



- **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: DM644x, DM646x, DM643x, DM648, C6424, C6452, C6455, OMAP2430, OMAP25xx, OMAP3430, OMAP35xx, DRx40x, DM360, C6474, TCI6488, DA830, C6747, OMAPL137, DRA44x, DRX45x, C6748, OMAPL138, C6472 and TCI6486 EVMs.
- Emulation Setup: TI Emulator / JTAG Jet (Signum) debugger
- Cabling: Standard Serial Connector

### **Software:**

- CCS - 3.3.80.11 (service release 10)
- Operating System: DSP BIOS – 5.41.03.17 or higher
- C6x Code generation tools: 6.1.12
- XDC Tool chain: 3.16.03.36 (optional)
- eBinder IDE – 1.7
- PrKernel version 4
- BSPs (if required)

### **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_RM_create ()`, to create the SoC specific EDMA3 Resource Manager 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_RM_open ()`, to create region specific EDMA3 Resource Manager 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 Resource Manager Performance Characteristics**

S No	Platform	Code	Data (In bytes)		Total
		(In bytes)	Initialized	Uninitialized	(In bytes)
1	c6424	25216	1945	19278	46439
2	c6452	25216	2617	20622	48455
3	c6455	25216	2617	20622	48455
4	c6474	25216	2617	20622	48455
5	c6747	25248	1945	19278	48471
6	c6748	25248	3337	19278	47863
7	da830	25248	1945	19278	48471
8	dm6437	25216	1945	19278	46439
9	dm6446	25216	1945	19278	46439
10	dm6467	25216	2617	20622	48455
11	dm648	25216	2617	20622	48455
12	omap2430	25216	2617	20622	48455
13	omap25xx	25216	2617	20622	48455
14	omap3430	25216	2617	20622	48455
15	omap35xx	25216	2617	20622	48455
16	omapl137	25248	1945	19278	48471
17	omapl138	25248	3337	19278	47863
18	tc16488	25216	2617	20622	48455

**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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