



AN APPLIED MATERIALS
COMPANY

NEMA| pico VG 1000 Graphics Processing Unit

Hardware User Manual

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Contents

Overview.....	4
Features.....	4
Configuration Options.....	5
Integration - Verification.....	6
Software.....	6
Register Specification (RDL).....	7
Registers' Memory Map.....	7
Registers' Description.....	11

1 Overview

NEMA| pico VG 1000, member of the NEMA-GPU Series, brings high quality graphics for User Interfaces in a very small silicon/ power budget targeting the Microcontrollers Market (MCU). NEMA| pico VG 1000 is the perfect candidate to support entry level IoT-platforms, wearable and embedded devices with low cost and ultra-low power requirements supporting SoC's with a 32/64-bit MCU (e.g. ARM Cortex-M processors) and provide fluid graphics experience for a wide range of applications. Developers are able to create compelling Graphical User Interfaces (GUIs) and software applications with ultra-long battery life at a significantly lower cost for power-memory-area constrained IoT devices.

1.1 Features

- Hardware Components:
 - Programmable Shader engine with a VLIW instruction set
 - Command list based DMAs to minimize CPU overhead
 - Primitive Rasterizer
 - Texture Mapping unit (with radial fill capability)
 - Blending unit
- Drawing Primitives:
 - Pixel/Line drawing
 - Filled rectangles
 - Triangles (Gouraud Shaded)
 - Quadrilateral
- Color formats
 - 32-bit RGBA8888/BGRA8888/ABGR8888
 - 24-bit RGB
 - 16-bit AL88/RGBA5551/BGRA5551/ARGB1555/ABGR1555/RGB565/BGR565/RGBA4444/BGRA4444/ARGB4444/ABGR4444
 - 8-bit A8/L8/AL44/RGB332/RGBA2222/ABGR2222/BGRA2222/ARGB2222
 - 4-bit A4/L4
 - 2-bit A2/L2
 - 1-bit A1/L1
 - YUV (Read only)
 - TSC
- Compression schemes (Optional)
 - TSC4(4 bits per pixel)
 - TSC6/ TSC6a/ TSC6a+(6 bits per pixel with/out Alpha)
 - TSC12/ TSC12a(12 bits per pixel with/out Alpha)

- Image transformation
 - Texture mapping
 - Point sampling
 - Bilinear filtering
 - Blit support
 - Rotation any angle
 - Mirroring
 - Stretch (independently on x and y axis)
 - Source and/or destination color keying
 - Format conversions on the fly
 - 2.5D Perspective Correct Projections
- Text rendering supports
 - Bitmap antialiased A1/A2/A4/A8
 - Font Kerning
 - Unicode(UTF8)
- Blending Support
 - Fully Programmable Alpha blending modes(Source and Destination)
 - Source/Destination color keying
- Antialiasing
 - 8x MSAA
 - Quaddrilaterals per edge Antialising
 - Triangles per edge Antialiasing
 - Antialiased Thick lines
 - Antialiased Circles

1.2 Configuration Options

NEMA| pico VG 1000 can be customized during design time by configuring a number of parameters that enable/disable several features of the design. The NEMA| pico VG 1000 GUI Configurator, a Graphical User Interface Configurator Tool, is used for the configuration of NEMA| pico VG 1000 parameters.

- Cache Sizes
- Compression Schemes
 - TSC4
 - TSC6 / TSC6a
 - TSC12 / TSC12a
- Master Interface
 - AMBA AHB 32bit
 - AMBA AXI4 32/ 64/ 128bit

1.3 Integration - Verification

The NEMA| pico VG 1000 GPU IP Platform is available in Verilog/SystemVerilog code and is easily integrated and verified. The NEMA| pico VG 1000 ASIC reference designs have been evaluated in various process technologies and has been verified through extensive simulation and rigorous code coverage measurements. It is accompanied with a complete verification suite that compares reference images with rendered images.

1.4 Software

- OS support
 - Bare Metal (no-OS)
 - RTOS (NEMA| GFX Library in ANSI C)
 - Linux
- Graphics API support
 - NEMA| GFX API library in pure C
 - NEMA| GFX - VG Extensions
 - Video Overlay Extensions
- Software Emulators and suites
 - NEMA| pix-presso
 - NEMA| gui-builder
 - NEMA| Bits

NEMA| GFX library which is available in pure ANSI C with no dependencies, allows easy portability to systems running RTOS or even to OS-less systems. The software package includes OS drivers for Linux and Software Libraries for supporting 2D Graphics APIs

- NEMA| GFX: Enables high quality 2.5D graphics on RTOS and OS-less systems. NEMA| GFX is a proprietary low level library that interfaces directly with the NEMA GPUs and provides a software abstraction layer to organize and employ drawing commands with ease and efficiency. NEMA| GFX can be used as a back-end to existing APIs and as a standalone Graphics API.

The software package includes Linux drivers, Software Libraries for 2D Graphics APIs and comes together with:

- NEMA| gui-builder, a graphical cross-platform software framework enabling rapid high-end Graphics User Interface (GUI) development on low resource hardware (non-commercial version, free download https://www.think-silicon.com/?section=2335&language=en_US)
- NEMA| pix-presso, a utility software for converting images to/from formats suitable for low power embedded devices (non-commercial version, free download https://www.think-silicon.com/?section=2335&language=en_US)
- NEMA| Bits, an EVK Kit for technology evaluation and pre-silicon application development

2 Register Specification (RDL)

2.1 Registers' Memory Map

The memory organization of the register map is shown in the tables of this section:

Address	Access	Reset Value	Name
0x0000	rw	0x0	NEMA_TEX0_BASE
0x0004	rw	0x0	NEMA_TEX0_FSTRIDE
0x0008	rw	0x0	NEMA_TEX0_RESXY
0x0010	rw	0x0	NEMA_TEX1_BASE
0x0014	rw	0x0	NEMA_TEX1_FSTRIDE
0x0018	rw	0x0	NEMA_TEX1_RESXY
0x001c	rw	0x0	NEMA_TEX_COLOR
0x0020	rw	0x0	NEMA_TEX2_BASE
0x0024	rw	0x0	NEMA_TEX2_FSTRIDE
0x0028	rw	0x0	NEMA_TEX2_RESXY
0x0030	rw	0x0	NEMA_TEX3_BASE
0x0034	rw	0x0	NEMA_TEX3_FSTRIDE
0x0038	rw	0x0	NEMA_TEX3_RESXY
0x0048	rw	0x0	NEMA_TSC_NEW_BLOCK_TRIG
0x004c	rw	0x0	NEMA_TSC_NEW_BLOCK_SEL
0x0080	rw	0x0	NEMA_BREAKPOINT
0x008c	rw	0x0	NEMA_BREAKPOINT_MASK
0x0094	rw	0x0	NEMA_CGCTRL
0x0098	rw	0xffffffff	NEMA_DIRTYMIN
0x009c	r	0x0	NEMA_DIRTYMAX
0x00c0	rw	0x0	NEMA_BUS_CTRL
0x00c4	rw	0x0	NEMA_IMEM_ADDR
0x00c8	rw	0x0	NEMA_IMEM_DATA_LOW
0x00cc	rw	0x0	NEMA_IMEM_DATA_HIGH

Address	Access	Reset Value	Name
0x00d0	rw	0x0	NEMA_BURST_SIZE
0x00e4	rw	0x80640007	NEMA_FLUSH_CTRL
0x00e8	rw	0x0	NEMA_CMDSTATUS
0x00ec	rw	0x0	NEMA_CMDRINGSTOP
0x00f0	rw	0x0	NEMA_CMDADDR
0x00f4	rw	0x0	NEMA_CMDSIZE
0x00f8	rw	0x0	NEMA_INTERRUPT
0x00fc	rw	0x0	NEMA_STATUS
0x0100	rw	0x0	NEMA_DRAW_CMD_NOHOLD
0x0104	rw	0x0	NEMA_DRAW_STARTXY
0x0108	rw	0x0	NEMA_DRAW_ENDXY
0x010c	rw	0x0	DRAW_FAN_X
0x0110	rw	0x0	NEMA_CLIPMIN
0x0114	rw	0x7fff7fff	NEMA_CLIPMAX
0x0118	rw	0x05000000	NEMA_MATMULT
0x011c	rw	0x0	NEMA_CODEPTR
0x0120	rw	0x0	NEMA_DRAW_PT0_X
0x0124	rw	0x0	NEMA_DRAW_PT0_Y
0x0128	rw	0x0	DRAW_FAN_Y
0x012c	rw	0x0	NEMA_DRAW_COLOR
0x0130	rw	0x0	NEMA_DRAW_PT1_X
0x0134	rw	0x0	NEMA_DRAW_PT1_Y
0x0138	rw	0x0	NEMA_BYPASS_ADDR
0x013c	rw	0x0	BYPASS_DATA
0x0140	rw	0x0	NEMA_DRAW_PT2_X
0x0144	rw	0x0	NEMA_DRAW_PT2_Y
0x0148	rw	0x0	NEMA_CLID
0x0150	rw	0x0	NEMA_DRAW_PT3_X
0x0154	rw	0x0	NEMA_DRAW_PT3_Y

NEMA| pico VG 1000 Graphics Processing Unit

Address	Access	Reset Value	Name
0x0158	rw	0x0	NEMA_CLIPMIN1
0x015c	rw	0x7fff7fff	NEMA_CLIPMAX1
0x0160	rw	0x0	NEMA_MM00
0x0164	rw	0x0	NEMA_MM01
0x0168	rw	0x0	NEMA_MM02
0x016c	rw	0x0	NEMA_MM10
0x0170	rw	0x0	NEMA_MM11
0x0174	rw	0x0	NEMA_MM12
0x0178	rw	0x0	NEMA_MM20
0x017c	rw	0x0	NEMA_MM21
0x0180	rw	0x0	NEMA_MM22
0x0184	rw	0x0	NEMA_DEPTH_START_L
0x0188	rw	0x0	NEMA_DEPTH_START_H
0x018c	rw	0x0	NEMA_DEPTH_DX_L
0x0190	rw	0x0	NEMA_DEPTH_DX_H
0x0194	rw	0x0	NEMA_DEPTH_DY_L
0x0198	rw	0x0	NEMA_DEPTH_DY_H
0x01a0	rw	0x0	NEMA_RED_DX
0x01a4	rw	0x0	NEMA_RED_DY
0x01a8	rw	0x0	NEMA_GRE_DX
0x01ac	rw	0x0	NEMA_GRE_DY
0x01b0	rw	0x0	NEMA_BLU_DX
0x01b4	rw	0x0	NEMA_BLU_DY
0x01b8	rw	0x0	NEMA_ALF_DX
0x01bc	rw	0x0	NEMA_ALF_DY
0x01c0	rw	0x0	NEMA_RED_INIT
0x01c4	rw	0x0	NEMA_GRE_INIT
0x01c8	rw	0x0	NEMA_BLU_INIT
0x01cc	rw	0x0	NEMA_ALF_INIT

Address	Access	Reset Value	Name
0x01d0	rw	0x0	NEMA_ROPBLENDER_BLEND_MODE
0x01d4	rw	0x0	NEMA_ROPBLENDER_DST_CKEY
0x01d8	rw	0x0	NEMA_ROPBLENDER_CONST_COLOR
0x01dc	r	0x00241001	NEMA_IP_VERSION
0x01e0	rw	0x0	NEMA_CODEPTR2
0x01ec	r	0x86362000	NEMA_IDREG
0x01f0	r	0xf4030104	NEMA_CONFIG
0x01f4	r	0x000007e3	NEMA_CONFIGH
0x0200	w	0x0	NEMA_C0_REG
0x0204	w	0x0	NEMA_C1_REG
0x0208	w	0x0	NEMA_C2_REG
0x020c	w	0x0	NEMA_C3_REG
0x0320	w	0x0	DRAW_PT0_X
0x0324	w	0x0	DRAW_PT0_Y
0x0328	w	0x0	DRAW_FP_FAN_X
0x032c	w	0x0	DRAW_FP_FAN_Y
0x0330	w	0x0	DRAW_PT1_X
0x0334	w	0x0	DRAW_PT1_Y
0x0340	w	0x0	DRAW_PT2_X
0x0344	w	0x0	DRAW_PT2_Y
0x0350	w	0x0	DRAW_PT3_X
0x0354	w	0x0	DRAW_PT3_Y
0x0360	rw	0x3f800000	VMM00
0x0364	rw	0x0	VMM01
0x0368	rw	0x0	VMM02
0x036c	rw	0x0	VMM10
0x0370	rw	0x3f800000	VMM11
0x0374	rw	0x0	VMM12
0x0378	rw	0x0	VMM20

Address	Access	Reset Value	Name
0x037c	rw	0x0	VMM21
0x0380	rw	0x3f800000	VMM22
0x0388	rw	0x0	NEMA_RAST_BYPASS
0x04d0	rw	0x00000fff	NEMA_COORD_MASK
0x04d4	rw	0x00008000	DRAW_FLATNESS
0x0ff0	rw	0x0	NEMA_IRQ_ID
0x0ff4	rw	0x0	NEMA_GP_FLAGS
0x0ff8	rw	0x0	NEMA_SYS_INTERRUPT
0x0ffc	rw	0x0	NEMA_BUSERROR_MASK

2.2 Registers' Description

The following section is a detailed description of the register file. All registers are 32 bits wide.

NEMA_TEX0_BASE

Address	Access	Reset	Description
0x0000	rw	0x0	Base address of drawing surface 0.

Fields

BASE		
31	0	
0		Reset

Fields Description

BASE

Specifies the base address of drawing surface 0.

NEMA_TEX0_FSTRIDE

Address	Access	Reset	Description
0x0004	rw	0x0	Image 0 Mode and Stride

Fields

DITH		FORMAT			RADFILL		RSVD		TILE		WRAP		RSVD		MODE		STRIDE		
31	30			24	23	22	21	20	19	18	17	16	15						0
0	0			0	0	0	0	0	0	0	0	0	0					Reset	

Fields Description

STRIDE

Specifies the image stride distance in bytes from one scanline to another (signed)

MODE

Specifies the image mode (applicable only for Textures not for Framebuffer)

- * 0x0 Point sampling
- * 0x1 Bilinear filtering

WRAP

Specifies the image wrapping mode (applicable only for Textures not for Framebuffer).

- * 0x0 Clamp
- * 0x1 Repeat
- * 0x2 Border
- * 0x3 Mirror

TILE

Enables the Tile Mode.

RADFILL

Radial fill enable

FORMAT

Specifies the image format

- * 0x00 RGBX8888
- * 0x01 RGBA8888
- * 0x02 XRGB8888
- * 0x03 ARGB8888
- * 0x04 RGBA5650
- * 0x05 RGBA5551
- * 0x06 RGBA4444
- * 0x08 RGBA0008
- * 0x09 L8
- * 0x0B L1 (Only available as input format)

- * 0x0C A1 (Only available as input format)
- * 0x0D UYVY (Only available as input format)
- * 0x0E ABGR8888
- * 0x10 BGRA8888
- * 0x11 BGRX8888
- * 0x12 TSC4
- * 0x16 TSC6
- * 0x17 TSC6A
- * 0x27 A1LE (Only available as input format)
- * 0x28 A2LE (Only available as input format)
- * 0x29 A4LE (Only available as input format)
- * 0x2A L1LE (Only available as input format)
- * 0x2B L2LE (Only available as input format)
- * 0x2C L4LE (Only available as input format)
- * 0x30 A2 (Only available as input format)
- * 0x31 L2 (Only available as input format)
- * 0x34 A4 (Only available as input format)
- * 0x35 L4 (Only available as input format)
- * 0x38 RGBA3320
- * 0x39 BGR24
- * 0x3C RGB24
- * 0x40 RGBA2222
- * 0x41 ABGR2222
- * 0x42 BGRA2222
- * 0x43 ARGB2222
- * 0x44 AL88
- * 0x45 AL44
- * 0x46 ARGB1555
- * 0x47 ARGB4444
- * 0x48 BGRA5551
- * 0x49 ABGR1555
- * 0x4a BGRA4444
- * 0x4b ABGR4444
- * 0x4C TSC12
- * 0x4D TSC12A
- * 0x4E TSC6AP (Only available as input format)

DITH

If set for destination texture, enables color dithering.
(Applicable to output formats RGBA5650, RGBA5551, RGBA4444).

NEMA_TEXO_RESXY

Address	Access	Reset	Description
0x0008	rw	0x0	Image 0 Resolution

Fields

RESY																RESX																
31								16								15								0								
0																0																Reset

Fields Description**RESX**

Specifies the size of resolution X

RESY

Specifies the size of resolution Y

NEMA_TEX1_BASE

Address	Access	Reset	Description
0x0010	rw	0x0	Base address of drawing surface 1.

Fields

BASE		
31	0	
0		Reset

Fields Description

BASE

Specifies the base address or drawing surface 1.

NEMA_TEX1_FSTRIDE

Address	Access	Reset	Description
0x0014	rw	0x0	Image 1 Mode and Stride

Fields

DITH		FORMAT		RADFILL		RSVD		TILE		WRAP		RSVD		MODE		STRIDE	
31	30	24	23	22	21	20	19	18	17	16	15	0					
0	0		0	0	0	0	0	0	0	0	0						Reset

Fields Description

STRIDE

Specifies the image stride distance in bytes from one scanline to another (signed)

MODE

Specifies the image mode (applicable only for Textures not for Framebuffer)

- * 0x0 Point sampling
- * 0x1 Bilinear filtering

WRAP

Specifies the image wrapping mode (applicable only for Textures not for Framebuffer).

- * 0x0 Clamp
- * 0x1 Repeat
- * 0x2 Border
- * 0x3 Mirror

TILE

Enables the Tile Mode.

RADFILL

Radial fill enable

FORMAT

Specifies the image format

- * 0x00 RGBX8888
- * 0x01 RGBA8888
- * 0x02 XRGB8888
- * 0x03 ARGB8888
- * 0x04 RGBA5650
- * 0x05 RGBA5551
- * 0x06 RGBA4444
- * 0x08 RGBA0008
- * 0x09 L8
- * 0x0B L1 (Only available as input format)

- * 0x0C A1 (Only available as input format)
- * 0x0D UYVY (Only available as input format)
- * 0x0E ABGR8888
- * 0x10 BGRA8888
- * 0x11 BGRX8888
- * 0x12 TSC4
- * 0x16 TSC6
- * 0x17 TSC6A
- * 0x27 A1LE (Only available as input format)
- * 0x28 A2LE (Only available as input format)
- * 0x29 A4LE (Only available as input format)
- * 0x2A L1LE (Only available as input format)
- * 0x2B L2LE (Only available as input format)
- * 0x2C L4LE (Only available as input format)
- * 0x30 A2 (Only available as input format)
- * 0x31 L2 (Only available as input format)
- * 0x34 A4 (Only available as input format)
- * 0x35 L4 (Only available as input format)
- * 0x38 RGBA3320
- * 0x39 BGR24
- * 0x3C RGB24
- * 0x40 RGBA2222
- * 0x41 ABGR2222
- * 0x42 BGRA2222
- * 0x43 ARGB2222
- * 0x44 AL88
- * 0x45 AL44
- * 0x46 ARGB1555
- * 0x47 ARGB4444
- * 0x48 BGRA5551
- * 0x49 ABGR1555
- * 0x4a BGRA4444
- * 0x4b ABGR4444
- * 0x4C TSC12
- * 0x4D TSC12A
- * 0x4E TSC6AP (Only available as input format)

DITH

If set for destination texture, enables color dithering.
(Applicable to output formats RGBA5650, RGBA5551, RGBA4444).

NEMA_TEX1_RESXY

Address	Access	Reset	Description
0x0018	rw	0x0	Image 1 Resolution

Fields

RESY																RESX																
31								16								15								0								
0																0																Reset

Fields Description**RESX**

Specifies the size of resolution X

RESY

Specifies the size of resolution Y

NEMA_TEX_COLOR

Address	Access	Reset	Description
0x001c	rw	0x0	Texture Map default color (for use with Luminance and Alpha-only color formats)

Fields

ALPHA				BLUE				GREEN				RED			
31		24		23		16		15		8		7		0	
0				0				0				0			

Reset

Fields Description

RED

Specifies the Red (R) value

GREEN

Specifies the Green (G) value

BLUE

Specifies the Blue (B) value

ALPHA

Specifies the Alpha (A) value

NEMA_TEX2_BASE

Address	Access	Reset	Description
0x0020	rw	0x0	Base address of drawing surface 2.

Fields

BASE	
31	0
0	
Reset	

Fields Description**BASE**

Specifies the base address of drawing surface 2.

NEMA_TEX2_FSTRIDE

Address	Access	Reset	Description
0x0024	rw	0x0	Image 2 Mode and Stride

Fields

DITH		FORMAT		RADFILL		RSVD		TILE		WRAP		RSVD		MODE		STRIDE	
31	30	24	23	22	21	20	19	18	17	16	15	0					
0	0		0	0	0	0	0	0	0	0	0						Reset

Fields Description

STRIDE

Specifies the image stride distance in bytes from one scanline to another (signed)

MODE

Specifies the image mode (applicable only for Textures not for Framebuffer)

- * 0x0 Point sampling
- * 0x1 Bilinear filtering

WRAP

Specifies the image wrapping mode (applicable only for Textures not for Framebuffer).

- * 0x0 Clamp
- * 0x1 Repeat
- * 0x2 Border
- * 0x3 Mirror

TILE

Enables the Tile Mode.

RADFILL

Radial fill enable

FORMAT

Specifies the image format

- * 0x00 RGBX8888
- * 0x01 RGBA8888
- * 0x02 XRGB8888
- * 0x03 ARGB8888
- * 0x04 RGBA5650
- * 0x05 RGBA5551
- * 0x06 RGBA4444
- * 0x08 RGBA0008
- * 0x09 L8
- * 0x0B L1 (Only available as input format)

- * 0x0C A1 (Only available as input format)
- * 0x0D UYVY (Only available as input format)
- * 0x0E ABGR8888
- * 0x10 BGRA8888
- * 0x11 BGRX8888
- * 0x12 TSC4
- * 0x16 TSC6
- * 0x17 TSC6A
- * 0x27 A1LE (Only available as input format)
- * 0x28 A2LE (Only available as input format)
- * 0x29 A4LE (Only available as input format)
- * 0x2A L1LE (Only available as input format)
- * 0x2B L2LE (Only available as input format)
- * 0x2C L4LE (Only available as input format)
- * 0x30 A2 (Only available as input format)
- * 0x31 L2 (Only available as input format)
- * 0x34 A4 (Only available as input format)
- * 0x35 L4 (Only available as input format)
- * 0x38 RGBA3320
- * 0x39 BGR24
- * 0x3C RGB24
- * 0x40 RGBA2222
- * 0x41 ABGR2222
- * 0x42 BGRA2222
- * 0x43 ARGB2222
- * 0x44 AL88
- * 0x45 AL44
- * 0x46 ARGB1555
- * 0x47 ARGB4444
- * 0x48 BGRA5551
- * 0x49 ABGR1555
- * 0x4a BGRA4444
- * 0x4b ABGR4444
- * 0x4C TSC12
- * 0x4D TSC12A
- * 0x4E TSC6AP (Only available as input format)

DITH

If set for destination texture, enables color dithering.
(Applicable to output formats RGBA5650, RGBA5551, RGBA4444).

NEMA_TEX2_RESXY

Address	Access	Reset	Description
0x0028	rw	0x0	Image 2 Resolution

Fields

RESY		RESX	
31	16	15	0
0		0	

Reset

Fields Description

RESX

Specifies the size of resolution X

RESY

Specifies the size of resolution Y

NEMA_TEX3_BASE

Address	Access	Reset	Description
0x0030	rw	0x0	Base address of drawing surface 3.

Fields

BASE	
31	0
0	
Reset	

Fields Description**BASE**

Specifies the base address of drawing surface 3.

NEMA_TEX3_FSTRIDE

Address	Access	Reset	Description
0x0034	rw	0x0	Image 3 Mode and Stride

Fields

DITH		FORMAT			RADFILL		RSVD		TILE		WRAP		RSVD		MODE		STRIDE					
31	30	24			23	22	21	20	19	18	17	16	15	0								
0	0			0	0	0	0	0	0	0	0	0						Reset				

Fields Description

STRIDE

Specifies the image stride distance in bytes from one scanline to another (signed)

MODE

Specifies the image mode (applicable only for Textures not for Framebuffer)

- * 0x0 Point sampling
- * 0x1 Bilinear filtering

WRAP

Specifies the image wrapping mode (applicable only for Textures not for Framebuffer).

- * 0x0 Clamp
- * 0x1 Repeat
- * 0x2 Border
- * 0x3 Mirror

TILE

Enables the Tile Mode.

RADFILL

Radial fill enable

FORMAT

Specifies the image format

- * 0x00 RGBX8888
- * 0x01 RGBA8888
- * 0x02 XRGB8888
- * 0x03 ARGB8888
- * 0x04 RGBA5650
- * 0x05 RGBA5551
- * 0x06 RGBA4444
- * 0x08 RGBA0008
- * 0x09 L8
- * 0x0B L1 (Only available as input format)

- * 0x0C A1 (Only available as input format)
- * 0x0D UYVY (Only available as input format)
- * 0x0E ABGR8888
- * 0x10 BGRA8888
- * 0x11 BGRX8888
- * 0x12 TSC4
- * 0x16 TSC6
- * 0x17 TSC6A
- * 0x27 A1LE (Only available as input format)
- * 0x28 A2LE (Only available as input format)
- * 0x29 A4LE (Only available as input format)
- * 0x2A L1LE (Only available as input format)
- * 0x2B L2LE (Only available as input format)
- * 0x2C L4LE (Only available as input format)
- * 0x30 A2 (Only available as input format)
- * 0x31 L2 (Only available as input format)
- * 0x34 A4 (Only available as input format)
- * 0x35 L4 (Only available as input format)
- * 0x38 RGBA3320
- * 0x39 BGR24
- * 0x3C RGB24
- * 0x40 RGBA2222
- * 0x41 ABGR2222
- * 0x42 BGRA2222
- * 0x43 ARGB2222
- * 0x44 AL88
- * 0x45 AL44
- * 0x46 ARGB1555
- * 0x47 ARGB4444
- * 0x48 BGRA5551
- * 0x49 ABGR1555
- * 0x4a BGRA4444
- * 0x4b ABGR4444
- * 0x4C TSC12
- * 0x4D TSC12A
- * 0x4E TSC6AP (Only available as input format)

DITH

If set for destination texture, enables color dithering.
(Applicable to output formats RGBA5650, RGBA5551, RGBA4444).

NEMA_TEX3_RESXY

Address	Access	Reset	Description
0x0038	rw	0x0	Image 3 Resolution

Fields

RESY		RESX	
31	16	15	0
0		0	

Reset

Fields Description

RESX

Specifies the size of resolution X

RESY

Specifies the size of resolution Y

NEMA_TSC_NEW_BLOCK_TRIG

Address	Access	Reset	Description
0x0048	rw	0x0	Trigger to reset TSc block.

Fields

RSVD	
31	0
0	
Reset	

Fields Description

NEMA_TSC_NEW_BLOCK_SEL

Address	Access	Reset	Description
0x004c	rw	0x0	Select how TSc block will be reset.

Fields

RSVD		SEL	
31	2	1	0
0		0	Reset

Fields Description

SEL

- 0: Reset TSc block when NEMA_DRAW_CMD_NOHOLD is written or tessellator starts new geometry or NEMA_TSC_NEW_BLOCK_TRIG is written.
- 1: Reset TSc block when NEMA_DRAW_CMD_NOHOLD is written or NEMA_TSC_NEW_BLOCK_TRIG is written.
- 2: Reset TSc block when NEMA_TSC_NEW_BLOCK_TRIG is written.

NEMA_BREAKPOINT

Address	Access	Reset	Description
0x0080	rw	0x0	Debug feature. Specifies a Breakpoint on the Command List

Fields

NEMA_BREAKPOINT	
31	0
0	
Reset	

Fields Description**NEMA_BREAKPOINT**

Specifies the Breakpoint ID

NEMA_BREAKPOINT_MASK

Address	Access	Reset	Description
0x008c	rw	0x0	Debug feature. Specifies a Breakpoint Mask.

Fields

MASK		
31	0	
0		Reset

Fields Description

MASK

Specifies the Breakpoint Mask

NEMA_CGCTRL

Address	Access	Reset	Description
0x0094	rw	0x0	Clock gating controller

Fields

ALL	RSVD	RSVD	RSVD	MEM_C0	RSVD	RSVD	RSVD	C0	RSVD	RSVD	RSVD	SCH_C0	RSVD	RSVD	RSVD	RF_C0	RSVD	RSVD	RSVD	PIPE_C0	RSVD	RSVD	RSVD	BUS_TEX_C0	RSVD	RSVD	RSVD	ROP_C0	RAST	RF	CL
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Reset

Reset

Fields Description**CL**

Disable clock gating for the Command List Processor

RF

Disable clock gating for the NemaP Configuration Register File

RAST

Disable clock gating for the NemaP Rasterizer

ROP_C0

Disable clock gating for the Render Output Unit of core 0

BUS_TEX_C0

Disable clock gating for the BusInterface (memory System) and Core 0 Texture Map

PIPE_C0

Disable clock gating for Core 0 Pipeline

RF_C0

Disable clock gating for Core 0 Register File

SCH_C0

Disable clock gating for Core 0 Scheduler

C0

Disable clock gating for Core 0

MEM_C0

Disable clock gating for Core 0 Instruction Memory

ALL

Disable clock gating for all modules

NEMA_DIRTYMIN

Address	Access	Reset	Description
0x0098	rw	0xffffffff	Read the Dirty_Min value. Resets dirty region to resolution size on write function.

Fields

DIRTYMIN		
31	0	
FFFFFFFF		Reset

Fields Description

DIRTYMIN

Write any value to reset dirty region to resolution size
Read the Dirty_min value

NEMA_DIRTYMAX

Address	Access	Reset	Description
0x009c	r	0x0	Read the Dirty_Max value

Fields

DIRTYMAX	
31	0
0	
Reset	

Fields Description**DIRTYMAX (*Read only*)**

Read the Dirty_max value

NEMA_BUS_CTRL

Address	Access	Reset	Description
0x00c0	rw	0x0	Indicates the value of the AWCACHE and the ARCACHE signals of the AXI Bus Interface.

Fields

RSVD								AWCACHE		ARCACHE		
31							8	7	4	3	0	
0								0		0		Reset

Fields Description

ARCACHE

Specifies the value of the output ARCACHE signal of the AXI Master Read Bus Interface

AWCACHE

Specifies the value of the output AWCACHE signal of the AXI Master Write Bus Interface

NEMA_IMEM_ADDR

Address	Access	Reset	Description
0x00c4	rw	0x0	Load shader instruction memory address. This register can be auto incremented. Its content should be considered volatile

Fields

RSVD				ADDR		Reset
31			4	3	0	
			0		0	

Fields Description**ADDR**

Specifies the load shader instruction memory address

NEMA_IMEM_DATA_LOW

Address	Access	Reset	Description
0x00c8	rw	0x0	The lower bits (31-0) of the 64-bit load shader instruction memory data

Fields

IMEM_DATA_LOW	
31	0
0	
Reset	

Fields Description

IMEM_DATA_LOW

Specifies the lower bits (31-0) of the load shader instruction memory data

NEMA_IMEM_DATA_HIGH

Address	Access	Reset	Description
0x00cc	rw	0x0	The higher bits (63-32) of the 64-bit load shader instruction memory data

Fields

IMEM_DATA_HIGH	
31	0
0	
Reset	

Fields Description**IMEM_DATA_HIGH**

Specifies the higher bits (63-32) of the load shader instruction memory data

Address	Access	Reset	Description
0x00d0	rw	0x0	Controls the size of the burst for the texture and framebuffer read.



Value of the texture read burst size in log2(bytes).
Value of 0 or greater than log2(UNEMA_TEX_BURST) will result in burst size equal to UNEMA_TEX_BURST (biggest possible).
Value of 1 or smaller than log2(UNEMA_AXI_WIDTH_M/8) will result in burst size equal to UNEMA_AXI_WIDTH_M/8 (smallest possible).
Value should be greater or equal to the texture format size used, e.g. TSc6 (12 bytes) mode requires a value greater or equal to 4.

Value of the framebuffer read burst size in log2(bytes).
 Value of 0 or greater than log2(UNEMA_FB_BURST) will result in burst size equal to UNEMA_FB_BURST (biggest possible).
 Value of 1 or smaller than log2(UNEMA_AXI_WIDTH_M/8) will result in burst size equal to UNEMA_AXI_WIDTH_M/8 (smallest possible).
 Value should be greater or equal to the framebuffer format size used, e.g. TSc6 (12 bytes) mode requires a value greater or equal to 4.

NEMA_FLUSH_CTRL

Address	Access	Reset	Description
0x00e4	rw	0x80640007	Controls the system flush

Fields

WCACHE_EN		WCACHE_TIMEOUT														RSVD		WRITE_FLUSH		RSVD		WRITE_FLUSH_HOST		RSVD		WRITE_FLUSH_CMD		RSVD		READ_FLUSH_HOST		RSVD		READ_FLUSH_CMD	
31	30															16	15	14	13	12	11	10	8	7	6	5	4	3	1	0					
1	64														0	0	0	0	0			0	0	0	0	3	1	Reset							

Fields Description**READ_FLUSH_CMD**

If set to 1, the read caches are flushed when the Command List Processor triggers the Rasterizer (Register NEMA_DRAW_CMD_NOHOLD)

READ_FLUSH_HOST

If set to 1, the read caches are flushed when the Host triggers the Rasterizer (Register NEMA_DRAW_CMD_NOHOLD)

READ_FLUSH

When set to 1, flush read caches

WRITE_FLUSH_CMD

If set to 1, the write caches are flushed when the Command List Processor triggers the Rasterizer (Register NEMA_DRAW_CMD_NOHOLD)

WRITE_FLUSH_HOST

If set to 1, the write caches are flushed when the Host triggers the Rasterizer (Register NEMA_DRAW_CMD_NOHOLD)

WRITE_FLUSH

When set to 1, flush write caches

WCACHE_TIMEOUT

Timeout for the lines of the WCache

WCACHE_EN

When set to 1, write cache is enabled

Address	Access	Reset	Description
0x00e8	rw	0x0	On read, returns internal CL processor status. On write, resets CL processor. Its content should be considered volatile.

BUSY_CMD				SYSTEM_DATA				FIFO_READ_DATA				CMDMEM_BUSY				RSVD								FIFO_AVAIL				RSVD				STK_PNT_ADDR				RSVD				CMD_FSM				RSVD				CMD_FSM_FETCH			
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																				
0	0	0	0	0		0													0		0		0		0			0		0		Reset																			

Indicates if the Command List Processor is busy

NEMA_CMDRINGSTOP

Address	Access	Reset	Description
0x00ec	rw	0x0	Ring Buffer pointer.

Fields

CMDRINGSTOP	
31	0
0	
Reset	

Fields Description**CMDRINGSTOP**

Stores the Ring Buffer last written address

NEMA_CMDADDR

Address	Access	Reset	Description
0x00f0	rw	0x0	Command list base address.

Fields

CMDADDR	
31	0
0	
Reset	

Fields Description

CMDADDR

Specifies the base address of every new command list ready to be executed

NEMA_CMDSIZE

Address	Access	Reset	Description
0x00f4	rw	0x0	Command list length in words(32-bits)

Fields

CMDSIZE	
31	0
0	
Reset	

Fields Description**CMDSIZE**

Specifies the length of the command list ready to be executed.

NEMA_INTERRUPT

Address	Access	Reset	Description
0x00f8	rw	0x0	Interrupt control register

Fields

CLK_DVFS		RSVD		THROTTLE		RSVD										CLEAR		DRAW		CL		POLARITY	
31	30	29	28	27	26	4										3	2	1	0				
0		0		0		0										0	0	0	0	Reset			

Fields Description

POLARITY

1: IRQ signal is active low

0: IRQ signal is active high

CL

When set to 1, signals an interrupt at the end of a command list

DRAW

When set to 1, signals an interrupt at the end of a drawing command

CLEAR

When set to 1, the interrupt in the NEMA_IRQ_ID register is cleared

THROTTLE

When set to 1, the throttle signal will be ignored.

CLK_DVFS

Specify the core_clk_dvfs output

Address	Access	Reset	Description
0x00fc	rw	0x0	On read, returns Nema status. On writes, resets the GPU.

[illegible]

Indicates if the Core 0 is busy

Indicates if the Core 0 graphics pipeline is busy

Indicates if the Core 0 Texture Map Unit is busy

Indicates if the Core 0 Render Output Unit is busy

Indicates if the Rasterizer Vertex Matrix Multiplication Unit and Tessellation Unit are busy

Indicate if the Rasterizer Setup Unit is busy

Indicate if the Rasterizer Traverse Unit is busy

Indicate if the Rasterizer Interpolation Unit is busy

Indicate if the Rasterizer Clockgating Unit is busy

Indicates if the Command List Processor is busy

Indicates if the Command List bus is busy

Indicates if the Bus Interface Unit is busy

SYSTEM

Indicates if the system is busy

NEMA_DRAW_CMD_NOHOLD

Address	Access	Reset	Description
0x0100	rw	0x0	Rasterizer Command (e.g. draw triangle, rectangle etc)

Fields

DRAW_TILE_SIZE										DRAW_TILE										DRAW_POS_CULLING										DRAW_NEG_CULLING										DRAW_GRADIENT										AA_EDGE_0										AA_EDGE_1										AA_EDGE_2										AA_EDGE_3										RSVD										DRAW_CMD									
31	30	29	28	27	26	25	24	23	22											4	3	0																																																																																							
0	0	0	0	0	0	0	0	0	0	0										0										Reset																																																																															

Fields Description**DRAW_CMD**

Draw Command

- * 0x01 Draw Line
- * 0x02 Draw Rectangle
- * 0x03 Draw Point
- * 0x04 Draw Triangle
- * 0x05 Draw Quadrilateral
- * 0x06 Draw Quadratic Bezier
- * 0x07 Draw Cubic Bezier
- * 0x08 Draw Quadratic Bezier Line
- * 0x09 Draw Cubic Bezier Line
- * 0x0A Stroke line (1 pixel width)
- * 0x0B Draw Triangle Fan

AA_EDGE_3

When set to 1, Antialiasing feature is enabled for edge 3

AA_EDGE_2

When set to 1, Antialiasing feature is enabled for edge 2

AA_EDGE_1

When set to 1, Antialiasing feature is enabled for edge 1

AA_EDGE_0

When set to 1, Antialiasing feature is enabled for edge 0

DRAW_GRADIENT

When set to 1, color gradient is enabled

DRAW_NEG_CULLING

When set to 1, negative culling (clockwise) is enabled

DRAW_POS_CULLING

When set to 1, positive culling (counter-clockwise) is enabled

DRAW_TILE

When set to 1, tile mode is enabled

DRAW_TILE_SIZE

When set to 1, tile size is 2x2

Address	Access	Reset	Description
0x0104	rw	0x0	Vertex 0 drawing primitive. This register is used only for integer values. For greater accuracy NEMA_DRAW_START_X and NEMA_DRAW_START_Y registers are used which accept 16.16 fixed point values. This register is updated also by NEMA_DRAW_START_X and NEMA_DRAW_START_Y. Its content should be considered volatile.

START_Y		START_X	
31	16	15	0
0		0	

Reset

START X

Specifies the X coordinate (integer value) of vertex 0

START Y

Specifies the Y coordinate (integer value) of vertex 0

NEMA_DRAW_ENDXY

Address	Access	Reset	Description
0x0108	rw	0x0	Vertex 1 drawing primitive. This register is used only for integer values. For greater accuracy NEMA_DRAW_END_X and NEMA_DRAW_END_Y registers are used which accept 16.16 fixed point values. This register is updated also by NEMA_DRAW_END_X and NEMA_DRAW_END_Y. Its content should be considered volatile.

Fields

END_Y																END_X																
31															16	15													0			
0																0																Reset

Fields Description

END_X

Specifies the X coordinate (integer value) of vertex 1

END_Y

Specifies the Y coordinate (integer value) of vertex 1

DRAW_FAN_X

Address	Access	Reset	Description
0x010c	rw	0x0	X coordinate of the Fan center point. Its content should be considered volatile.

Fields

X		
31	0	
0		Reset

Fields Description**X**

Specifies the X coordinate of bezier vertex 4 drawing primitive (fixed point 16.16 format)

NEMA_CLIPMIN

Address	Access	Reset	Description
0x0110	rw	0x0	Clipping Rectangle upper left vertex

Fields

CLIPMIN_Y		CLIPMIN_X	
31	16	15	0
0		0	

Reset

Fields Description

CLIPMIN_X

Define the upper left X coordinate

CLIPMIN_Y

Define the upper left Y coordinate

NEMA_CLIPMAX

Address	Access	Reset	Description
0x0114	rw	0x7fff7fff	Clipping Rectangle bottom right vertex

Fields

CLIPMAX_Y		CLIPMAX_X	
31	16	15	0
7FFF		7FFF	
		Reset	

Fields Description**CLIPMAX_X**

Define the bottom left X coordinate

CLIPMAX_Y

Define the bottom left Y coordinate

NEMA_MATMULT

Address	Access	Reset	Description
0x0118	rw	0x5000000	Rasterizer matrix multiplication control. This register is partially updated by other registers. Its content should be considered volatile.

Fields

RSVD		ADD_HALF		BYPASS_MM		RSVD		RSVD		BYPASS_VMM		RSVD																		
31	30	29	28	27	26	25	24	23															0							
0		0	0	1		0	1	0														Reset								

Fields Description

BYPASS_VMM

When set to 1, the vertex matrix multiplications are bypassed

BYPASS_MM

When set to 1, the matrix multiplications are bypassed

ADD_HALF

When set to 1, the 0.5 value is added to the X and Y coordinates

NEMA_CODEPTR

Address	Access	Reset	Description
0x011c	rw	0x0	Shader code pointer

Fields

BCG		FRG	
31	16	15	0
0		0	
Reset			

Fields Description

FRG

Specifies the pointer for the instruction that will be executed for the foreground pixels

BCG

Specifies the pointer for the instruction that will be executed for the background pixels

Address	Access	Reset	Description
0x0120	rw	0x0	X coordinate of vertex 0 drawing primitive. The value is 16.16 fixed point. This register is updated also by NEMA_DRAW_PT0 and NEMA_DRAW_PT1. Its content should be considered volatile.

X
Specifies the X coordinate of vertex 0 drawing primitive (16.16 fixed point)

NEMA_DRAW_PT0_Y

Address	Access	Reset	Description
0x0124	rw	0x0	Y coordinate of vertex 0 drawing primitive. The value is 16.16 fixed point. This register is updated also by NEMA_DRAW_PT0 and NEMA_DRAW_PT1. Its content should be considered volatile.

Fields

Y	
31	0
0	
Reset	

Fields Description**Y**

Specifies the Y coordinate of vertex 0 drawing primitive (16.16 fixed point)

DRAW_FAN_Y

Address	Access	Reset	Description
0x0128	rw	0x0	Y coordinate of the Fan center point. Its content should be considered volatile.

Fields

Y		
31	0	
0		Reset

Fields Description

Y
Specifies the X coordinate of bezier vertex 4 drawing primitive (fixed point 16.16 format)

Address	Access	Reset	Description
0x012c	rw	0x0	Rasterizer drawing color for filling primitives

DRAW_COLOR	
31	0
0	

DRAW_COLOR
Specifies the drawing color for filling primitives

Address	Access	Reset	Description
0x0130	rw	0x0	X coordinate of vertex 1 drawing primitive. The value is 16.16 fixed point. This register is updated also by NEMA_DRAW_PT0 and NEMA_DRAW_PT1. Its content should be considered volatile.

X
Specifies the X coordinate of vertex 1 drawing primitive (16.16 fixed point)

NEMA_DRAW_PT1_Y

Address	Access	Reset	Description
0x0134	rw	0x0	Y coordinate of vertex 1 drawing primitive. The value is 16.16 fixed point. This register is updated also by NEMA_DRAW_PT0 and NEMA_DRAW_PT1. Its content should be considered volatile.

Fields

Y	
31	0
0	
Reset	

Fields Description

Y Specifies the Y coordinate of vertex 1 drawing primitive (16.16 fixed point)

NEMA_BYPASS_ADDR

Address	Access	Reset	Description
0x0138	rw	0x0	Address of bypass mode of rasterizer setup access

Fields

NEMA_BYPASS_ADDR			
31		0	
	0		Reset

Fields Description

NEMA_BYPASS_ADDR

Address of bypass mode of rasterizer setup access

BYPASS_DATA

Address	Access	Reset	Description
0x013c	rw	0x0	Data and enable of bypass mode of rasterizer

Fields

NEMA_BYPASS_DATA	
31	0
0	
Reset	

Fields Description**NEMA_BYPASS_DATA**

Data and enable of bypass mode of rasterizer

NEMA_DRAW_PT2_X

Address	Access	Reset	Description
0x0140	rw	0x0	X coordinate of vertex 2 drawing primitive. The value is 16.16 fixed point

Fields

X		
31	0	
0		Reset

Fields Description

X
Specifies the X coordinate of vertex 2 drawing primitive (16.16 fixed point)

NEMA_DRAW_PT2_Y

Address	Access	Reset	Description
0x0144	rw	0x0	Y coordinate of vertex 2 drawing primitive. The value is 16.16 fixed point

Fields

Y	
31	0
0	
Reset	

Fields Description

Y
Specifies the Y coordinate of vertex 2 drawing primitive (16.16 fixed point)

NEMA_CLID

Address	Access	Reset	Description
0x0148	rw	0x0	Command List ID Key

Fields

CLID		
31	0	
0		Reset

Fields Description

CLID

Specifies the last executed command list

NEMA_DRAW_PT3_X

Address	Access	Reset	Description
0x0150	rw	0x0	X coordinate of vertex 3 drawing primitive. The value is 16.16 fixed point

Fields

X		
31	0	
0		Reset

Fields Description

X
Specifies the X coordinate of vertex 3 drawing primitive (16.16 fixed point)

NEMA_DRAW_PT3_Y

Address	Access	Reset	Description
0x0154	rw	0x0	Y coordinate of vertex 3 drawing primitive. The value is 16.16 fixed point

Fields

Y		
31	0	
0		Reset

Fields Description

Y
Specifies the Y coordinate of vertex 3 drawing primitive (16.16 fixed point)

NEMA_CLIPMIN1

Address	Access	Reset	Description
0x0158	rw	0x0	Second Clipping Rectangle upper left vertex

Fields

CLIPMIN_Y		CLIPMIN_X	
31	16	15	0
0		0	
		Reset	

Fields Description**CLIPMIN_X**

Define the upper left X coordinate

CLIPMIN_Y

Define the upper left Y coordinate

NEMA_CLIPMAX1

Address	Access	Reset	Description
0x015c	rw	0x7fff7fff	Second Clipping Rectangle bottom right vertex

Fields

CLIPMAX_Y		CLIPMAX_X	
31	16	15	0
7FFF		7FFF	
		Reset	

Fields Description

CLIPMAX_X

Define the bottom left X coordinate

CLIPMAX_Y

Define the bottom left Y coordinate

NEMA_MM00

Address	Access	Reset	Description
0x0160	rw	0x0	(0,0) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM00	
31	21	20	0
0		0	
Reset			

Fields Description**MM00**

Specifies the (0,0) element

NEMA_MM01

Address	Access	Reset	Description
0x0164	rw	0x0	(0,1) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM01	
31	21	20	0
0		0	
Reset			

Fields Description

MM01

Specifies the (0,1) element

NEMA_MM02

Address	Access	Reset	Description
0x0168	rw	0x0	(0,2) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM02	
31	21	20	0
0		0	
Reset			

Fields Description**MM02**

Specifies the (0,2) element

NEMA_MM10

Address	Access	Reset	Description
0x016c	rw	0x0	(1,0) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM10	
31	21	20	0
0		0	
Reset			

Fields Description

MM10

Specifies the (1,0) element

NEMA_MM11

Address	Access	Reset	Description
0x0170	rw	0x0	(1,1) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM11	
31	21	20	0
0		0	
Reset			

Fields Description**MM11**

Specifies the (1,1) element

NEMA_MM12

Address	Access	Reset	Description
0x0174	rw	0x0	(1,2) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM12	
31	21	20	0
0		0	
Reset			

Fields Description

MM12

Specifies the (1,2) element

NEMA_MM20

Address	Access	Reset	Description
0x0178	rw	0x0	(2,0) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM20	
31	21	20	0
0		0	
Reset			

Fields Description**MM20**

Specifies the (2,0) element

NEMA_MM21

Address	Access	Reset	Description
0x017c	rw	0x0	(2,1) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM21	
31	21	20	0
0		0	
Reset			

Fields Description

MM21

Specifies the (2,1) element

NEMA_MM22

Address	Access	Reset	Description
0x0180	rw	0x0	(2,2) matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		MM22	
31	21	20	0
0		0	
Reset			

Fields Description**MM22**

Specifies the (2,2) element

NEMA_DEPTH_START_L

Address	Access	Reset	Description
0x0184	rw	0x0	Depth value of the STARTXY pixel. This register defines the integral part of the depth value which is the lower 32 bits

Fields

START_L	
31	0
0	
Reset	

Fields Description

START_L

Specifies the fractional part of the depth value of the STARTXY pixel

NEMA_DEPTH_START_H

Address	Access	Reset	Description
0x0188	rw	0x0	Depth value of the STARTXY pixel. This register defines the integral part of the depth value which is the higher 32 bits

Fields

START_H	
31	0
0	
Reset	

Fields Description**START_H**

Specifies the integral value of the depth value of the STARTXY pixel

NEMA_DEPTH_DX_L

Address	Access	Reset	Description
0x018c	rw	0x0	For each step at x-axis, depth value is added. This register defines the fractional part of the depth value which is the lower 32 bits

Fields

DX_L	
31	0
0	
Reset	

Fields Description

DX_L

Specifies the fractional part of the added depth value for each step at x-axis

NEMA_DEPTH_DX_H

Address	Access	Reset	Description
0x0190	rw	0x0	For each step at x-axis, depth value is added. This register defines the integral part of the depth value which is the higher 32 bits

Fields

DX_H	
31	0
0	
Reset	

Fields Description**DX_H**

Specifies the integral part of the added depth value for each step at x-axis

NEMA_DEPTH_DY_L

Address	Access	Reset	Description
0x0194	rw	0x0	For each step at y-axis, depth value is added. This register defines the fractional part of the depth value which is the lower 32 bits

Fields

DY_L	
31	0
0	
Reset	

Fields Description

DY_L

Specifies the fractional part of the added depth value for each step at y-axis

NEMA_DEPTH_DY_H

Address	Access	Reset	Description
0x0198	rw	0x0	For each step at y-axis, depth value is added. This register defines the integral part of the depth value which is the higher 32 bits

Fields

DY_H	
31	0
0	
Reset	

Fields Description**DY_H**

Specifies the integral part of the added depth value for each step at y-axis

NEMA_RED_DX

Address	Access	Reset	Description
0x01a0	rw	0x0	For each step at x-axis, Red (R) value is added. The value is 16,16 fixed point

Fields

DX		
31	0	
0		Reset

Fields Description

DX

Specifies the added Red (R) value for each step at x-axis

NEMA_RED_DY

Address	Access	Reset	Description
0x01a4	rw	0x0	For each step at y-axis, Red (R) value is added. The value is 16,16 fixed point

Fields

DY	
31	0
0	
Reset	

Fields Description**DY**

Specifies the added Red (R) value for each step at y-axis

NEMA_GRE_DX

Address	Access	Reset	Description
0x01a8	rw	0x0	For each step at x-axis, Green (G) value is added. The value is 16,16 fixed point

Fields

DX		
31	0	
0		Reset

Fields Description

DX

Specifies the added Green (G) value for each step at x-axis

NEMA_GRE_DY

Address	Access	Reset	Description
0x01ac	rw	0x0	For each step at y-axis, Green (G) value is added. The value is 16,16 fixed point

Fields

DY	
31	0
0	
Reset	

Fields Description**DY**

Specifies the added Green (G) value for each step at y-axis

NEMA_BLU_DX

Address	Access	Reset	Description
0x01b0	rw	0x0	For each step at x-axis, Blue (B) value is added. The value is 16,16 fixed point

Fields

DX		
31	0	
0		Reset

Fields Description

DX

Specifies the added Blue (B) value for each step at x-axis

NEMA_BLU_DY

Address	Access	Reset	Description
0x01b4	rw	0x0	For each step at y-axis, Blue (B) value is added. The value is 16,16 fixed point

Fields

DY	
31	0
0	
Reset	

Fields Description**DY**

Specifies the added Blue (B) value for each step at y-axis

NEMA_ALF_DX

Address	Access	Reset	Description
0x01b8	rw	0x0	For each step at x-axis, Alpha (A) value is added. The value is 16,16 fixed point

Fields

DX		
31	0	
0		Reset

Fields Description

DX

Specifies the added Alpha (A) value for each step at x-axis

NEMA_ALF_DY

Address	Access	Reset	Description
0x01bc	rw	0x0	For each step at y-axis, Alpha (A) value is added. The value is 16,16 fixed point

Fields

DY	
31	0
0	
Reset	

Fields Description**DY**

Specifies the added Alpha (A) value for each step at y-axis

NEMA_RED_INIT

Address	Access	Reset	Description
0x01c0	rw	0x0	Red (R) value of the STARTXY pixel. The value is 16,16 fixed point

Fields

INIT		
31	0	
0		Reset

Fields Description

INIT

Specifies the Red (R) value of the STARTXY pixel

NEMA_GRE_INIT

Address	Access	Reset	Description
0x01c4	rw	0x0	Green (G) value of the STARTXY pixel. The value is 16,16 fixed point

Fields

INIT		
31	0	
0		Reset

Fields Description**INIT**

Specifies the Green (G) value of the STARTXY pixel

NEMA_BLU_INIT

Address	Access	Reset	Description
0x01c8	rw	0x0	Blue (B) value of the STARTXY pixel. The value is 16,16 fixed point

Fields

INIT		
31	0	
0		Reset

Fields Description

INIT

Specifies the Blue (B) value of the STARTXY pixel

NEMA_ALF_INIT

Address	Access	Reset	Description
0x01cc	rw	0x0	Alpha (A) value of the STARTXY pixel. The value is 16,16 fixed point

Fields

INIT	
31	0
0	
Reset	

Fields Description**INIT**

Specifies the Alpha (A) value of the STARTXY pixel

NEMA_ROPBLENDER_BLEND_MODE

Address	Access	Reset	Description
0x01d0	rw	0x0	Blending Modes for different calculations between the source (Fragment Processing Core) and destination (Frame Buffer) colors

Fields

CLKEY_DST CLKEY_SRC		RSVD				CLKEY_DST_N				RSVD				ANTIALIASING				RSVD				DEST		RSVD				SOURCE	
31	30	29	26	25	24	17	16	15	12	11	8	7	4	3	0														
0	0	0				0	0				0	0				0	0				0			0					

Reset

Fields Description

SOURCE

Blending mode of the current pixel (source pixel)

DEST

Blending mode of the stored pixel in the FrameBuffer (destination pixel)

ANTIALIASING

If set, disables Antialiasing

CLKEY_DST_N

If set, enables Negative Destination Color Keying.

CLKEY_SRC

If set, enables Source Color Keying

CLKEY_DST

If set, enables Destination Color Keying

NEMA_ROPBLENDER_DST_CKEY

Address	Access	Reset	Description
0x01d4	rw	0x0	When Color Keying is enabled. The new pixel is written in the Frame Buffer, only if the destination pixel has the same RGB value with the Destination Color Key, which is the value of this register

Fields

ALPHA		BLUE		GREEN		RED	
31	24	23	16	15	8	7	0
0		0		0		0	

Reset
Fields Description**RED**

Specifies the Red (R) value

GREEN

Specifies the Green (G) value

BLUE

Specifies the Blue (B) value

ALPHA

Specifies the Alpha (A) value

NEMA_ROPBLENDER_CONST_COLOR

Address	Access	Reset	Description
0x01d8	rw	0x0	Constant Color value which is used for blending when the blending modes. DSBF_CONSTCOLOR and DSBF_CONSTALPHA are configured in the NEMA_ROPBLENDER_BLEND_MODE Register. * if the blending mode is DSBF_CONSTALPHA then the Constant Alpha value Ca is obtained from bits 31-24 * if the blending mode is DSBF_CONSTCOLOR then the Constant Alpha value Cc is obtained from bits 31-0

Fields

ALPHA		BLUE		GREEN		RED	
31	24	23	16	15	8	7	0
0		0		0		0	

Reset

Fields Description

RED

Specifies the Red (R) value

GREEN

Specifies the Green (G) value

BLUE

Specifies the Blue (B) value

ALPHA

Specifies the Alpha (A) value

NEMA_IP_VERSION

Address	Access	Reset	Description
0x01dc	r	0x241001	Returns the current GPU IP version

Fields

UNEMA_VERSION	
31	0
241001	
Reset	

Fields Description**UNEMA_VERSION (*Read only*)**

The current version of the GPU IP

NEMA_CODEPTR2

Address	Access	Reset	Description
0x01e0	rw	0x0	Shader code pointer

Fields

BCG		FRG	
31	16	15	0
0		0	
		Reset	

Fields Description

FRG

Specifies the pointer for the instruction that will be executed for the foreground pixels if we are working on neg_area geometries (rasterizer)

BCG

Specifies the pointer for the instruction that will be executed for the background pixels if we are working on neg_area geometries (rasterizer)

NEMA_IDREG

Address	Access	Reset	Description
0x01ec	r	0x86362000	GPU ID Register (fixed value)

Fields

IDREG	
31	0
86362000	
Reset	

Fields Description**IDREG (*Read only*)**

The fixed value is 0x86362000

NEMA_CONFIG

Address	Access	Reset	Description
0x01f0	r	0xf4030104	GPU configuration status

Fields

BUS		BL		TSC6		BLENDER		ASYNC		DIRTY		RSVD				COMPRESS		CG		RSVD		CORES		THREADS	
31	30	29	28	27	26	25						18		17	16	15		12		11	8		7	0	
1	1	1	1	0	1	0						1		1	0		1		4		Reset				

Fields Description

THREADS (Read only)

Indicates the log2 number of threads

CORES (Read only)

Indicates the number of cores

CG (Read only)

When set to 1, indicates that clock gating is enabled

COMPRESS (Read only)

When set to 1, indicates that TSC compression mode is enabled

DIRTY (Read only)

When set to 1, indicates that Dirty Region is enabled

ASYNC (Read only)

When set to 1, Bus to Memory is Asynchronous to core clock

BLENDER (Read only)

When set to 1, indicates that H/W Blender is enabled

TSC6 (Read only)

When set to 1, indicates that TSC6 compression mode is enabled.

BL (Read only)

When set to 1, indicates that Bilinear filtering is enabled

BUS (Read only)

When set to 1, indicates that the master bus is AXI

When set to 0, indicates that the master bus is AHB

NEMA_C0_REG

Address	Access	Reset	Description
0x0200	w	0x0	A 32-bit integer RGBA value is stored in constant register 0 for fragment calculations.

Fields

ALPHA				BLUE				GREEN				RED			
31		24		23		16		15		8		7		0	
0				0				0				0			

Reset

Fields Description

RED (Write only)

Specifies the Red (R) value

GREEN (Write only)

Specifies the Green (G) value

BLUE (Write only)

Specifies the Blue (B) value

ALPHA (Write only)

Specifies the Alpha (A) value

NEMA_C1_REG

Address	Access	Reset	Description
0x0204	w	0x0	A 32-bit integer RGBA value is stored in constant register 1 for fragment calculations.

Fields

ALPHA				BLUE				GREEN				RED			
31		24		23		16		15		8		7		0	
0				0				0				0			

Reset

Fields Description

RED (*Write only*)

Specifies the Red (R) value

GREEN (*Write only*)

Specifies the Green (G) value

BLUE (*Write only*)

Specifies the Blue (B) value

ALPHA (*Write only*)

Specifies the Alpha (A) value

NEMA_C2_REG

Address	Access	Reset	Description
0x0208	w	0x0	A 32-bit integer RGBA value is stored in constant register 2 for fragment calculations.

Fields

ALPHA		BLUE		GREEN		RED	
31	24	23	16	15	8	7	0
0		0		0		0	

Reset

Fields Description

RED (Write only)

Specifies the Red (R) value

GREEN (Write only)

Specifies the Green (G) value

BLUE (Write only)

Specifies the Blue (B) value

ALPHA (Write only)

Specifies the Alpha (A) value

NEMA_C3_REG

Address	Access	Reset	Description
0x020c	w	0x0	A 32-bit integer RGBA value is stored in constant register 3 for fragment calculations.

Fields

ALPHA				BLUE				GREEN				RED			
31		24		23		16		15		8		7		0	
0				0				0				0			

Reset

Fields Description

RED (*Write only*)

Specifies the Red (R) value

GREEN (*Write only*)

Specifies the Green (G) value

BLUE (*Write only*)

Specifies the Blue (B) value

ALPHA (*Write only*)

Specifies the Alpha (A) value

Address	Access	Reset	Description
0x0320	w	0x0	X coordinate of bezier vertex 0 drawing primitive. This register is written in FP32 IEEE format and can be read from the corresponding PT_X (0x162) register. Its content should be considered volatile.

X (Write only)

Specifies the X coordinate of bezier vertex 0 drawing primitive (fp32 format)

DRAW_PT0_Y

Address	Access	Reset	Description
0x0324	w	0x0	Y coordinate of bezier vertex 0 drawing primitive. This register is written in FP32 IEEE format and can be read from the corresponding PT_Y (0x162) register. Its content should be considered volatile.

Fields

Y	
31	0
0	
Reset	

Fields Description**Y (Write only)**

Specifies the Y coordinate of bezier vertex 0 drawing primitive (fp32 format)

DRAW_FP_FAN_X

Address	Access	Reset	Description
0x0328	w	0x0	X coordinate of the Fan center point. Its content should be considered volatile.

Fields

X		
31	0	
0		Reset

Fields Description

X (Write only)

Specifies the X coordinate of bezier vertex 4 drawing primitive (fp32 format)

DRAW_FP_FAN_Y

Address	Access	Reset	Description
0x032c	w	0x0	Y coordinate of the Fan center point. Its content should be considered volatile.

Fields

Y		
31	0	
0		Reset

Fields Description**Y (*Write only*)**

Specifies the X coordinate of bezier vertex 4 drawing primitive (fp32 format)

DRAW_PT1_X

Address	Access	Reset	Description
0x0330	w	0x0	X coordinate of bezier vertex 1 drawing primitive. This register is written in FP32 IEEE format and can be read from the corresponding PT_X (0x163) register. Its content should be considered volatile.

Fields

X	
31	0
0	
Reset	

Fields Description

X (Write only)

Specifies the X coordinate of bezier vertex 1 drawing primitive (fp32 format)

DRAW_PT1_Y

Address	Access	Reset	Description
0x0334	w	0x0	Y coordinate of bezier vertex 1 drawing primitive. This register is written in FP32 IEEE format and can be read from the corresponding PT_Y (0x163) register. Its content should be considered volatile.

Fields

Y	
31	0
0	
Reset	

Fields Description**Y (Write only)**

Specifies the Y coordinate of bezier vertex 1 drawing primitive (fp32 format)

DRAW_PT2_X

Address	Access	Reset	Description
0x0340	w	0x0	X coordinate of bezier vertex 2 drawing primitive.

Fields

X		
31	0	
0		Reset

Fields Description

X (Write only)

Specifies the X coordinate of bezier vertex 2 drawing primitive (fp32 format)

DRAW_PT2_Y

Address	Access	Reset	Description
0x0344	w	0x0	Y coordinate of bezier vertex 2 drawing primitive.

Fields

Y	
31	0
0	
Reset	

Fields Description**Y (*Write only*)**

Specifies the Y coordinate of bezier vertex 2 drawing primitive (fp32 format)

DRAW_PT3_X

Address	Access	Reset	Description
0x0350	w	0x0	X coordinate of bezier vertex 3 drawing primitive.

Fields

X		
31	0	
0		Reset

Fields Description

X (Write only)

Specifies the X coordinate of bezier vertex 3 drawing primitive (fp32 format)

DRAW_PT3_Y

Address	Access	Reset	Description
0x0354	w	0x0	Y coordinate of bezier vertex 3 drawing primitive.

Fields

Y		
31	0	
0		Reset

Fields Description**Y (*Write only*)**

Specifies the Y coordinate of bezier vertex 3 drawing primitive (fp32 format)

VMM00

Address	Access	Reset	Description
0x0360	rw	0x3f800000	(0,0) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM00	
		31 30	0
0		3F800000	Reset

Fields Description

VMM00

Specifies the (0,0) element

VMM01

Address	Access	Reset	Description
0x0364	rw	0x0	(0,1) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM01	
		31 30	0
0		0	Reset

Fields Description**VMM01**

Specifies the (0,1) element

VMM02

Address	Access	Reset	Description
0x0368	rw	0x0	(0,2) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

<div> <div>RSVD</div> <div>31</div> <div>30</div> </div>		VMM02	0
		0	0

Reset

Fields Description

VMM02

Specifies the (0,2) element

VMM10

Address	Access	Reset	Description
0x036c	rw	0x0	(1,0) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM10	
		31 30	0
0		0	Reset

Fields Description**VMM10**

Specifies the (1,0) element

VMM11

Address	Access	Reset	Description
0x0370	rw	0x3f800000	(1,1) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM11	
		31 30	0
0		3F800000	
			Reset

Fields Description

VMM11

Specifies the (1,1) element

VMM12

Address	Access	Reset	Description
0x0374	rw	0x0	(1,2) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM12	
		31 30	0
0		0	Reset

Fields Description**VMM12**

Specifies the (1,2) element

VMM20

Address	Access	Reset	Description
0x0378	rw	0x0	(2,0) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

<div> <div>RSVD</div> <div>31</div> <div>30</div> </div>		VMM20	0
		0	0

Reset

Fields Description

VMM20

Specifies the (2,0) element

VMM21

Address	Access	Reset	Description
0x037c	rw	0x0	(2,1) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM21	
		31 30	0
0		0	Reset

Fields Description**VMM21**

Specifies the (2,1) element

VMM22

Address	Access	Reset	Description
0x0380	rw	0x3f800000	(2,2) Bezier Vertex Transformation matrix floating point element. On read return the floating point value with the selected characteristics

Fields

RSVD		VMM22	
		31 30	0
0		3F800000	Reset

Fields Description

VMM22

Specifies the (2,2) element

NEMA_RAST_BYPASS

Address	Access	Reset	Description
0x0388	rw	0x0	Rasterizer Feature Bypass

Fields

RSVD										TRAVERSE_TILE_OPT		RSVD		TESS_BYPASS		VMM_BYPASS_BIT	
31					5	4	3	2	1	0							
0										0	0	0	0	Reset			

Fields Description**VMM_BYPASS_BIT**

Bypass Vertex MatMult Module

TESS_BYPASS

Bypass Tessellation Module

TRAVERSE_TILE_OPT

When 0 : Do not send last pixel of tile, when the whole tile is in background. When
 1 : Send tile last pixel even if the entire tile is in background

NEMA_COORD_MASK

Address	Access	Reset	Description
0x04d0	rw	0xfff	Inverted mask for rasterizer coordinates

Fields

NEMA_COORD_MASK	
31	0
FFF	
Reset	

Fields Description

NEMA_COORD_MASK

Inverted mask for rasterizer coordinates

DRAW_FLATNESS

Address	Access	Reset	Description
0x04d4	rw	0x8000	Width in pixels of Bezier Curve flatness. (Lower values improve accuracy)

Fields

FLATNESS	
31	0
8000	
Reset	

Fields Description**FLATNESS**

Specifies the convergence point of de Casteljau Algorithm for drawing Bezier Curves (fixed point 16.16 format)

NEMA_IRQ_ID

Address	Access	Reset	Description
0x0ff0	rw	0x0	Signals an interrupt when written

Fields

IRQ_ID	
31	0
0	
Reset	

Fields Description

IRQ_ID

Write any value to signal an interrupt

NEMA_GP_FLAGS

Address	Access	Reset	Description
0x0ff4	rw	0x0	Stop/Break the command list when debugging

Fields

RSVD				BRK_3	BRK_2	BRK_1	BRK_0	RSVD				IRQSYSERR_MASK_3	IRQSYSERR_MASK_2	IRQSYSERR_MASK_1	IRQSYSERR_MASK_0	LINE_MASK_3	LINE_MASK_2	LINE_MASK_1	LINE_MASK_0	LINE_3	LINE_2	LINE_1	LINE_0
31			20	19	18	17	16	15			12	11	10	9	8	7	6	5	4	3	2	1	0
0				0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	0

Reset

Fields Description**LINE_0**

GP_FLAG line 0.

LINE_1

GP_FLAG line 1.

LINE_2

GP_FLAG line 2.

LINE_3

GP_FLAG line 3.

LINE_MASK_0

GP_FLAG_mask when set to 1 masks/enables the generation of the output FREEZE signal from line 0

LINE_MASK_1

GP_FLAG_mask when set to 1 masks/enables the generation of the output FREEZE signal from line 1

LINE_MASK_2

GP_FLAG_mask when set to 1 masks/enables the generation of the output FREEZE signal from line 2

LINE_MASK_3

GP_FLAG_mask when set to 1 masks/enables the generation of the output FREEZE signal from line 3

IRQSYSERR_MASK_0

GP_FLAG_irqmask when set to 1 masks/enables the generation of the IRQ_SYSERROR from line 0

IRQSYSERR_MASK_1

GP_FLAG_irqmask when set to 1 masks/enables the generation of the IRQ_SYSERROR from line 1

IRQSYSERR_MASK_2

GP_FLAG_irqmask when set to 1 masks/enables the generation of the IRQ_SYSERROR from line 2

IRQSYSERR_MASK_3

GP_FLAG_irqmask when set to 1 masks/enables the generation of the IRQ_SYSERROR from line 3

BRK_0

When set to 1, set breakpoint for GP_FLAG line 0 if NEMA_GP_FLAGS[0] bit value is high.

BRK_1

When set to 1, set breakpoint for GP_FLAG line 0 if NEMA_GP_FLAGS[1] bit value is high.

BRK_2

When set to 1, set breakpoint for GP_FLAG line 0 if NEMA_GP_FLAGS[2] bit value is high.

BRK_3

When set to 1, set breakpoint for GP_FLAG line 0 if NEMA_GP_FLAGS[3] bit value is high.

NEMA_SYS_INTERRUPT

Address	Access	Reset	Description
0x0ff8	rw	0x0	On Read: Returns the SYSERROR_IRQ ID. On write: Clears the SYSERROR_IRQ.

Fields

RSVD												ERROR_BUS_ERR		ERROR_BUS_CODE2		ERROR_BUS_CODE1		ERROR_BUS_CODE0		ERROR_LINE_3		ERROR_LINE_2		ERROR_LINE_1		ERROR_LINE_0			
31												12	11	10	7		6	5	4	3	2	1	0						
0												0	0		0		0	0	0	0	0	0	0	Reset					

Fields Description**ERROR_LINE_0**

Indicates that IRQ_SYSERROR due to GP_FLAG line 0.

ERROR_LINE_1

Indicates that IRQ_SYSERROR due to GP_FLAG line 1.

ERROR_LINE_2

Indicates that IRQ_SYSERROR due to GP_FLAG line 2.

ERROR_LINE_3

Indicates that IRQ_SYSERROR due to GP_FLAG line 3.

ERROR_BUS_CODE0

Indicates the Interface Error Code (AXI only).

0: SLVERR

1: DECERR

ERROR_BUS_CODE1

Indicates the Bus Error Code occurrence direction (AXI only).

01: Read Direction

10: Write Direction

ERROR_BUS_CODE2

Indicates the Bus Error Code Interface.

1000: AHB/AXI Slave Port

0100: AHB/AXI M0 Master Port

0010: AHB/AXI M1 Master Port

0001: AXI CL Master Port

ERROR_BUS_ERR

Indicates that a bus error has occurred.

NEMA_BUSERROR_MASK

Address	Access	Reset	Description
0x0ffc	rw	0x0	Sets the mask for the Buserror Interrupt.

Fields

RSVD							MASK2		MASK1		RSVD
31						7	6	3	2	1	0
0							0		0		0
											Reset

Fields Description

MASK1

Sets the mask for the Bus Error Code occurrence direction (AXI only).

01: Read Direction

10: Write Direction

MASK2

Sets the mask for the Bus Error Code Interface.

1000: AHB/AXI Slave Port

0100: AHB/AXI M0 Master Port

0010: AHB/AXI M1 Master Port

0001: AXI CL Master Port