- **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 and OMAPL138 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 – 5.41.01.09 or higher
- C6x Code generation tools: 6.1.9
- XDC Tool chain: 3.16.00.18 (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_lld_<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_lld_<VERSION_NUMBER>\packages\ti\sdo\edma3\rm\src\configs\” folder.

EDMA3 Resource Manager APIs:

EDMA3_RM_create ()	Create (and initialize) a given EDMA3 Resource Manager (object)
EDMA3_RM_delete ()	Delete a given EDMA3 Resource Manager (object)
EDMA3_RM_open ()	Open instance of the EDMA3 Resource Manager
EDMA3_RM_close ()	Close instance of the EDMA3 Resource Manager
EDMA3_RM_allocResource ()	Request for a resource
EDMA3_RM_freeResource ()	Free the earlier requested resource
EDMA3_RM_mapEdmaChannel ()	Bind a DMA Channel to a PaRAM Set
EDMA3_RM_mapQdmaChannel ()	Bind a QDMA Channel to a PaRAM Set and set the trigger word for the QDMA channel
EDMA3_RM_registerTccCb ()	Register a callback against a TCC
EDMA3_RM_unregisterTccCb ()	Unregister the callback from the TCC
EDMA3_RM_allocContiguousResource ()	Allocate a contiguous region of specified resource
EDMA3_RM_freeContiguousResource ()	Free a contiguous region of specified resource
EDMA3_RM_setCCRegister ()	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	25152	1945	19278	46375
2	c6452	25152	2617	20622	48391
3	c6455	25152	2617	20622	48391
4	c6474	25152	2617	20622	48391
5	c6747	25184	1945	19278	46407
6	c6748	25184	3337	19278	47799
7	da830	25184	1945	19278	46407
8	dm6437	25152	1945	19278	46375
9	dm6446	25152	1945	19278	46375
10	dm6467	25152	2617	20622	48391
11	dm648	25152	2617	20622	48391
12	omap2430	25152	2617	20622	48391
13	omap25xx	25152	2617	20622	48391
14	omap3430	25152	2617	20622	48391
15	omap35xx	25152	2617	20622	48391
16	omapl137	25184	1945	19278	46407
17	omapl138	25184	3337	19278	47799
18	tci6488	25152	2617	20622	48391

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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