



- **Multi-instantiable and re-entrant safe driver**
- **Modeled after TI Device Driver Architecture for Stream Class Devices that allows for easy porting and customization**

Description

This EDMA3 Resource Manager has been developed for the following h/w and s/w environment

Hardware:

- Target Boards: DA830 EVM, TCI6608 (Little and Big Endian) Simulator, TCI6616 (Little and Big Endian) Simulator, C6748 EVM, OMAPL138 EVM, C6472 (Little and Big Endian) EVM, TCI6486 (Little and Big Endian) EVM, TI816X EVM, TI814X EVM, TI811X EVM, C6670 EVM, C6678 EVM, tci6614 EVM , tci6614 Simulator.
- Emulation Setup: TI Emulator
- Cabling: Standard Serial Connector

Software:

- CCS: 5.0.2
- Operating System: SYS BIOS 6.33.03.33
- C6x Code generation tools: 7.3.1
- TMS470 Code Generation Tools: 4.9.2
- XDC Tool chain: 3.23.01.43
- TCI6608/TCI6616 Simulator: 1.0.0

Other S/W Components Used:

- None



Capabilities

The DSP BIOS EDMA3 Resource Manager adopts a scalable architecture that eases customization/extension

- Isolates H/W and OS Accesses, Easy to maintain & re-target to new platforms
- Can stack custom-functions along control/data-path to realize “driver filters”
- Supports Multiple Instances

For easy and quick reconfiguration of driver for different SoCs, all its global configurable parameters can be passed at run time to the API `EDMA3_DRV_create ()`, to create the SoC specific EDMA3 Driver Object. In case this configuration is not passed at run time, it can be taken from the EDMA3 configuration file `edma3_<PLATFORM_NAME>_cfg.c`, for the specific SoC, if it has been provided there. The configuration files can be found in “`edma3_ild_<VERSION_NUMBER>\packages\ti\sdo\edma3\rm\src\configs`” folder.

Similarly, the shadow region specific information can also be passed at run time to the API `EDMA3_DRV_open ()`, to create region specific EDMA3 Driver Instance. In case this configuration is not passed at run time, it can be taken from the EDMA3 configuration file `edma3_<PLATFORM_NAME>_cfg.c`, for the specific SoC, if it has been provided there. The configuration files can be found in “`edma3_ild_<VERSION_NUMBER>\packages\ti\sdo\edma3\rm\src\configs`” folder.

EDMA3 Resource Manager APIs:

| | |
|--|--|
| <code>EDMA3_RM_create ()</code> | Create (and initialize) a given EDMA3 Resource Manager (object) |
| <code>EDMA3_RM_delete ()</code> | Delete a given EDMA3 Resource Manager (object) |
| <code>EDMA3_RM_open ()</code> | Open instance of the EDMA3 Resource Manager |
| <code>EDMA3_RM_close ()</code> | Close instance of the EDMA3 Resource Manager |
| <code>EDMA3_RM_allocResource ()</code> | Request for a resource |
| <code>EDMA3_RM_freeResource ()</code> | Free the earlier requested resource |
| <code>EDMA3_RM_mapEdmaChannel ()</code> | Bind a DMA Channel to a PaRAM Set |
| <code>EDMA3_RM_mapQdmaChannel ()</code> | Bind a QDMA Channel to a PaRAM Set and set the trigger word for the QDMA channel |
| <code>EDMA3_RM_registerTccCb ()</code> | Register a callback against a TCC |
| <code>EDMA3_RM_unregisterTccCb ()</code> | Unregister the callback from the TCC |
| <code>EDMA3_RM_allocContiguousResource ()</code> | Allocate a contiguous region of specified resource |
| <code>EDMA3_RM_freeContiguousResource ()</code> | Free a contiguous region of specified resource |
| <code>EDMA3_RM_setCCRegister ()</code> | Set the Channel Controller (CC) Register value, by specifying the register offset and the new value. |



| | |
|---------------------------------|--|
| EDMA3_RM_getCCRegister () | Get the Channel Controller (CC) Register value, by specifying the register offset. |
| EDMA3_RM_waitAndClearTcc () | Wait for a transfer completion interrupt to occur on the specific TCC. |
| EDMA3_RM_checkAndClearTcc () | Returns the status of a previously initiated transfer. |
| EDMA3_RM_allocLogicalChannel () | Request a DMA/QDMA/Link channel. |
| EDMA3_RM_freeLogicalChannel () | This API is used to free the specified channel (DMA/QDMA/Link) and its associated resources (PaRAM Set, TCC etc). |
| EDMA3_RM_setPaRAM () | Set the PaRAM Set associated with a logical channel |
| EDMA3_RM_getPaRAM () | Get the PaRAM Set associated with a logical channel |
| EDMA3_RM_getPaRAMPhyAddr () | Get the PaRAM Set Physical Address associated with a logical channel. |
| EDMA3_RM_getBaseAddress () | Get the Channel Controller or Transfer Controller (n) Physical Address. |
| EDMA3_RM_getGblConfigParams () | Get the SoC specific configuration structure for the EDMA3 Hardware. |
| EDMA3_RM_getInstanceInitCfg () | Get the Resource Manager Instance specific configuration structure for different EDMA3 resources' usage (owned resources, reserved resources etc). |
| EDMA3_RM_ioctl () | This function provides IOCTL functionality for EDMA3 Resource Manager. |
| EDMA3_RM_initXbarEventMap () | This function provides the functionality to map cross bar event to EDMA channels. |



EDMA3 Resource Manager Performance Characteristics

| S No | Platform | Code | Data (In bytes) | | Total |
|------|----------|------------|-----------------|---------------|------------|
| | | (In bytes) | Initialized | Uninitialized | (In bytes) |
| 1 | C6472 | 25920 | 2723 | 31239 | 59882 |
| 2 | C6748 | 25920 | 3451 | 33367 | 62738 |
| 3 | DA830 | 25920 | 2051 | 30567 | 58538 |
| 4 | TI816X | 25920 | 2723 | 31239 | 59882 |
| 5 | OMAPL138 | 25920 | 3451 | 33367 | 62738 |
| 6 | TCI6486 | 25920 | 2723 | 31239 | 59882 |
| 7 | TCI6498 | 25920 | 6867 | 35383 | 68170 |

References

- [1] EDMA3 Module Hardware Specifications
- [2] DSP BIOS Documentation
- [3] EDMA3 Resource Manager Documentation

Glossary

PaRAM Set Parameter RAM Set in an EDMA3 Controller

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