



- **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 Driver 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 Driver 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”
- Uses the EDMA3 Resource Manager services
- 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\sd0\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\sd0\edma3\rm\src\configs`” folder.

The following table gives a quick overview of the supported API services. For help on interfaces, refer to the EDMA3 Driver Help File.

EDMA3 Driver APIs:

<code>EDMA3_DRV_create ()</code>	Create (and initialize) a given EDMA3 Driver (object)
<code>EDMA3_DRV_delete ()</code>	Delete a given EDMA3 Driver (object)
<code>EDMA3_DRV_open ()</code>	Open Instance of the EDMA3 driver
<code>EDMA3_DRV_close ()</code>	Close Instance of the EDMA3 driver
<code>EDMA3_DRV_requestChannel ()</code>	Request for a logical channel for data transfer
<code>EDMA3_DRV_freeChannel ()</code>	Free the earlier requested logical channel
<code>EDMA3_DRV_clearErrorBits ()</code>	Clean up the earlier used logical channel (For removable devices)
<code>EDMA3_DRV_linkChannel ()</code>	Link two logical channels
<code>EDMA3_DRV_unlinkChannel ()</code>	Unlink two earlier linked channels
<code>EDMA3_DRV_chainChannel ()</code>	Chain two logical channels
<code>EDMA3_DRV_unchainChannel ()</code>	Unchain two earlier chained channels



EDMA3_DRV_setOptField ()	Set a particular subfield within the OPT field of a PaRAM Set
EDMA3_DRV_getOptField ()	Get a particular subfield within the OPT field of a PaRAM Set
EDMA3_DRV_setSrcParams ()	Set the Source specific parameters of the data transfer
EDMA3_DRV_setDestParams ()	Set the Destination specific parameters of the data transfer
EDMA3_DRV_setSrcIndex ()	Set the Source specific indices for the data transfer
EDMA3_DRV_setDestIndex ()	Set the Destination specific indices for the data transfer
EDMA3_DRV_setTransferParams ()	Set the various counts for the data transfer
EDMA3_DRV_enableTransfer ()	Enable the transfer on a particular logical channel
EDMA3_DRV_disableTransfer ()	Disable the transfer on a particular logical channel
EDMA3_DRV_bindPaRAMTcc ()	Bind the resources PaRAM Set and TCC
EDMA3_DRV_setQdmaTrigWord ()	Set the Trigger word for a QDMA channel
EDMA3_DRV_getPaRAM ()	Get the PaRAM Set associated with a logical channel
EDMA3_DRV_setPaRAM ()	Set the PaRAM Set associated with a logical channel
EDMA3_DRV_setPaRAMEntry ()	Set a particular PaRAM set entry of the PaRAM set associated with the specified logical channel
EDMA3_DRV_getPaRAMEntry ()	Get a particular PaRAM set entry of the PaRAM set associated with the specified logical channel
EDMA3_DRV_setPaRAMField ()	Set a particular PaRAM set field of the PaRAM set associated with the specified logical channel
EDMA3_DRV_getPaRAMField ()	Get a particular PaRAM set field of the PaRAM set associated with the specified logical channel
EDMA3_DRV_setEvtQPriority ()	Sets EDMA TC priority. User can program the priority of the Event Queues at a system-wide level. This means that the user can set the priority of an IO initiated by either of the TCs (Transfer Controllers) relative to IO initiated by the other bus masters on the device (ARM, DSP, USB, etc)
EDMA3_DRV_mapChToEvtQ ()	Associate Channel to Event Queue
EDMA3_DRV_getMapChToEvtQ ()	Get the Event Queue mapped to the specified DMA channel
EDMA3_DRV_setCCRegister ()	Set the Channel Controller (CC) Register value, by specifying the register offset and the new value.
EDMA3_DRV_getCCRegister ()	Get the Channel Controller (CC) Register value, by specifying the register offset.
EDMA3_DRV_waitAndClearTcc ()	Wait for a transfer completion interrupt to occur on the specific TCC.
EDMA3_DRV_checkAndClearTcc ()	Returns the status of a previously initiated transfer.
EDMA3_DRV_getPaRAMPhyAddr ()	Get the PaRAM Set Physical Address associated with a logical channel.
EDMA3_DRV_ioctl ()	This function provides IOCTL functionality for EDMA3 Driver.



EDMA3_DRV_getInstHandle	Return the previously opened EDMA3 Driver Instance handle
EDMA3_DRV_disableLogicalChannel	Disable the event driven DMA channel or QDMA channel

**EDMA3 Driver Performance Characteristics**

S No	Target	Code (In bytes)	Data (In bytes)		Total (In bytes)
			Initialized	Uninitialized	
1	C64P	17632	319	18690	36641
2	C674x	17632	319	18690	36641

References

[1] EDMA3 Module Hardware Specifications

[2] DSP BIOS Documentation

[3] EDMA3 Driver Documentation

Glossary

PaRAM Set Parameter RAM Set in an EDMA3 Controller

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