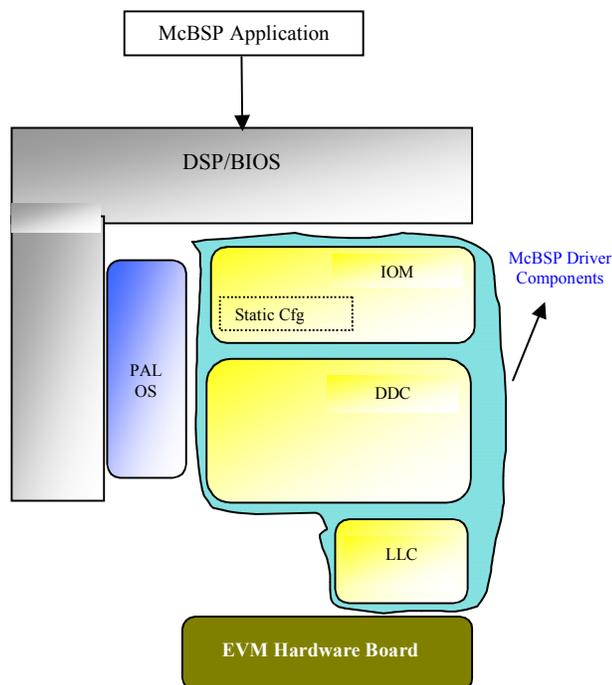




### Features Supported by the DSP/BIOS McBSP driver

- ❖ Middle layer of the driver conforms to IO Mini driver model defined by the DSP/BIOS DDK (Device Driver Development Kit) Framework.
- ❖ Designed for (but not limited to) use with codec drivers.
- ❖ Keeps External Frame Sync.
- ❖ Multi-instance (Handles multiple serial ports simultaneously).
- ❖ Supports run-time Start/Stop of the Audio Play and Record operation.
- ❖ Supports Pause-Resume feature for Audio Playback operation when integrated with the audio codec specific driver.
- ❖ Supports Mute ON/OFF feature for Audio Playback operation when integrated with the audio codec specific driver.



### Description

Details about the tools and the BIOS version that the driver is compatible with can be found in the system Release Notes.

The components used to develop the McBSP driver are given below.

#### 1. CSLR Modules used

- ❖ McBSP module.

#### 2. CPU Interrupts used

- ❖ EDMA transfer completion interrupt

#### 3. Peripherals Used

- ❖ McBSP



- ❖ EDMA
- ❖ EMIF for external memory interface

**4. Drivers used**

- ❖ EDMA

**5. Modes supported by the driver(Data access mechanism)**

- ❖ DMA interrupt mode.

The device independent layer of the McBSP driver is a class driver. The device independent layer of the driver is responsible for buffer management and application synchronization. The IO-mini layer contains the device-specific portions of the driver. From IOM mini driver DDC layer APIs are called from which LLC layer APIs are called.

The following table gives a quick overview of the supported class driver API services.

|                     |  |
|---------------------|--|
| GIO_create()        | Opens the McBSP driver for operation   |
| GIO_delete(gioChan) | Closes the McBSP driver from operation.  |
| GIO_submit()        | Submits a request Read/write to McBSP driver   |
| GIO_read()          | Read data from McBSP driver.   |
| GIO_write()         | Write data to McBSP driver for transmit.   |
| GIO_control()       | <p>Performs device specific control operations on the device.</p> <p>Supported control commands include:</p> <p>PSP_CTRL_McBSP_STOP</p> <p>PSP_CTRL_McBSP_START</p> <p>PSP_CTRL_McBSP_LOOPBACK</p> <p>PSP_CTRL_McBSP_PAUSE</p> <p>PSP_CTRL_McBSP_RESUME</p> <p>PSP_CTRL_McBSP_MUTE_ON</p> <p>PSP_CTRL_McBSP_MUTE_OFF</p> <p>PSP_CTRL_McBSP_CHAN_RESET</p> <p>PSP_CTRL_McBSP_DEVICE_RESET</p> <p>PSP_CTRL_McBSP_CNG_ADDR</p> <p>PSP_CTRL_McBSP_CONFIG_DATA</p> <p>PSP_CTRL_McBSP_SRGR_START</p> <p>PSP_CTRL_McBSP_SRGR_STOP</p> |

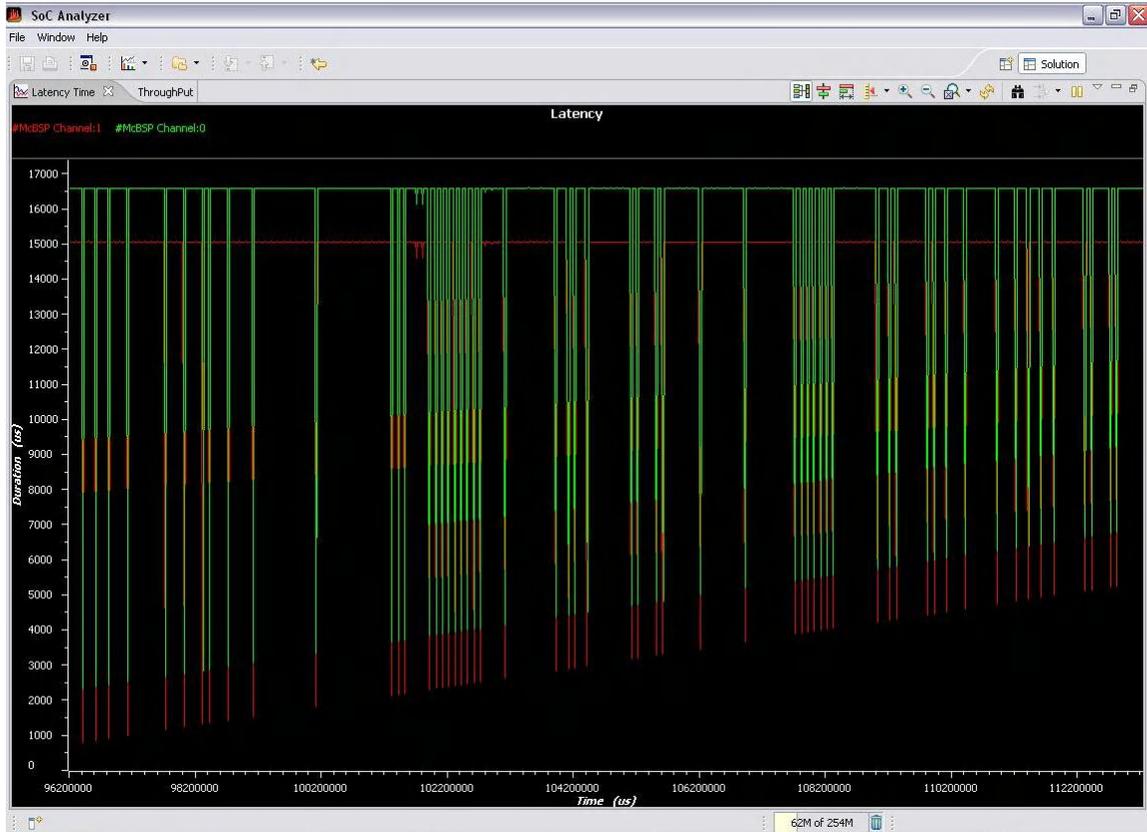


|              |  |
|--------------|--|
|              | PSP_CTRL_McBSP_FSGR_START<br>PSP_CTRL_McBSP_FSGR_STOP<br>PSP_CTRL_McBSP_SET_CLKMODE<br>PSP_CTRL_McBSP_SET_FRMSYNCMODE<br>PSP_CTRL_McBSP_CONFIG_SRGR<br>PSP_CTRL_McBSP_SET_BCLK_POL<br>PSP_CTRL_McBSP_SET_FRMSYNC_POL<br>PSP_CTRL_McBSP_MODIFY_LOOPJOB<br>PSP_CTRL_McBSP_RECEIVE_SYNCERR_INT_ENABLE<br>PSP_CTRL_McBSP_XMIT_SYNCERR_INT_ENABLE |
| GIO_Flush () | Flush the data in the channel.   |
| GIO_Abort()  | Abort the channel operation.   |

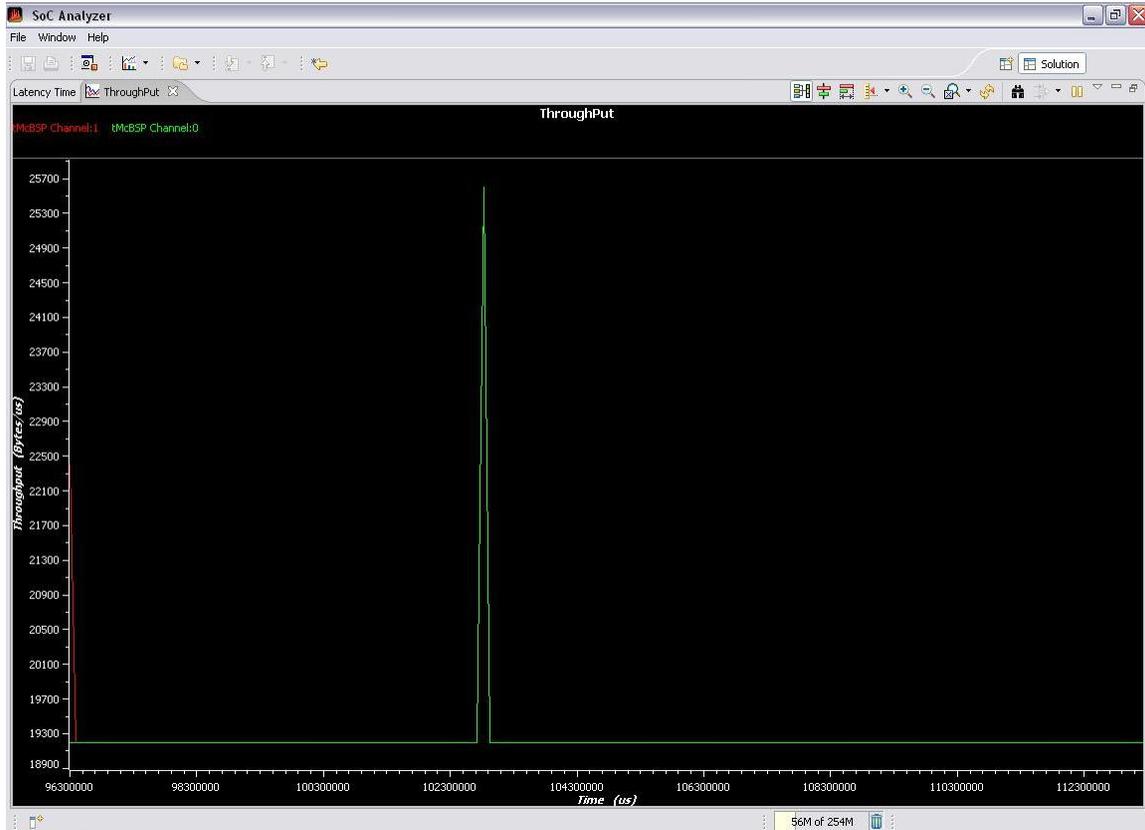
### Performance and Benchmarks

| MCBSP DEVICE DRIVER<br>SUB-COMPONENT | PROGRAM MEMORY<br>(IN BYTES) | DATA MEMORY<br>(IN BYTES) |                |              |
|--------------------------------------|------------------------------|---------------------------|----------------|--------------|
|                                      |                              | MEMORY TYPE               |                | TOTAL        |
|                                      |                              | INITIALIZED               | UN INITIALIZED |              |
| dda(iom)                             | 2348                         | 28                        | 188            | 2564         |
| ddc                                  | 18064                        | 200                       | 5204           | 23468        |
| llc                                  | 4140                         | 0                         | 16             | 4156         |
| <b>Total</b>                         | <b>24552</b>                 | <b>228</b>                | <b>5408</b>    | <b>30188</b> |

- System Components Total Memory (Code & Data): **30188** Bytes



- Latency graph for McBSP receive and transmit channels



- Throughput graphs for McBSP receive and transmit channels

**Note:** The Driver Performance Characteristics can be included once testing is done on DM6437/C6424 SOC. The graphs are taken for McBSP operating in slave mode at 48 KHz sampling rate. For generating performance figures of McBSP driver in other modes please refer the top-level user guide for usage of SoC Analyzer.

All memory requirements are expressed in kilobytes (1 kilobyte = 1024 8-bit bytes) for **full-featured** device driver usage.

This data was gathered using the \*.map file generated by the CCS.

Uninitialized data: .bss  
Initialized data: .cinit + .const  
Initialized code: .text + .text: init



## References

[1] McBSP Module Hardware Specifications

[2] EDMA 3.0 Module Hardware Specifications

[3] SPRU943.pdf - TMS320DM643x DMP Multichannel Buffered Serial Port (McBSP) Interface User's Guide

## Glossary

|      |  |
|------|--|
| CSLR | TI Terminology, Chip Support Register Layer              |
| IOM  | TI Terminology, IO Mini layer                            |
| EDMA | TI Terminology, Enhanced Direct Memory Access Controller |
| LLC  | TI Terminology, Lower Level Controller                   |
| DDC  | TI Terminology, Device Driver Core                       |