structure.

### 5.1.9.1 tOCT6100\_API\_GET\_VERSION Structure

**achApiVersion**      array

This character array contains the string version of the API. This string is always terminated with a null-character.

Direction: OUT      Type: UINT8[ 64 ]

Default:      achApiVersion [ 0 - 63 ] = '\0';

### 5.1.10 Oct6100FreeResources

This routine closes all open channels and removes them from any dependencies, such as conference bridges. Optionally, other function parameters allow the user to close these other resources, such as conference bridges or TSI connections.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100FreeResourcesDef (
    tPOCT6100_FREE_RESOURCES          f_pFreeResources );

UINT32 Oct6100FreeResources (
    tPOCT6100_INSTANCE_API            f_pApiInstance,
    tPOCT6100_FREE_RESOURCES          f_pFreeResources );
```

#### Parameters

**f\_pFreeResources** pointer to a tOCT6100\_FREE\_RESOURCES structure. The definitions of the structure's elements are listed below. The user allocates this structure.

#### 5.1.10.1 tOCT6100\_FREE\_RESOURCES Structure

<b>fFreeTsiConnections</b>	TRUE / FALSE
If this parameter is set to TRUE, all opened TSI connections will be closed.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fFreeConferenceBridges</b>	TRUE / FALSE
If this parameter is set to TRUE, all opened conference bridges will be closed.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fFreePlayoutBuffers</b>	TRUE / FALSE
If this parameter is set to TRUE, all loaded playout buffers in external memory will be unloaded.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fFreePhasingTssts</b>	TRUE / FALSE
If this parameter is set to TRUE, all opened phasing TSSTs will be closed.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fFreeAdpcmChannels</b>	TRUE / FALSE
If this parameter is set to TRUE, all opened ADPCM channels will be closed.	
Direction: IN	Type: BOOL
Default:	FALSE

### 5.1.11 Oct6100ProductionBist

This routine returns the current production BIST status information through the **tOCT6100\_PRODUCTION\_BIST** structure members. Typically, the user will call this function periodically until the **ulBistStatus** member changes from **cOCT6100\_BIST\_IN\_PROGRESS** to another value. This function is only available if the **fEnableProductionBist** flag of the **tOCT6100\_CHIP\_OPEN** structure was set to TRUE.

#### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ProductionBistDef (
    tPOCT6100_PRODUCTION_BIST          f_pProductionBist );

UINT32 Oct6100ProductionBist (
    tPOCT6100_INSTANCE_API              f_pApiInstance,
    tPOCT6100_PRODUCTION_BIST          f_pProductionBist );
```

#### Parameters

**f\_pProductionBist**      pointer to a **tOCT6100\_PRODUCTION\_BIST** structure. The definitions of the structure's elements are listed below. The user allocates this structure.

#### 5.1.11.1 tOCT6100\_PRODUCTION\_BIST Structure

<b>ulCurrentLoop</b>	0 - <b>ulNumProductionBistLoops</b>
The current BIST loop. The upper range of this parameter is defined by the <b>ulNumProductionBistLoops</b> of the <b>tOCT6100_OPEN_CHIP</b> structure.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulCurrentAddress</b>	32-bit value
The current address in external memory being checked.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulCurrentTest</b>	1 – 3
The current test being executed:	
1. Walking bit set to '1'.	
2. Walking bit set to '0'.	
3. Walking bit set to '1'.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE

**ulBistStatus**

cOCT6100\_BIST\_IN\_PROGRESS  
cOCT6100\_BIST\_CONFIGURATION\_FAILED  
cOCT6100\_BIST\_STATUS\_CRC\_FAILED  
cOCT6100\_BIST\_MEMORY\_FAILED  
cOCT6100\_BIST\_SUCCESS

The current external memory BIST status. Here is a brief description of each status.

**cOCT6100\_BIST\_IN\_PROGRESS**

The BIST is in progress and no errors have been detected yet. **ulCurrentLoop** and **ulCurrentAddress** give an approximation of the progress.

**cOCT6100\_BIST\_CONFIGURATION\_FAILED**

The initial configuration of the internal processors failed. The BIST could not take place.

**cOCT6100\_BIST\_STATUS\_CRC\_FAILED**

The current status event's CRC did not match the computed value. The small region in external memory used to exchange information between the API and the firmware is corrupted.

**cOCT6100\_BIST\_MEMORY\_FAILED**

The external memory BIST failed at location **ulFailedAddress**. The firmware read value **ulReadValue** while expecting **ulExpectedValue**.

**cOCT6100\_BIST\_SUCCESS**

The BIST completed successfully. No errors were detected.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_BIST\_IN\_PROGRESS

**ulFailedAddress**

0x08000000 – (0x08000000 + external memory size)  
cOCT6100\_INVALID\_VALUE

If **ulBistStatus** is set to cOCT6100\_BIST\_MEMORY\_FAILED, this parameter represents the address in external memory where the failure occurred.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

**ulReadValue**

32-bit value

If **ulBistStatus** is set to cOCT6100\_BIST\_MEMORY\_FAILED, this parameter represents the value read at the failed location.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

**ulExpectedValue**

32-bit value

If **ulBistStatus** is set to cOCT6100\_BIST\_MEMORY\_FAILED, this parameter represents the expected value that should have been read at the failed location.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

## 5.1.12 Oct6100ApiGetCapacityPins

This routine returns the channel capacity supported by this chip. The API determines the capacity by reading the 4 CAPACITY pins on the device to identify their state, either '0' or '1'. If the hardware implementation incorrectly pulls these 4 pins to the wrong value, the API will return this incorrect value.

The user MUST call this function when the chip is NOT open and when no other process is using the chip. This API function is not serialized.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ApiGetCapacityPinsDef (
    tPOCT6100_API_GET_CAPACITY_PINS        f_pGetCapacityPins );

UINT32 Oct6100ApiGetCapacityPins (
    tPOCT6100_INSTANCE_API                 f_pApiInstance,
    tPOCT6100_API_GET_CAPACITY_PINS        f_pGetCapacityPins );
```

### Parameters

**f\_pGetCapacityPins** pointer to a tPOCT6100\_API\_GET\_CAPACITY\_PINS structure. The definitions of the structure's elements are listed below. The user allocates this structure.

### 5.1.12.1 tOCT6100\_API\_GET\_CAPACITY\_PINS Structure

**pProcessContext** pointer

In some systems the user-provided functions (read, write, serialization, time, etc) may need a context structure in order to communicate with the host OS. The API passes this pointer to all user functions allowing the user function to retrieve the correct context. This parameter may be ignored by the user if it is not needed.

Direction: IN                      Type: PVOID

Default:                              NULL

**ulUserChipId** identifier

This value is passed to create the unique semaphore names that are associated to a single API instance.

Direction: IN                      Type: UINT32

Default:                              0

**ulMemoryType** cOCT6100\_MEM\_TYPE\_SDR  
cOCT6100\_MEM\_TYPE\_DDR

The type of RAM memory used with the chip.

Direction: IN                      Type: UINT32

Default:                              cOCT6100\_MEM\_TYPE\_DDR



**fEnableMemClkOut**

TRUE / FALSE

If **ulMemoryType** is set to **cOCT6100\_MEMORY\_TYPE\_SDR** this parameter indicates whether the pins **SDRAM\_CLK\_O[0,1]** are to be driven by the chip. If **DDR RAM** is used it indicates whether pins **DDRAM\_[CK\_O, NCK\_O, CK\_LOCAL\_O]** are to be driven by the chip. If set to **TRUE**, then the clock is to be generated internally at the frequency specified by **ulMemClkFreq**.

Direction: IN

Type: BOOL

Default:

TRUE

**ulMemClkFreq**

133000000

The frequency of the memory interface, in Hz.

If **fEnableMemClkOut** is **FALSE** then this parameter indicates the frequency of the oscillator.

If **fEnableMemClkOut** is **TRUE**, then this parameter indicates the clock frequency that the chip will generate.

Direction: IN/OUT

Type: UINT32

Default:

133000000 (133 MHz)

**ulCapacityValue**

16,32,64,128,256,512,672

The maximum number of channels supported by this chip.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

## 5.2 Channel Functions

These functions are used to open, close and monitor echo channels.

Here is a short list of the features supported by a channel:

- *ADPCM Compression / decompression*
- *Silence suppression*
- *Adaptive noise reduction*
- *DC offset removal*
- *RIN/SOUT level control*

### 5.2.1 Oct6100ChannelOpen

This function opens an echo cancellation channel.

The channel configuration is broken down into 4 configuration sections: the main channel, the TDM, the VQE and the CODEC configuration sections.

If opened with all the default parameters, the channel's echo cancellation operation mode is set to power-down. The echo cancellation process must remain in this mode until the input ports (RIN and SIN) are assigned a valid H.100 TDM timeslot. Note that traffic can still go through the channel if the echo cancellation operation mode is in power-down but VQE features are not available.

Assignment of a timeslot can be done with the **Oct6100ChannelOpen** or **Oct6100ChannelModify** functions. Calling **Oct6100ChannelModify** will activate the echo cancellation process of a channel if **ulEchoOperationMode** is set to **cOCT6100\_ECHO\_OP\_MODE\_NORMAL** and the two input ports are assigned to a valid H.100 TDM timeslot.

This function returns a handle by which the API identifies this channel.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChannelOpenDef (
    tPOCT6100_CHANNEL_OPEN                f_pChannelOpen );

UINT32 Oct6100ChannelOpen (
    tPOCT6100_INSTANCE_API                f_pApiInstance,
    tPOCT6100_CHANNEL_OPEN                f_pChannelOpen );
```

#### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pChannelOpen	Pointer to a tOCT6100_CHANNEL_OPEN structure. The structure's elements are defined below. The user allocates this structure.

### 5.2.1.1 tOCT6100\_CHANNEL\_OPEN Structure

**pulChannelHndl**

handle

The parameter returns the handle for the created channel. This handle is a unique value that identifies the channel in all future function calls that affects this channel. The user allocates the memory for this pointer.

Direction: IN/OUT

Type: PUINT32

Default:

NULL

**ulUserChanId**

32-bit value

User specified field stored in the API channel structure. This parameter is returned with the channel handle when an event is detected for the current channel.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

**ulEchoOperationMode**

cOCT6100\_ECHO\_OP\_MODE\_NORMAL  
cOCT6100\_ECHO\_OP\_MODE\_HT\_FREEZE  
cOCT6100\_ECHO\_OP\_MODE\_HT\_RESET  
cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN  
cOCT6100\_ECHO\_OP\_MODE\_NO\_ECHO  
cOCT6100\_ECHO\_OP\_MODE\_SPEECH\_RECOGNITION

This parameter indicates the echo channel operation mode.

To bypass the echo canceller this parameter must be set to cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN. Use this mode for BERT testing or TDM bypass tests. The state of the channel should be set to cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN and then set to cOCT6100\_ECHO\_OP\_MODE\_NORMAL at the start of each call. This will reset the AF and NLP context. Resetting the echo-path model at the beginning of the call will ensure that the OCT6100 converges as quickly as possible on the new echo-path.

Setting the mode to cOCT6100\_ECHO\_OP\_MODE\_HT\_FREEZE prevents the AF from updating its echo-path model. The OCT6100 will keep the last echo-path model found and apply it to the signal. This mode is typically only used for validation tests such as G.168 tests and is not used in applications.

Setting the mode to cOCT6100\_ECHO\_OP\_MODE\_HT\_RESET clears the echo-path model, making the Adaptive Filter transparent. To render the OCT6100 completely transparent, the NLP must also be disabled. This mode is typically used for tests; controlling the AF is required for G.168 testing.

If using the cOCT6100\_ECHO\_OP\_MODE\_NO\_ECHO operation mode, the **fEnableNlp** parameter of the voice quality enhancement configuration structure must be set to TRUE. This mode allows voice quality features (adaptive noise reduction, automatic level control, buffer playout, tone detection, etc...) to be used without performing echo cancellation.

Finally, the cOCT6100\_ECHO\_OP\_MODE\_SPEECH\_RECOGNITION operation mode is used when echo cancellation needs to be enabled but not the NLP, while still allowing voice quality features. For this mode to work correctly, the **fEnableNlp** parameter of the voice quality enhancement configuration structure also needs to be set to TRUE, even though the NLP will not act on the signal. Also, the **ulComfortNoiseMode** must not be set to cOCT6100\_COMFORT\_NOISE\_OFF.

Certain features can only be enabled in certain operation modes. Refer to the **Echo Operation Mode** section at the end of this document for a detailed table.

Direction: IN

Type: UINT32

Default:

cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN

**fEnableToneDisabler**

TRUE / FALSE

If TRUE, echo cancellation and the NLP will be disabled on the channel upon detection of a 2100 Hz signal with phase reversals, and only the NLP will be disabled on the channel upon detection of a 2100 Hz signal without phase reversals. Echo cancellation on the channel will resume upon detection of a guard-band following the disabling signal.

Direction: IN

Type: BOOL

Default:

FALSE

**fEnableExtToneDetection**

TRUE / FALSE

Setting this parameter to TRUE enables the extended tone detection mode for this channel. This mode allows detection of tones on both RIN and SIN, but at half the channel capacity.

To activate this mode, the API must be configured to support extended tone detection (done by setting **fEnableExtToneDetection** (tOCT6100\_CHIP\_OPEN) to TRUE). Note that the tone profile used should be one with all tones detected on the SIN port. Enabling this mode will then also perform tone detection on the RIN port.

Direction: IN

Type: BOOL

Default:

FALSE

**TdmConfig**

structure

This structure contains all parameters related to the TDM interface of a channel. The RIN, ROUT, SIN and SOUT port values are assigned within this structure.

Direction: IN

Type: tOCT6100\_CHANNEL\_OPEN\_TDM

Default:

see structure description

**VqeConfig**

structure

This structure contains all the voice quality enhancement parameters.

Direction: IN

Type: tOCT6100\_CHANNEL\_OPEN\_VQE

Default:

see structure description

**CodecConfig**

structure

This structure contains all encoder/decoder related parameters.

Direction: IN

Type: tOCT6100\_CHANNEL\_OPEN\_CODEC

Default:

see structure description

### 5.2.1.2 tOCT6100\_CHANNEL\_OPEN\_TDM Structure

**ulSinPcmLaw** cOCT6100\_PCM\_U\_LAW  
cOCT6100\_PCM\_A\_LAW

This parameter represents the PCM law of the samples read from the SIN port of the channel.

Direction: IN Type: UINT32  
Default: cOCT6100\_PCM\_U\_LAW

**ulSinNumTssts** 1, 2

This parameter indicates the number of TSSTs used for the SIN port. See the **TSST Formats** section for more information.

Direction: IN Type: UINT32  
Default: 1

**ulSinTimeslot** 0 – 255 for 16 MHz stream frequency  
0 – 127 for 8 MHz stream frequency  
0 – 63 for 4 MHz stream frequency  
0 – 31 for 2 MHz stream frequency  
cOCT6100\_UNASSIGNED

The TDM timeslot of the channel's SIN port. Note that allowed values are affected by the frequency of the clock that controls the **ulSinStream**.

If the value of **ulSinTimeslot** is unknown when the channel is opened, this parameter must be set to cOCT6100\_UNASSIGNED. Note that if **ulSinTimeslot** is set to cOCT6100\_UNASSIGNED, **ulSinStream** must also be set to cOCT6100\_UNASSIGNED. This parameter can be configured later by a call to **Oct6100ChannelModify**.

Direction: IN Type: UINT32  
Default: cOCT6100\_UNASSIGNED

**ulSinStream** 0 – 31 for **ulMaxTdmStreams** of 32  
0 – 15 for **ulMaxTdmStreams** of 16  
0 – 7 for **ulMaxTdmStreams** of 8  
0 – 3 for **ulMaxTdmStreams** of 4  
cOCT6100\_UNASSIGNED

The TDM stream of the channel's SIN port. Note that allowed values are affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

If the value of **ulSinStream** is unknown when the channel is opened, this parameter must be set to cOCT6100\_UNASSIGNED. Note that if **ulSinStream** is set to cOCT6100\_UNASSIGNED, **ulSinTimeslot** must also be set to cOCT6100\_UNASSIGNED. This parameter can be configured later by a call to **Oct6100ChannelModify**.

Direction: IN Type: UINT32  
Default: cOCT6100\_UNASSIGNED

<b>ulRinPcmLaw</b>	cOCT6100_PCM_U_LAW cOCT6100_PCM_A_LAW
This parameter represents the PCM law of the samples read from the RIN port of the channel.	
Direction: IN	Type: UINT32
Default:	cOCT6100_PCM_U_LAW
<b>ulRinNumTssts</b>	1, 2
This parameter indicates the number of TSSTs used for the RIN port. Refer to the <b>TSST Formats</b> section for more information.	
Direction: IN	Type: UINT32
Default:	1
<b>ulRinTimeslot</b>	see <b>ulSinTimeslot</b> parameter
The TDM timeslot of the channel's RIN port. Note that allowed values are affected by the frequency of the clock that controls the <b>ulRinStream</b> .	
If the value of <b>ulRinTimeslot</b> is unknown when the channel is opened, this parameter must be set to cOCT6100_UNASSIGNED. Note that if <b>ulRinTimeslot</b> is set to cOCT6100_UNASSIGNED, <b>ulRinStream</b> must also be set to cOCT6100_UNASSIGNED. This parameter can be configured later by a call to <b>Oct6100ChannelModify</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_UNASSIGNED
<b>ulRinStream</b>	see <b>ulSinStream</b> parameter
The TDM stream of the channel's RIN port. Note that allowed values are also affected by the <b>ulMaxTdmStreams</b> value specified at the <b>Oct6100ChipOpen</b> call.	
If the value of <b>ulRinStream</b> is unknown when the channel is opened, this parameter must be set to cOCT6100_UNASSIGNED. Note that if <b>ulRinStream</b> is set to cOCT6100_UNASSIGNED, <b>ulRinTimeslot</b> must also be set to cOCT6100_UNASSIGNED. This parameter can be configured later by a call to <b>Oct6100ChannelModify</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_UNASSIGNED
<b>ulSoutPcmLaw</b>	cOCT6100_PCM_U_LAW cOCT6100_PCM_A_LAW
This parameter represents the PCM law of the samples driven by the SOUT port of the channel.	
Direction: IN	Type: UINT32
Default:	cOCT6100_PCM_U_LAW
<b>ulSoutNumTssts</b>	1, 2
This parameter indicates the number of TSSTs used for the SOUT port. Refer to the <b>TSST Formats</b> section for more information.	
Direction: IN	Type: UINT32
Default:	1

#### **ulSoutTimeslot**

see **ulSinTimeslot** parameter

The TDM timeslot of the channel's SOUT port. Note that allowed values are affected by the frequency of the clock that controls the **ulSoutStream**.

If the value of **ulSoutTimeslot** is unknown when the channel is opened, this parameter must be set to **cOCT6100\_UNASSIGNED**. Note that if **ulSoutTimeslot** is set to **cOCT6100\_UNASSIGNED**, **ulSoutStream** must also be set to **cOCT6100\_UNASSIGNED**. This parameter can be configured later by a call to **Oct6100ChannelModify**.

Direction: IN

Type: UINT32

Default:

**cOCT6100\_UNASSIGNED**

#### **ulSoutStream**

see **ulSinStream** parameter

The TDM stream of the channel's SOUT port. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

If the value of **ulSoutStream** is unknown when the channel is opened, this parameter must be set to **cOCT6100\_UNASSIGNED**. Note that if **ulSoutStream** is set to **cOCT6100\_UNASSIGNED**, **ulSoutTimeslot** must also be set to **cOCT6100\_UNASSIGNED**. This parameter can be configured later by a call to **Oct6100ChannelModify**.

Direction: IN

Type: UINT32

Default:

**cOCT6100\_UNASSIGNED**

#### **ulRoutPcmLaw**

**cOCT6100\_PCM\_U\_LAW**  
**cOCT6100\_PCM\_A\_LAW**

This parameter represents the PCM law of the samples driven by the ROUT port of the channel.

Direction: IN

Type: UINT32

Default:

**cOCT6100\_PCM\_U\_LAW**

#### **ulRoutNumTssts**

1, 2

This parameter indicates the number of TSSTs used for the Rout port. Refer to the **TSST Formats** section for more information.

Direction: IN

Type: UINT32

Default:

1

#### **ulRoutTimeslot**

see **ulSinTimeslot** parameter

The TDM timeslot of the channel's ROUT port. Note that allowed values are affected by the frequency of the clock that controls the **ulRoutStream**.

If the value of **ulRoutTimeslot** is unknown when the channel is opened, this parameter must be set to **cOCT6100\_UNASSIGNED**. Note that if **ulRoutTimeslot** is set to **cOCT6100\_UNASSIGNED**, **ulRoutStream** must also be set to **cOCT6100\_UNASSIGNED**. This parameter can be configured later by a call to **Oct6100ChannelModify**.

Direction: IN

Type: UINT32

Default:

**cOCT6100\_UNASSIGNED**



**ulRoutStream**

see **ulSinStream** parameter

The TDM stream of the channel's ROUT port. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

If the value of **ulRoutStream** is unknown when the channel is opened, this parameter must be set to **cOCT6100\_UNASSIGNED**. Note that if **ulRoutStream** is set to **cOCT6100\_UNASSIGNED**, **ulRoutTimeslot** must also be set to **cOCT6100\_UNASSIGNED**. This parameter can be configured later by a call to **Oct6100ChannelModify**.

Direction: IN

Type: UINT32

Default:

**cOCT6100\_UNASSIGNED**

### 5.2.1.3 tOCT6100\_CHANNEL\_OPEN\_VQE Structure

**fEnableNlp** TRUE / FALSE

If TRUE, the NLP will be activated on this channel. The NLP should only be disabled when performing controlled tests such as G.168 compliance testing or TDM bypass tests.

Some features cannot be used when this parameter is set to FALSE. Refer to **Echo operation mode** section at the end of this document for more information.

Direction: IN Type: BOOL

Default: TRUE

**fEnableTailDisplacement** TRUE / FALSE

If TRUE, tail displacement will be supported by this channel. The **ulTailDisplacement** parameter specifies the offset of the echo cancellation window.

Tail displacement can be used when the echo path delay exceeds the tail length. This is necessary when using a link with a fixed network delay in the echo path.

Direction: IN Type: BOOL

Default: FALSE

**ulTailDisplacement** 0 - 896  
cOCT6100\_AUTO\_SELECT\_TAIL

This parameter represents the offset of the echo cancellation window, in milliseconds. Setting this parameter to cOCT6100\_AUTO\_SELECT\_TAIL uses the tail displacement value specified when the chip was opened. This parameter is ignored if **fEnableTailDisplacement** is set to FALSE. Note that the actual tail displacement value used in the chip is in 16 ms increments. For example, if the value set in **ulTailDisplacement** is 511 ms, the actual tail displacement setting will be 496 ms.

Direction: IN Type: UINT32

Default: cOCT6100\_AUTO\_SELECT\_TAIL

**ulTailLength** 32 – 128 ms (increment of 4 ms)  
cOCT6100\_AUTO\_SELECT\_TAIL

This parameter represents the maximum tail length, in milliseconds, to be used on the channel. The value is specified in increments of 4 milliseconds. This value cannot be modified once the channel is opened. Setting this parameter to cOCT6100\_AUTO\_SELECT\_TAIL uses the maximum tail length supported by the image.

Direction: IN Type: UINT32

Default: cOCT6100\_AUTO\_SELECT\_TAIL

**fSinDcOffsetRemoval**

TRUE / FALSE

If TRUE, the DC Offset Removal module will remove the DC offset of the SIN signal. Enabling DC offset removal will improve the performance of the echo canceller and should always be left on. It can be turned off for bypass tests.

DC offsets are introduced by various low-frequency noise sources, such as electrical interference.

Direction: IN

Type: BOOL

Default:

TRUE

**fRinDcOffsetRemoval**

TRUE / FALSE

If TRUE, the DC Offset Removal module will remove the DC offset of the RIN signal.

Direction: IN

Type: BOOL

Default:

TRUE

**fRinLevelControl**

TRUE / FALSE

If FALSE, the Level Control module will be bypassed. Note that the **fRinAutomaticLevelControl** flag must be set to FALSE for the Level Control module to perform correctly.

Direction: IN

Type: BOOL

Default:

FALSE

**IRinLevelControlGainDb**

-24 – 24

If **fRinLevelControl** is set to TRUE, then this parameter is the gain applied to the RIN signal.

Direction: IN

Type: INT32

Default:

0

**fSoutLevelControl**

TRUE / FALSE

If FALSE, the Level Control module will be bypassed. Note that the **fSoutAutomaticLevelControl** flag must be set to FALSE for the Level Control module to perform correctly.

Direction: IN

Type: BOOL

Default:

FALSE

**ISoutLevelControlGainDb**

-24 – 24

If **fSoutLevelControl** is set to TRUE, then this parameter is the gain applied to the SOUT signal.

Direction: IN

Type: INT32

Default:

0

**fRinAutomaticLevelControl** TRUE / FALSE

When set to TRUE, the Automatic Level Control (ALC) module will be activated on the RIN path. ALC allows the user to specify a target level for the voice of the talker on the line. The level is set using the **IRinAutomaticLevelControlTargetDb** parameter. Note that the **fRinLevelControl** and **fRinHighLevelCompensation** flags must be set to FALSE for the Automatic Level Control module to perform correctly.

Direction: IN                      Type: BOOL  
Default:                              FALSE

**IRinAutomaticLevelControlTargetDb** -40 – 0

If **fRinAutomaticLevelControl** is set to TRUE, then this parameter is the target level, in dBm0, to be reached on the RIN signal.

Direction: IN                      Type: INT32  
Default:                              -20

**fSoutAutomaticLevelControl** TRUE / FALSE

When set to TRUE, the Automatic Level Control (ALC) module will be activated on the SOUT path. ALC allows the user to specify a target level for the voice of the talker on the line. The level is set using the **ISoutAutomaticLevelControlTargetDb** parameter. Note that the **fSoutLevelControl** flag must be set to FALSE for the Automatic Level Control module to perform correctly.

Direction: IN                      Type: BOOL  
Default:                              FALSE

**ISoutAutomaticLevelControlTargetDb** -40 – 0

If **fSoutAutomaticLevelControl** is set to TRUE, then this parameter is the target level, in dBm0, to be reached on the SOUT signal.

Direction: IN                      Type: INT32  
Default:                              -20

**fRinHighLevelCompensation** TRUE / FALSE

When set to TRUE, the High Level Compensation (HLC) module will be activated on the RIN path. HLC reduces the signal level when it approaches saturation, to avoid the introduction of non-linearities into the echo path. The threshold for saturation is set using the **IRinHighLevelCompensationThresholdDb** parameter. Note that the **fRinLevelControl** and **fRinAutomaticLevelControl** flags must be set to FALSE for the High Level Compensation module to perform correctly.

Direction: IN                      Type: BOOL  
Default:                              FALSE

**IRinHighLevelCompensationThresholdDb** -40 – 0

If **fRinHighLevelCompensation** is set to TRUE, then this parameter represents, in dBm0, the automatically adjusted threshold on the RIN signal.

Direction: IN                      Type: INT32  
Default:                              -10

**fSoutAdaptiveNoiseReduction**      TRUE / FALSE

If FALSE, the Adaptive Noise Reduction module is bypassed. This feature is available only with OCT61x6 devices. If this feature is enabled in an OCT61x2 or OCT61x4 device, the function will return the error cOCT6100\_ERR\_NOT\_SUPPORTED\_CHANNEL\_ANR.

Direction: IN      Type: BOOL  
Default:      FALSE

**ulComfortNoiseMode**      cOCT6100\_COMFORT\_NOISE\_NORMAL  
cOCT6100\_COMFORT\_NOISE\_FAST\_LATCH  
cOCT6100\_COMFORT\_NOISE\_EXTENDED  
cOCT6100\_COMFORT\_NOISE\_OFF

This parameter represents the comfort noise applied to the channel. Here is a brief description of each mode.

**cOCT6100\_COMFORT\_NOISE\_NORMAL**

This mode gives optimal subjective results. It may not pass certain objective tests.

**cOCT6100\_COMFORT\_NOISE\_FAST\_LATCH**

This mode is similar to the normal mode but delivers rapid latching of background noise at the beginning of a call. Certain wireless carriers prefer this mode of operation. It may not pass certain objective tests.

**cOCT6100\_COMFORT\_NOISE\_EXTENDED**

This mode is fully G.168 compliant. It delivers good subjective quality.

**cOCT6100\_COMFORT\_NOISE\_OFF**

This mode turns off the comfort noise generation. This may be required in certain machine-connected applications such as speech recognition or power measurements.

Direction: IN      Type: UINT32  
Default:      cOCT6100\_COMFORT\_NOISE\_NORMAL

**fDtmfToneRemoval**      TRUE / FALSE

If TRUE, the OCT6100 will remove any DTMF tones detected on the SIN port.

Direction: IN      Type: BOOL  
Default:      FALSE

**fAcousticEcho**      TRUE / FALSE

If TRUE, acoustic echo cancellation will be performed on the channel. This parameter should only be enabled in acoustic echo situations, where the echo path is highly non-linear. Enabling this parameter will lower the amount of residual echo perceived, while increasing the risk of double-talk clipping.

Direction: IN      Type: BOOL  
Default:      FALSE

**fSoutNoiseBleaching**

TRUE / FALSE

If TRUE, the SOUT noise bleaching module is enabled. This parameter activates a noise reduction algorithm that completely removes all background noise present while silence is detected. The target application of this algorithm is for pre-processing of the signal before mixing with another signal (such as music). Note that using this algorithm alone (without post-mixing) will not provide good subjective quality because it removes all ambient sound during silence periods.

This feature is only available with OCT61x6 devices. If this feature is enabled in an OCT61x2 or OCT61x4 device, the function will return the error cOCT6100\_ERR\_NOT\_SUPPORTED\_CHANNEL\_NOISE\_BLEACHING.

Direction: IN

Type: BOOL

Default:

FALSE

**fSoutConferencingNoiseReduction** TRUE / FALSE

If FALSE, the conferencing noise reduction module is bypassed. This feature is available only with OCT61x6 devices. If this feature is enabled in an OCT61x2 or OCT61x4 device, the function will return the error cOCT6100\_ERR\_NOT\_SUPPORTED\_CHANNEL\_CNR.

Direction: IN

Type: BOOL

Default:

FALSE

**ulNonLinearityBehaviorA** 0 - 13

This parameter adjusts the behavior of the echo canceller when non-linear white noise affects the echo-cancelled path.

Here is a table describing the behavior of the algorithm based on the selected value.

Parameter value	Risk of double talk clipping	Risk of residual echo
0	Decreased	Increased
13	Increased	Decreased

Direction: IN                      Type: UINT32  
Default:                              1

**ulNonLinearityBehaviorB** 0 - 8

This parameter adjusts the behavior of the echo canceller when spectrally rich noise affects the echo-cancelled path.

Here is a table describing the behavior of the algorithm based on the selected value.

Parameter value	Risk of double talk clipping	Risk of residual echo
0	Decreased	Increased
8	Increased	Decreased

Direction: IN                      Type: UINT32  
Default:                              0

**ulDoubleTalkBehavior** cOCT6100\_DOUBLE\_TALK\_BEH\_NORMAL  
cOCT6100\_DOUBLE\_TALK\_BEH\_LESS\_AGGRESSIVE

This parameter configures the behavior of the algorithm on double talk. Setting this parameter to cOCT6100\_DOUBLE\_TALK\_BEH\_NORMAL will give the best optimal subjective results. When setting this parameter to cOCT6100\_DOUBLE\_TALK\_BEH\_LESS\_AGGRESSIVE, the NLP will be less aggressive, resulting in slightly improved double talk behavior, but may leave residual echo.

The parameter cOCT6100\_DOUBLE\_TALK\_BEH\_LESS\_AGGRESSIVE should only be used in network situations where the echo response is known to be very linear.

Direction: IN                      Type: UINT32  
Default:                              cOCT6100\_DOUBLE\_TALK\_BEH\_NORMAL

**IDefaultEriDb** 0, -3, -6, -9 or -12 dB

The default ERL that is assumed by the NLP when not converged, e.g. at the beginning of a call.

Direction: IN                      Type: INT32  
Default:                              -6 dB

**IAecDefaultErlDb** 0, -3 or -6 dB

The acoustic echo cancellation default ERL that is assumed.

Direction: IN Type: INT32

Default: 0 dB

**ulAecTailLength** 128, 256, 512 or 1024 ms

This parameter represents the maximum tail length, in milliseconds, to be used on the channel, when performing acoustic echo cancellation. This value must be greater than the configured channel tail length (**ulTailLength**) plus the requested tail displacement (**ulTailDisplacement**).

Direction: IN Type: UINT32

Default: 128 ms

**ulSoutAutomaticListenerEnhancementGainDb** 0 - 30

The SOUT automatic listener enhancement gain that will be applied. This feature adjusts the level of the Sin Path to compensate for loud noise present in the environment of the listener. This value determines by how many dBs the user wants the SIN voice to be above the RIN noise. Setting this parameter to 0 will disable this feature.

Direction: IN Type: UINT32

Default: 0

**fSoutNaturalListenerEnhancement** TRUE / FALSE

If TRUE, the SOUT natural listener enhancement module will be activated. The natural listener enhancement algorithm will adjust the voice level of the SOUT talker to the RIN voice level or to the value above the noise set by **ulSoutAutomaticListenerEnhancementGainDb**. The algorithm will use as a target the highest of the two.

Direction: IN Type: BOOL

Default: FALSE

**ulSoutNaturalListenerEnhancementGainDb** 0 - 30

The SOUT natural listener enhancement gain that will be applied. This value determines by how many dBs the user wants the SIN voice to be above the RIN background noise.

Direction: IN Type: UINT32

Default: 0

**IAnrSnrEnhancementDb** -9, -12, -15, -18, -21, -24, -27 or -30 dB

If the SOUT adaptive noise reduction module is activated, this parameter represents the attenuation that will be applied to the noise signal.

Direction: IN Type: INT32

Default: -18 dB



**ulAnrVoiceNoiseSegregation** 0 - 15

This parameter affects the behavior of the SOUT adaptive noise reduction algorithm. It is used to adjust the algorithm that differentiates between noise and voice. This will determine which part of the signal is reduced.

Here is a table describing the behavior of the algorithm based on the selected values.

Parameter value	Aggressiveness in considering what is a noise signal
0	Least – Only very pure background noise will be considered as background noise
6	Default - For optimal operation
15	Most – All low energy voice will be considered as background noise

Direction: IN                      Type: UINT32  
Default:                              6

**ulToneDisablerVqeActivationDelay** 300, 300 + N\*512, 16172 ms  
(increments of 512 ms)

The following feature only applies if the tone disabler is activated. After detection of a 2100 Hz tone or 2100 Hz tone with phase reversal, the tone disabler disables VQE features. After the data transmission is complete, this parameter specifies the required silence period before the re-activation of the VQE features. The value is specified in increments of 512 milliseconds.

Direction: IN                      Type: UINT32  
Default:                              300

**fEnableMusicProtection** TRUE / FALSE

If TRUE, the Octasic Music Protection module will be activated.

Effective Music Protection means that music heard while “on hold” or in the background of speech during phone conversations is not cut, clipped or incorrectly transmitted by the echo canceller on the line.

Direction: IN                      Type: BOOL  
Default:                              FALSE

**fIdleCodeDetection** TRUE / FALSE

If TRUE, the idle code detection module will be activated. The idle code detector will reinitialize the state of the Adaptive Filter between calls to achieve faster convergence at the beginning of each call. The idle code detector module will also reset the context of the following modules:

- Automatic Level Control
- Automatic Listener Enhancement
- High Level Compensation
- Natural Listener Enhancement

The idle code detector triggers when a low energy signal or constant DC offset is detected on RIN and SIN ports for 1 second.

Direction: IN                      Type: BOOL  
Default:                              TRUE

#### 5.2.1.4 tOCT6100\_CHANNEL\_OPEN\_CODEC Structure

**ulAdpcmNibblePosition** cOCT6100\_ADPCM\_IN\_LOW\_BITS  
cOCT6100\_ADPCM\_IN\_HIGH\_BITS

This is the position of the ADPCM bits within the H.100 TDM timeslot.

Direction: IN

Type: UINT32

Default:

cOCT6100\_ADPCM\_IN\_LOW\_BITS

**ulEncoderPort** cOCT6100\_CHANNEL\_PORT\_ROUT  
cOCT6100\_CHANNEL\_PORT\_SOUT  
cOCT6100\_NO\_ENCODING

This parameter is the channel port used by the encoder.

If set to **cOCT6100\_NO\_ENCODING**, no encoding can take place on this channel.

Direction: IN

Type: UINT32

Default:

cOCT6100\_CHANNEL\_PORT\_SOUT

**ulEncodingRate** cOCT6100\_G711\_64KBPS  
cOCT6100\_G726\_40KBPS  
cOCT6100\_G726\_32KBPS  
cOCT6100\_G726\_24KBPS  
cOCT6100\_G726\_16KBPS  
cOCT6100\_G727\_40KBPS\_4\_1  
cOCT6100\_G727\_40KBPS\_3\_2  
cOCT6100\_G727\_40KBPS\_2\_3  
cOCT6100\_G727\_32KBPS\_4\_0  
cOCT6100\_G727\_32KBPS\_3\_1  
cOCT6100\_G727\_32KBPS\_2\_2  
cOCT6100\_G727\_24KBPS\_3\_0  
cOCT6100\_G727\_24KBPS\_2\_1  
cOCT6100\_G727\_16KBPS\_2\_0

This parameter represents the rate of the encoder. G.727 defines contain a suffix: The first number is the number of core bits, and the second is the number of enhanced bits.

The API ignores this parameter if **ulEncoderPort** is set to cOCT6100\_NO\_ENCODING.

Direction: IN

Type: UINT32

Default:

cOCT6100\_G711\_64KBPS

**ulDecoderPort** cOCT6100\_CHANNEL\_PORT\_RIN  
cOCT6100\_CHANNEL\_PORT\_SIN  
cOCT6100\_NO\_DECODING

This parameter is the channel port used by the Decoder. The Decoder reads samples coming from the TDM interface. The samples read are decoded and then fed to the Echo Canceller module.

If set to cOCT6100\_NO\_DECODING, no decoding can take place on this channel.

Direction: IN

Type: UINT32

Default:

cOCT6100\_CHANNEL\_PORT\_RIN

### **ulDecodingRate**

cOCT6100\_G711\_64KBPS  
cOCT6100\_G726\_40KBPS  
cOCT6100\_G726\_32KBPS  
cOCT6100\_G726\_24KBPS  
cOCT6100\_G726\_16KBPS  
cOCT6100\_G727\_2C\_ENCODED  
cOCT6100\_G727\_3C\_ENCODED  
cOCT6100\_G727\_4C\_ENCODED  
cOCT6100\_G726\_ENCODED  
cOCT6100\_G711\_G726\_ENCODED  
cOCT6100\_G711\_G727\_2C\_ENCODED  
cOCT6100\_G711\_G727\_3C\_ENCODED  
cOCT6100\_G711\_G727\_4C\_ENCODED

This parameter represents the rate of the decoder. G.727 defines contain a suffix: The first number is the number of core bits, and the second is the number of enhanced bits

If the decoding rate is a combination of G.711 with either G.726 or G.727, the number of TSSTs assigned to the Decoder input port must be set to 2.

The API ignores this parameter if **ulDecoderPort** is set to cOCT6100\_NO\_DECODING.

Direction: IN

Type: UINT32

Default:

cOCT6100\_G711\_64KBPS

### **fEnableSilenceSuppression**

TRUE / FALSE

Silence suppression can be enabled only if **ulEncoderPort** is set to cOCT6100\_CHANNEL\_PORT\_SOUT. Silence suppression is only active when the **ulEchoOperationMode** parameter is not set to cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN.

Silence suppression requires a valid phasing TSST.

The API ignores this parameter if **ulEncoderPort** is set to cOCT6100\_NO\_ENCODING.

Direction: IN

Type: BOOL

Default:

FALSE

### **ulPhasingType**

cOCT6100\_SINGLE\_PHASING  
cOCT6100\_DUAL\_PHASING  
cOCT6100\_NO\_PHASING

It indicates how **ulPhase** is interpreted. See **ulPhase** description for more information. Setting this parameter to cOCT6100\_NO\_PHASING specifies that no phasing TSST is associated with this channel.

The API ignores this parameter if **ulEncoderPort** is set to cOCT6100\_NO\_ENCODING.

Note that silence suppression cannot be enabled (**fEnableSilenceSuppression** set to TRUE) if this parameter is set to cOCT6100\_NO\_PHASING. The OCT6100 device requires a valid phasing TSST to output the silence suppression information on the H.100 bus.

Direction: IN

Type: UINT32

Default:

cOCT6100\_NO\_PHASING

<b>ulPhase</b>	1 – <b>ulPhasing_length</b> – 1
<p>If <b>ulPhasingType</b> specifies <b>cOCT6100_SINGLE_PHASING</b> or <b>cOCT6100_DUAL_PHASING</b>, then the specific phase value used to identify the beginning of a packetization boundary must be specified. The <b>ulPhase</b> indicates the frame in which the external agent SAR is fetching the first sample used to assemble the next packet.</p> <p>When <b>cOCT6100_DUAL_PHASING</b> is specified, the <b>ulPhase</b> indicates the beginning of an ADPCM packet boundary and must be even. A PCM packet boundary must also exist at (<b>ulPhase</b> + (<b>ulPhasingLength</b>/2)) MOD <b>ulPhasingLength</b>.</p> <p><b>ulPhasingLength</b> is specified when a phasing TSST is opened by the <b>Oct6100PhasingTsstOpen</b> function.</p> <p>If <b>ulPhasingType</b> is set to <b>cOCT6100_NO_PHASING</b>, this parameter is ignored. The API ignores this parameter if <b>ulEncoderPort</b> is set to <b>cOCT6100_NO_ENCODING</b>.</p> <p>Direction: IN                      Type: UINT32 Default:                              1</p>	
<b>ulPhasingTsstHndl</b>	phasing TSST handle
<p>If silence suppression is enabled, a valid phasing TSST handle must be specified. A phasing TSST handle is returned by the <b>Oct6100PhasingTsstOpen</b> function.</p> <p>If <b>ulEncoderPort</b> is set to <b>cOCT6100_NO_ENCODING</b> or <b>ulPhasingType</b> is set to <b>cOCT6100_NO_PHASING</b>, this parameter is ignored.</p> <p>Direction: IN                      Type: UINT32 Default:                              <b>cOCT6100_INVALID_HANDLE</b></p>	

## 5.2.2 Oct6100ChannelClose

This function closes a channel.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChannelCloseDef (
    tPOCT6100_CHANNEL_CLOSE          f_pChannelClose );

UINT32 Oct6100ChannelClose (
    tPOCT6100_INSTANCE_API          f_pApilInstance,
    tPOCT6100_CHANNEL_CLOSE          f_pChannelClose );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pChannelClose	Pointer to a tOCT6100_CHANNEL_CLOSE structure. The structure's elements are defined below. The user allocates this structure.

### 5.2.2.1 tOCT6100\_CHANNEL\_CLOSE Structure

ulChannelHndl	handle
---------------	--------

This is the handle of the channel to be closed. This value was returned by a call to **Oct6100ChannelOpen**.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE

## 5.2.3 Oct6100ChannelModify

This function allows the user to dynamically change some of the channel configuration parameters.

In addition to the main channel state, parameters are separated into three categories: TSST, CODEC and VQE.

Each categories is a member of the modify structure and has a modified flag within that main structure (except for the main state). The API will process the changes within a category only if the modified flag is set to TRUE.

Setting a parameter to cOCT6100\_KEEP\_PREVIOUS\_SETTING leaves its value unchanged. Leaving all default values unchanged (except **ulChannelHndl**) will result in no modifications being performed on the channel.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ChannelModifyDef (
    tPOCT6100_CHANNEL_MODIFY      f_pChannelModify );

UINT32 Oct6100ChannelModify (
    tPOCT6100_INSTANCE_API        f_pApiInstance,
    tPOCT6100_CHANNEL_MODIFY      f_pChannelModify );
```

### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pChannelModify	Pointer to a tOCT6100_CHANNEL_MODIFY structure. The structure's elements are defined below. The user allocates this structure.

### 5.2.3.1 tOCT6100\_CHANNEL\_MODIFY Structure

<b>ulChannelHndl</b>	handle
The handle of the channel on which parameters are to be changed. This value is returned by a call to <b>Oct6100ChannelOpen</b> . This parameter will be ignored if <b>fApplyToAllChannels</b> is set to TRUE.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulUserChanId</b>	32-bit value
	cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING

<b>ulEchoOperationMode</b>	cOCT6100_ECHO_OP_MODE_NORMAL cOCT6100_ECHO_OP_MODE_HT_FREEZE cOCT6100_ECHO_OP_MODE_HT_RESET cOCT6100_ECHO_OP_MODE_POWER_DOWN cOCT6100_ECHO_OP_MODE_NO_ECHO cOCT6100_ECHO_OP_MODE_SPEECH_RECOGNITION cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fEnableToneDisabler</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fApplyToAllChannels</b>	TRUE / FALSE  If TRUE, the changes specified by this function call will be applied to all channels that are currently open. Note that the API semaphore will be held in locked state during the whole time it takes to modify all channels. Direction: IN                      Type: BOOL Default:                              FALSE
<b>fDisableToneDetection</b>	TRUE / FALSE  If TRUE, tone detection will be disabled, for all tones currently detected on the channel. Direction: IN                      Type: BOOL Default:                              FALSE
<b>fStopBufferPayout</b>	TRUE / FALSE  If TRUE, buffer payout will be stopped as soon as possible, without necessarily reaching the end of the buffer. This will also clear the buffer payout list. Direction: IN                      Type: BOOL Default:                              FALSE
<b>fRemoveConfBridgeParticipant</b>	TRUE / FALSE  If TRUE, the channel will be removed from any conference bridge that it is on. The API will not return an error if the channel is not a participant on a conference bridge. Direction: IN                      Type: BOOL Default:                              FALSE
<b>fRemoveBroadcastTssts</b>	TRUE / FALSE  If TRUE, all broadcast timeslots associated to the channel will be removed. The API will not return an error if no broadcast timeslots are associated to the channel. Direction: IN                      Type: BOOL Default:                              FALSE

<b>fTdmConfigModified</b>	TRUE / FALSE
This flag indicates modifications are requested in the <b>TdmConfig</b> structure. Setting this flag to FALSE will cause the API to ignore any modifications requested in the <b>TdmConfig</b> structure.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fVqeConfigModified</b>	TRUE / FALSE
This flag indicates modifications are requested in the <b>VqeConfig</b> structure. Setting this flag to FALSE will cause the API to ignore any modifications requested in the <b>VqeConfig</b> structure.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fCodecConfigModified</b>	TRUE / FALSE
This flag indicates modifications are requested in the <b>CodecConfig</b> structure. Setting this flag to FALSE will cause the API to ignore any modifications requested in the <b>CodecConfig</b> structure.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>TdmConfig</b>	structure
This structure contains all parameters related to the TDM interface of a channel. The RIN, ROUT, SIN and SOUT port values are assigned within this structure.	
Direction: IN	Type: tOCT6100_CHANNEL_MODIFY_TDM
Default:	see structure description
<b>VqeConfig</b>	structure
This structure contains all the voice quality enhancement parameters.	
Direction: IN	Type: tOCT6100_CHANNEL_MODIFY_VQE
Default:	see structure description
<b>CodecConfig</b>	structure
This structure contains all encoder/decoder related parameters.	
Direction: IN	Type: tOCT6100_CHANNEL_MODIFY_CODEC
Default:	see structure description



### 5.2.3.2 tOCT6100\_CHANNEL\_MODIFY\_TDM Structure

**ulSinPcmLaw** cOCT6100\_PCM\_U\_LAW  
cOCT6100\_PCM\_A\_LAW  
cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

**ulSinNumTssts** 1, 2  
cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

**ulSinTimeslot** 0 – 255 for 16 MHz stream frequency  
0 – 127 for 8 MHz stream frequency  
0 – 63 for 4 MHz stream frequency  
0 – 31 for 2 MHz stream frequency  
cOCT6100\_UNASSIGNED  
cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

If **fApplyToAllChannels** is set to TRUE, this parameter must be either cOCT6100\_UNASSIGNED or cOCT6100\_KEEP\_PREVIOUS\_SETTING.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

**ulSinStream** 0 – 31 for **ulMaxTdmStreams** of 32  
0 – 15 for **ulMaxTdmStreams** of 16  
0 – 7 for **ulMaxTdmStreams** of 8  
0 – 3 for **ulMaxTdmStreams** of 4  
cOCT6100\_UNASSIGNED  
cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

If **fApplyToAllChannels** is set to TRUE, this parameter must be either cOCT6100\_UNASSIGNED or cOCT6100\_KEEP\_PREVIOUS\_SETTING.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

**ulRinPcmLaw** cOCT6100\_PCM\_U\_LAW  
cOCT6100\_PCM\_A\_LAW  
cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

<b>ulRinNumTssts</b>	1, 2 cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulRinTimeslot</b>	see <b>ulSinTimeslot</b> parameter  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulRinStream</b>	see <b>ulSinStream</b> parameter  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulSoutPcmLaw</b>	cOCT6100_PCM_U_LAW cOCT6100_PCM_A_LAW cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulSoutNumTssts</b>	1, 2 cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulSoutTimeslot</b>	see <b>ulSinTimeslot</b> parameter  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulSoutStream</b>	see <b>ulSinStream</b> parameter  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulRoutPcmLaw</b>	cOCT6100_PCM_U_LAW cOCT6100_PCM_A_LAW cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING

Copyright © 2008 Octasic Inc.  
oct61XXas5000-038

### 5.2.3.3 tOCT6100\_CHANNEL\_MODIFY\_VQE Structure

<b>fEnableNlp</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fEnableTailDisplacement</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulTailDisplacement</b>	0 – 896 cOCT6100_KEEP_PREVIOUS_SETTING cOCT6100_AUTO_SELECT_TAIL  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fSinDcOffsetRemoval</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fRinDcOffsetRemoval</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fRinLevelControl</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>IRinLevelControlGainDb</b>	-24 – 24 cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING

<b>fSoutLevelControl</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: BOOL
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>ISoutLevelControlGainDb</b>	-24 – 24 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>fRinAutomaticLevelControl</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: BOOL
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>IRinAutomaticLevelControlTargetDb</b>	-40 – 0 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: INT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>fSoutAutomaticLevelControl</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: BOOL
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>ISoutAutomaticLevelControlTargetDb</b>	-40 – 0 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: INT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>fRinHighLevelCompensation</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: BOOL
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>IRinHighLevelCompensationThresholdDb</b>	-40 – 0 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: INT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING

<b>fSoutAdaptiveNoiseReduction</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulComfortNoiseMode</b>	cOCT6100_COMFORT_NOISE_NORMAL cOCT6100_COMFORT_NOISE_FAST_LATCH cOCT6100_COMFORT_NOISE_EXTENDED cOCT6100_COMFORT_NOISE_OFF cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fDtmfToneRemoval</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fAcousticEcho</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fSoutConferencingNoiseReduction</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fSoutConferencingNoiseReduction</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING

<b>ulNonLinearityBehaviorA</b>	0 - 13 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulNonLinearityBehaviorB</b>	0 - 8 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulDoubleTalkBehavior</b>	cOCT6100_DOUBLE_TALK_BEH_NORMAL cOCT6100_DOUBLE_TALK_BEH_LESS_AGGRESSIVE cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>IDefaultErIDb</b>	0, -3, -6, -9 or -12 dB cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: INT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>IAecDefaultErIDb</b>	0, -3 or -6 dB cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: INT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulAecTailLength</b>	128, 256, 512 or 1024 ms cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulSoutAutomaticListenerEnhancementGainDb</b>	0 - 30 cOCT6100_KEEP_PREVIOUS_SETTING
See tOCT6100_CHANNEL_OPEN Structure.	
Direction: IN	Type: UINT32
Default:	cOCT6100_KEEP_PREVIOUS_SETTING

<b>fSoutNaturalListenerEnhancement</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulSoutNaturalListenerEnhancementGainDb</b>	0 - 30  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              0
<b>lAnrSnrEnhancementDb</b>	-9, -12, -15, -18, -21, -24, -27 or -30 dB cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: INT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulAnrVoiceNoiseSegregation</b>	0 – 15 cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulToneDisablerVqeActivationDelay</b>	300, 300 + N*512, 16172 ms (increment of 512 ms) cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fEnableMusicProtection</b>	TRUE / FALSE  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fIdleCodeDetection</b>	TRUE / FALSE  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING



#### 5.2.3.4 tOCT6100\_CHANNEL\_MODIFY\_CODEC Structure

**ulEncoderPort**                      cOCT6100\_CHANNEL\_PORT\_ROUT  
   cOCT6100\_CHANNEL\_PORT\_SOUT  
   cOCT6100\_NO\_ENCODING  
   cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

**ulEncodingRate**                      cOCT6100\_G711\_64KBPS  
   cOCT6100\_G726\_40KBPS  
   cOCT6100\_G726\_32KBPS  
   cOCT6100\_G726\_24KBPS  
   cOCT6100\_G726\_16KBPS  
   cOCT6100\_G727\_40KBPS\_4\_1  
   cOCT6100\_G727\_40KBPS\_3\_2  
   cOCT6100\_G727\_40KBPS\_2\_3  
   cOCT6100\_G727\_32KBPS\_4\_0  
   cOCT6100\_G727\_32KBPS\_3\_1  
   cOCT6100\_G727\_32KBPS\_2\_2  
   cOCT6100\_G727\_24KBPS\_3\_0  
   cOCT6100\_G727\_24KBPS\_2\_1  
   cOCT6100\_G727\_16KBPS\_2\_0  
   cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

Direction: IN

Type: UINT32

Default:

cOCT6100\_KEEP\_PREVIOUS\_SETTING

**ulDecoderPort**                      cOCT6100\_CHANNEL\_PORT\_RIN  
   cOCT6100\_CHANNEL\_PORT\_SIN  
   cOCT6100\_NO\_DECODING  
   cOCT6100\_KEEP\_PREVIOUS\_SETTING

See tOCT6100\_CHANNEL\_OPEN Structure.

Direction: IN

Type: UINT32

Default:

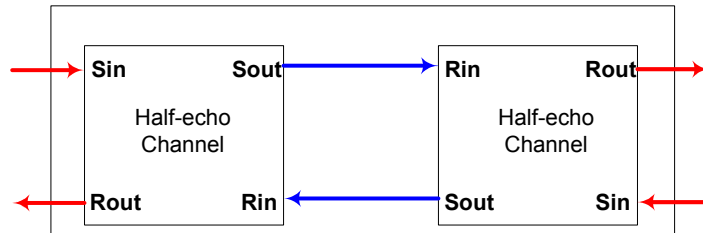
cOCT6100\_KEEP\_PREVIOUS\_SETTING

<b>ulDecodingRate</b>	cOCT6100_G711_64KBPS cOCT6100_G726_40KBPS cOCT6100_G726_32KBPS cOCT6100_G726_24KBPS cOCT6100_G726_16KBPS cOCT6100_G727_2C_ENCODED cOCT6100_G727_3C_ENCODED cOCT6100_G727_4C_ENCODED cOCT6100_G726_ENCODED cOCT6100_G711_G726_ENCODED cOCT6100_G711_G727_2C_ENCODED cOCT6100_G711_G727_3C_ENCODED cOCT6100_G711_G727_4C_ENCODED cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>fEnableSilenceSuppression</b>	TRUE / FALSE cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: BOOL Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulPhasingType</b>	cOCT6100_SINGLE_PHASING cOCT6100_DUAL_PHASING cOCT6100_NO_PHASING cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulPhase</b>	0 – <b>ulPhasing_length</b> – 1 cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING
<b>ulPhasingTsstHndl</b>	phasing TSST handle cOCT6100_KEEP_PREVIOUS_SETTING  See tOCT6100_CHANNEL_OPEN Structure. Direction: IN                      Type: UINT32 Default:                              cOCT6100_KEEP_PREVIOUS_SETTING

## 5.2.4 Oct6100ChannelCreateBiDir

This function creates a bi-directional channel. A bi-directional channel is composed of two echo canceller channels where the SOUT port of each channel is connected to the RIN port of the other channel, as illustrated in the following drawing:

Bi-directional echo channel



A bi-directional channel requires that only 4 ports (SIN \* 2 and ROUT \* 2) be connected to the TDM bus to perform echo cancellation on both echo cancellation channels.

To do this, the API binds two channels into a bi-directional channel. The channels must be properly configured for the bind operation to succeed. A channel is deemed properly configured if it supports the following configuration:

- The timeslot and stream values for the SOUT and RIN port must be set to cOCT6100\_UNASSIGNED
- No PCM law translation
- No ADPCM compression or decompression
- No silence suppression
- No conferencing

After the user binds the channels together using this function, each channel can still be modified independently using the **Oct6100ChannelModify** function.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ChannelCreateBiDirDef (
    tPOCT6100_CHANNEL_CREATE_BIDIR          f_pChannelCreateBiDir );
```

```
UINT32 Oct6100ChannelCreateBiDir (
    tPOCT6100_INSTANCE_API                  f_pApiInstance,
    tPOCT6100_CHANNEL_CREATE_BIDIR          f_pChannelCreateBiDir );
```

### Parameters

**f\_pApiInstance** Pointer to an instance structure of the chip.

**f\_pChannelCreateBiDir** Pointer to a tOCT6100\_CHANNEL\_CREATE\_BIDIR structure. The structure's elements are defined below. The user allocates this structure.

#### 5.2.4.1 tOCT6100\_CHANNEL\_CREATE\_BIDIR Structure

**pulBiDirChannelHndl**

handle

This parameter returns the handle for the newly created bi-directional channel. This handle is a unique value that identifies the bi-directional channel in all future function calls that affects this bi-directional channel. The user allocates the memory for this pointer.

Direction: IN/OUT

Type: PUINT32

Default:

NULL

**ulFirstChannelHndl**

handle

This is the handle of one of the two channels used to create the bi-directional channel. This value was returned by a call to **Oct6100ChannelOpen**.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE

**ulSecondChannelHndl**

handle

This is the handle of the second channel used to create the bi-directional channel. This value was returned by a call to **Oct6100ChannelOpen**.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE

## 5.2.5 Oct6100ChannelDestroyBiDir

This function destroys a bi-directional channel.

Calling this function does not close any resource. The two channels that were used to create the channel remain open but the API severs the link between them.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChannelDestroyBiDirDef (
    tPOCT6100_CHANNEL_DESTROY_BIDIR    f_pChannelDestroyBiDir
);

UINT32 Oct6100ChannelDestroyBiDir (
    tPOCT6100_INSTANCE_API              f_pApilInstance,
    tPOCT6100_CHANNEL_DESTROY_BIDIR    f_pChannelDestroyBiDir
);
```

### Parameters

**f\_pApilInstance**                      Pointer to an instance structure of the chip.

**f\_pChannelDestroyBiDir** Pointer to a tOCT6100\_CHANNEL\_DESTROY\_BIDIR structure.  
The structure's elements are defined below. The user allocates this structure.

### 5.2.5.1 tOCT6100\_CHANNEL\_DESTROY\_BIDIR Structure

<b>ulBiDirChannelHndl</b>	handle
This is the handle of the bi-directional channel for the API to destroy. This value was returned by a call to <b>Oct6100ChannelCreateBiDir</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE

### 5.2.6 Oct6100ChannelBroadcastTsstAdd

This function is used to broadcast an output to multiple timeslots. It assigns a broadcast H.100 timeslot to one of the output port (ROUT or SOUT) of the echo channel specified by **ulChannelHndl**. TSSTs assigned to a port with this function cannot be modified by a call to **Oct6100ChannelModify**.

To remove a broadcast TSST from a port, the user must call the function **Oct6100ChannelBroadcastTsstRemove**.

## Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChannelBroadcastTsstAddDef (
    tPOCT6100_CHANNEL_BROADCAST_TSST_ADD
    f_pChannelBroadcastTsstAdd );

UINT32 Oct6100ChannelAssignTsst(
    tPOCT6100_INSTANCE_API                                f_pApiInstance,
    tPOCT6100_CHANNEL_BROADCAST_TSST_ADD
    f_pChannelBroadcastTsstAdd );
```

## Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pChannelBroadcastTsstAdd	Pointer to a tOCT6100_CHANNEL_BROADCAST_TSST_ADD structure. The structure's elements are defined below. The user allocates this structure.

#### 5.2.6.1 tOCT6100\_CHANNEL\_BROADCAST\_TSST\_ADD Structure

<b>ulChannelHndl</b>	handle
Channel handle. This handle is returned by a call to <b>Oct6100ChannelOpen</b> .	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulPort</b>	cOCT6100_CHANNEL_PORT_ROUT cOCT6100_CHANNEL_PORT_SOUT
This parameter represents the port on which the broadcast TSST will be attached.	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_PORT

**ulTimeslot**                      0 – 255 for 16 MHz stream frequency  
                                     0 – 127 for 8 MHz stream frequency  
                                     0 – 63 for 4 MHz stream frequency  
                                     0 – 31 for 2 MHz stream frequency

This is the H.100 timeslot of the channel's selected port. Note that allowed values are affected by the frequency of the clock that controls the **ulStream**.

Direction: IN                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_TIMESLOT

**ulStream**                        0 – 31 for **ulMaxTdmStreams** of 32  
                                     0 – 15 for **ulMaxTdmStreams** of 16  
                                     0 – 7 for **ulMaxTdmStreams** of 8  
                                     0 – 3 for **ulMaxTdmStreams** of 4

This is the TDM stream of the channel's selected port. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

Direction: IN                      Type: UINT32  
Default:                              cOCT6100\_INVALID\_STREAM

## Usage

f_pApilInstance	Pointer to an instance structure of the chip.
f_pChanBroadcastTsstRemove	Pointer to a tOCT6100_CHANNEL_BROADCAST_TSST_REMOVE structure. The structure's elements are defined below. The user allocates this structure.

<b>ulChannelHndl</b>	handle
Channel's handle. This handle is returned by a call to <b>Oct6100ChannelOpen</b> .	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulPort</b>	cOCT6100_CHANNEL_PORT_ROUT cOCT6100_CHANNEL_PORT_SOUT
This parameter represents the port on which the broadcast TSST is attached.	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_PORT
<b>ulTimeslot</b>	0 – 255 for 16 MHz stream frequency 0 – 127 for 8 MHz stream frequency 0 – 63 for 4 MHz stream frequency 0 – 31 for 2 MHz stream frequency
This is the H.100 timeslot of the channel's selected port. Note that allowed values are affected by the frequency of the clock that controls the <b>ulStream</b> .	
This parameter is ignored if <b>fRemoveAll</b> is set to TRUE.	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_TIMESLOT



Direction:	IN	Type:	BOOL
Default:			FALSE

## 5.2.8 Oct6100ChannelMute

This function mutes the selected ports of the echo channel specified by **ulChannelHndl**.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ChannelMuteDef (
    tPOCT6100_CHANNEL_MUTE          f_pChannelMute );

UINT32 Oct6100ChannelMute (
    tPOCT6100_INSTANCE_API          f_pApilInstance,
    tPOCT6100_CHANNEL_MUTE          f_pChannelMute );
```

### Parameters

<b>f_pApilInstance</b>	Pointer to an instance structure of the chip.
<b>f_pChannelMute</b>	Pointer to a <b>tOCT6100_CHANNEL_MUTE</b> structure. The structure's elements are defined below. The user allocates this structure.

### 5.2.8.1 tOCT6100\_CHANNEL\_MUTE Structure

<b>ulChannelHndl</b>	handle Channel's handle. This handle is returned by a call to <b>Oct6100ChannelOpen</b> . Direction: IN Type: UINT32 Default: cOCT6100_INVALID_HANDLE
<b>ulPortMask</b>	cOCT6100_CHANNEL_MUTE_PORT_RIN cOCT6100_CHANNEL_MUTE_PORT_ROUT cOCT6100_CHANNEL_MUTE_PORT_SIN cOCT6100_CHANNEL_MUTE_PORT_SIN_WITH_FEATURES cOCT6100_CHANNEL_MUTE_PORT_SOUT cOCT6100_CHANNEL_MUTE_NONE

This parameter represents the port mask on which muting should be applied. Many ports can be muted by ORing the required defines together.

If this function is called more than once, the value for **ulPortMask** is not replaced, but accumulated. For example, if RIN is masked on the first function call, and ROUT and SOUT are masked on the second function call, then RIN, ROUT and SOUT will now be masked. To remove a mask, the un-mute function must be used.

The **cOCT6100\_CHANNEL\_MUTE\_PORT\_SIN\_WITH\_FEATURES** port mask will mute the signal on the SIN port, but will allow features such as buffer playout and tone detection on that port to continue working.

Direction: IN	Type: UINT32
Default:	cOCT6100_CHANNEL_MUTE_NONE

## 5.2.9 Oct6100ChannelUnMute

This function un-mutes the selected ports of the echo channel specified by **ulChannelHndl**.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ChannelUnMuteDef (
    tPOCT6100_CHANNEL_UNMUTE          f_pChannelUnMute );
```

```
UINT32 Oct6100ChannelUnMute (
    tPOCT6100_INSTANCE_API             f_pApiInstance,
    tPOCT6100_CHANNEL_UNMUTE          f_pChannelUnMute );
```

### Parameters

<b>f_pApiInstance</b>	Pointer to an instance structure of the chip.
<b>f_pChannelUnMute</b>	Pointer to a <b>tOCT6100_CHANNEL_UNMUTE</b> structure. The structure's elements are defined below. The user allocates this structure.

### 5.2.9.1 tOCT6100\_CHANNEL\_UNMUTE Structure

<b>ulChannelHndl</b>	<p>handle</p> <p>Channel's handle. This handle is returned by a call to <b>Oct6100ChannelOpen</b>.</p> <p>Direction: IN                      Type: UINT32</p> <p>Default:                            cOCT6100_INVALID_HANDLE</p>
<b>ulPortMask</b>	<p>cOCT6100_CHANNEL_MUTE_PORT_RIN cOCT6100_CHANNEL_MUTE_PORT_ROUT cOCT6100_CHANNEL_MUTE_PORT_SIN cOCT6100_CHANNEL_MUTE_PORT_SIN_WITH _FEATURES cOCT6100_CHANNEL_MUTE_PORT_SOUT cOCT6100_CHANNEL_MUTE_PORT_NONE</p> <p>This parameter represents the port mask on which un-muting should be applied. Many ports can be unmuted by ORing the required defines together.</p> <p>Direction: IN                      Type: UINT32</p> <p>Default:                            cOCT6100_CHANNEL_MUTE_NONE</p>

### 5.2.10 Oct6100ChannelGetStats

This function retrieves the channel-related statistics.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ChannelGetStatsDef (
    tPOCT6100_CHANNEL_STATS          f_pChannelStats );

UINT32 Oct6100ChannelGetStats (
    tPOCT6100_INSTANCE_API          f_pApiInstance,
    tPOCT6100_CHANNEL_STATS          f_pChannelStats );
```

#### Parameters

**f\_pApiInstance**     Pointer to an instance structure of the chip.

**f\_pChannelStats**     Pointer to a tOCT6100\_CHANNEL\_STATS structure. The structure's elements are defined below. The user allocates this structure.

#### 5.2.10.1 tOCT6100\_CHANNEL\_STATS Structure

<b>ulChannelHndl</b>	handle
The channel's handle for which the statistics are requested. This value was returned by a call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>fResetStats</b>	TRUE / FALSE
If TRUE, the API resets the following channel statistics: IMaxERL, IMaxERLE and ulMaxEchoDelay.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>ulUserChanId</b>	See tOCT6100_CHANNEL_OPEN structure.
<b>ulEchoOperationMode</b>	See tOCT6100_CHANNEL_OPEN structure.
<b>fEnableToneDisabler</b>	See tOCT6100_CHANNEL_OPEN structure.
<b>ulMutePortsMask</b>	cOCT6100_CHANNEL_MUTE_PORT_RIN cOCT6100_CHANNEL_MUTE_PORT_ROUT cOCT6100_CHANNEL_MUTE_PORT_SIN cOCT6100_CHANNEL_MUTE_PORT_SIN_WITH_FEATURES cOCT6100_CHANNEL_MUTE_PORT_SOUT cOCT6100_CHANNEL_MUTE_NONE
Ports that are currently muted, resulting from a call to <b>Oct6100ChannelMute</b> .	
Direction: OUT	Type: UINT32
Default:	cOCT6100_CHANNEL_MUTE_NONE
<b>fEnableExtToneDetection</b>	See tOCT6100_CHANNEL_OPEN structure.

**ICurrentERL** -127 – 127 dB

Current Echo Return Loss.

ERL defines the echo return loss estimated by the echo canceller. This value becomes valid as the Adaptive Filter is converged. In technical terms, it is the decrease in power of the receive signal as it passes through the local path hybrid and returns to the echo canceller on the send path through Sin. This parameter is measured over a certain period of time

The API returns cOCT6100\_INVALID\_SIGNED\_STAT if the channel is not converged.

Direction: OUT

Type: INT32

Default:

cOCT6100\_INVALID\_SIGNED\_STAT

**ICurrentERLE** -127 – 127 dB

Current Echo Return Loss Enhancement.

ERLE refers to the attenuation of the echo signal as it passes through the Send Path (Send In to Send Out) of the echo canceller. This specifically excludes any non-linear processing on the output of the canceller to provide further attenuation.

The API returns cOCT6100\_INVALID\_SIGNED\_STAT if the channel is not converged.

Direction: OUT

Type: INT32

Default:

cOCT6100\_INVALID\_SIGNED\_STAT

**IMaxERL** -127 – 127 dB

Maximum value of the ERL since the last reset or in the last measurement period.

The API returns cOCT6100\_INVALID\_SIGNED\_STAT if the channel is not converged.

Direction: OUT

Type: INT32

Default:

cOCT6100\_INVALID\_SIGNED\_STAT

**IMaxERLE** -127 – 127 dB

Maximum value of the ERLE since the last reset or in the last measurement period.

The API returns cOCT6100\_INVALID\_SIGNED\_STAT if the channel is not converged.

Direction: OUT

Type: INT32

Default:

cOCT6100\_INVALID\_SIGNED\_STAT

**ulNumEchoPathChanges** 32-bits value

This counter is incremented when a change is detected on the echo path.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_STAT

<b>ulCurrentEchoDelay</b>	32-bits value
The delay in milliseconds at which the algorithm has detected energy on Sin correlated to the receive path. Technically, this defines the furthest in the H register that significant values are found.	
The API returns cOCT6100_INVALID_STAT if the channel is not converged.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulMaxEchoDelay</b>	32-bits value
The longest delay in milliseconds at which the algorithm has found energy on Sin correlated to the receive path since the last reset of the statistics. Technically, this defines the furthest in the H register that significant values are found.	
The API returns cOCT6100_INVALID_STAT if the channel is not converged.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulToneDisablerStatus</b>	cOCT6100_TONE_DISABLER_EC_DISABLED cOCT6100_TONE_DISABLER_EC_ENABLED
Status of the tone disabler for the current channel. This parameter will only return cOCT6100_TONE_DISABLER_EC_DISABLED if the tone disabler is enabled ( <b>fEnableToneDisabler</b> has been set to TRUE) and a 2100 Hz tone is present for the requested channel.	
If the tone disabler is enabled and the tone detector detects a 2100 Hz tone with phase reversals on the channel, both echo cancellation and the NLP will be disabled. If the tone disabler is enabled and a 2100 Hz tone without phase reversals is detected on the channel, only the NLP will be disabled on the channel. In both cases, the API will return cOCT6100_TONE_DISABLER_EC_DISABLED.	
If there is no 2100 Hz tone with or without phase reversals, the tone disabler will not disable echo cancellation or the NLP on the channel. In this case, the API will return cOCT6100_TONE_DISABLER_EC_ENABLED.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>fSinVoiceDetected</b>	TRUE / FALSE
If TRUE, voice activity is currently detected on the Sin port signal. This feature is available only with OCT61x6 devices. This will always be FALSE when running the API on OCT61x2 or OCT61x4 devices..	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fEchoCancellerConverged</b>	TRUE / FALSE
If TRUE, the echo canceller has detected and converged on an echo path and is removing echo.	
The API returns FALSE if the channel is not converged.	
Direction: OUT	Type: BOOL
Default:	FALSE

<b>IRinLevel</b>	-127 – 127 dBm0
Average power of the signal level on the Rin port.	
Direction: OUT	Type: INT32
Default:	cOCT6100_INVALID_SIGNED_STAT
<b>ISinLevel</b>	-127 – 127 dBm0
Average power of the signal level on the Sin port.	
Direction: OUT	Type: INT32
Default:	cOCT6100_INVALID_SIGNED_STAT
<b>IRinAppliedGain</b>	-24 – 24 dB
Current gain applied to the signal level on the Rin port.	
Direction: OUT	Type: INT32
Default:	cOCT6100_INVALID_SIGNED_STAT
<b>ISoutAppliedGain</b>	-24 – 24 dB
Current gain applied to the signal level on the Sout port.	
Direction: OUT	Type: INT32
Default:	cOCT6100_INVALID_SIGNED_STAT
<b>IComfortNoiseLevel</b>	-127 – 127 dBm0
Average power of the comfort noise injected.	
Direction: OUT	Type: INT32
Default:	cOCT6100_INVALID_SIGNED_STAT
<b>TdmConfig</b>	structure
This structure contains all the configurations and statistics related to the TDM interface of a channel.	
Direction: OUT	Type: tOCT6100_CHANNEL_STATS_TDM
Default:	see structure description
<b>VqeConfig</b>	structure
This structure contains all the configurations and statistics related to the voice quality enhancement parameters.	
Direction: OUT	Type: tOCT6100_CHANNEL_STATS_VQE
Default:	see structure description
<b>CodecConfig</b>	structure
This structure contains all the configurations and statistics related to the encoder/decoder related parameters.	
Direction: OUT	Type: tOCT6100_CHANNEL_STATS_CODEC
Default:	see structure description

### 5.2.10.2 tOCT6100\_CHANNEL\_STATS\_TDM Structure

<b>ulSinPcmLaw</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSinNumTssts</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSinTimeslot</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSinStream</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRinPcmLaw</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRinNumTssts</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRinTimeslot</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRinStream</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSoutPcmLaw</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSoutNumTssts</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSoutTimeslot</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulSoutStream</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRoutPcmLaw</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRoutNumTssts</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRoutTimeslot</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulRoutStream</b>	See tOCT6100_CHANNEL_OPEN_TDM structure.
<b>ulMaxBroadcastTssts</b>	0 – 4096



This parameter defines the maximum number of entry allowed in the broadcast TSSTs arrays **pulRoutBroadcastStream**, **pulRoutBroadcastTimeslot**, **pulSoutBroadcastStream** and **pulSoutBroadcastTimeslot**.

The actual number of valid entry returned by the API will be specified by **ulNumRoutBroadcastTssts** and **ulNumSoutBroadcastTssts**.

Direction: OUT                      Type: UINT32  
Default:                              0

**ulNumRoutBroadcastTssts**                      0 – **ulMaxBroadcastTssts**

This parameter defines the number of H.100 TDM timeslot associated to the ROUT port of the echo channel returned by this function call. Since broadcasting is supported on output ports, more then one TSST can be associated to the ROUT port.

The number of valid entries present in the arrays **pulRoutBroadcastTimeslot** and **pulRoutBroadcastStream** is defined by this parameter.

Direction: OUT                      Type: UINT32  
Default:                              0

**ulNumSoutBroadcastTssts**                      0 – **ulMaxBroadcastTssts**

This parameter defines the number of H.100 TDM timeslot associated to the SOUT port of the echo channel returned by this function call. Since broadcasting is supported on output ports, more then one TSST can be associated to the SOUT port.

The number of valid entries present in the arrays **pulSoutBroadcastTimeslot** and **pulSoutBroadcastStream** is defined by this parameter.

Direction: OUT                      Type: UINT32  
Default:                              0

**pulSoutBroadcastTimeslot**                      array.

This contains valid H.100 TDM timeslot values associated to the SOUT port of the echo channel. The user allocates the memory for this array. Its size is specified by **ulMaxOutputTssts**.

Direction: OUT                      Type: PUINT32  
Default:                              NULL

**pulSoutBroadcastStream**                      array.

This contains valid H.100 TDM steam values associated to the SOUT port of the echo channel. The user allocates the memory for this array. Its size is specified by **ulMaxBroadcastTssts**.

Direction: OUT                      Type: PUINT32  
Default:                              NULL

**pulRoutBroadcastTimeslot**                      array

This contains valid H.100 TDM timeslot values associated to the ROUT port of the echo channel. The user allocates the memory for this array. Its size is specified by **ulMaxBroadcastTssts**.

Direction: OUT                      Type: PUINT32  
Default:                              NULL

**pulRoutBroadcastStream**                      array.

This contains valid H.100 TDM stream values associated to the ROUT port of the echo channel. The user allocates the memory for this array. Its size is specified by **ulMaxBroadcastTssts**.

Direction: OUT                      Type: PUINT32  
Default:                              NULL

**fMoreRoutBroadcastTssts**                      TRUE / FALSE

If TRUE, not all ROUT broadcast TSSTs were returned during this function call because **ulMaxBroadcastTssts** was too small.

Direction: OUT                      Type: BOOL  
Default:                              FALSE

**fMoreSoutBroadcastTssts**                      TRUE / FALSE

If TRUE, not all SOUT broadcast TSSTs were returned during this function call because **ulMaxBroadcastTssts** was too small.

Direction: OUT                      Type: BOOL  
Default:                              FALSE

### 5.2.10.3 tOCT6100\_CHANNEL\_STATS\_VQE Structure

<b>fEnableNlp</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fEnableTailDisplacement</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulTailDisplacement</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulTailLength</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fSinDcOffsetRemoval</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fRinDcOffsetRemoval</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fRinLevelControl</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>IRinLevelControlGainDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fSoutLevelControl</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ISoutLevelControlGainDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fRinAutomaticLevelControl</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>IRinAutomaticLevelControlTargetDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fSoutAutomaticLevelControl</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ISoutAutomaticLevelControlTargetDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fRinHighLevelCompensation</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>IRinHighLevelCompensationThresholdDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fSoutAdaptiveNoiseReduction</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.

---

<b>fSoutNoiseBleaching</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fSoutConferencingNoiseReduction</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulComfortNoiseMode</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fDtmfToneRemoval</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fAcousticEcho</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulNonLinearityBehaviorA</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulNonLinearityBehaviorB</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulDoubleTalkBehavior</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>IDefaultErIDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>IAecDefaultErIDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulAecTailLength</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulSoutAutomaticListenerEnhancementGainDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fSoutNaturalListenerEnhancement</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulSoutNaturalListenerEnhancementGainDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>IAnrSnrEnhancementDb</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulAnrVoiceNoiseSegregation</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>ulToneDisablerVqeActivationDelay</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.
<b>fEnableMusicProtection</b>	See tOCT6100_CHANNEL_OPEN_VQE structure.

**fIdleCodeDetection**

See tOCT6100\_CHANNEL\_OPEN\_VQE  
structure.

#### 5.2.10.4      **tOCT6100\_CHANNEL\_STATS\_CODEC Structure**

<b>ulAdpcmNibblePosition</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulEncoderPort</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulEncodingRate</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulDecoderPort</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulDecodingRate</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>fEnableSilenceSuppression</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulPhasingType</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulPhase</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.
<b>ulPhasingTsstHndl</b>	See tOCT6100_CHANNEL_OPEN_CODEC structure.

### 5.3 Conference Bridge Functions

Conference bridge functions are used to open, close, and monitor the conference bridge structure. Functions to add and remove channels to a conference bridge are also described in this section.

A **simple** conference bridge mixes all the SOUT or RIN port signals of the channels present on the bridge. Each channel will receive the resulting signal (minus its own signal) as its RIN port signal.

In the case of 512- and 672-channel devices, some limitations apply. Rin conferencing can be applied on up to 671 channels. The number of channels of Sout conferencing is limited to 447, however using this many mixers reduces the total device capacity to 542 channels. If 672 channels of echo cancellation are required, then only 188 channels can also support Sout conferencing.

The following table indicates the number of Sout conferencing channels that can be supported by the 512- and 672-channel devices.

Device Capacity	Number of channels performing only echo cancellation	Number of channels performing echo cancellation and Sout conferencing	Total channels
512	65	447 (max)	512
672	484	188	672 (max)
672	95	447 (max)	542

Limitations on conference bridges are based on the number of available mixer and TSI resources. The total available mixer resources is 1342 and the total available TSI resources is 1532. The preceding table's values are calculated like this:

For Rin conferencing participants:

- Mixer resources required = total nb of participants \* 2
- TSI resources required = total nb of participants \* 2

For Sout conferencing participants:

- Mixer resources required = total nb of participants \* 3
- TSI resources required = total nb of participants \* 3

A **flexible** conference bridge can be used to mask the signal of certain participants from other participants, i.e. each channel will receive the sum of all the channels present on the bridge minus its own and the masked channels. These flexible bridges are limited to 32 participants. This is typically used for call monitoring, or "coaching" where a third party wishes to hear many participants, but only be heard by one participant. The equations to calculate resource allocation for flexible conference bridges are the following:

For Rin flexible conferencing participants:

- Mixer resources required =  
nb of Conference Bridges \* ( nb of part. per bridge \* (nb of part. per bridge + 1 ) )
- TSI resources required = total nb of participants \* 3

For Sout flexible conferencing participants:

- Mixer resources required =

nb of Conference Bridges \* ( nb of part. per bridge \* (nb of part. per bridge + 1 ) -  
nb of part. per bridge )

- TSI resources required = total nb of participants \* 3

A channel performing ADPCM compression or decompression **cannot** be used for conferencing.

### 5.3.1 Oct6100ConfBridgeOpen

This function opens a conference bridge. Initially, there is no channel connected to the bridge. Channels are added to the bridge by calling **Oct6100ConfBridgeAddChan**. A channel is removed from the bridge by calling the function **Oct6100ConfBridgeRemoveChan**.

This function returns a handle by which the API identifies this bridge.

#### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100ConfBridgeOpenDef (
    tPOCT6100_CONF_BRIDGE_OPEN          f_pConfBridgeOpen );
```

```
UINT32 Oct6100ConfBridgeOpen (
    tPOCT6100_INSTANCE_API              f_pApilInstance,
    tPOCT6100_CONF_BRIDGE_OPEN          f_pConfBridgeOpen );
```

#### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pConfBridgeOpen	Pointer to a tOCT6100_CONF_BRIDGE_OPEN structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.1.1 tOCT6100\_CONF\_BRIDGE\_OPEN Structure

pulConfBridgeHndl	handle
-------------------	--------

The parameter returns the handle for the newly created conference bridge. This handle is a unique value that identifies the bridge in all future function calls affecting this bridge. The user allocates the memory for this pointer.

Direction: IN/OUT	Type: PUINT32
Default:	NULL

fFlexibleConferencing	TRUE / FALSE
-----------------------	--------------

If TRUE, flexible conferencing is enabled. In this mode, the user can choose which signals are masked for every participant in the conference. Enabling this mode will limit the number of participants to be added to the conference bridge to 32.

Direction: IN	Type: BOOL
Default:	FALSE



### 5.3.2 Oct6100ConfBridgeClose

This function closes a conference bridge.

A conference bridge can only be closed if no channels are present on the bridge.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeCloseDef (
    tPOCT6100_CONF_BRIDGE_CLOSE          f_pConfBridgeClose );

UINT32 Oct6100ConfBridgeClose (
    tPOCT6100_INSTANCE_API                f_pApilInstance,
    tPOCT6100_CONF_BRIDGE_CLOSE          f_pConfBridgeClose );
```

#### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pConfBridgeClose	Pointer to a tOCT6100_CONF_BRIDGE_CLOSE structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.2.1 tOCT6100\_CONF\_BRIDGE\_CLOSE Structure

ulConfBridgeHndl	handle
Handle of the conference bridge to be closed. This value is returned by a call to <b>Oct6100ConfBridgeOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE

### 5.3.3 Oct6100ConfBridgeChanAdd

This function adds a channel to an already opened conference bridge. The conference bridge and channel handles must be valid to perform a valid addition.

A channel can only be part of one conference bridge at a time. To move a channel from a bridge to another, the user must remove the channel from the first bridge and add it to the second.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeChanAddDef (
    tPOCT6100_CONF_BRIDGE_CHAN_ADD    f_pConfBridgeAdd );

UINT32 Oct6100ConfBridgeChanAdd (
    tPOCT6100_INSTANCE_API             f_pApilInstance,
    tPOCT6100_CONF_BRIDGE_CHAN_ADD    f_pConfBridgeAdd );
```

#### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pConfBridgeAdd	Pointer to a tOCT6100_CONF_BRIDGE_ADD_CHAN structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.3.1 tOCT6100\_CONF\_BRIDGE\_CHAN\_ADD Structure

<b>ulConfBridgeHndl</b>	handle
Handle of the conference bridge. This value is returned by a call to <b>Oct6100ConfBridgeOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulChannelHndl</b>	handle
Handle of the echo cancellation channel to be added to the conference bridge. This value is returned by a call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ullInputPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_RIN
This parameter indicates which channel port of the channel will be added to the conference bridge.	
Direction: IN	Type: UINT32
Default:	cOCT6100_CHANNEL_PORT_SOUT

**ulListenerMaskIndex** 0 - 31

When flexible conference bridges are enabled, this is the index of the current channel. This Index or channel number is used to identify the listener in the **ulListenerMask** parameter.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

**ulListenerMask** 32-bit value

When flexible conference bridges are enabled, this bit mask dictates which conference bridge participants cannot be heard by this channel. The user sets the bit at position **ulListenerMaskIndex** to subtract the signal from the specified participant. For example, setting the mask to 0x8 would remove channel with **ulListenerMaskIndex** equal to 3 from the mixed signal for this channel.

Direction: IN

Type: UINT32

Default:

0x0

**fMute** TRUE / FALSE

If TRUE, this channel will be added muted to the conference bridge.

Direction: IN

Type: BOOL

Default:

FALSE

**ulTappedChannelHndl** handle

This parameter is used when the channel being added to the conference bridge is to perform lawful interception. When this parameter is not set to cOCT6100\_INVALID\_HANDLE, it represents the echo cancellation channel to be tapped in the conference bridge.

When this parameter is used, the participant added to the bridge will hear the SOUT ports of all participants, as well as the ROUT port of the tapped participant.

The **ulRinStream** and **ulRinTimeslot** parameters of the TDM configuration of the channel specified by this handle must be set to **cOCT6100\_UNASSIGNED** for tapping to work correctly. This is done automatically when adding the participant, but the user should take care of never modifying the channel to re-assign the TSST.

An error will be returned by the API if the user tries to remove a tapped channel from a conference bridge. The channel tapping the participant should be removed first.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE

### 5.3.4 Oct6100ConfBridgeChanRemove

This function removes a channel from a conference bridge.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeChanRemoveDef (
    tPOCT6100_CONF_BRIDGE_CHAN_REMOVE    f_pConfBridgeRemove );

UINT32 Oct6100ConfBridgeChanRemove (
    tPOCT6100_INSTANCE_API                f_pApilInstance,
    tPOCT6100_CONF_BRIDGE_CHAN_REMOVE    f_pConfBridgeRemove );
```

#### Parameters

**f\_pApilInstance** Pointer to an instance structure of the chip.

**f\_pConfBridgeRemove** Pointer to a tOCT6100\_CONF\_BRIDGE\_CHAN\_REMOVE structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.4.1 tOCT6100\_CONF\_BRIDGE\_CHAN\_REMOVE Structure

<b>ulConfBridgeHndl</b>	handle
Handle of the conference bridge from which the channel is removed. This value is returned by a call to <b>Oct6100ConfBridgeOpen</b> . This parameter is ignored if <b>fRemoveAll</b> is set to FALSE.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulChannelHndl</b>	handle
Handle of the echo cancellation channel to be removed from the conference bridge. This value is returned by a call to <b>Oct6100ChannelOpen</b> . This parameter is ignored if <b>fRemoveAll</b> is set to TRUE.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>fRemoveAll</b>	TRUE / FALSE
If TRUE, all channels currently on the conference bridge will be removed.	
Direction: IN	Type: BOOL
Default:	FALSE

### 5.3.5 Oct6100ConfBridgeChanMute

This function will mute a channel currently on a conference bridge.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeChanMuteDef (
    tPOCT6100_CONF_BRIDGE_CHAN_MUTE    f_pConfBridgeMute );

UINT32 Oct6100ConfBridgeChanMute (
    tPOCT6100_INSTANCE_API              f_pApiInstance,
    tPOCT6100_CONF_BRIDGE_CHAN_MUTE    f_pConfBridgeMute );
```

#### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pConfBridgeMute	Pointer to a tOCT6100_CONF_BRIDGE_CHAN_MUTE structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.5.1 tOCT6100\_CONF\_BRIDGE\_CHAN\_MUTE Structure

<b>ulChannelHndl</b>	handle
Handle of the echo cancellation channel to be muted. This value is returned by a call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE

### 5.3.6 Oct6100ConfBridgeChanUnMute

This function will un-mute a channel currently on a conference bridge. The channel will now be broadcast onto its conference bridge

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeChanUnMuteDef (
    tPOCT6100_CONF_BRIDGE_CHAN_UNMUTE    f_pConfBridgeUnMute );

UINT32 Oct6100ConfBridgeChanUnMute (
    tPOCT6100_INSTANCE_API                f_pApiInstance,
    tPOCT6100_CONF_BRIDGE_CHAN_UNMUTE    f_pConfBridgeUnMute );
```

#### Parameters

f\_pApiInstance            Pointer to an instance structure of the chip.

f\_pConfBridgeUnMute    Pointer to a tOCT6100\_CONF\_BRIDGE\_CHAN\_UNMUTE structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.6.1 tOCT6100\_CONF\_BRIDGE\_CHAN\_UNMUTE Structure

<b>ulChannelHndl</b>	handle
Handle of the echo cancellation channel to be un-muted. This value is returned by a call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE

### 5.3.7 Oct6100ConfBridgeDominantSpeakerSet

This function determines which member of a conference bridge is the dominant speaker. The signal level of the other participants on the bridge is reduced when the dominant speaker is talking. This allows the dominant speaker to interrupt and talk-over whenever needed, while allowing feedback from other callers. This feature is available only with OCT61x6 devices. If this is executed on an OCT61x2 or OCT61x4 device, the function will return the error cOCT6100\_ERR\_NOT\_SUPPORTED\_DOMINANT\_SPEAKER. Dominant speaker can only be set on a conferencing channel that uses Sout for its input port.

NOTE: The **fEnableNlp** and **fSoutConferencingNoiseReduction** variables of the channel must be set to TRUE for this feature to work properly.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeDominantSpeakerSetDef (
    tPOCT6100_CONF_BRIDGE_DOMINANT_SPEAKER_SET
    f_pConfBridgeDominantSpeaker );

UINT32 Oct6100ConfBridgeDominantSpeakerSet (
    tPOCT6100_INSTANCE_API f_pApiInstance,
    tPOCT6100_CONF_BRIDGE_DOMINANT_SPEAKER_SET
    f_pConfBridgeDominantSpeaker );
```

#### Parameters

**f\_pApiInstance** Pointer to an instance structure of the chip.

**f\_pConfBridgeDominantSpeaker** Pointer to a tOCT6100\_CONF\_BRIDGE\_DOMINANT\_SPEAKER\_SET structure. The structure's elements are defined below. The user allocates this structure.

#### 5.3.7.1 tOCT6100\_CONF\_BRIDGE\_DOMINANT\_SPEAKER\_SET Structure

**ulConfBridgeHndl** handle

This parameter is used to remove a dominant speaker attribute from a conference bridge.

This parameter is the handle of the conference bridge for which the dominant speaker is set. This value is returned by a call to **Oct6100ConfBridgeOpen**. This parameter is ignored if **ulChannelHndl** is given a value.

Direction: IN                      Type: UINT32

Default:                              cOCT6100\_INVALID\_HANDLE

**ulChannelHndl**

handle

This parameter is used to add the dominant speaker attribute to a conference bridge participant.

This parameter is the handle of the echo cancellation channel that will be set as the dominant speaker of the conference bridge. This value is returned by a call to **Oct6100ChannelOpen**. To remove the dominant speaker attribute of a conference bridge participant, the **ulConfBridgeHndl** parameter is used, and this parameter should be set to **cOCT6100\_CONF\_NO\_DOMINANT\_SPEAKER\_HNDL**.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE



### 5.3.8 Oct6100ConfBridgeMaskChange

This function changes the listener mask of a flexible bridge participant.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeMaskChangeDef (
    tPOCT6100_CONF_BRIDGE_MASK_CHANGE

                                f_pConfBridgeMaskChange );

UINT32 Oct6100ConfBridgeMaskChange (
    tPOCT6100_INSTANCE_API      f_pApiInstance,
    tPOCT6100_CONF_BRIDGE_MASK_CHANGE

                                f_pConfBridgeMaskChange );
```

#### Parameters

**f\_pApiInstance**                      Pointer to an instance structure of the chip.

**f\_pConfBridgeMaskChange**

   Pointer to a  
   tOCT6100\_CONF\_BRIDGE\_MASK\_CHANGE structure. The  
   structure's elements are defined below. The user allocates this  
   structure.

#### 5.3.8.1 tOCT6100\_CONF\_BRIDGE\_MASK\_CHANGE Structure

**ulChannelHndl**                                      handle

   This parameter is the handle of the echo cancellation channel representing the  
   flexible bridge participant where the listener mask will be updated.

   Direction: IN                                      Type: UINT32

   Default:    cOCT6100\_INVALID\_HANDLE

**ulNewListenerMask**                                      32-bit value

   This parameter is the new listener mask to apply for the selected participant in  
   the flexible bridge. Refer to the **ulListenerMask** member of the conference  
   channel add function for a description of the listener mask.

   Direction: IN                                      Type: UINT32

   Default:    0x0

### 5.3.9 Oct6100ConfBridgeGetStats

This function fills a `tOCT6100_CONF_BRIDGE_STATS` structure with the current statistics for the specified conference bridge. All statistics returned by this function are initialized by the **Oct6100ConfBridgeOpen** function.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ConfBridgeGetStatsDef (
    tPOCT6100_CONF_BRIDGE_STATS          f_pConfBridgeStats );

UINT32 Oct6100ConfBridgeGetStats (
    tPOCT6100_INSTANCE_API                f_pApiInstance,
    tPOCT6100_CONF_BRIDGE_STATS          f_pConfBridgeStats );
```

#### Parameters

<code>f_pApiInstance</code>	Pointer to an instance structure of the chip
<code>f_pConfBridgeStats</code>	Pointer to a <code>tOCT6100_CONF_BRIDGE_STATS</code> statistics structure to be filled in by this routine. The structure's elements are defined below. The user allocates this structure.

#### 5.3.9.1 tOCT6100\_CONF\_BRIDGE\_STATS Structure

<b>ulConfBridgeHndl</b>	handle
Handle of the conference bridge for which statistics are requested. This value is returned by a call to <b>Oct6100ConfBridgeOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulNumChannels</b>	0 – 447
This is the number of channels currently present on the conference bridge. This count does not include the channels which are taps in the conference bridge.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>ulNumTappedChannels</b>	0 – 447
This is the number of channels currently being tapped on the conference bridge.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_STAT
<b>fFlexibleConferencing</b>	TRUE / FALSE
If TRUE, this is a flexible conference bridge.	
Direction: OUT	Type: BOOL
Default:	cOCT6100_INVALID_STAT

## 5.4 Phasing TSST Functions

Phasing TSST functions are used for silence suppression and compression changes on an echo cancellation channel.

### 5.4.1 Oct6100PhasingTsstOpen

This function opens a phasing counter on a TDM H.1x0 timeslot. The TSST is used to synchronize compression rate changes by the OCT6100 device with packetization boundaries of a SAR device. Incremental values are driven by an external source (possibly the SAR device). The value range is between 0 and **ulPhasingLength** – 1. The configured **ulPhase** value (see **tOCT6100\_CHANNEL\_OPEN** structure) indicates that the external agent SAR is now fetching the first sample used to assemble the next packet. For example, a packet that consists of 40 samples of voice could be phased with a phasing TSST counting from 0 to 39.

With the phasing TSST and a phase, the OCT6100 device can determine the packetization boundary.

Phasing TSSTs are also used to allow silence suppression indications to be sent to the packetization device at the right moment. On the last byte of every packet (i.e. byte preceding packetization boundary) the chip can be configured to indicate whether the current packet should be suppressed. The device needs a phasing TSST from the SAR device to indicate the packetization boundaries.

The device supports up to 16 independent phasing TSSTs.

In cases where continuous (every H.1x0 frame) silence suppression and compression changes information is desired, the external agent should always drive a value of (**ulPhase** – 1) on the TDM timeslot used as the phasing counter. For example, if **ulPhasingLength** is 40 and **ulPhase** is 39, the external agent should continuously drive 38 on the TDM timeslot to receive silence suppression or compression changes information at every frame.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100PhasingTsstOpenDef (
    tPOCT6100_PHASING_TSST_OPEN          f_pPhasingTsstOpen );

UINT32 Oct6100PhasingTsstOpen (
    tPOCT6100_INSTANCE_API                f_pApiInstance,
    tPOCT6100_PHASING_TSST_OPEN          f_pPhasingTsstOpen );
```

#### Parameters

<b>f_pApiInstance</b>	Pointer to an instance structure of the chip
<b>f_pPhasingTsstOpen</b>	Pointer to a <b>tOCT6100_PHASING_TSST_OPEN</b> structure. The structure's elements are defined below.

### 5.4.1.1 tOCT6100\_PHASING\_TSST\_OPEN Structure

<b>pulPhasingTsstHndl</b>	handle
Pointer to a single UINT32 that returns the handle for the created phasing TSST. This handle is a unique value that identifies the phasing TSST in all future function calls affecting this phasing TSST. The user allocates the UINT32 for the handle.	
Direction: IN/OUT	Type: PUINT32
Default:	NULL
<b>ulPhasingLength</b>	2 – 240
The external agent driving the phasing TSST will drive incremental values within the 0 - ( <b>ulPhasingLength</b> – 1) range.	
Direction: IN	Type: UINT32
Default:	88
<b>ulTimeslot</b>	0 – 255 for 16 MHz stream frequency 0 – 127 for 8 MHz stream frequency 0 – 63 for 4 MHz stream frequency 0 – 31 for 2 MHz stream frequency
This is the timeslot component of the phasing H.100 timeslot. Note that allowed values are affected by the frequency of the clock that controls the <b>ulInputStream</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_TIMESLOT
<b>ulStream</b>	0 – 31 for <b>ulMaxStream</b> of 32 0 – 15 for <b>ulMaxStream</b> of 16 0 – 7 for <b>ulMaxStream</b> of 8 0 – 3 for <b>ulMaxStream</b> of 4
This is the stream component of the phasing H.100 timeslot. Note that this value is also affected by the <b>ulMaxStream</b> value specified at the <b>Oct6100ChipOpen</b> call.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_STREAM

## 5.4.2 Oct6100PhasingTsstClose

This function closes the specified phasing TSST.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100PhasingTsstCloseDef (
    tPOCT6100_PHASING_TSST_CLOSE    f_pPhasingTsstClose );
```

```
UINT32 Oct6100PhasingTsstClose (
    tPOCT6100_INSTANCE_API            f_pApilInstance,
    tPOCT6100_PHASING_TSST_CLOSE    f_pPhasingTsstClose );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip
f_pPhasingTsstClose	Pointer to a tOCT6100_PHASING_TSST_CLOSE structure. The structure's elements are defined below.

### 5.4.2.1 tOCT6100\_PHASING\_TSST\_CLOSE Structure

ulPhasingTsstHndl	handle
-------------------	--------

Handle that identifies the phasing TSST to be closed. This handle is returned by the **Oct6100PhasingTsstOpen** call that opened the phasing TSST.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE

## 5.5 Tone Detection Functions

The OCT6100 firmware includes a tone profile, which defines the group of tones that can be detected on any open channel. Each tone of the profile is identified by its Tone Number, which determines the specific tone and detection port. The list of available tones is always provided with the firmware in an accompanying text file. For example, the text file contains lines such as the following:

```
#define ROUT_DTMF_1 0x10000011
```

This means that tone number 0x10000011 corresponds with the detection of the DTMF 1 tone on the Rout port. To enable the detection of that tone on a specific channel, the user must call the **Oct6100ToneDetectionEnable** function, passing it the targeted channel handle (returned from the call to **Oct6100ChannelOpen**) as well as 0x10000011, the Tone Number.

Once enabled, the channel will generate a tone event every time a DTMF 1 tone is detected on the Rout port. The user must call the **Oct6100InterruptServiceRoutine** regularly and check the `tOCT6100_INTERRUPT_FLAGS` parameter `fToneEventsPending` to see if any tone events are pending.

If `fToneEventsPending` is TRUE the user must call the **Oct6100EventGetTone** function to retrieve the pending tone events. A given channel may be configured to detect any combination of available tones by calling **Oct6100ToneDetectionEnable** multiple times with the `ulToneNumber` parameter set to the desired tone number.

The following table indicates delays before the generation of present and stop events. Those delays may vary depending on the energy and the frequency of the tone. A new tone is detected if there is a signal change longer than 10ms.

Tones	Delay before PRESENT event (ms)	Delay between PRESENT events (ms)	Delay before STOP event (ms)
2100HB_END	252	252	N/A
2100GB_ON	300 +/- 100	N/A	N/A
2100GB_WSPR	250	425*	N/A
1100GB_ON	425	N/A	20
SS5	30	N/A	20
SS7	400	N/A	20
DTMF	40	N/A	20
MF-R1	30	N/A	20
MF-R2	30	N/A	20

\* The 2100Hz tone must continue for 50ms after the phase reversal to get the 2100GB\_WSPR event.

WSPR = well space phase reversal

HB = Hold Band = silence

GB = Guard Band

## 5.5.1 Oct6100ToneDetectionEnable

This function allows the user to enable the detection of a preprogrammed tone on a channel.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ToneDetectionEnableDef (
    tPOCT6100_TONE_DETECTION_ENABLE    f_pToneDetectEnable );

UINT32 Oct6100ToneDetectionEnable (
    tPOCT6100_INSTANCE_API              f_pApilInstance,
    tPOCT6100_TONE_DETECTION_ENABLE    f_pToneDetectEnable );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pToneDetectEnable	Pointer to a tOCT6100_TONE_DETECTION_ENABLE structure. The structure's elements are defined below. The user allocates this structure.

### 5.5.1.1 tOCT6100\_TONE\_DETECTION\_ENABLE Structure

<b>ulChannelHndl</b>	handle
The handle that identifies the channel for which tone detection is enabled. The handle is returned by the call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulToneNumber</b>	see <b>Tone Detection Functions Section</b>
Selects the tone to be detected on the specified channel.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_TONE

## 5.5.2 Oct6100ToneDetectionDisable

This function allows the user to disable the detection of a specific tone on a channel.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100ToneDetectionDisableDef (
    tPOCT6100_TONE_DETECTION_DISABLE    f_pToneDetectDisable );

UINT32 Oct6100ToneDetectionDisable (
    tPOCT6100_INSTANCE_API                f_pApilInstance,
    tPOCT6100_TONE_DETECTION_DISABLE    f_pToneDetectDisable );
```

### Parameters

**f\_pApilInstance**            Pointer to an instance structure of the chip.

**f\_pToneDetectDisable**    Pointer to a **tOCT6100\_TONE\_DETECTION\_DISABLE** structure. The structure's elements are defined below. The user allocates this structure.

### 5.5.2.1 tOCT6100\_TONE\_DETECTION\_DISABLE Structure

<b>ulChannelHndl</b>	handle
The handle that identifies the channel for which tone detection is to be disabled. The handle is returned by the call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulToneNumber</b>	see <b>Tone Detection Functions Section</b>
Selects the tone to be disabled for the specified channel.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_TONE
<b>fDisableAll</b>	TRUE / FALSE
Setting this flag to TRUE will disable tone detection on all enabled tones. The <b>ulToneNumber</b> parameter is ignored when this is set to TRUE.	
Direction: IN	Type: BOOL
Default:	FALSE



## 5.6 Buffer Payout Functions

These functions are used to manage buffer payout on a channel. Three functions are used to manage the payout: add, start and stop functions. The **Oct6100BufferPayoutAdd** function is used to add a buffer to the buffer list for the selected channel port. Up to 127 buffers can be added to a channel port.

Once all the buffers are added to the channel's list, they can be played out by calling **Oct6100BufferPayoutStart**. The payout will stop once all buffers have been played out or when the function **Oct6100BufferPayoutStop** is called by the user.

Other supporting functions are used to load or unload buffers into the chip's external memory: load, load in blocks and unload functions. This can be done at initialization or while the chip is operating.

Since loading buffers into the external memory of the chip can be a long process, depending on the size of the buffer to be loaded, the user is supplied with two types of load functions. **Oct6100BufferPayoutLoad** loads the buffer directly into memory in one call, blocking the user application until this is done. **Oct6100BufferPayoutLoadBlock** loads the buffer in blocks specified by the user, yielding control to the application after each block is loaded into external memory.

Note that the buffer payout function cannot be used on a channel that is also performing DTMF tone removal.

### 5.6.1 Oct6100BufferPayoutLoad

This function allows the user to load a buffer into external memory.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100BufferPayoutLoadDef (
    tPOCT6100_BUFFER_LOAD          f_pBufferLoad );

UINT32 Oct6100BufferPayoutLoad (
    tPOCT6100_INSTANCE_API         f_pApiInstance,
    tPOCT6100_BUFFER_LOAD          f_pBufferLoad );
```

#### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pBufferLoad	Pointer to a tOCT6100_BUFFER_LOAD structure. The structure's elements are defined below. The user allocates this structure.

#### 5.6.1.1 tOCT6100\_BUFFER\_LOAD Structure

<b>pulBufferIndex</b>	0-1343
Buffer index in the buffer memory. This value is used in future <b>Oct6100BufferPayout</b> function calls to reference this buffer.	
Direction: OUT	Type: PUINT32
Default:	NULL

<b>pulPlayoutFreeMemSize</b>	0 - total space in external memory for playout
Optional parameter that returns the amount of external memory, in bytes, left that can be used for buffer playout after loading the specified buffer. Note that this value does not necessarily refer to a contiguous memory block.	
Direction: OUT	Type: PUINT32
Default:	NULL
<b>pbyBufferPattern</b>	pointer
A byte pointer pointing to a valid buffer to be loaded into the chip's external memory.	
Direction: IN	Type: PUINT8
Default:	NULL
<b>ulBufferSize</b>	64 – max space left in external memory
Size of the buffer loaded into external memory. This value must be modulo 16. This size is specified in bytes. Note that the actual external memory size used is the specified size rounded up to be modulo 64.	
Direction: IN	Type: UINT32
Default:	64
<b>ulBufferPcmLaw</b>	cOCT6100_PCM_U_LAW cOCT6100_PCM_A_LAW
PCM law of the buffer being loaded into external memory.	
Direction: IN	Type: UINT32
Default:	cOCT6100_PCM_U_LAW

## 5.6.2 Oct6100BufferPayoutLoadBlockInit

This function allows the user to initialize loading a buffer into external memory using blocks. The external memory is reserved after this function returns, but the user must call the **Oct6100BufferPayoutLoadBlock** function to copy the actual buffer into external memory.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100BufferPayoutLoadBlockInitDef (
    tPOCT6100_BUFFER_LOAD_BLOCK_INIT      f_pBufferLoadBlockInit );
```

```
UINT32 Oct6100BufferPayoutLoadBlockInit (
    tPOCT6100_INSTANCE_API                f_pApIInstance,
    tPOCT6100_BUFFER_LOAD_BLOCK_INIT      f_pBufferLoadBlockInit );
```

### Parameters

**f\_pApIInstance**            Pointer to an instance structure of the chip.

**f\_pBufferLoadBlockInit**   Pointer to a tOCT6100\_BUFFER\_LOAD\_BLOCK\_INIT structure. The structure's elements are defined below. The user allocates this structure.

### 5.6.2.1 tOCT6100\_BUFFER\_LOAD\_BLOCK\_INIT Structure

<b>pulBufferIndex</b>	0-1343
Buffer index in the buffer memory. This value is used in future <b>Oct6100BufferPayout</b> function calls to reference this buffer.	
Direction: OUT	Type: PUINT32
Default:	NULL
<b>pulPayoutFreeMemSize</b>	0 – total space in external memory for payout
Optional parameter that returns the amount of external memory left, in bytes, that can be used for buffer payout after loading the specified buffer. Note that this value does not necessarily refer to a contiguous memory block.	
Direction: OUT	Type: PUINT32
Default:	NULL
<b>ulBufferSize</b>	64 – max space left in external memory
Size of the buffer loaded into external memory. This size is specified in bytes. This value must be modulo 16. Note that the actual external memory size used is the specified size rounded up to be modulo 64.	
Direction: IN	Type: UINT32
Default:	64

<b>ulBufferPcmLaw</b>	cOCT6100_PCM_U_LAW cOCT6100_PCM_A_LAW
PCM law of the buffer being loaded into external memory.	
Direction: IN	Type: UINT32
Default:	cOCT6100_PCM_U_LAW

### 5.6.3 Oct6100BufferPayoutLoadBlock

This function allows the user to load a buffer block into external memory. The user must call the **Oct6100BufferPayoutLoadBlockInit** function first, to reserve the external memory needed for loading the buffer.

This function must be called repeatedly, loading a portion of the buffer each time. The user can specify the size of each block.

The API does not check that the entire buffer has been loaded. It is the user's responsibility to ensure that all blocks have been loaded.

#### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100BufferPayoutLoadBlockDef (  
    tPOCT6100_BUFFER_LOAD_BLOCK          f_pBufferLoadBlock );  
  
UINT32 Oct6100BufferPayoutLoadBlock (  
    tPOCT6100_INSTANCE_API                f_pApilInstance,  
    tPOCT6100_BUFFER_LOAD_BLOCK          f_pBufferLoadBlock );
```

#### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pBufferLoadBlock	Pointer to a tOCT6100_BUFFER_LOAD_BLOCK structure. The structure's elements are defined below. The user allocates this structure.

#### 5.6.3.1 tOCT6100\_BUFFER\_LOAD\_BLOCK Structure

<b>ulBufferIndex</b>	0-1343
Index of the buffer where data should be copied into the chip external memory.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulBlockOffset</b>	0 – maximum buffer size
Offset, in bytes, of the first byte in the block to be loaded. This offset is with respect to the beginning of the buffer. This value must be modulo 2.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE

Copyright © 2008 Octasic Inc.  
oct61XXas5000-038

## 5.6.4 Oct6100BufferPayoutUnload

This function allows the user to unload a buffer from the chip's external memory. Note that although unloading a buffer that is currently playing is permitted, the samples played out may be invalid.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100BufferPayoutUnloadDef (
    tPOCT6100_BUFFER_UNLOAD          f_pBufferUnload );

UINT32 Oct6100BufferPayoutUnload (
    tPOCT6100_INSTANCE_API           f_pApilInstance,
    tPOCT6100_BUFFER_UNLOAD          f_pBufferUnload);
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pBufferUnload	Pointer to a tOCT6100_BUFFER_UNLOAD structure. The structure's elements are defined below. The user allocates this structure.

### 5.6.4.1 tOCT6100\_BUFFER\_UNLOAD Structure

<b>ulBufferIndex</b>	0-1343
Index of the buffer to be removed from the chip external memory.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE

## 5.6.5 Oct6100BufferPayoutAdd

This function allows the user to add a buffer to the current list of buffers for one of the channel's output ports.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100BufferPayoutAddDef (
    tPOCT6100_BUFFER_PLAYOUT_ADD          f_pBufferPayoutAdd );
```

```
UINT32 Oct6100BufferPayoutStart (
    tPOCT6100_INSTANCE_API                f_pApiInstance,
    tPOCT6100_BUFFER_PLAYOUT_ADD          f_pBufferPayoutAdd );
```

### Parameters

<b>f_pApiInstance</b>	Pointer to an instance structure of the chip.
<b>f_pBufferPayoutAdd</b>	Pointer to a tOCT6100_BUFFER_PLAYOUT_ADD structure. The structure's elements are defined below. The user allocates this structure.

### 5.6.5.1 tOCT6100\_BUFFER\_PLAYOUT\_ADD Structure

<b>ulChannelHndl</b>	handle
The handle that identifies the channel on which the specified buffer is to be played. The handle is returned by the call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulBufferIndex</b>	0-1343
Index of the buffer to be played on the selected port.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulPayoutPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT
This is the channel port on which the buffer will be played. Note that the PCM law in which the buffer is played on the ROUT or SOUT port is determined by the PCM law of the RIN and SIN port respectively.	
Direction: IN	Type: UINT32
Default:	cOCT6100_CHANNEL_PORT_ROUT
<b>ulMixingMode</b>	cOCT6100_MIXING_MINUS_6_DB cOCT6100_MIXING_MINUS_12_DB cOCT6100_MIXING_MUTE
This parameter selects the level of the original signal mixed with the buffer.	
Direction: IN	Type: UINT32
Default:	cOCT6100_MIXING_MINUS_6_DB

<b>IGainDb</b>	-24 – 24
This parameter is the gain applied to the selected port's signal during playout.	
Direction: IN	Type: INT32
Default:	0
<b>fRepeat</b>	TRUE / FALSE
This parameter represents whether or not the <b>ulRepeatCount</b> parameter should be used for setting the repeat count of the selected buffer. If set to FALSE, the buffer will play only once.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>ulRepeatCount</b>	1 – 32767 cOCT6100_REPEAT_INFINITY
This parameter represents the number of times that the selected buffer should be played out. If the user sets this parameter to cOCT6100_REPEAT_INFINITY, once started, this buffer will play until the procedure <b>Oct6100BufferPlayoutStop</b> is called. This parameter is ignored if <b>fRepeat</b> is set to FALSE.	
Direction: IN	Type: UINT32
Default:	cOCT6100_REPEAT_INFINITY
<b>ulDuration</b>	32-bit value
This parameter represents the time (duration), in milliseconds, that this buffer should be played. If set, this parameter overrides the <b>fRepeat</b> flag.	
When this parameter is used, the API converts the <b>ulDuration</b> into a <b>ulRepeatCount</b> and uses that to configure the device. If <b>ulRepeatCount</b> is calculated to be above 32767, then multiple buffer playout events are created to accommodate this.	
If the required buffer playout sequence is complicated and requires many different playout events, then using multiple playout events for a single buffer may be undesirable. To get around this problem, a longer buffer can be used, containing many repetitions of the desired signal. This will cause the calculated <b>ulRepeatCount</b> to be smaller, thus using less playout events.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulBufferLength</b>	64 – size of buffer currently loaded into memory
This parameter allows the user to play only the N first bytes of a buffer. The specified length is with respect to the beginning of the buffer. Setting this value to cOCT6100_AUTO_SELECT will play the buffer completely. This value must be modulo 16.	
Direction: IN	Type: UINT32
Default:	cOCT6100_AUTO_SELECT



### 5.6.6 Oct6100BufferPlayoutStart

This function allows the user to activate buffer playout on a channel. Note that issuing a playout start command on a port that has no buffers “added” will play nothing, i.e. the signal on the port will be left unchanged.

The `playout_start` command will not return an error if some of the buffers in the list to be played have been unloaded. In this situation, the samples played out may be invalid.

Buffer playout can only be started if the following conditions are met:

- The **fEnableNlp** flag of the channel configuration is set to TRUE.
- The **ulEchoOperationMode** parameter of the channel configuration is not set to cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN or cOCT6100\_ECHO\_OP\_MODE\_HT\_FREEZE.

Trying to start buffer playout without the above conditions will result in an error from the API.

After a start command is issued, the “added” buffers will begin to play. Once played out, these buffers are removed from the internal buffer list. Therefore, to play the same buffers again on a same channel, they must be “re-added” before another start command is issued.

## Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100BufferPlayoutStartDef (
    tPOCT6100_BUFFER_PLAYOUT_START f_pBufferPlayoutStart );
```

```
UINT32 Oct6100BufferPayoutStart (
    tPOCT6100_INSTANCE_API          f_pApilInstance,
    tPOCT6100_BUFFER_PLAYOUT_START  f_pBufferPayoutStart );
```

## Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pBufferPayoutStart	Pointer to a tOCT6100_BUFFER_PLAYOUT_START structure. The structure's elements are defined below. The user allocates this structure.

#### 5.6.6.1 tOCT6100\_BUFFER\_PLAYOUT\_START Structure

<b>ulChannelHndl</b>	handle
----------------------	--------

The handle that identifies the channel on which buffer playout will be started. The handle is returned by the call to **Oct6100ChannelOpen**.

Direction: IN

Type: UINT32

Default:

cOCT6100 INVALID HANDLE

**ulPayoutPort**

cOCT6100\_CHANNEL\_PORT\_SOUT  
cOCT6100\_CHANNEL\_PORT\_ROUT

This is the channel port on which the buffer is to be played. Note that the PCM law in which the buffer is played on the ROUT or SOUT port is determined by the PCM law of the Rin and Sin port respectively.

Direction: IN

Type: UINT32

Default:

cOCT6100\_CHANNEL\_PORT\_ROUT

**fNotifyOnPayoutStop**

TRUE / FALSE

This flag indicates whether or not a buffer payout event of type **cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_STOP** should be generated when the current list stops playing. The events can be retrieved via a call to **Oct6100BufferPayoutGetEvent**. This feature is only available if the user allocated a software buffer to store the buffer payout events, when the chip was opened, using the **ulSoftBufferPayoutEventsBufSize** parameter. Note that issuing a call to **Oct6100BufferPayoutStop** will not generate an event when the payout stops.

Direction: IN

Type: BOOL

Default:

FALSE

**ulUserId**

32-bit value

User specified field stored in the API buffer payout structure. This parameter is returned with the channel handle and port when a buffer payout event is detected for the current channel and port. Only used when the **fNotifyOnPayoutStop** flag is set.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

**fAllowStartWhileActive**

TRUE / FALSE

This flag indicates whether or not the API should return an error to this call if a buffer is currently playing on the specified channel and port. If a buffer is currently playing, and this flag is set to TRUE, the new buffers will be added to the end of the currently playing list.

Direction: IN

Type: BOOL

Default:

FALSE

## 5.6.7 Oct6100BufferPayoutStop

This function stops the buffer payout on the channel's selected port.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100BufferPayoutStopDef (
    tPOCT6100_BUFFER_PLAYOUT_STOP          f_pBufferPayoutStop );

UINT32 Oct6100BufferPayoutStop (
    tPOCT6100_INSTANCE_API                  f_pApilInstance,
    tPOCT6100_BUFFER_PLAYOUT_STOP          f_pBufferPayoutStop );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pBufferPayoutStop	Pointer to a tOCT6100_BUFFER_PLAYOUT_STOP structure. The structure's elements are defined below. The user allocates this structure.

### 5.6.7.1 tOCT6100\_BUF\_PLAYOUT\_STOP Structure

<b>ulChannelHndl</b>	handle
	Handle that identifies the echo channel on which the buffer is currently playing. The handle is returned by the call to <b>Oct6100ChannelOpen</b> .
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulPayoutPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT
	This is the echo channel port on which the buffer is currently playing.
Direction:	IN
Type:	UINT32
Default:	cOCT6100_CHANNEL_PORT_ROUT

**fStopCleanly**

TRUE / FALSE

This flag indicates if the buffer playing during this function call will stop immediately (FALSE) or if it will stop only once all its samples have been played out (TRUE).

Direction: IN

Type: BOOL

Default:

TRUE

**pfNotifyOnPlayoutStop**

TRUE / FALSE

Optional output parameter. This variable returns the user configuration for this parameter that was specified when the **Oct6100BufferPlayoutStart** function was called.

Direction: OUT

Type: PBOOL

Default:

NULL

**pfAlreadyStopped**

TRUE / FALSE

Optional output parameter. This flag will be set to FALSE if a playout list was playing on the selected port before stopping. Note that this parameter will also be set to FALSE if one or more events were added but playout was not started using the **Oct6100BufferPlayoutStart** function.

Direction: OUT

Type: PBOOL

Default:

NULL

## 5.7 Caller ID Functions

These functions are used to manage the transmission (using FSK modulation) of Caller ID information. Both ETSI (ETS300 659.1 and 659.2) and Bellcore (GR-30-Core) standards are supported.

The caller ID module must be initialized by invoking the **Oct6100CallerIdInit** function before being used. The standard (ETSI or Bellcore) to be used when generating the messages must be specified using the **ulCallerIdGeneratorType** member of the initialization function.

Two main functions are used to manage the caller ID feature: the transmit and abort functions. The **Oct6100CallerIdTransmit** function is used to start the transmission of a user-specified message. The **Oct6100CallerIdAbort** function is used to stop the transmission of a caller ID. For example, **Oct6100CallerIdAbort** could be invoked if an off-hook signal of the called party was detected.

Another optional function is available to the user: transmission of the Dual-Tone Alerting Signal. The **Oct6100CallerIdTransmitAs** function is used to transmit the terminal alerting signal if doing terminal equipment alerting. This signal is used to signify to the called party that a caller ID message will follow soon. Note that it is the responsibility of the user to detect the terminal equipment acknowledge signal.

The **fEnableCallerId** flag of the **tOCT6100\_OPEN\_CHIP** structure must be set to TRUE for caller ID to work.

Note that the caller ID functions are a superset of the buffer playout functions and therefore using caller ID and buffer playout simultaneously on a given channel will not work.

### 5.7.1 Oct6100CallerIdInit

This function allows the user to initialize the caller ID buffers used to generate the caller ID messages. Note that this function call can take a few milliseconds to complete since all generated buffers must be loaded into the chip's external memory. It is recommended that this function be called before opening any channels to assure the shortest execution time.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100CallerIdInitDef (
    tPOCT6100_CALLER_ID_INIT          f_pldInit );

UINT32 Oct6100CallerIdInit (
    tPOCT6100_INSTANCE_API            f_pApiInstance,
    tPOCT6100_CALLER_ID_INIT          f_pldInit );
```

#### Parameters

<b>f_pApiInstance</b>	Pointer to an instance structure of the chip.
<b>f_pldInit</b>	Pointer to a <b>tOCT6100_CALLER_ID_INIT</b> structure. The structure's elements are defined below. The user allocates this structure.

#### 5.7.1.1 tOCT6100\_CALLER\_ID\_INIT Structure

**ulCallerIdGeneratorType**

cOCT6100\_CALLER\_ID\_TYPE\_ETSI  
cOCT6100\_CALLER\_ID\_TYPE\_BELLCORE

Type of generator used in the caller ID module. For the ETSI (ETS300 659.1 and 659.2) standard use cOCT6100\_CALLER\_ID\_TYPE\_ETSI. For the Bellcore (GR-30-Core) standard use cOCT6100\_CALLER\_ID\_TYPE\_BELLCORE.

Direction: IN

Type: UINT32

Default:

cOCT6100\_CALLER\_ID\_TYPE\_ETSI

## 5.7.2 Oct6100CallerIdTerminate

This function allows the user to unload the caller ID buffers used to generate the caller ID messages. Note that this function will free all external memory used up by the caller ID module, but will not free the internal associated API instance structures. Upon return of this function, all external memory that was used by the caller ID module will be available for buffer payout.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100CallerIdTerminateDef (  
    tPOCT6100_CALLER_ID_TERMINATE        f_pldTerminate );
```

```
UINT32 Oct6100CallerIdTerminate (  
    tPOCT6100_INSTANCE_API                f_pApilInstance,  
    tPOCT6100_CALLER_ID_TERMINATE        f_pldTerminate );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pldTerminate	Pointer to a tOCT6100_CALLER_ID_TERMINATE structure. The structure's elements are defined below. The user allocates this structure.

### 5.7.2.1 tOCT6100\_CALLER\_ID\_TERMINATE Structure

ulDummy	32-bit value
---------	--------------

The API does not use this structure member. It exists only to preserve the OCT6100 API functions format.

Direction: IN	Type: UINT32
Default:	0

### 5.7.3 Oct6100CallerIdTransmit

This function allows the user to start transmission of a caller identification message.

#### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100CallerIdTransmitDef (  
    tPOCT6100_CALLER_ID_TRANSMIT          f_pldTransmit );  
  
UINT32 Oct6100CallerIdTransmit (  
    tPOCT6100_INSTANCE_API                f_pApiInstance,  
    tPOCT6100_CALLER_ID_TRANSMIT          f_pldTransmit );
```

#### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pldTransmit	Pointer to a tOCT6100_CALLER_ID_TRANSMIT structure. The structure's elements are defined below. The user allocates this structure.

#### 5.7.3.1 tOCT6100\_CALLER\_ID\_TRANSMIT Structure

<b>byMessageType</b>	8-bit value
Message type to be transmitted. Ignored if <b>fPreFormattedMessage</b> is set to TRUE.	
Direction: IN	Type: UINT8
Default:	0
<b>byMessageLength</b>	0 - 126
Length of the message to be transmitted.	
Direction: IN	Type: UINT8
Default:	0
<b>pbyMessage</b>	pointer
A byte pointer pointing to a valid message to be transmitted.	
Direction: IN	Type: PUINT8
Default:	NULL
<b>ulChannelHndl</b>	handle
The handle that identifies the channel on which the caller ID message will be transmitted. The handle is returned by the call to <b>Oct6100ChannelOpen</b> . Setting this parameter to cOCT6100_INVALID_HANDLE will return the caller ID message duration without transmitting the message on a channel.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE



<b>ulPayoutPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT cOCT6100_INVALID_VALUE
This is the channel port on which the caller ID message should be transmitted. Setting this parameter to cOCT6100_INVALID_VALUE will return the caller ID message duration without transmitting the message on a channel port.	
Direction: IN	Type: UINT32
Default:	cOCT6100_CHANNEL_PORT_ROUT
<b>ulNumMarkBits</b>	cOCT6100_CALLER_ID_NUM_MARK_BITS_180 cOCT6100_CALLER_ID_NUM_MARK_BITS_80
Number of mark bits that will be inserted after the seizure signal is transmitted. For on-hook caller ID, this should be set to cOCT6100_CALLER_ID_NUM_MARK_BITS_180. For off-hook caller id, this parameter should be set to cOCT6100_CALLER_ID_NUM_MARK_BITS_80.	
Direction: IN	Type: UINT32
Default:	cOCT6100_CALLER_ID_NUM_MARK_BITS_180
<b>fTransmitSeizureSignal</b>	TRUE / FALSE
Whether or not the channel seizure signal will be transmitted. For regular on-hook caller ID, this should be TRUE. For off-hook caller ID, this value should be set to FALSE.	
Direction: IN	Type: BOOL
Default:	TRUE
<b>fPreFormattedMessage</b>	TRUE / FALSE
If set to TRUE, the message pointed by <b>pbbyMessage</b> will be considered pre-formatted and no processing will be done on it. The message will be transmitted exactly as it is in the buffer. This mode can be used for single or multiple data messages. The API will assume that the message type, message length and checksum fields are already filled by the user.	
Direction: IN	Type: BOOL
Default:	TRUE
<b>ulPreTransmitDelayMs</b>	0 - 60000
This parameter specifies the amount of pure silence in milliseconds that is inserted before the caller ID information is transmitted. For example, if the ringing time is 2 seconds and the user wishes to wait 500 milliseconds after the ring has stopped before transmitting the caller ID information, this parameter would be set to 2500 ms. Note that a value between 1 and 7 milliseconds will result in 8 milliseconds of delay before transmission.	
Direction: IN	Type: UINT32
Default:	0

### **fNotifyOnTransmitEnd**

TRUE / FALSE

This flag indicates whether or not a buffer playout event of type **cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_CALLER\_ID\_STOP** should be generated when playout of the caller ID message terminates. The events can be retrieved via a call to **Oct6100BufferPlayoutGetEvent**. This feature is only available if the user has allocated a software buffer to store the buffer playout events, when the chip was opened, using the **ulSoftBufferPlayoutEventsBufSize** parameter. Note that issuing a call to **Oct6100CallerIdAbort** will prevent an event from being generated when the transmission aborts.

Direction: IN

Type: BOOL

Default:

FALSE

### **ulUserId**

32-bit value

User-specified field stored in the API buffer playout instance structure. This parameter is returned with the channel handle and port when a buffer playout event is generated for the current channel and port. Only used when the **fNotifyOnTransmitEnd** flag is set.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

### **pulDurationMs**

32-bits value

Optional parameter. The API returns the calculated duration, in milliseconds, of the transmission of the caller identification message. This value does not include the pre-transmission delay inserted using the **ulPreTransmitDelayMs** parameter.

In the case where the duration of a caller identification message is required without actual transmission on a channel port, the **pulDurationMs** parameter should be used with the following parameters:

- **ulChannelHndl** set to cOCT6100\_INVALID\_HANDLE
- **ulPlayoutPort** set to cOCT6100\_INVALID\_VALUE

Upon function call return with this set of parameter values, the **pulDurationMs** parameter will contain the duration of the transmission of the configured caller identification message, but no playout activity will occur on a channel port.

Direction: OUT

Type: PUINT32

Default:

NULL

## 5.7.4 Oct6100CallerIdTransmitAs

This function allows the user to start transmission of a caller identification Alerting Signal. DT-AS is supported for ETSI and CAS is supported for Bellcore.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100CallerIdTransmitAsDef (
    tPOCT6100_CALLER_ID_TRANSMIT_AS      f_pldTransmitAs );

UINT32 Oct6100CallerIdTransmitAs (
    tPOCT6100_INSTANCE_API                f_pApiInstance,
    tPOCT6100_CALLER_ID_TRANSMIT_AS      f_pldTransmitAs );
```

### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pldTransmit	Pointer to a tOCT6100_CALLER_ID_TRANSMIT_AS structure. The structure's elements are defined below. The user allocates this structure.

### 5.7.4.1 tOCT6100\_CALLER\_ID\_TRANSMIT\_AS Structure

<b>ulChannelHndl</b>	handle
The handle that identifies the channel on which the caller ID alerting signal will be transmitted. The handle is returned by the call to <b>Oct6100ChannelOpen</b> .	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulPlayoutPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT
This is the channel port on which the caller ID alerting signal will be transmitted.	
Direction: IN	Type: UINT32
Default:	cOCT6100_CHANNEL_PORT_ROUT
<b>ulDurationMs</b>	cOCT6100_CALLER_ID_AS_DURATION_80_MS cOCT6100_CALLER_ID_AS_DURATION_100_MS
This parameter specifies the duration, in milliseconds, of the alerting signal. Currently, 2 durations are supported: 80 and 100 milliseconds. For Bellcore type generator, this should be set to 80 milliseconds. For the ETSI on-hook alerting signal, this should be set to 100 milliseconds. For the ETSI off-hook alerting signal, this should be set to 80 milliseconds.	
Direction: IN	Type: UINT32
Default:	0

**ulPreTransmitDelayMs**                      0 - 60000

This parameter specifies the amount of pure silence, in milliseconds, that is inserted before the caller ID alerting signal is transmitted. For example, if the ringing time is 2 seconds and the user wishes to wait 200 milliseconds after the ring has stopped before transmitting the caller ID alerting signal, this parameter would be set to 2200 ms. Note that a value between 1 and 7 milliseconds will result in 8 milliseconds of delay before transmission.

Direction: IN                                  Type: UINT32

Default:    0

**fNotifyOnTransmitEnd**                      TRUE / FALSE

This flag indicates whether or not a buffer playout event of type **cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_CALLER\_ID\_AS\_STOP** should be generated when playout of the alerting signal terminates. The events can be retrieved via a call to **Oct6100BufferPlayoutGetEvent**. This feature is only available if the user allocated a software buffer to store the buffer playout events, when the chip was opened, using the **ulSoftBufferPlayoutEventsBufSize** parameter. Note that issuing a call to **Oct6100CallerIdAbort** will prevent and event from being generated when the transmission of the alerting signal aborts.

Direction: IN                                  Type: BOOL

Default:    FALSE

**ulUserEventId**                              32-bit value

User specified field stored in the API buffer playout instance structure. This parameter is returned with the channel handle and port when a buffer playout event is detected for the current channel and port. Only used when the **fNotifyOnTransmitEnd** flag is set.

Direction: IN                                  Type: UINT32

Default:    cOCT6100\_INVALID\_VALUE

## 5.7.5 Oct6100CallerIdAbort

This function allows the user to abort transmission of a caller identification message. This function can be used to stop transmission when the called party goes off-hook.

Note that since caller ID uses buffer playout, any buffer that was playing using the buffer playout functions will also be stopped.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100CallerIdAbortDef (
    tPOCT6100_CALLER_ID_ABORT          f_pldAbort );

UINT32 Oct6100CallerIdAbort (
    tPOCT6100_INSTANCE_API              f_pApiInstance,
    tPOCT6100_CALLER_ID_ABORT          f_pldAbort );
```

### Parameters

f_pApiInstance	Pointer to an instance structure of the chip.
f_pldTransmit	Pointer to a tOCT6100_CALLER_ID_ABORT structure. The structure's elements are defined below. The user allocates this structure.

### 5.7.5.1 tOCT6100\_CALLER\_ID\_ABORT Structure

<b>ulChannelHndl</b>	handle
The handle that identifies the channel on which transmission should be aborted. The handle is returned by the call to <b>Oct6100ChannelOpen</b> .	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulPlayoutPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT
This is the channel port on which the transmission should be aborted.	
Direction:	IN
Type:	UINT32
Default:	cOCT6100_CHANNEL_PORT_ROUT
<b>pfAlreadyAborted</b>	TRUE / FALSE
Optional output parameter. This flag will be set to FALSE if a caller ID message was playing on the selected port before aborting.	
Direction:	OUT
Type:	PBOOL
Default:	NULL
<b>pfNotifyOnTransmitEnd</b>	TRUE / FALSE
Optional output parameter. This parameter returns the user configuration set when the transmission was started.	
Direction:	OUT
Type:	PBOOL
Default:	NULL

## 5.8 Event functions

**Oct6100EventGet** functions are used to retrieve the tone detection events generated in the chip, as well as the buffer playout events.

### 5.8.1 Oct6100EventGetTone

This function allows the user to retrieve tone detection events. When the appropriate tone detector is enabled, an event is generated when a tone is detected or when the tone stops being detected.

When this function is called, it is possible to receive both the “start” and “stop” event for the same tone. The device generates tone events every 32 ms. If the tone starts and stops in less than 64 ms, then both events will appear in the API queue at the same time.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100EventGetToneDef (
    tPOCT6100_EVENT_GET_TONE          f_pEventGetTone );

UINT32 Oct6100EventGetTone (
    tPOCT6100_INSTANCE_API            f_pApiInstance,
    tPOCT6100_EVENT_GET_TONE          f_pEventGetTone );
```

#### Parameters

<b>f_pApiInstance</b>	Pointer to an instance structure of the chip.
<b>f_pEventGetTone</b>	Pointer to a <b>tOCT6100_GET_TONE_EVENT</b> structure. The structure's elements are defined below. The user allocates this structure.

#### 5.8.1.1 tOCT6100\_EVENT\_GET\_TONE Structure

<b>pToneEvent</b>	pointer
Pointer to an array of <b>tOCT6100_TONE_EVENT</b> structures. The user must allocate this memory; its size must be consistent with <b>ulMaxToneEvent</b> .	
Direction:	IN/OUT
Type:	tPOCT6100_TONE_EVENT
Default:	NULL
<b>ulMaxToneEvent</b>	1 – <b>ulSoftToneEventsBufferSize</b>
Maximum number of tone events that can be returned to the user. The upper range of this parameter is defined by the <b>ulSoftToneEventsBufSize</b> parameter of the <b>tOCT6100_CHIP_OPEN</b> structure.	
Direction:	IN
Type:	UINT32
Default:	1
<b>ulNumValidToneEvent</b>	0 - <b>ulMaxToneEvent</b>
The number of tone events returned.	
Direction:	OUT
Type:	UINT32
Default:	cOCT6100_INVALID_VALUE

<b>fResetBufs</b>	TRUE / FALSE
Reset flag for the tone events buffer. Setting this parameter to TRUE will empty the tone events buffer without returning them.	
Direction: IN	Type: BOOL
Default:	FALSE
<b>fMoreEvents</b>	TRUE / FALSE
Indicates if more tone events are present in the software buffer.	
Direction: OUT	Type: BOOL
Default:	FALSE

### 5.8.1.2 tOCT6100\_TONE\_EVENT Structure

<b>ulChannelHndl</b>	handle
Handle of the channel that generated the message.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulUserChanId</b>	32-bit value
User-defined field associated to the channel that generated this event.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulToneDetected</b>	see <b>Tone Detection Functions Section</b>
Tone value associated to the message.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulTimestamp</b>	32-bit value
Value of the local timestamp when the message was created. This timestamp is in H.1x0 frame count.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulEventType</b>	cOCT6100_TONE_STOP cOCT6100_TONE_PRESENT
This is the reported event type.	
When the tone is detected, the event type reported is cOCT6100_TONE_PRESENT.	
If the tone was present but detection stopped, the event type is cOCT6100_TONE_STOP.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE

**ulExtToneDetectionPort**

cOCT6100\_CHANNEL\_PORT\_RIN  
cOCT6100\_CHANNEL\_PORT\_SIN  
cOCT6100\_INVALID\_VALUE

Channel port on which the tone was detected. If the channel is not in extended tone detection mode, the API will return a value of cOCT6100\_INVALID\_VALUE, which can be ignored. This mode is enabled by setting the **fEnableExtToneDetection** parameter to TRUE in the **Oct6100ChipOpen** function call and the **Oct6100ChannelOpen** function.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE



## 5.8.2 Oct6100BufferPayoutGetEvent

This function allows the user to retrieve buffer payout events. An event can be generated when a buffer list stops playing.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100BufferPayoutGetEventDef (
    tPOCT6100_BUFFER_PLAYOUT_GET_EVENT  f_pBufPayoutGetEvent);

UINT32 Oct6100BufferPayoutGetEvent (
    tPOCT6100_INSTANCE_API               f_pApiInstance,
    tPOCT6100_BUFFER_PLAYOUT_GET_EVENT  f_pBufPayoutGetEvent);
```

### Parameters

**f\_pApiInstance**            Pointer to an instance structure of the chip.

**f\_pBufPayoutGetEvent**            Pointer to a tOCT6100\_BUFFER\_PLAYOUT\_GET\_EVENT structure. The structure's elements are defined below. The user allocates this structure.

### 5.8.2.1 tOCT6100\_BUFFER\_PLAYOUT\_GET\_EVENT Structure

<b>pBufferPayoutEvent</b>	pointer
Pointer to an array of <b>tOCT6100_BUFFER_PLAYOUT_EVENT</b> structures. The user must allocate this memory; its size must be consistent with <b>ulMaxEvent</b> . This structure is explained below.	
Direction:	IN/OUT
Type:	tPOCT6100_BUFFER_PLAYOUT_EVENT
Default:	NULL
<b>ulMaxEvent</b>	1 - <b>ulSoftBufPlayouEventsBufSize</b>
Maximum number of buffer payout events that can be returned to the user. The upper range of this parameter is defined by the <b>ulSoftBufPlayouEventsBufSize</b> parameter of the <b>tOCT6100_CHIP_OPEN</b> structure.	
Direction:	IN
Type:	UINT32
Default:	1
<b>ulNumValidEvent</b>	0 - <b>ulMaxEvent</b>
The number of valid buffer payout events returned.	
Direction:	OUT
Type:	UINT32
Default:	cOCT6100_INVALID_VALUE
<b>fResetBufs</b>	TRUE / FALSE
Reset flag for the buffer payout events buffer.	
Direction:	IN
Type:	BOOL
Default:	FALSE

<b>fMoreEvents</b>	TRUE / FALSE
Indicates if more buffer playout events are present in the software buffer.	
Direction: OUT	Type: BOOL
Default:	FALSE

### 5.8.2.2 tOCT6100\_BUFFER\_PLAYOUT\_EVENT Structure

<b>ulChannelHndl</b>	handle
Handle of the channel where the event was detected.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE
<b>ulUserChanId</b>	32-bit value
User-defined field associated to the channel where this event was detected.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulChannelPort</b>	cOCT6100_CHANNEL_PORT_SOUT cOCT6100_CHANNEL_PORT_ROUT
This is the channel port where the event was detected.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_CHANNEL_PORT_ROUT
<b>ulUserEventId</b>	32-bit value
User-defined field supplied when the <b>Oct6100BufferPlayoutStart</b> , <b>Oct6100CallerIdTransmit</b> or <b>Oct6100CallerIdTransmitAs</b> command was issued for the channel and port where the buffer playout event was detected.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulTimestamp</b>	32-bit value
Value of the timestamp, in milliseconds, when the event was created. The precision of this value is dependent on the frequency at which the interrupt service routine is called.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE

**ulEventType**

cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_STOP  
cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_CALLER\_ID\_STOP  
cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_CALLER\_ID\_AS\_STOP

This is the reported buffer playout event type. If a playout buffer currently playing stops, the event type is returned according to the command which started playing it:

- **Oct6100BufferPlayoutStart** will generate an event of type cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_STOP.
- **Oct6100CallerIdTransmit** will generate an event of type cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_CALLER\_ID\_STOP.
- **Oct6100CallerIdTransmitAs** will generate an event of type cOCT6100\_BUFFER\_PLAYOUT\_EVENT\_CALLER\_ID\_AS\_STOP.

Direction: OUT

Type: UINT32

Default:

cOCT6100\_INVALID\_VALUE

## 5.9 TSI Connection Functions

These functions are used to open and close a TSI connection. A TSI connection reads one TDM sample from a TSST each 125 usec, and outputs it on another one. This functionality is useful for debugging or board tests. TSI connections are not used for normal device operation.

### 5.9.1 Oct6100TsiCnctOpen

This function opens a connection between two TSSTs.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100TsiCnctOpenDef (
    tPOCT6100_TSI_CNCT_OPEN          f_pTsiCnctOpen );

UINT32 Oct6100TsiCnctOpen (
    tPOCT6100_INSTANCE_API            f_pApiInstance,
    tPOCT6100_TSI_CNCT_OPEN          f_pTsiCnctOpen);
```

#### Parameters

<b>f_pApiInstance</b>	Pointer to an instance structure of the chip.
<b>f_pTsiCnctOpen</b>	Pointer to a tOCT6100_TSI_CNCT_OPEN structure. The structure's elements are defined below. The user allocates this structure.

#### 5.9.1.1 tOCT6100\_TSI\_CNCT\_OPEN Structure

**pulTsiCnctHndl**                      handle

The parameter returns the handle for the created TSI connection. This handle is a unique value that identifies the channel in all future function calls affecting this connection. The user allocates the memory for this pointer.

Direction: IN/OUT	Type: PUINT32
Default:	NULL

**ullInputTimeslot**                      0 – 255 for 16 MHz stream frequency  
     0 – 127 for 8 MHz stream frequency  
     0 – 63 for 4 MHz stream frequency  
     0 – 31 for 2 MHz stream frequency

The timeslot of the TSI connection input TSST. Note that allowed values are affected by the frequency of the clock that controls the **ullInputStream**.

Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_TIMESLOT

**ulInputStream**                      0 – 31 for **ulMaxTdmStreams** of 32  
   0 – 15 for **ulMaxTdmStreams** of 16  
   0 – 7 for **ulMaxTdmStreams** of 8  
   0 – 3 for **ulMaxTdmStreams** of 4

The stream of the TSI connection input TSST. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

Direction: IN                      Type: UINT32  
Default:                          cOCT6100\_INVALID\_STREAM

**ulOutputTimeslot**                      see **ulInputTimeslot** parameter

The timeslot of the TSI connection output TSST. Note that allowed values are affected by the frequency of the clock that controls the **ulOutputStream**.

Direction: IN                      Type: UINT32  
Default:                          cOCT6100\_INVALID\_TIMESLOT

**ulOutputStream**                      see **ulInputStream** parameter

The stream of the TSI connection output TSST. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

Direction: IN                      Type: UINT32  
Default:                          cOCT6100\_INVALID\_STREAM

## 5.9.2 Oct6100TsiCnctClose

This function closes a TSI connection.

### Usage

```
#include "oct6100_api.h"
```

```
UINT32 Oct6100TsiCnctCloseDef (
    tPOCT6100_TSI_CNCT_CLOSE          f_pTsiCnctClose );
```

```
UINT32 Oct6100TsiCnctClose (
    tPOCT6100_INSTANCE_API             f_pApilInstance,
    tPOCT6100_TSI_CNCT_CLOSE          f_pTsiCnctClose );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pTsiCnctClose	Pointer to a tOCT6100_TSI_CNCT_CLOSE structure. The structure's elements are defined below. The user allocates this structure.

### 5.9.2.1 tOCT6100\_TSI\_CNCT\_CLOSE Structure

ulTsiCnctHndl	handle
---------------	--------

Handle of the TSI connection to be closed. This handle is returned by a call to **Oct6100TsiCnctOpen**. The function sets the handle to an invalid value.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE

## 5.10 ADPCM Channel Functions

These functions are used to open and close an ADPCM compression or decompression channel. An ADPCM channel reads one TDM sample from a TSST each 125 usec, and outputs the compressed or decompressed result on another one.

### 5.10.1 Oct6100AdpcmChanOpen

This function opens an ADPCM channel.

Note that such a channel also requires an echo processor.

#### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100AdpcmChanOpenDef (
    tPOCT6100_ADPCM_CHAN_OPEN          f_pAdpcmChanOpen );

UINT32 Oct6100AdpcmChanOpen (
    tPOCT6100_INSTANCE_API              f_pApilInstance,
    tPOCT6100_ADPCM_CHAN_OPEN          f_pAdpcmChanOpen );
```

#### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pAdpcmChanOpen	Pointer to a tOCT6100_ADPCM_CHAN_OPEN structure. The structure's elements are defined below. The user allocates this structure.

#### 5.10.1.1 tOCT6100\_ADPCM\_CHAN\_OPEN Structure

**pulChanHndl** handle

This parameter returns the handle for the created ADPCM channel. This handle is a unique value that identifies the channel in all future function calls affecting this channel. The user allocates the memory for this pointer.

Direction: IN/OUT      Type: PUINT32

Default: NULL

**ulChanMode** cOCT6100\_ADPCM\_ENCODING  
cOCT6100\_ADPCM\_DECODING

Codec configuration of the channel. If set to cOCT6100\_ADPCM\_ENCODING, the channel will compress PCM samples according to **ulEncodingRate**. If set to cOCT6100\_ADPCM\_DECODING, the channel will decompressed the input samples according to **ulDecodingRate**.

Direction: IN      Type: UINT32

Default: cOCT6100\_ADPCM\_ENCODING

**ulEncodingRate**

cOCT6100\_G711\_64KBPS  
cOCT6100\_G726\_40KBPS  
cOCT6100\_G726\_32KBPS  
cOCT6100\_G726\_24KBPS  
cOCT6100\_G726\_16KBPS  
cOCT6100\_G727\_40KBPS\_4\_1  
cOCT6100\_G727\_40KBPS\_3\_2  
cOCT6100\_G727\_40KBPS\_2\_3  
cOCT6100\_G727\_32KBPS\_4\_0  
cOCT6100\_G727\_32KBPS\_3\_1  
cOCT6100\_G727\_32KBPS\_2\_2  
cOCT6100\_G727\_24KBPS\_3\_0  
cOCT6100\_G727\_24KBPS\_2\_1  
cOCT6100\_G727\_16KBPS\_2\_0

This parameter represents the rate of the encoder. G.727 defines contain a suffix: The first number is the number of core bits, and the second is the number of enhanced bits

The API will ignore this parameter if **ulChanMode** is set to cOCT6100\_ADPCM\_DECODING.

Direction: IN

Type: UINT32

Default:

cOCT6100\_G726\_32KBPS

**ulDecodingRate**

cOCT6100\_G711\_64KBPS  
cOCT6100\_G726\_40KBPS  
cOCT6100\_G726\_32KBPS  
cOCT6100\_G726\_24KBPS  
cOCT6100\_G726\_16KBPS  
cOCT6100\_G727\_2C\_ENCODED  
cOCT6100\_G727\_3C\_ENCODED  
cOCT6100\_G727\_4C\_ENCODED  
cOCT6100\_G726\_ENCODED  
cOCT6100\_G711\_G726\_ENCODED  
cOCT6100\_G711\_G727\_2C\_ENCODED  
cOCT6100\_G711\_G727\_3C\_ENCODED  
cOCT6100\_G711\_G727\_4C\_ENCODED

The API will ignore this parameter if **ulChanMode** is set to cOCT6100\_ADPCM\_ENCODING.

This parameter represents the rate of the decoder. G.727 defines contain a suffix: The first number is the number of core bits, and the second is the number of enhanced bits

If the decoding rate is a combination of G.711 with either G.726 or G.727, the number of TSSTs assigned to the Decoder input port must be set to 2.

Direction: IN

Type: UINT32

Default:

cOCT6100\_G726\_32KBPS



**ulInputTimeslot**                      0 – 255 for 16 MHz stream frequency  
   0 – 127 for 8 MHz stream frequency  
   0 – 63 for 4 MHz stream frequency  
   0 – 31 for 2 MHz stream frequency

The timeslot of the channel input TSST. Note that allowed values are affected by the frequency of the clock that controls the **ulInputStream**.

Direction: IN                              Type: UINT32  
Default:                                      cOCT6100\_INVALID\_TIMESLOT

**ulInputStream**                        0 – 31 for **ulMaxTdmStreams** of 32  
   0 – 15 for **ulMaxTdmStreams** of 16  
   0 – 7 for **ulMaxTdmStreams** of 8  
   0 – 3 for **ulMaxTdmStreams** of 4

The stream of the channel input TSST. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

Direction: IN                              Type: UINT32  
Default:                                      cOCT6100\_INVALID\_STREAM

**ulInputNumTssts**                      1, 2

This parameter indicates the number of TSSTs used to read the input samples. See the **TSST Formats** section for more information.

Direction: IN                              Type: UINT32  
Default:                                      1

**ulInputPcmLaw**                        cOCT6100\_PCM\_U\_LAW  
   cOCT6100\_PCM\_A\_LAW

PCM law of the samples read from the H.100 bus.

Direction: IN                              Type: UINT32  
Default:                                      cOCT6100\_PCM\_U\_LAW

**ulOutputTimeslot**                      see **ulInputTimeslot** parameter

The timeslot of the channel output TSST. Note that allowed values are affected by the frequency of the clock that controls the **ulOutputStream**.

Direction: IN                              Type: UINT32  
Default:                                      cOCT6100\_INVALID\_TIMESLOT

**ulOutputStream**                        see **ulInputStream** parameter

The stream of the channel output TSST. Note that allowed values are also affected by the **ulMaxTdmStreams** value specified at the **Oct6100ChipOpen** call.

Direction: IN                              Type: UINT32  
Default:                                      cOCT6100\_INVALID\_STREAM

**ulOutputNumTssts**                      1, 2

This parameter indicates the number of TSSTs used to drive the output samples. See the **TSST Formats** section for more information.

Direction: IN                              Type: UINT32  
Default:                                      1

**ulOutputPcmLaw**

cOCT6100\_PCM\_U\_LAW  
cOCT6100\_PCM\_A\_LAW

PCM law of the samples written to the H.100 bus.

Direction: IN

Type: UINT32

Default:

cOCT6100\_PCM\_U\_LAW

**ulAdpcmNibblePosition**

cOCT6100\_ADPCM\_IN\_LOW\_BITS  
cOCT6100\_ADPCM\_IN\_HIGH\_BITS

This is the position of the ADPCM bits within the H.100 TDM timeslot.

Direction: IN

Type: UINT32

Default:

cOCT6100\_ADPCM\_IN\_LOW\_BITS

## 5.10.2 Oct6100AdpcmChanClose

This function closes an ADPCM channel.

### Usage

```
#include "oct6100_api.h"

UINT32 Oct6100AdpcmChanCloseDef (
    tPOCT6100_ADPCM_CHAN_CLOSE      f_pAdpcmChanClose );

UINT32 Oct6100AdpcmChanClose (
    tPOCT6100_INSTANCE_API           f_pApilInstance,
    tPOCT6100_ADPCM_CHAN_CLOSE      f_pAdpcmChanClose );
```

### Parameters

f_pApilInstance	Pointer to an instance structure of the chip.
f_pAdpcmChanClose	Pointer to a tOCT6100_ADPCM_CHAN_CLOSE structure. The structure's elements are defined below. The user allocates this structure.

### 5.10.2.1 tOCT6100\_ADPCM\_CHAN\_CLOSE Structure

<b>ulChanHndl</b>	handle
Handle of the ADPCM channel to be closed. This handle is returned by a call to <b>Oct6100AdpcmChanOpen</b> . The function sets the handle to an invalid value.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_HANDLE

## 5.11 Interrupt Functions

Refer to the **Target System Architecture** description for the interrupt treatment flow.

The interrupts are divided into the following categories:

- Fatal – Indicates that the chip has encountered a fatal error, and must be reset to operate properly.
- Error – Indicates that the chip has detected an error that must be handled by the user application. There is no recovery required by the chip, the severity and/or recovery, if any, can only be determined by the application.
- API Sync – This interrupt is used by the API to maintain synchronization with the chip. The API schedules interrupts at regular intervals to cause the ISR to be called. This is done to prevent corruption in the device statistics and counters caused by counters wrapping.

The category to which an interrupt belongs to is indicated by the name's prefix of interrupt.

### 5.11.1 Oct6100InterruptServiceRoutine

This function is called by the OS Interrupt Service Routine (ISR) to service the interrupts. It takes the appropriate action to treat any active interrupts when called by the OS ISR.

The user can enable interrupts using the **Oct6100ChipOpen** or **Oct6100InterruptConfigure** function. Disabled interrupts are not serviced by this routine and will not generate a hardware interrupt on the interrupt pin of the device.

To create a polled system, the user must call this routine often enough for proper operation of the device. In systems that use tone detection and/or buffer playout events, the polling frequency should be fast enough to empty the hardware event buffers and receive the event information in a timely manner. A 20 ms polling interval should suffice most applications where events are required.

In systems that do not make use of events, polling the device at an interval of 20 seconds should suffice.

This function will reset all conditions causing the interrupt. This ensures that the interrupt pin will be inactive when it returns from the function call.

#### Usage

```
#include "oct6100_api.h"

void Oct6100InterruptServiceRoutineDef (
    tPOCT6100_INTERRUPT_FLAGS          f_pInterruptFlags );

void Oct6100InterruptServiceRoutine (
    tPOCT6100_INSTANCE_API             f_pApiInstance,
    tPOCT6100_INTERRUPT_FLAGS          f_pInterruptFlags );
```

#### Parameters

f_pApiInstance	Pointer to the tOCT6100_INSTANCE_API structure of the chip to be serviced.
f_pInterruptFlags	Pointer to a tOCT6100_INTERRUPT_FLAGS structure. This structure indicates which errors or alarms were detected or treated by the <b>Oct6100InterruptServiceRoutine</b> function.

#### 5.11.1.1 tOCT6100\_INTERRUPT\_FLAGS Structure

The following parameters indicate the events detected during the ISR operation.

<b>fFatalGeneral</b>	TRUE / FALSE
If TRUE, an internal fatal chip error has been detected.	
Direction:	OUT                      Type: BOOL
Default:	FALSE

### **ulFatalGeneralFlags**

32-bit value

If **fFatalGeneral** is set to TRUE, this mask contains the type of fatal general error(s) detected. Please report this information to Octasic. The mask can be composed of the following error types:

- cOCT6100\_FATAL\_GENERAL\_ERROR\_TYPE\_1
- cOCT6100\_FATAL\_GENERAL\_ERROR\_TYPE\_2
- cOCT6100\_FATAL\_GENERAL\_ERROR\_TYPE\_3
- cOCT6100\_FATAL\_GENERAL\_ERROR\_TYPE\_4
- cOCT6100\_FATAL\_GENERAL\_ERROR\_TYPE\_5

Direction: OUT                      Type: UINT32

Default:                              0

### **fFatalReadTimeout**

TRUE / FALSE

If TRUE, a read to the external memory has failed.

Direction: OUT                      Type: BOOL

Default:                              FALSE

### **fErrorRefreshTooLate**

TRUE / FALSE

If TRUE, refreshes to the external memory may have exceeded the configured period. Information in the external memory bank may be corrupt

Direction: OUT                      Type: BOOL

Default:                              FALSE

### **fErrorPIIJitter**

TRUE / FALSE

If TRUE, the chip read invalid data from the external memory. Information in the external memory bank may have been corrupted. Contact Octasic if this error persists.

Direction: OUT                      Type: BOOL

Default:                              FALSE

### **fErrorOverflowToneEvents**

TRUE / FALSE

If TRUE, the tone event buffer located in external memory has overflowed.

Direction: OUT                      Type: BOOL

Default:                              FALSE

### **fErrorH100OutOfSync**

TRUE / FALSE

If TRUE, the H.100 slave has lost its framing on the bus, causing the chip's H.100 data pins to be tri-stated.

Direction: OUT                      Type: BOOL

Default:                              FALSE

### **fErrorH100CIkA**

TRUE / FALSE

If TRUE, the CT\_C8\_A clock behavior does not conform to the H.100 specification.

Direction: OUT                      Type: BOOL

Default:                              FALSE

<b>fErrorH100FrameA</b>	TRUE / FALSE
If TRUE, the CT_FRAME_A clock behavior does not conform to the H.100 specification.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fErrorH100ClkB</b>	TRUE / FALSE
If TRUE, the CT_C8_B clock is not running at 16.384 MHz. This parameter is valid only if the tOCT6100_CHIP_OPEN parameter <b>fEnableFastH100Mode</b> is set to TRUE	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fToneEventsPending</b>	TRUE / FALSE
If TRUE, tone events are present within the tone event software buffer. Use function <b>Oct6100EventGetTone</b> to retrieve these events. Note that tone events do not generate a hardware interrupt in an interrupt-driven system. The user should poll the ISR regularly and rapidly enough to reach the desired tone detection responsiveness.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fBufferPayoutEventsPending</b>	TRUE / FALSE
If TRUE, buffer payout events are present within the buffer payout event software buffer. Use function <b>Oct6100BufferPayoutGetEvent</b> to retrieve these events. Note that buffer payout events do not generate a hardware interrupt in an interrupt-driven system. The user should poll the ISR regularly and rapidly enough to reach the desired buffer payout event detection responsiveness.	
Direction: OUT	Type: BOOL
Default:	FALSE
<b>fApiSynch</b>	TRUE / FALSE
If TRUE, the chip interrupted the API for purposes of maintaining synchronization with the API. This is used for information purposes only.	
Direction: OUT	Type: BOOL
Default:	FALSE

### 5.11.2 Oct6100InterruptMask

The operating system's interrupt service routine uses this function to disable the chip's interrupt pin. When the chip generates an interrupt, the OS starts its interrupt service routine (see the **System Architecture** description in the **Overview** section).

The API's ISR must be called to treat the interrupt. Either the OS calls the API's ISR directly from its ISR, or it defers the treatment of the ISR to a later time, and at a lower CPU priority level. In this case, the interrupt pin of the chip must be disabled until the current interrupt has been treated. This function serves this purpose.

The function first reads the chip's interrupt register to determine the source of the interrupt (many devices can share the same interrupt line). If the chip is the source of the interrupt, the function performs a single write to the chip's interrupt register, which disables the interrupt pins from generating another interrupt for up to 60 ms.

After the disable timer has expired, the interrupt pin will be reactivated. If the conditions causing the original interrupt persist or a new event has occurred, the interrupt pin will be asserted right after the disable timer expires. The API's ISR will re-enable the interrupt pin when it completes allowing new interrupts to occur in potentially less than 60 ms.

#### Usage

```
#include "oct6100_apimi.h"

UINT32 Oct6100InterruptMaskDef (
    tPOCT6100_INTERRUPT_MASK          f_pInterruptMask );

UINT32 Oct6100InterruptMask (
    tPOCT6100_INTERRUPT_MASK          f_pInterruptMask );
```

#### Parameters

**f\_pInterruptMask**      Pointer to a tOCT6100\_INTERRUPT\_MASK structure. The structure's elements are defined below.

#### 5.11.2.1 tOCT6100\_INTERRUPT\_MASK Structure

**ulUserChipIndex**      identifier

This parameter identifies the chip instance that is targeted. It corresponds to the **ulUserChipId** parameter of the **Oct6100ChipOpen** function. See the **System Architecture** description in the **Overview** section for more details.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_CHIP\_NUMBER



### 5.11.3 Oct6100InterruptConfigure

This function is used to change the current configuration of the interrupt servicing. Note that the chip should be successfully opened before calling this function.

#### Usage

```
#include "oct6100_api.h"

void Oct6100InterruptConfigureDef (
    tPOCT6100_INTERRUPT_CONFIGURE      f_pInterruptConfigure );

void Oct6100InterruptConfigure (
    tPOCT6100_INSTANCE_API              f_pApiInstance,
    tPOCT6100_INTERRUPT_CONFIGURE      f_pInterruptConfigure );
```

#### Parameters

**f\_pApiInstance** Pointer to the tOCT6100\_INSTANCE\_API structure of the chip for which the interrupts are to be reconfigured.

**f\_pInterruptConfigure** Pointer to an interrupt configuration structure. The structure's elements are defined below.

#### 5.11.3.1 tOCT6100\_INTERRUPT\_CONFIGURE Structure

The following parameters determine which events will trigger an interrupt, and how that event will be treated by the API's ISR. The description of the interrupts is provided in the description of the **tOCT6100\_INTERRUPT\_FLAGS** structure.

Interrupts can be permanently disabled, preventing them from asserting the hardware interrupt pin and generating an event (**cOCT6100\_INTERRUPT\_DISABLE**).

If the interrupt is enabled, it can operate in one of two modes:

- . It can be reset and kept enabled (**cOCT6100\_INTERRUPT\_NO\_TIMEOUT**) allowing another interrupt of the same type to be detected immediately.
- . It can be cleared and disabled for a certain period (**cOCT6100\_INTERRUPT\_TIMEOUT**), masking the interrupt for a configurable amount of time. This can be used to prevent being flooded by less important interrupts.

#### ulFatalGeneralConfig

cOCT6100\_INTERRUPT\_DISABLE  
cOCT6100\_INTERRUPT\_NO\_TIMEOUT

The configuration of the general fatal interrupt. The interrupt can be prevented from asserting the hardware interrupt pin and generating an event (**cOCT6100\_INTERRUPT\_DISABLE**). If the interrupt is enabled, it can be reset and kept enabled (**cOCT6100\_INTERRUPT\_NO\_TIMEOUT**). The configuration of this interrupt can be changed dynamically, see **Oct6100InterruptConfigure**.

Default: cOCT6100\_INTERRUPT\_NO\_TIMEOUT

**ulFatalMemoryConfig**

cOCT6100\_INTERRUPT\_DISABLE  
cOCT6100\_INTERRUPT\_NO\_TIMEOUT  
cOCT6100\_INTERRUPT\_TIMEOUT

The configuration of all fatal interrupts associated to the operation of the external memories. The interrupt can be disabled from asserting the hardware interrupt pin and generating an event (cOCT6100\_INTERRUPT\_DISABLE). If the interrupt is enabled, it can behave in one of two ways once the interrupt has been treated. It can be reset and kept enabled (cOCT6100\_INTERRUPT\_NO\_TIMEOUT) or it can be cleared and disabled for a timeout period time (cOCT6100\_INTERRUPT\_TIMEOUT). In the latter case, the timeout period is specified by the ulFatalMemoryTimeout parameter. The configuration of this interrupt can be changed dynamically, see **Oct6100InterruptConfigure**. This parameter indicates the operation of the following members of the tOCT6100\_INTERRUPT\_FLAGS structure:

fFatalReadTimeout

Default: cOCT6100\_INTERRUPT\_NO\_TIMEOUT

**ulErrorMemoryConfig**

see **ulFatalMemoryConfig**

The configuration of all data integrity interrupts associated to the operation of the external memories. This parameter indicates the operation of the following members of the tOCT6100\_INTERRUPT\_FLAGS structure:

fErrorRefreshTooLate

fErrorPIIJitter

Default: cOCT6100\_INTERRUPT\_NO\_TIMEOUT

**ulErrorOverflowToneEventsConfig** see **ulFatalMemoryConfig**

The configuration of all error interrupts associated to the overflow of the tone events buffer contained in external memory. This parameter indicates the operation of the following members of the tOCT6100\_INTERRUPT\_FLAGS structure:

fErrorOverflowToneEvents

Default: cOCT6100\_INTERRUPT\_NO\_TIMEOUT

**ulErrorH100Config**

see **ulFatalMemoryConfig**

The configuration of all error interrupts associated to H.100 bus. This parameter indicates the operation of the following members of the tOCT6100\_INTERRUPT\_FLAGS structure:

fErrorH100OutOfSync

fErrorH100CIkA

fErrorH100CIkB

fErrorH100FrameA

Default: cOCT6100\_INTERRUPT\_NO\_TIMEOUT

**ulFatalMemoryTimeout**

10 – 10000 ms

This parameter specifies the timeout period of all the fatal memory interrupts when the **ulFatalMemoryConfig** parameter specifies cOCT6100\_INTERRUPT\_TIMEOUT. This parameter is rounded up to the next nearest multiple of 10 ms before being applied.

Direction: IN

Type: UINT32

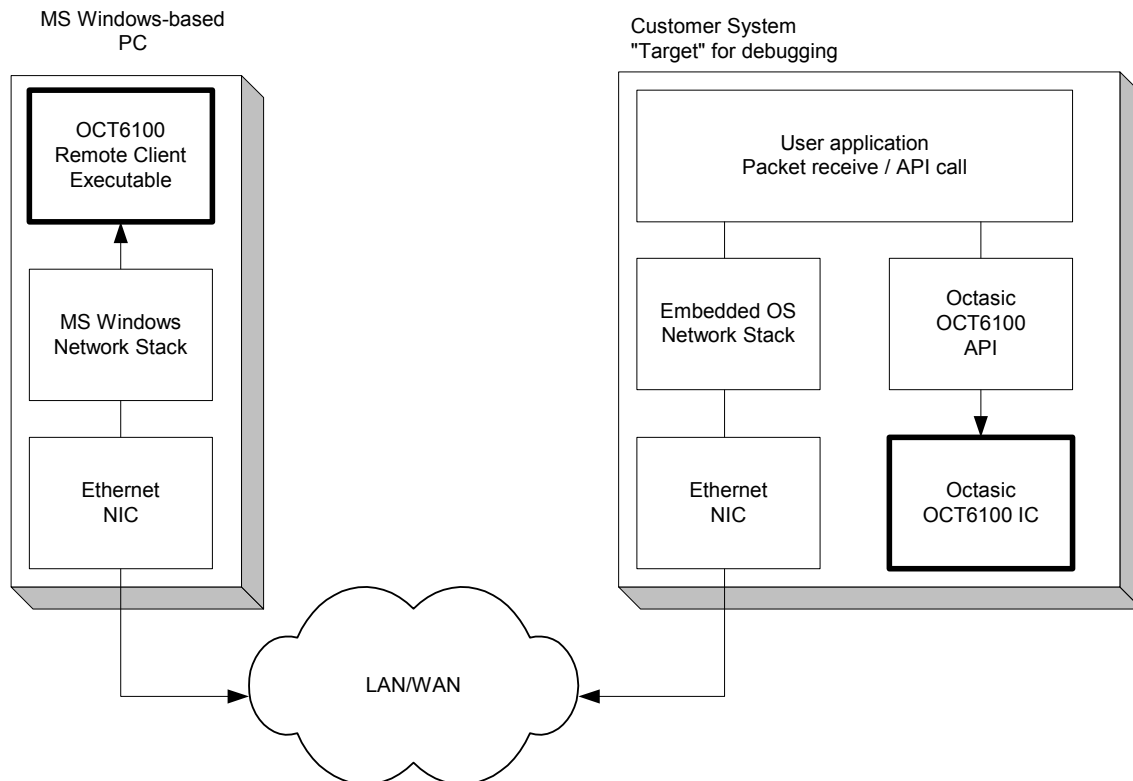
Default:

100

<b>ulErrorMemoryTimeout</b>	see <b>ulFatalMemoryTimeout</b>
<b>ulErrorOverflowToneEventsTimeout</b>	see <b>ulFatalMemoryTimeout</b>
<b>ulErrorH100Timeout</b>	see <b>ulFatalMemoryTimeout</b>

## 5.12 Remote Debugging

The API supports remote debugging. This allows the customer or an Octasic support engineer to run a debugger executable remotely. This executable is provided by Octasic and is called the **Oct6100 Remote Client**. This approach allows the user to monitor the device and to perform real-time captures of the voice streams and captures of the device's internal state. Communication between the debugger executable and the API is done via a non-guaranteed packet based messaging protocol using IP and UDP.



When the OCT6100 Remote Client is launched, a destination IP address and UDP port are selected. A socket is opened in the customer's system to accept these packets. When packets are received with the agreed source and destination addresses and ports, the packet must be passed to the API. The API only needs the packet's payload. Thus, the user must provide code to open a Socket, receive the Remote Client's packets, strip off the IP and UDP headers, and pass the payload to the API. The packet payload is passed to the API via the **Oct6100RemoteDebug** function. Once the API call completes, it will return a "response" packet. It is the user's responsibility to send this packet back to the Oct6100 Remote Client.

In the case where the target platform does not support IP/UDP, software can be written by the user to convert the remote debugger's packets to another messaging protocol supported by the target platform. For example, in a CompactPCI environment, the main CPU board can convert packets received on its Ethernet port to messages passed onto another CompactPCI board on which the target platform resides. This can be over PCI for example. An application must be written by the user to open a target socket on the CPU board and to send/receive debug messages to the target platform. The messaging protocol between the CPU board and the target platform is design-specific. Octasic can provide assistance with the definition of such an interface.

## 5.12.1 Oct6100RemoteDebug

This function interprets the remote debugging packets received by the user's software. Commands contained in the packet are executed by the API. In addition, a response packet is constructed and returned by the function. It is the responsibility of the user's software to transmit the response packet back to the source of the debugging packet.

### Usage

```
#include "oct6100_api.h"

void Oct6100RemoteDebugDef (
    tPOCT6100_REMOTE_DEBUG          f_pRemoteDebug );

void Oct6100RemoteDebug (
    tPOCT6100_INSTANCE_API          f_pApilInstance,
    tPOCT6100_REMOTE_DEBUG          f_pRemoteDebug );
```

### Parameters

**f\_pApilInstance** pointer to the tOCT6100\_INSTANCE\_API structure of the chip for which the interrupts are to be reconfigured.

**f\_pRemoteDebug** pointer to a tOCT6100\_REMOTE\_DEBUG structure. The definitions of the structure's elements are listed below.

### 5.12.1.1 Structure tOCT6100\_REMOTE\_DEBUG

**ulReceivedPktLength** 32 – 32768

The length of the received packet, in bytes. The length must be a multiple of 4.

Direction: IN                      Type: UINT32

Default: 0

**pulReceivedPktPayload** pointer to array

The payload of the received packet. The payload is contained in an array of UINT32s. The data is placed in the array as follows:

	31	24	23	16	15	8	7	0
pulReceivedPktPayload[ 0 ] =	Byte 0	Byte 1	Byte 2	Byte 3				
pulReceivedPktPayload[ 1 ] =	Byte 4	Byte 5	Byte 6	Byte 7				

.....

Where Byte X is the Xth received byte of the packet's payload.

Direction: IN/IN                      Type: PUINT32

Default: NULL

**ulMaxResponsePktLength** 32 – 32768

The size of the buffer provided to contain the response packet payload constructed by the API, **pulResponsePktPayload**, in bytes. Must always be equal or greater than **ulReceivedPktLength**.

Direction: IN                      Type: UINT32

Default: 0

**ulResponsePktLength**                      0 – 32768

The actual size of the response packet payload constructed by the API, contained in the user provided buffer **pulResponsePktPayload**, in bytes.

Direction: OUT                              Type: UINT32

Default:                                      0

**pulResponsePktPayload**                      pointer to array

The payload of the API constructed response packet. The payload is contained in an array of UINT32s. The data is placed in the array as follows:

31 24 23 16 15 8 7 0

pulResponsePktPayload[ 0 ] = Byte 0 Byte 1 Byte 2 Byte 3

pulResponsePktPayload[ 1 ] = Byte 4 Byte 5 Byte 6 Byte 7

.....

Where Byte X is the Xth transmitted byte of the packet's payload.

Direction: IN/OUT                              Type: PUINT32

Default:                                      NULL

### 5.13 Monitoring Functions

To make board-level integration and debugging easier, the OCT6100 API offers monitoring functions allowing the user to retrieve live debug information specific to a channel from the chip. This live information can then be stored into a binary file and sent to Octasic Support.

The **fEnableChannelRecording** parameter of the **Oct6100ChipOpen** function must be set to TRUE. In the case of 672 channel devices, 1 channel will be used for this function.

The first thing to be done when debugging a channel is to select the debug channel using the **Oct6100DebugSelectChannel** function. This will tell the chip to start monitoring the channel.

Once the channel is selected, the user can dump the recorded information using the **Oct6100DebugGetData** function. This dump contains, among other things, up to 2 minutes of recorded PCM signal from all ports of the channel.

In case of a problem with the performance of the echo canceller, the host application should write the retrieved data to a binary file and send it to Octasic Support to have the issue resolved.

All these monitoring functions can be used dynamically on any channel.

---

**NOTE:** The selected channel's **ulEchoOperationMode** parameter must be different from **cOCT6100\_ECHO\_OP\_MODE\_POWER\_DOWN** for monitored information to be valid.

---

### 5.13.1 Oct6100DebugSelectChannel

This function selects the debug channel to be monitored by the chip.

#### Usage

```
#include "oct6100_api.h"

void Oct6100DebugSelectChannelDef (
    tPOCT6100_DEBUG_SELECT_CHANNEL    f_pDebugSelectChan );

void Oct6100DebugSelectChannel (
    tPOCT6100_INSTANCE_API            f_pApiInstance,
    tPOCT6100_DEBUG_SELECT_CHANNEL    f_pDebugSelectChan );
```

#### Parameters

f_pApiInstance	pointer to the tOCT6100_INSTANCE_API structure of the chip for which the interrupts are to be reconfigured.
f_pDebugSelectChan	pointer to a tOCT6100_DEBUG_SELECT_CHANNEL structure. The definitions of the structure's elements are listed below.

#### 5.13.1.1 Structure tOCT6100\_DEBUG\_SELECT\_CHANNEL

**ulChannelHndl**                      handle

This is the handle of the channel to be monitored. This value was returned by a call to Oct6100ChannelOpen. To stop the monitoring process, set this parameter to cOCT6100\_INVALID\_HANDLE.

Direction: IN

Type: UINT32

Default:

cOCT6100\_INVALID\_HANDLE



### 5.13.2 Oct6100DebugGetData

This function retrieves the recorded data of the debug channel. This function is called repeatedly until all bytes have been retrieved by the API and written to a file by the user. Refer to the sample code after the parameter description for an example on how to use the debug functions.

When this function is first called, the API will instruct the OCT6100 to freeze the recording process, so that nothing is lost. The user must then call this function repeatedly to obtain the debug data. Once all the recorded data has been retrieved, the chip resumes recording data.

#### Usage

```
#include "oct6100_api.h"

void Oct6100DebugGetDataDef (
    tPOCT6100_DEBUG_GET_DATA_          f_pGetData );

void Oct6100DebugGetData (
    tPOCT6100_INSTANCE_API              f_pApilInstance,
    tPOCT6100_DEBUG_GET_DATA_          f_pGetData );
```

#### Parameters

f_pApilInstance	pointer to the tOCT6100_INSTANCE_API structure of the chip for which the interrupts are to be reconfigured.
f_pGetData	pointer to a tOCT6100_DEBUG_GET_DATA structure. The definitions of the structure's elements are listed below.

### 5.13.2.1 Structure tOCT6100\_DEBUG\_GET\_DATA

#### ulGetDataMode

cOCT6100\_DEBUG\_GET\_DATA\_MODE\_120S  
cOCT6100\_DEBUG\_GET\_DATA\_MODE\_120S\_LITE  
cOCT6100\_DEBUG\_GET\_DATA\_MODE\_16S  
cOCT6100\_DEBUG\_GET\_DATA\_MODE\_16S\_LITE

This parameter determines how much recorded data should be retrieved. The x120S modes will retrieve the last 2 minutes of data and the x16S modes will retrieve the last 16 seconds of data. The "LITE" modes should always be used unless otherwise specified by a support agent.

The error cOCT6100\_ERR\_NOT\_SUPPORTED\_DEBUG\_DATA\_MODE\_120S will be returned if the firmware does not the requested mode.

For a given dump, the user cannot change the value of this parameter. Once the mode has been selected, the entire dump must be completed at that length.

The following table summarizes the resulting size of the dumps according to the selected data mode.

Parameter value	Approximate dump size
cOCT6100_DEBUG_GET_DATA_MODE_120S	4274 KB
cOCT6100_DEBUG_GET_DATA_MODE_120S_LITE	3239 KB
cOCT6100_DEBUG_GET_DATA_MODE_16S	1376 KB
cOCT6100_DEBUG_GET_DATA_MODE_16S_LITE	407 KB

These are maximum values, applicable when **ulGetDataContent** is set to cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_COMPLETE.

Direction: IN

Type: UINT32

Default:

cOCT6100\_DEBUG\_GET\_DATA\_MODE\_120S\_LITE

#### ulGetDataContent

cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_COMPLETE  
cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_RIN\_PCM  
cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_SIN\_PCM  
cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_SOUT\_PCM

This parameter determines the content of the debug data to be retrieved. The default value, cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_COMPLETE, should be used to retrieve all recorded information related to the debug channel.

Specifying cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_xxx\_PCM will instruct the API to only return the PCM recorded data of the selected port. In this case, the data is a direct 8-bit PCM recording of the TDM H.1x0 voice stream as seen or written on the selected port. The PCM data is encoded in the channel's current law. The cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_xxx\_PCM contents can be used to retrieve the PCM data of all ports one after the other.

Note that if one of the cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_xxx\_PCM contents are used, the Oct6100DebugSelectChannel function should be called again once the dumps are finished to instruct the API to continue recording. Conversely, using cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_COMPLETE causes the API to resume recording once the data has been retrieved.

Direction: IN

Type: UINT32

Default:

cOCT6100\_DEBUG\_GET\_DATA\_CONTENT\_COMPLETE

<b>ulRemainingNumBytes</b>	32-bit value
How many bytes are left to be retrieved before the dump is complete. The <b>Oct6100DebugGetData</b> function should be called in a loop until this parameter is equal to 0.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulTotalNumBytes</b>	32-bit value
This is the total number of bytes that need to be retrieved to recreate the information recorded by the chip for the debug channel, which can then be stored in a binary file.	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulMaxBytes</b>	32-bit value
Maximum number of bytes that the user is ready to accept from the API. This represents the size of the buffer pointed by <b>pbyData</b> . This value must be modulo 1024.	
Direction: IN	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>ulValidNumBytes</b>	1 - <b>ulMaxBytes</b>
This is the number of bytes that are valid in the <b>pbyData</b> array. This value ranges between 1 and <b>ulMaxBytes</b> .	
Direction: OUT	Type: UINT32
Default:	cOCT6100_INVALID_VALUE
<b>pbyData</b>	pointer to array
Byte pointer to a memory block where the recorded data will be copied to. The user must allocate this memory.	
Direction: IN/OUT	Type: PUINT8
Default:	NULL

## Sample Code

The sample code below illustrates how the debug functions should be used:

```
void Oct6100GetDumpDataExample()
{
    tOCT6100_DEBUG_GET_DATA          GetData;
    tOCT6100_DEBUG_SELECT_CHANNEL    SelectChannel;
    UINT32                            ulResult;
    int                               iNumWritten;
    FILE *                            pDumpFile;

    Oct6100DebugSelectChannelDef( &SelectChannel );

    /* Channel handle (returned from a call to Oct6100ChannelOpen) */
    /* of the channel to be monitored (hot channel). */
    SelectChannel.ulChannelHndl = g_ulChannelHndl;

    /* Select the debug channel. The chip firmware will start recording */
}
```

```
/* information on this channel. PCM data will be accumulated in the */
/* chip's external memory for up to 2 minutes. */
ulResult = Oct6100DebugSelectChannel( pApiInstance, &SelectChannel );
if ( ulResult != cOCT6100_ERR_OK )
{
    /* Error handling. */
    return;
}

/* Wait 16 seconds for data to be recorded on the current debug channel. */
/* During this time, information is recorded on the debug channel. */
/* The user could, for example, play a test case buffer on the debug channel's */
/* inputs to record how the chip reacts. When this is done, */
/* the information can be dumped in a file and sent to Octasic for analysis. */
Sleep( 16 * 1000 );

/* Open binary file that will receive dump information to be sent to Octasic. */
pDumpFile = fopen( "oct61xx_support.bin", "wb" );
if ( pDumpFile == NULL )
{
    /* Error handling. */
    return;
}
Oct6100DebugGetDataDef( &GetData );

/* Select how much data should be recorded. */
GetData.ulGetDataMode = cOCT6100_DEBUG_GET_DATA_MODE_16S_LITE;

/* Other available choices are: */
/* cOCT6100_DEBUG_GET_DATA_MODE_120S */
/* cOCT6100_DEBUG_GET_DATA_MODE_16S */
/* cOCT6100_DEBUG_GET_DATA_MODE_120S_LITE */

/* Set number of bytes available in transfer buffer. */
GetData.ulMaxBytes = 2048 * 50;

/* Allocate memory for the transfer buffer. */
GetData.pbyData = (PUINT8)malloc( GetData.ulMaxBytes );
if ( GetData.pbyData == NULL )
{
    /* Error handling. */
    fclose( pDumpFile );
    return;
}

/* Read all the dump information in a loop. */
/* Transfer at most GetData.ulMaxBytes at a time. */
do
{
    /* Call the API function for retrieving the dump information. */
    ulResult = Oct6100DebugGetData( pApiInstance, &GetData );
    if ( ulResult != cOCT6100_ERR_OK )
    {
        /* Error handling. */
        break;
    }

    /* Write the data at the end of the dump file. */
    iNumWritten = fwrite( GetData.pbyData, 1, GetData.ulValidNumBytes, pDumpFile );
    if ( iNumWritten != (int)GetData.ulValidNumBytes )
    {
        /* Error handling. */
        break;
    }

    /* Repeat this until all the bytes have been read. */
} while ( GetData.ulRemainingNumBytes != 0x0 );

/* Free the transfer buffer. */
```

```
free( GetData.pbyData );  
  
/* Close the dump file. */  
fclose( pDumpFile );  
}
```

Once the data has been recorded to the file, the Oct6100 Remote Client application can be used to extract the PCM data files from the binary dump file. Calling the executable with the binary dump file as an argument does this. Refer to the Remote Client User guide (Octasic literature number **oct6100ug5000**) for more information.

## 6 User Supplied Functions Description

Several user-supplied functions are required for the API to be independent from the target system and OS. This includes functions for process serialization, access to the current time, and device access routines.

### 6.1 Serialization Functions

The API code needs the ability to serialize access to several internal structures. This serialization can be performed using a semaphore, mutex, or any other serialization method. A single serialization object is required by the API, the user supplies functions to create and destroy this object, as well as functions to seize and release it.

Please note that the API's code is written with the assumption that the underlying OS uses priority inheritance for threads using the API. That is, if Thread 1 is scheduled as a low priority thread and is currently using an exclusive resource that Thread 2, a thread with a higher priority, needs to go on with the execution, then Thread 1's priority will be increased to that of Thread 2 to avoid deadlock.

#### 6.1.1 Oct6100UserCreateSerializeObject

This function creates a user-supplied serialization object. The serialization object can be a semaphore, mutex, or any other form of serialization. A handle that identifies the created object is returned. The returned handle is used in any subsequent call that affects the created serialization object.

##### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserCreateSerializeObject(  
    tPOCT6100_CREATE_SERIALIZE_OBJECT    f_pCreate );
```

##### Parameters

f_pCreate	Pointer to a tOCT6100_CREATE_SERIALIZE_OBJECT structure. The structure's elements are defined below.
-----------	---

##### 6.1.1.1 tOCT6100\_CREATE\_SERIALIZE\_OBJECT Structure

ulSerialObjHndl	32-bit value
Handle returned by this routine to identify the created serialization object in future calls that affects it.	
Direction: OUT	Type: tOCT6100_USER_SERIAL_OBJECT
Default:	N/A

## 6.1.2 Oct6100UserDestroySerializeObject

Destroys the user serialization object created using **Oct6100UserCreateSerializationObject** and identified by the provided handle.

### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserDestroySerializeObject (  
    tPOCT6100_DESTROY_SERIALIZE_OBJECT    f_pDestroy );
```

### Parameters

f_pDestroy	Pointer to a tOCT6100_DESTROY_SERIALIZE_OBJECT structure. The structure's elements are defined below.
------------	---

### 6.1.2.1 tOCT6100\_DESTROY\_SERIALIZE\_OBJECT Structure

ulSerialObjHndl	32-bit value
Pointer to the handle returned from the call to the <b>Oct6100UserCreateSerializationObject</b> function that created the object.	
Direction: IN	Type: tOCT6100_USER_SERIAL_OBJECT
Default:	N/A

### 6.1.3 Oct6100UserSeizeSerializeObject

Seizes the serialization object indicated by the provided handle. The routine attempts to seize the semaphore for the specified amount of time before returning without success.

#### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserSeizeSerializeObject(  
    tPOCT6100_SEIZE_SERIALIZE_OBJECT    f_pSeize );
```

#### Parameters

**f\_pSeize**                      Pointer to a tOCT6100\_SEIZE\_SERIALIZE\_OBJECT structure.  
The structure's elements are defined below.

#### 6.1.3.1 tOCT6100\_SEIZE\_SERIALIZE\_OBJECT Structure

**ulSerialObjHndl**                      32-bit value  
Pointer to the handle returned from the call to the  
**Oct6100UserCreateSerializationObject** function that created the object.  
Direction: IN                      Type: tOCT6100\_USER\_SERIAL\_OBJECT  
Default:                              N/A

**ulTryTimeMs**                      32-bit value,  
cOCT6100\_WAIT\_INFINITY  
The period, in ms, during which the routine attempts to seize the serialization  
object before it returns without success. If equal to 0, the function attempts to  
seize the semaphore only once.  
If set to cOCT6100\_WAIT\_INFINITY, the function does not return until the  
serialization object is seized.  
Direction: IN                      Type: UINT32  
Default:                              N/A



## 6.1.4 Oct6100UserReleaseSerializeObject

Releases the serialization object indicated by the provided handle and seized using the **Oct6100UserSeizeSerializationObject** function.

### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserReleaseSerializeObject(  
    tPOCT6100_RELEASE_SERIALIZE_OBJECT    f_pRelease );
```

### Parameters

f_pRelease	Pointer to a tOCT6100_RELEASE_SERIALIZE_OBJECT structure. The structure's elements are defined below.
------------	---

### 6.1.4.1 tOCT6100\_RELEASE\_SERIALIZE\_OBJECT Structure

ulSerialObjHndl	32-bit value
Pointer to the handle returned from the call to the <b>Oct6100UserCreateSerializationObject</b> function that created the object.	
Direction:	IN                      Type: tOCT6100_USER_SERIAL_OBJECT
Default:	N/A

## 6.2 Write Functions

### 6.2.1 Oct6100UserDriverWriteApi, Oct6100UserDriverWriteOs

Performs a single word write to the chip. Any error returned by the function is considered a fatal error. Two versions of the function are needed because the function may be accessed from two different software layers. Refer to the **System Architecture** description provided in the **Overview** section. Thus, each function must have a different name, but the functionality remains identical.

#### Usage

```
#include "oct6100_apiud.h"

UINT32 Oct6100UserWriteApi(
    tPOCT6100_WRITE_PARMS          f_pWriteParms );

UINT32 Oct6100UserWriteOs(
    tPOCT6100_WRITE_PARMS          f_pWriteParms );
```

#### Parameters

**f\_pWriteParms**                      Pointer to a tOCT6100\_WRITE\_PARMS structure. The structure's elements are defined below.

#### 6.2.1.1 tOCT6100\_WRITE\_PARMS Structure

**pProcessContext**                      pointer

This parameter is used only if **fMultiProcessSystem** is set to TRUE in the tOCT6100\_OPEN\_CHIP structure. Pointer to structure provided by user during creation of local API instance.

Direction: IN                      Type: PVOID  
Default:                              N/A

**ulUserChipId**                              identifier

The chip identifier parameter provided to the Oct6100ChipOpen function. (see **System Architecture**).

Direction: IN                      Type: UINT32  
Default:                              N/A

**ulWriteAddress**                              0 – 0x0FFFFFFE

Start address of the word access. This address is in bytes but be on a word boundary.

Direction: IN                      Type: UINT32  
Default:                              N/A

**usWriteData**                                  16 bit field

This is the word to be written by this function call.

Direction: IN                      Type: UINT16  
Default:                              N/A

## 6.2.2 Oct6100UserDriverWriteSmearApi, Oct6100UserDriverWriteSmearOs

Performs a write of the same data word to multiple addresses of the chip. Any error returned by this function is considered a fatal error. One or two versions of the function are needed because the function may be accessed from one or two different software layers, depending on the user system architecture. See the **System Architecture** description in the **Overview**. Thus, each function must have a different name, but the functionality remains identical.

### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserWriteSmearApi(  
    tPOCT6100_WRITE_SMEAR_PARMS          f_pWriteSmearParms );
```

```
UINT32 Oct6100UserWriteSmearOs(  
    tPOCT6100_WRITE_SMEAR_PARMS          f_pWriteSmearParms );
```

### Parameters

**f\_pWriteSmearParms** Pointer to a tOCT6100\_WRITE\_SMEAR\_PARMS structure. The structure's elements are defined below.

### 6.2.2.1 tOCT6100\_WRITE\_SMEAR\_PARMS Structure

**pProcessContext** pointer

This parameter is used only if **fMultiProcessSystem** is set to TRUE in the tOCT6100\_OPEN\_CHIP structure. Pointer to structure provided by user during creation of local API instance.

Direction: IN                      Type: PVOID  
Default:                              N/A

**ulUserChipId** identifier

The chip identifier parameter provided to the Oct6100ChipOpen function. (see **System Architecture**).

Direction: IN                      Type: UINT32  
Default:                              N/A

**ulWriteAddress** 0 – 0x0FFFFFFE

Start address of the writes. This is a byte address that points to words and must be even. This is the address of the first location. For each subsequent word, the address is incremented by two.

Direction: IN                      Type: UINT32  
Default:                              N/A

**usWriteData** 16 bit field

The word to be written.

Direction: IN                      Type: UINT16  
Default:                              N/A

**ulWriteLength**

32-bit value

The number of accesses that must be performed.

Direction: IN

Type: UINT32

Default:

N/A

### 6.2.3 Oct6100UserDriverWriteBurstApi, Oct6100UserDriverWriteBurstOs

Writes an array of data words to consecutive addresses of the chip. Any error returned by the function is considered a fatal error. Two versions of the function are needed because the function may be accessed from two different software layers. See the **System Architecture** description in the **Overview**. Thus, each function must have a different name, but the functionality remains identical.

#### Usage

```
#include "oct6100_apiud.h"

UINT32 Oct6100UserWriteBurstApi(
    tPOCT6100_WRITE_BURST_PARMS    f_pWriteBurstParms );

UINT32 Oct6100UserWriteBurstOs(
    tPOCT6100_WRITE_BURST_PARMS    f_pWriteBurstParms );
```

#### Parameters

**f\_pWriteBurstParms**      Pointer to a tOCT6100\_WRITE\_BURST\_PARMS structure. The structure's elements are defined below.

#### 6.2.3.1 tOCT6100\_WRITE\_BURST\_PARMS Structure

**pProcessContext**      pointer

This parameter is used only if **fMultiProcessSystem** is set to TRUE in the tOCT6100\_OPEN\_CHIP structure. Pointer to structure provided by user during creation of local API instance.

Direction: IN      Type: PVOID  
Default:      N/A

**ulUserChipId**      identifier

The chip identifier parameter provided to the Oct6100ChipOpen function. (see **System Architecture**).

Direction: IN      Type: UINT32  
Default:      N/A

**ulWriteAddress**      0 – 0x0FFFFFFE

Start address of the writes. This is a byte address that points to words and must be even. This is the address of the first location to write to. For each subsequent word the address is incremented by two.

Direction: IN      Type: UINT32  
Default:      N/A

**pusWriteData**

Array of words to be written starting at **ulWriteAddress**.

Direction: IN      Type: PUINT16  
Default:      N/A

**ulWriteLength**

32-bit value

The number of accesses that must be performed.

Direction: IN

Type: UINT32

Default:

N/A

## 6.3 Read Functions

### 6.3.1 Oct6100UserDriverReadApi, Oct6100UserDriverReadOs

Reads a single word from the chip. Any error returned by the function is considered a fatal error. Two versions of the function are needed because the function may be accessed from two different software layers. See the **System Architecture** description in the **Overview**. Thus, each function must have a different name, but the functionality remains identical.

#### Usage

```
#include "oct6100_apiud.h"

UINT32 Oct6100UserReadApi(
    tPOCT6100_READ_PARMS          f_pReadParms );

UINT32 Oct6100UserReadOs(
    tPOCT6100_READ_PARMS          f_pReadParms );
```

#### Parameters

**f\_pReadParms**                      Pointer to a tOCT6100\_READ\_PARMS structure. The structure's elements are defined below.

#### 6.3.1.1 tOCT6100\_READ\_PARMS Structure

**pProcessContext**                      pointer

This parameter is used only if **fMultiProcessSystem** is set to TRUE in the tOCT6100\_OPEN\_CHIP structure. Pointer to structure provided by user during creation of local API instance.

Direction: IN                      Type: PVOID  
Default:                              N/A

**ulUserChipId**                              identifier

The chip identifier parameter provided to the Oct6100ChipOpen function. (see **System Architecture**).

Direction: IN                      Type: UINT32  
Default:                              N/A

**ulReadAddress**                              0 – 0x0FFFFFFE

This is the address of the word to be read. This is a byte address that must be on a word boundary.

Direction: IN                      Type: UINT32  
Default:                              N/A

**pusReadData**

Pointer to a single UINT16 to receive the data.

Direction: IN/OUT                      Type: PUINT16  
Default:                              N/A

### 6.3.2 Oct6100UserDriverReadBurstApi, Oct6100UserDriverReadBurstOs

Performs a burst of reads to the chip. Any error returned by this function is considered a fatal error. Two versions of the function are needed because the function may be accessed from two different software layers. See the **System Architecture** description in the **Overview**. Thus, each function must have a different name, but the functionality remains identical.

#### Usage

```
#include "oct6100_apiud.h"

UINT32 Oct6100UserReadBurstApi(
    tPOCT6100_READ_BURST_PARMS    f_pReadBurstParms );

UINT32 Oct6100UserReadBurstOs(
    tPOCT6100_READ_BURST_PARMS    f_pReadBurstParms );
```

#### Parameters

**f\_pReadBurstParms** Pointer to a tOCT6100\_READ\_BURST\_PARMS structure. The structure's elements are defined below.

#### 6.3.2.1 tOCT6100\_READ\_BURST\_PARMS Structure

<b>pProcessContext</b>	pointer
This parameter is used only if <b>fMultiProcessSystem</b> is set to TRUE in the tOCT6100_OPEN_CHIP structure. Pointer to structure provided by user during creation of local API instance.	
Direction:	IN
Type:	PVOID
Default:	N/A
<b>ulUserChipId</b>	identifier
The chip identifier parameter provided to the Oct6100ChipOpen function. (see <b>System Architecture</b> ).	
Direction:	IN
Type:	UINT32
Default:	N/A
<b>ulReadAddress</b>	0 – 0x0FFFFFFE
Start address of the burst. This is a byte address that must be on a word boundary. This is the address of the first word in the burst. For each subsequent word, the address is incremented by two.	
Direction:	IN
Type:	UINT32
Default:	N/A
<b>pusReadData</b>	
Pointer to an array of UINT16s used to receive the data read. Each element is one word.	
Direction:	IN/OUT
Type:	PUINT16
Default:	N/A



**ulReadLength**

32-bit value

Length of the **pulReadData** (burst length in words).

Direction: IN

Type: UINT32

Default:

N/A

## 6.4 Time Functions

The API requires wall-clock time, in microseconds ( $\mu$ s) for resource and event management. There are resources that require a minimum invalid time before reuse to guarantee proper operation.

### 6.4.1 Oct6100UserGetTime

Gets the current value of the user supplied wall-clock time. The time is specified in  $\mu$ s. It is important that this timer never wrap. Of course, if the counter is initialized to 0 before the API calls this function then the counter will only wrap in several thousand years, thus insuring that no wrapping occurs. The API code is written with the assumption that the counter will never wrap.

#### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserGetTime(  
    tPOCT6100_GET_TIME    f_pGetTime );
```

#### Return Values

COCT6100\_GET\_TIME\_FAILED\_X      the values 0xFFFF0000 - 0xFFFF000F are reserved for time routine return values. The x is the last hex digit of the returned value. This return value is passed by the API function to the original calling user routine. Any error returned in this range by this function is considered a fatal error by the API.

#### Parameters

f\_pGetTime      pointer to a tOCT6100\_GET\_TIME structure. The definitions of the structure's elements are listed below.

#### 6.4.1.1 Structure tOCT6100\_GET\_TIME

**pProcessContext**      pointer

This parameter is used only if **fMultiProcessSystem** is set to TRUE in the tOCT6100\_OPEN\_CHIP structure. Pointer to structure provided by user during creation of local API instance.

Direction: IN      Type: PVOID  
Default:      N/A

**ulWallTimeUs[2]**      UINT32

The returned wall-time in  $\mu$ s. Element 1 of the array contains the MSB bits.

Direction: OUT      Type: UINT32[2]  
Default:      N/A

## 6.5 Memory Functions

The API requires some simple memory management functions from the user. The required functions are **Oct6100UserMemSet** and **Oct6100UserMemCopy**.

### 6.5.1 Oct6100UserMemSet

This function is used to set a memory space to a specified value.

#### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserMemSet(  
    PVOID                f_pAddress,  
    UINT32                f_ulPattern,  
    UINT32                f_ulLength );
```

#### Parameters

f_pAddress	Pointer to the memory segment where f_ulPattern will be written.
f_ulPattern	Byte pattern written into memory.
f_ulLength	Number of bytes after f_pAddress that must be written to f_ulPattern.

### 6.5.2 Oct6100UserMemCopy

This function is used to copy data from one memory location to another.

#### Usage

```
#include "oct6100_apiud.h"
```

```
UINT32 Oct6100UserMemCopy(  
    PVOID f_pDestination,  
    PVOID f_pSource,  
    UINT32 f_ulLength );
```

#### Parameters

f_pDestination	Pointer to the memory segment where the information needs to be copied.
f_pSource	Pointer to the memory segment where the information to be copied is located.
f_ulLength	Number of bytes to be copied.

## 7 Echo Operation Mode

The **ulEchoOperationMode** parameter of the channel configuration structure determines the state of the echo canceller. The **fEnableNlp** parameter of the channel configuration structure determines the state of the Non-Linear processor (NLP). Certain features are not available in certain modes.

The table below indicates which features are available in each of the echo operation modes and NLP states. An "X" in a box indicates that the feature IS available.

Note that the table below lists all features that the OCT61xx can support. Not all features are available for all OCT61xx devices. Please refer to the OCT6100 Hardware specification for the feature list for your specific part.

MODES	ECHO OPERATION MODE						NLP ENABLE	
	POWER DOWN	HT FREEZE	HT RESET	NO ECHO NLP ON	SPEECH RECOG. NLP OFF	NORMAL	FALSE	TRUE
ADPCM	X	X	X	X	X	X	X	X
Broadcast TSST	X	X	X	X	X	X	X	X
Conferencing	X	X	X	X	X	X	X	X
Law Conversion	X	X	X	X	X	X	X	X
Phasing	X	X	X	X	X	X	X	X
TSI Connection	X	X	X	X	X	X	X	X
Tone Detection		X	X	X	X	X	X	X
DC Removal		X	X	X	X	X	X	X
MLC		X	X	X	X	X	X	X
Silence Supp.		X	X	X	X	X		X
ANR		X	X	X	X	X		X
CNR		X	X	X	X	X		X
Tone Removal		X	X	X	X	X		X
Dominant speaker		X	X	X	X	X		X
Buffer Playout			X	X	X	X		X
ALC				X	X	X		X
HLC				X	X	X		X
Sin Voice Detection				X	X	X		X
Tone Disabler		X	X		X	X	X	X
Default ERL		X	X			X		X
NLP Behavior A		X	X			X		X
Echo Cancellation					X	X	X	X
AEC					X	X	X	X
Comfort Noise						X		X
Tail Displacement					X	X	X	X
NLP Behavior B						X		X
Idle code detection						X		X
Octasic Music Protection						X		X

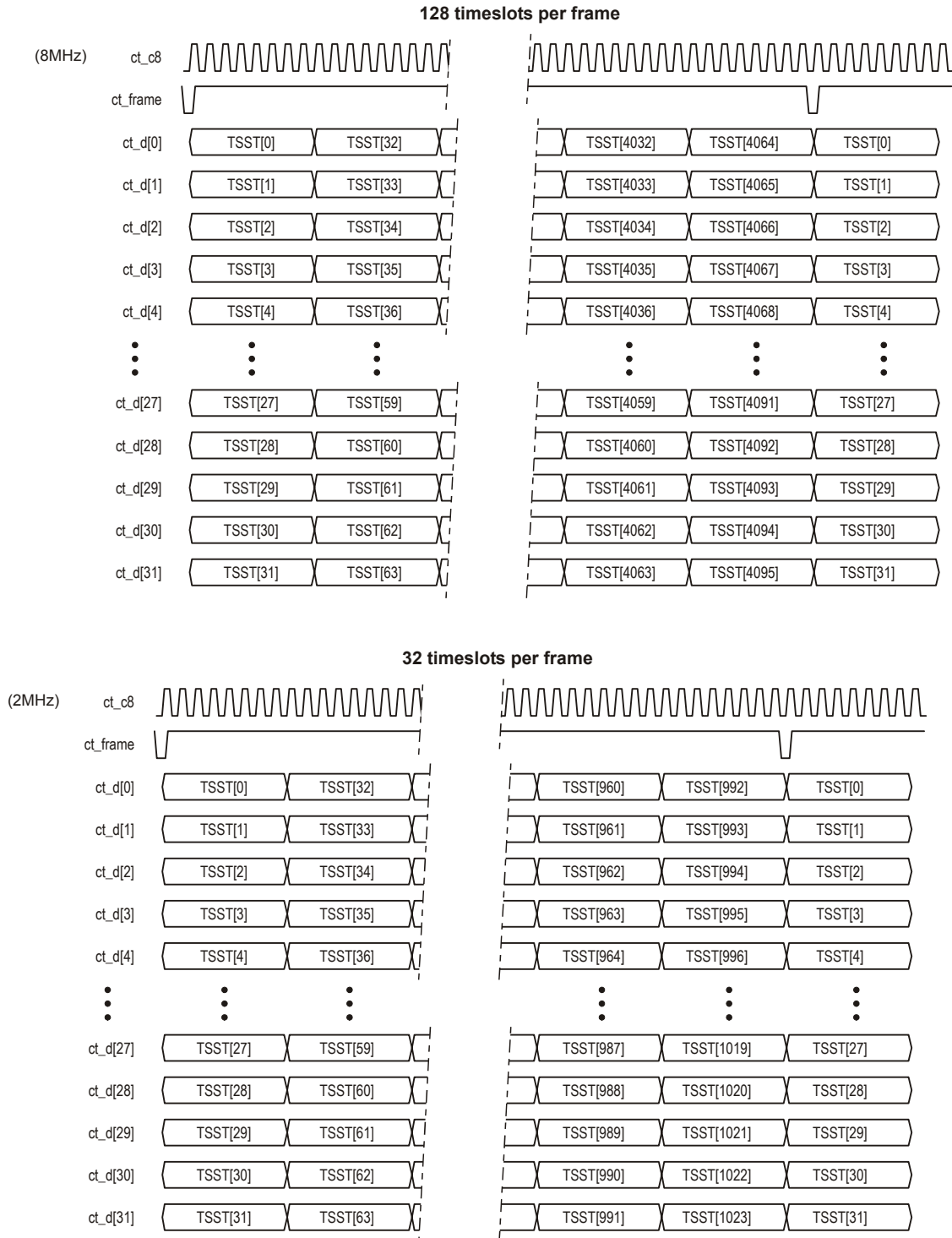


## 8 API access count per function

This section provides information about the number of writes and reads performed by API functions.

Function Name	Characteristics		Num Write Word	Num Read Word
Oct6100ChipOpen	image of 238997 bytes		136249	16152
Oct6100ChipGetStats			0	0
Oct6100ChipGetImageInfo			0	0
Oct6100ChannelOpen	with ADPCM		84	20
Oct6100ChannelOpen	without ADPCM		76	20
Oct6100ChannelModify	Modify Op mode only		66	0
Oct6100ChannelModify	Modify VQE only		38	0
Oct6100ChannelModify	Modify Codec only		46	0
Oct6100ChannelModify	Modify TDM only		46	0
Oct6100ChannelModify	Modify All		66	0
Oct6100ChannelGetStats			0	11
Oct6100ChannelClose			37	2
Oct6100InterruptServiceRoutine	No Tone events		5	15
Oct6100ToneDetectionEnable			1	1
Oct6100EventGetTone	No Tone Events		1	2
Oct6100EventGetTone	1 Tone Event		1	34
Oct6100ToneDetectionDisable			3	3
Oct6100ConfBridgeOpen			0	0
Oct6100ConfBridgeChanAdd			25	0
Oct6100ConfBridgeChanRemove			10	0
Oct6100ConfBridgeGetStats			0	0
Oct6100ConfBridgeClose			0	0
Oct6100BufferPlayoutLoad	16384-byte buffer		8192	0
Oct6100BufferPlayoutAdd			8	2
Oct6100BufferPlayoutStart			4	0
Oct6100BufferPlayoutStop			8	0
Oct6100BufferPlayoutUnload			0	0

## 9 TSST to Timeslot Mapping





## 10 TSST Formats

The OCT6100 supports auto-detection of the compression format in the input direction and notifies an external SAR device on the current compression rate and silence indications in output direction.

When the formats allow changes between PCM, G.726/G.727 and silence, additional encodings and potentially TSSTs are required to carry complete information for a single channel on the H.100 bus.

### 10.1 Input TSST Formats

#### 10.1.1 One TSST Format

##### 1 TSST Format Decompression Formats

Format of Fixed Rate Samples

b7	b6	b5	b4	b3	b2	b1	b0
PCM 64kbps							
b7	b6	b5	b4	b3	b2	b1	b0
x	x	x	ADPCM 40kbps				
b7	b6	b5	b4	b3	b2	b1	b0
x	x	x	x	32kbps			
b7	b6	b5	b4	b3	b2	b1	b0
x	x	x	x	x	24kbps		
b7	b6	b5	b4	b3	b2	b1	b0
x	x	x	x	x	x	16kbps	

Format of Auto Rate Detected Samples

b7	b6	b5	b4	b3	b2	b1	b0
PCM[7]		1	PCM[5:0]				

**Note:** This format is intended for comfort noise samples from the SAR device. Since comfort noise should be rather low in energy, bit 6 is always 1 in u-law and A-law. (u-law max value of 471 / 8159. A-law max value of 252 / 4096).

b7	b6	b5	b4	b3	b2	b1	b0
R	0	1	ADPCM 40kbps				
b7	b6	b5	b4	b3	b2	b1	b0
R	0	0	1	32kbps			
b7	b6	b5	b4	b3	b2	b1	b0
R	0	0	0	1	24kbps		
b7	b6	b5	b4	b3	b2	b1	b0
R	0	0	0	0	1	16kbps	

**R** - Reset ADPCM Codec, when set to '1' the codec is reset before processing the sample. When the format changes from PCM to any ADPCM format, a reset is performed on the first ADPCM sample whether indicated or not.

## 10.1.2 Two TSST Format

### 2 TSST Format Decompression Formats

Associated TSST (Configured TSST - 1)								Configured TSST (odd)							
b7	b6	b5	b4	b3	b2	b1	b0	b7	b6	b5	b4	b3	b2	b1	b0
1	R	Reserved						PCM Sample							
b7	b6	b5	b4	b3	b2	b1	b0	b7	b6	b5	b4	b3	b2	b1	b0
0	0	Reserved						R	0	1	ADPCM 40kbps				
b7	b6	b5	b4	b3	b2	b1	b0	b7	b6	b5	b4	b3	b2	b1	b0
0	0	Reserved						R	0	0	1	32kbps			
b7	b6	b5	b4	b3	b2	b1	b0	b7	b6	b5	b4	b3	b2	b1	b0
0	0	Reserved						R	0	0	0	1	24kbps		
b7	b6	b5	b4	b3	b2	b1	b0	b7	b6	b5	b4	b3	b2	b1	b0
0	0	Reserved						R	0	0	0	0	1	16kbps	

**R** - Reset ADPCM Codec, when set to '1' the codec is reset before processing the sample. When the format changes from PCM to any ADPCM format, a reset is performed on the first ADPCM sample whether indicated or not.

10.2 Output TSST Formats

10.2.1 One TSST Format

1 TSST Format Compression Formats

Silence Suppression Indication

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	0	0	0	0

**Note:** This indication will be presented in the frame of the sample that would end a packet as determined by the phasing TSST and the phase of the channel. This indicates that the OCT6100 voice activity detector has determined that this packet should be suppressed. In One TSST mode, if the channel has been configured for PCM, then silence suppression will not operate properly.

Format of Samples

b7	b6	b5	b4	b3	b2	b1	b0
PCM 64kbps							

b7	b6	b5	b4	b3	b2	b1	b0
0	0	1	ADPCM 40kbps				

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	1	32kbps			

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	1	24kbps		

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	0	1	16kbps	

## 10.2.2 Two TSST Format

### 2 TSST Format Compression Formats

#### Associated TSST (Configured TSST - 1)

b7	b6	b5	b4	b3	b2	b1	b0
1	TX PCM Unsigned Mag						

b7	b6	b5	b4	b3	b2	b1	b0
0	TX PCM Unsigned Mag						

b7	b6	b5	b4	b3	b2	b1	b0
0	TX PCM Unsigned Mag						

b7	b6	b5	b4	b3	b2	b1	b0
0	TX PCM Unsigned Mag						

b7	b6	b5	b4	b3	b2	b1	b0
0	TX PCM Unsigned Mag						

#### Configured TSST (odd)

b7	b6	b5	b4	b3	b2	b1	b0
PCM Sample							

b7	b6	b5	b4	b3	b2	b1	b0
0	0	1	ADPCM 40kbps				

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	1	32kbps			

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	1	24kbps		

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	0	1	16kbps	

#### Silence Suppression Indication

b7	b6	b5	b4	b3	b2	b1	b0
0	TX PCM Unsigned Mag						

b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	0	0	0	0

**Note:** This indication will be presented in the frame of the sample that would end a packet as determined by the phasing TSST and the phase of the channel. This indicates that the OCT6100 voice activity detector has determined that this packet should be suppressed.

## 11 Revision History

Version	Date	Changes
3.8	December 2008	<ul style="list-style-type: none"> <li>Updated Conference bridge section</li> <li>Updated Buffer Playout section</li> </ul>
3.7	September 2008	<ul style="list-style-type: none"> <li>Removed cOCT6100_MIXING_0_DB from ulMixingMode</li> <li>Added multi-process system description in API architecture section.</li> <li>Added sample code for multi-process applications.</li> <li>Modified description of pulDurationMs parameter in Oct6100CallerIdTransmit function.</li> <li>Added Adaptive Filter dynamic BIST feature.</li> </ul>
3.6	June 2007	<ul style="list-style-type: none"> <li>Tone Event Delay Modification.</li> <li>Added fEnable2100StopEvent.</li> <li>Removed ALC tone reset and ALC noise bleed timeout features.</li> </ul>
3.5	December 2006	<ul style="list-style-type: none"> <li>Added fRoutNoiseReductionLevel and lRoutNoiseReductionLevelGainDb.</li> </ul>
3.4	November 2006	<ul style="list-style-type: none"> <li>Added Oct6100ApiGetCapacityPins function.</li> </ul>
3.3	October 2006	<ul style="list-style-type: none"> <li>Added new shorter production BIST mode.</li> </ul>
3.2	April 2006	<ul style="list-style-type: none"> <li>New "content" parameter to the debug recording functions.</li> </ul>
3.1	March 2006	<ul style="list-style-type: none"> <li>New OCT6170 product family.</li> </ul>
3.0	February 2006	<ul style="list-style-type: none"> <li>New RIN and SOUT ALC reset parameters upon detection of continuous tones.</li> <li>Added ALC noise bleed out time parameter.</li> <li>New RIN port DTMF tone removal feature using bi-directional channel linking.</li> </ul>
2.9	November 2005	<ul style="list-style-type: none"> <li>Added source code example for debug recording functions.</li> </ul>
2.8	September 2005	<ul style="list-style-type: none"> <li>Added idle code detection parameter.</li> </ul>
2.7	July 2005	<ul style="list-style-type: none"> <li>Added double talk behavior parameter.</li> <li>Added SOUT noise bleaching parameter.</li> <li>Changed the default non-linearity behavior A to 1.</li> </ul>
2.6	April 2005	<ul style="list-style-type: none"> <li>Added tone profile number parameter description to the chip image info.</li> </ul>
2.5	February 2005	<ul style="list-style-type: none"> <li>Default ERL new supported values: -9 and -12.</li> </ul>
2.4	January 2005	<ul style="list-style-type: none"> <li>New speech recognition echo operation mode.</li> <li>New per channel tail length parameter.</li> <li>New tone disabler VQE active delay.</li> <li>New RIN port DTMF tone removal feature.</li> <li>No more array upper limits on the event functions.</li> <li>New per channel acoustic echo tail length parameter.</li> <li>New production BIST function.</li> <li>New music protection flag in channel functions.</li> <li>New debug recording functions.</li> </ul>
2.3	November 2004	<ul style="list-style-type: none"> <li>New adaptive noise reduction parameters.</li> </ul>

		<ul style="list-style-type: none"> <li>• New modify channel flag to apply the configuration to all opened channels.</li> <li>• New modify channel flags to stop buffer playout, disable tone detection, remove a participant from a bridge and close all broadcast TSSTs.</li> </ul>
2.2	September 2004	<ul style="list-style-type: none"> <li>• New caller ID stop events.</li> </ul>
2.1	August 2004	<ul style="list-style-type: none"> <li>• New listener enhancement parameters.</li> <li>• New ROUT noise reduction feature.</li> </ul>
2.0	July 2004	<ul style="list-style-type: none"> <li>• New modify of channel number of TSSTs.</li> <li>• New channel mute and un-mute functions.</li> </ul>
1.9	June 2004	<ul style="list-style-type: none"> <li>• New tap feature in simple conferencing.</li> </ul>
1.8	June 2004	<ul style="list-style-type: none"> <li>• New image info flag for the dominant speaker feature.</li> <li>• New channel applied gain statistics.</li> </ul>
1.7	April 2004	<ul style="list-style-type: none"> <li>• New buffer playout parameter that controls the gain.</li> <li>• New buffer playout 0 dB mixing mode.</li> <li>• New conference bridge function for changing the participant mask.</li> <li>• New Automatic Level Control parameters.</li> <li>• New High Level Compensation parameters.</li> <li>• New echo operation mode that activates the voice quality features without echo cancellation.</li> <li>• New parameters to the buffer playout stop function.</li> </ul>
1.6	March 2004	<ul style="list-style-type: none"> <li>• Caller ID specification.</li> <li>• Acoustic echo cancellation not using non-linearity behavior B and tail displacement parameters.</li> <li>• New acoustic default ERL parameter.</li> <li>• Image info structure modifications.</li> <li>• New conferencing noise reduction feature.</li> <li>• Changed the minimum playout buffer size to 64.</li> </ul>

For more information on this or other products visit our web site: <http://www.octasic.com>

Or contact us at:

**Tel:** +1 (514) 282-1361

**Fax:** +1 (514) 282-7672

**Email:** [support@octasic.com](mailto:support@octasic.com)

**Address:**

**OCTASIC Inc.**

4101 Molson St, Suite 300

Montreal, Quebec

H1Y 3L1, Canada