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Find the *Rastergraf Eclipse 3* at our website: ***Click HERE***

Rastergraf

Eclipse3

High Resolution
Graphics Controllers for
PMC and CompactPCI

Solaris ▪ Windows ▪ RTOS ▪ Linux



Eclipse3PMC



Eclipse3CPCI

Rastergraf - graphics and PMC carriers for embedded systems

Eclipse3 Family

Rastergraf's Eclipse3 PMC and CompactPCI boards deliver high performance graphics control solutions for all the most popular embedded computing processing environments, including Solaris, Linux, Windows and leading real-time operating systems such as VxWorks and LynxOS.

Using the 128-bit Borealis graphics accelerator, the Eclipse3 supports screen resolutions up to 1920 x 1200 (VGA) and 1600 x 1200 (optional DVI), while displaying up to 16.7 million colors.

A quad-image VGA/FCode BIOS enables Eclipse3 boards to operate in virtually any x86 or SPARC system using VGA, RGB+Sync-On-Green, or DVI displays.

The Eclipse3CPCI for CompactPCI supports both front and rear panel options and is available with either 3U or 6U panels.

Embedded Life-Cycle Support

Rastergraf's comprehensive selection of PMC, CompactPCI, and PCI solutions are designed to satisfy the product life-cycle requirements demanded by the embedded computing market.

The Embedded Graphics Source.

Rastergraf products include:

• Single and dual-head display-only PMC

• Single head display/capture

• Single display-only CPCI

• CompactPCI and PCI carriers

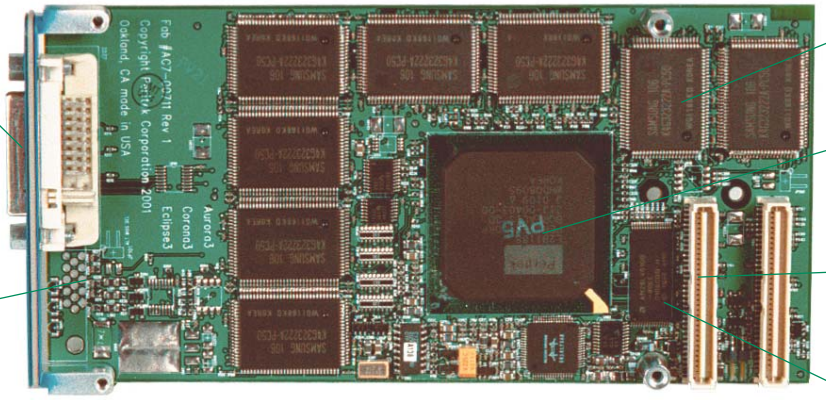
Please contact Rastergraf for more information or consult our web page at *www.rastergraf.com*..

Eclipse3 Family Highlights

- Very High Performance 128-bit Graphics Accelerator
- Supports resolutions from 640 x 480 up to 1920 x 1200
- OpenGL 1.1 rendering in hardware
- 128-bit drawing engine
- 33/66 MHz, 32-bit PCI interface
- Displays up to 16.7 million colors
- Supports 8, 16, or 32-bits per pixel
- Hardware bit-mapped cursor
- VGA sync, Sync-On-Green and composite sync support
- Front panel VGA interface
- Optional DVI supports digital output up to 1600 x 1200
- 16 MB or 32 MB Frame Buffer memory
- 32-bit Z-Buffer
- 250 MHz integrated DAC
- E3cPCI Rear-Panel I/O option
- E3cPCI Available with 3U or 6U front panel

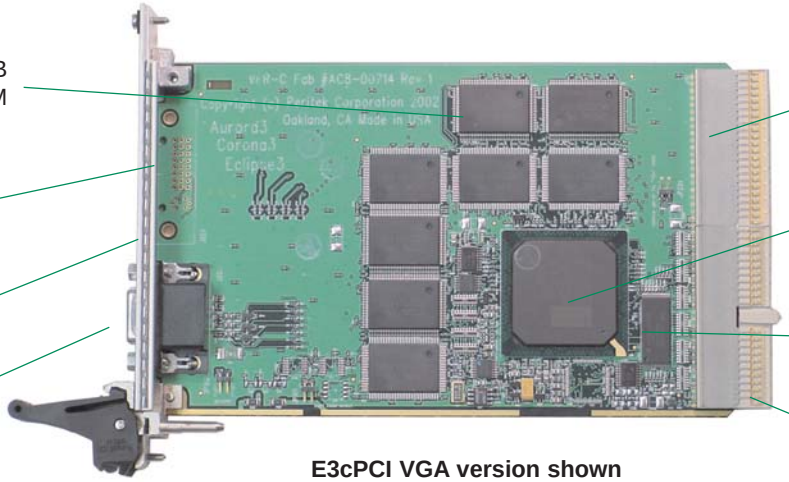
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Eclipse3PMC Features



E3PMC DVI version shown

Eclipse3CPMC Features



E3cPCI VGA version shown

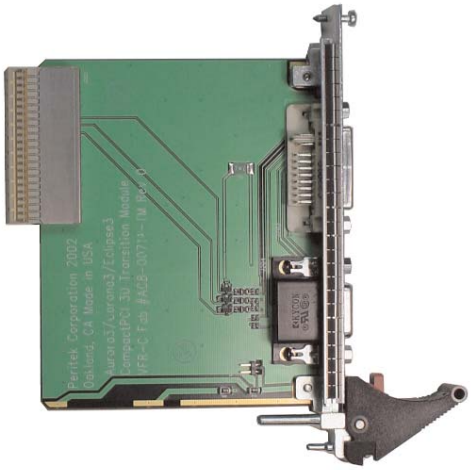
Rear-Panel I/O Transtion Module

Optional CompactPCI Rear-Panel I/O transition module with VGA & DVI-I rear panel connections.

Must be ordered with /DVI option.

Not available with Front-Panel VGA connector configuration.

Available with either 3U or 6U panel.



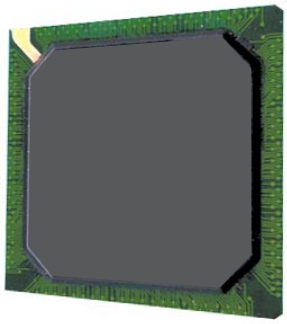
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Borealis Technical Overview

The Eclipse3 is powered by the Borealis graphics accelerator, which is a 128-bit PCI graphics controller. It drives very high resolution VGA graphics over an enhanced 128-bit wide local data bus. It's designed to draw up to sixteen 256-color pixels to memory each instruction cycle and can generate many hundreds of thousands of shaded triangles per second. To increase overall system throughput, the chip's display list function enables the host CPU and the Eclipse3 card to process data independently.

Borealis Features

128-Bit Design
The Borealis supports up to 32 MB of on-board 100 MHz SGRAM. The chip's 128-bit core drawing engine can stretch and bi-linearly interpolate 8 pixels per clock cycle, supporting horizontal/vertical non-integer zooms in a single pass. Its performance is rated at 533 MB/sec. Fully PCI 2.1 compliant.



The Borealis Graphics accelerator

Borealis Feature Summary

- 64-bit wide pixel data bus
- Fine-grained PLL programming
- Large Screen ISO-compliant refresh rates
- Pixel re-synchronization
- Direct color
- Gamma correction
- 256-shade gray scale
- Triple monotonic 8-bit DACs
- 100 MHz 8-bit VGA data input
- On-chip diagnostics
- Power-down modes
- Integrated color maps and DAC

Memory Resources
Borealis's video frame buffer memory is configured as 16 or 32 MB block of 100 MHz SGRAM, with a 128-bit wide (512K x 128) data bus. Its video RAM is accessible as a linear buffer via the memory window's interface or via the drawing engine. Borealis3 supports simultaneous read/write of 16 pixels of 8-bits, 8 pixels of 16-bits, or 4 pixels of 32-bits.

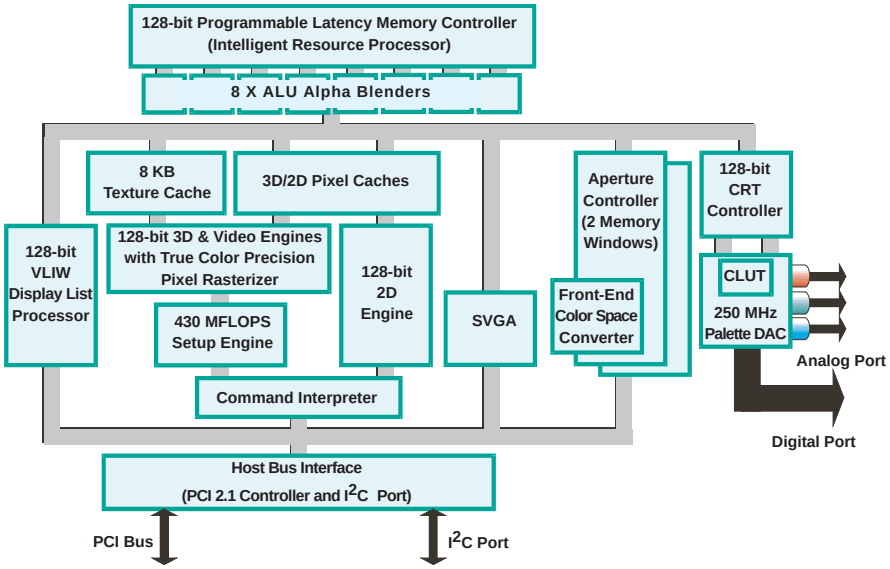
On-chip Texture Cache:
8 Kbits of on-chip texture cache for bitmaps shared between adjacent pixels. Removes artifacts and smoothes transitions between large 2D or 3D images, elements, and textures.

32-Bit Z Buffering:
Stores Z (depth) value for each pixel. Provides automatic hidden surface removal in the hardware, freeing the CPU and system bus.

Color-space conversion
YUV formatted data is common to NTSC/PAL video (including DVD). Data acquired from a color decoder (video capture chip) or from the host computer is stored in off-screen memory. It is then copied to on-screen memory, and during the copy process it is converted to the current drawing display format (8-, 16-, or 32-bit). In the process, a color key in the source or target data space can be used to limit writing of the converted data to specific pixels. Continual copying/converting of live video to a display window is the perfect application of the Display List Processor.

Display List Processor
Executes a sequence of commands from memory, enabling the graphics engine to perform repetitive tasks without using up PCI bandwidth or CPU resources. This list, which can be modified and expanded, is stored in local (chip) memory.

Graphics Output
Borealis features a triple 250 MHz 8-bit DAC with a 128-bit memory interface. It supports 8/16/32 bits per pixel. The integrated RAMDAC features a X11 compliant cursor hardware generator. Its translucent cursor enhances graphical user interface functionality. The cursor pattern is contained in a downloadable 64 x 64 x 2 memory.



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Display Formats and Output Usage

Graphics Output Flexibility

Please contact the factory if you have a special configuration requirement. Also, refer to the User's Manual, which provides comprehensive information about connectors and cabling.

Analog Non-Interlaced Video Output

The standard version of the Eclipse3 supports a VGA (analog) output up to 1920x1200x32 bpp with a programmable composite sync on green.(SOG) mode. It has a standard VGA connectors on the front panel.

Digital DVI Output

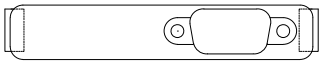
The Eclipse3 /DVI option adds DVI capability with a resolution up to 1600x1200 and operates in single-link mode only. It has a DVI-I front-panel connector capable of supplying both DVI and VGA. It requires a breakout cable that splits out into two standard DVI-I (DVI+VGA) connectors.

Note that on the Eclipse3PMC, the DVI connector replaces the VGA connector. On the Eclipse3CPCI and Eclipse3PCI, both connectors are present on the front panel.

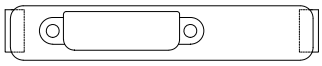
Video Mode	Resolution	Pixel Size (bits)	Windows Format	Refresh Freq. (Hz)	Notes
Analog Non-Interlaced	up to 1920x1200	8,16,32	WUXGA max	150 Hz at VGA, 77 Hz at WUXGA	Also supports Sync On Green
Digital DVI (single link only)	up to 1600x1200	8,16,32	UXGA max	60 Hz	Eclipse3 /DVI option ONLY

Eclipse3 Front Panels

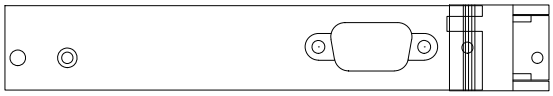
Front Panel for Eclipse3PMC



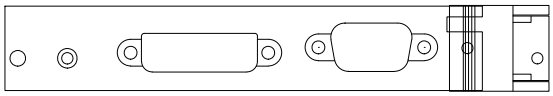
Front Panel for Eclipse3PMC/DVI



Front Panel for Eclipse3CPCI/3U



Front Panel for Eclipse3CPCI/3U/DVI



Front Panel for Eclipse3CPCI/6U



Front Panel for Eclipse3CPCI/6U/DVI



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Display Resolutions

Resolution	Vertical Scan Rate			
	Windows and RTOS		Solaris	
	Format	Maximum	Index	Frequency
640 x 480	VGA	150+ Hz	8 9	60 Hz 75 Hz
800 x 600	SVGA	150+ Hz	6 7	60 Hz 75 Hz
1024 x 768	UVGA	142 Hz	0 1	60 Hz 75 Hz
1152 x 864	Sun	126 Hz	2 [default] 3	60 Hz 75 Hz
1280 x 1024	SXGA	107 Hz	4 5	60 Hz 75 Hz
1600 x 1200	UXGA	91 Hz	C	60 Hz
1920 x 1080	HDTV	83 Hz	n/a	n/a
1920 x 1200	WUXGA	77 Hz	D	60 Hz

Ruggedization

Rastergraf is not in the militarized business. The intent of the following table is to illustrate how the Rastergraf graphic boards fit into the standard ruggedized classes.

Rastergraf boards use standard distribution grade derated commercial temperature range or industrial temperature range components. No formal component tracking is maintained.

Spec	Air-Cooled Level 0	Air-Cooled Level 50	Air-Cooled Level 100	Air-Cooled Level 200
Graphics Board(s)	Gemini Eclipse3 Topaz	Gemini Eclipse3 Topaz	Gemini Eclipse3 Topaz	Eclipse3 Topaz
Operating Temperature (4, 6)	0°C to 50°C	-20°C to 65°C	-40°C to 71°C	-40°C to 85°C
Storage Temperature	-40°C to 85°C	-40°C to 85°C	-55°C to 125°C	-55°C to 125°C
Humidity Operating	0 to 95% non-condensing	0 to 100% non-condensing	0 to 100% non-condensing	0 to 100% non-condensing
Humidity Storage	0 to 95% condensing	0 to 100% condensing	0 to 100% condensing	0 to 100% condensing
Vibration Sine (1)	2 g peak 15-2 kHz	2 g peak 15-2 kHz	10 g peak 15-2 kHz	10 g peak 15-2 kHz
Vibration Random (2)	0.01 g2/Hz 15-2 kHz	0.02 g2/Hz 15-2 kHz	0.04 g2/Hz 15-2 kHz	0.04 g2/Hz 15-2 kHz
Shock (3)	20 g peak	20 g peak	30 g peak	30 g peak
Conformal Coat (5)	optional	optional	optional	optional
Ordering Option (7)	/CA or /CS	/A5A or /A5S	/A1A or /A1S	/A2A or /A2S

Notes:
1. Sine vibration based on a sine sweep duration of 10 minutes per axis in each of three mutually perpendicular axes. May be displacement limited from 15 to 44 Hz, depending on specific test equipment. **Shock and Vibration values are by design and not tested in production.**
2. Random vibration 60 minutes per axis, in each of three mutually perpendicular axes.
3. Three hits in each axis, both directions, 1/2 sine and saw tooth. Total 36 hits.
4. Standard air-flow is 8 cfm at sea level. Some higher-powered products may require additional airflow. Consult the factory for details.
5. Conformal coating type to be specified by customer. Consult the factory for details..
6. Temperature is measured at the card interior (not at edge) using on-board LM75 temperature monitor.
7. Last letter in ordering option: A for Acrylic Conformal Coating, S for Silicone Conformal Coating

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Graphics Software Support

SDL Subroutine Library includes Built-In Self Test module
WindML support (requires SDL)
Accelerated X Server with OpenGL
Windows 2K/XP drivers including accelerated DirectX and OpenGL

Software Support Matrix

	SDL	X	DirectX 7	Self-Test using SDL	Multi-Head	OpenGL	x86 BIOS	xSun and OpenGL DDX	Test S/W using SunVTS	SPARC FCode
Solaris SPARC 32/64-bit					✓			✓	✓	✓
Solaris x86	✓	✓			✓	✓	✓			
VxWorks x86/PowerPC	✓			✓	✓		✓			
Windows XP/7			✓		✓	✓	✓			
Linux x86/PowerPC	✓	✓		✓		✓	✓			
LynxOS PowerPC	✓	✓				✓				

SDL Graphics Library

SDL is a graphics library designed to be a device-independent programming interface. SDL is ideally suited to demanding board level and embedded systems applications. Drivers are available for selected host CPU boards and operating systems. SDL is supplied in object library format, which means that its target code size can be controlled by limiting the number of functions used in a given application. SDL has been designed to run on any CPU and operating system that uses linear addressing and is supported by the GNU C compiler and linker.

SDL is easy to use. It includes a complete set of graphics primitives that interface to the Borealis graphics controller's accelerated functions. All graphics primitives are drawn as single pixel lines. Rectangles, polygons, circles, ellipses, and chords can be filled with a solid color or stipple patterns.

Complete information about SDL is contained in the Standard Drawing Library C Reference Manual that is available for download from our web site at http://www.rastergraf.com.

SDL Feature Summary

- Solid (thin and wide) and dashed lines, polylines, and rectangles
- Pixblits to/from the display and host memory
- Filled and hollow polygons, ellipses, circles, sectors, and chords
- Solid and Pattern Fills - Pixel Processing
- Proportional and Fixed Width Fonts
- Clipping Rectangle and Logical Origin
- VGA output 640x480 to 1920x1200
- DVI output 640x480 to 1600x1200
- 8/16/24 bpp
- Sync On Green

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Product Specifications

Graphics Controller	Borealis, 32-bit, 33/66 MHz PCI 2.1
Maximum Dot Clock	250 MHz
Horizontal Scan Rates	31.5 to 115 kHz
Display Memory	16MB or 32MB SGRAM
Display Colors	16.7 Million @ 24 bits (uses a full 32-bit word) 65,536 @ 16-bits, 256 @ 8-bits
Environment	
Temperature	0°C to +70°C, operating, -55°C to +85°C, storage
Humidity	5% - 95% non-condensing
Power Requirements	+5V ±5%, 0.2 A (Max.) +3.3V ±5%, 1.0 A (Max.) Local 3.3V regulator option if no host 3.3V.
PCI Compatibility	32-bit, 33/66 MHz.PCI 2.1 compliant Universal PCI Bus signaling (5V and 3.3V)
Standards Compatibility	PMC: IEEE 1386-2001 CompactPCI: PICMG 2.0
PCI Device IDs and Interrupts	Borealis: IDSEL = PMC IDSEL Interrupt = INTA
PCI Subsystem Vendor ID	0x10F0 (Vendor Code)
PCI Subsystem Device ID	0x0003 for 16 MB boards, 0x0007 for 32 MB boards
Video Connector (standard)	**DB15-HD** VESA (Standard VGA)
Video Connector (/DVI option)	**DVI-I** (optional) supplies both DVI-D and VGA. DVI-I to DVI-D+VGA splitter cables are readily available.
Analog Monitor Support	Standard multi-frequency VGA compatible mon itors supports resolutions up to 1920x1200. Sync-On-Green (SOG) is jumper selectable.
Composite Video Signal	1 Volt peak to peak, consisting of: 660 mV Reference White 54 mV Reference Black 286 mV Sync
Analog Flatpanel Support	VGA compatible, up to 1920x1200.
Digital Flatpanel Support	Optional - DVI, up to 1600x1200.
MTBF	361K hours using Bellcore model (ground benign).
Quad-Image BIOS	Allows board to function as system console on x86 (VGA/DVI), SPARC (FCode), and Sync-On-Green monitor-based systems.
Maintenance Features	DDC-2B control enables system software to interrogate monitor for type and capabilities; RAMDAC 1-bit ADC sense function can detect monitor connections; RAMDAC's integral CRC capability allows any 24 video data lines to be test ed; Optional LM75 thermal sensor can report board temp.
Power-management capabilities	Depending on operating system support, most devices can be at least partially powered down.

Ordering Information

Eclipse3 General Description:
High performance graphics controller on a PMC, 3U CPCI, or PCI medium board format. 16MB SGRAM, VGA graphics output, Quad-image BIOS supports VGA, DVI, RGB+Sync-On-Green, and FCode. Front panel VGA connector.

Eclipse3PMC for PMC

Eclipse3cPCI for CompactPCI (must also specify /3U or /6U)

Options:

/DVI
Digital Video Interface. Replace VGA connector with DVI on PMC. Add DVI connector on CPCI and PCI.

/32MB
32MB SGRAM (increases memory from 16 MB)

/3U
Specify 3U front or rear panel for E3cPCI

/6U
Specify 6U front or rear panel for E3cPCI

/RIO
Specify rear I/O version of E3cPCI (see page 3). Requires /DVI option as well. Includes Rear I/O adapter panel and matching 3U or 6U panel.

/GL
OpenGL license per board

Video Adapter:

DGA
DVI-to-VGA adapter enables access to VGA on DVI connector.

Software:

SDL/R3.6.7
SDL graphics library for x86/PPC VxWorks, x86/PPC Linux, and PPC LynxOS.

WML/R1.2
WindML for for WindML 3.0 for x86/PPC VxWorks. Requires SDL.

Windows Drivers
Drivers for Windows XP and Windows 7 (32-bit only). Downloadable from www.rastergraf.com

DRV/LN/B/R3.0
2D accelerated X-Windows DDX drivers for x86 and PPC Linux and x86 Solaris. Supports XFree86 4.x and X.org X11R6.8.2.

LYX/B/R1.3
2D accelerated X-Windows DDX drivers for LynxOS 4.0

DDX/SO/R5.0
2D X-Windows DDX drivers for SPARC Solaris 2.6-10.

GL/SO/R1.2
One license per board - serial number controlled.
High Performance Direct Rendering Infrastructure (DRI) based hardware accelerated 3D/OpenGL DDX driver for SPARC Solaris 2.6-10. Requires DDX/SO/R5.0

SunVTS R3.0
Support SunVTS 6.1 for x86 and SPARC Solaris 2.6-10. For SPARC Solaris, also requires DDX/SO/R5.0.

NOTES: **/RX.X** is software revision number, subject to change.
Solaris x86 support requires Solaris 9 or newer.

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