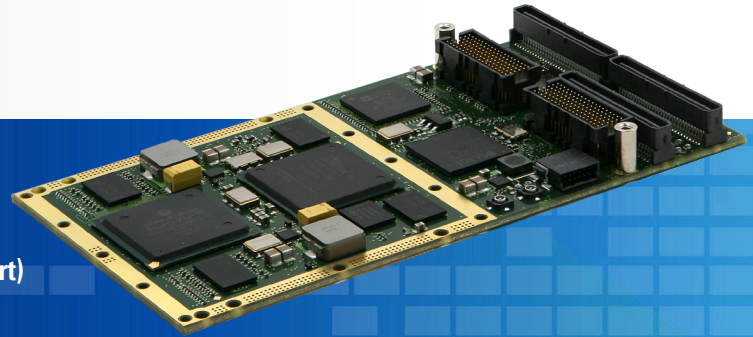


BuiltSAFE™ VCP-8166

H.264/AVC Codec PMC/XMC Module

- Xilinx Spartan-6 LX100T FPGA
- H.264/AVC low-latency base-profile (interlaced loop support)
- Rugged air-cooled
- And Rugged conduction-cooled packages



Mercury's BuiltSAFE™ products bring the highest level of flight safety assurance to aerospace and defense applications. Our proven, reusable Design Assurance Level (DAL) certified artifacts for mission computing, avionics, networking and datalink comms processing save time and cost while decreasing risk.

The BuiltSAFE VCP-8166 is a H.264/AVC Codec PMC/XMC mezzanine for video applications requiring air-cooled or conduction-cooled equipment. It is specifically designed for the most demanding applications, combining hard real-time video compression with very low-latency processing within harsh environments.

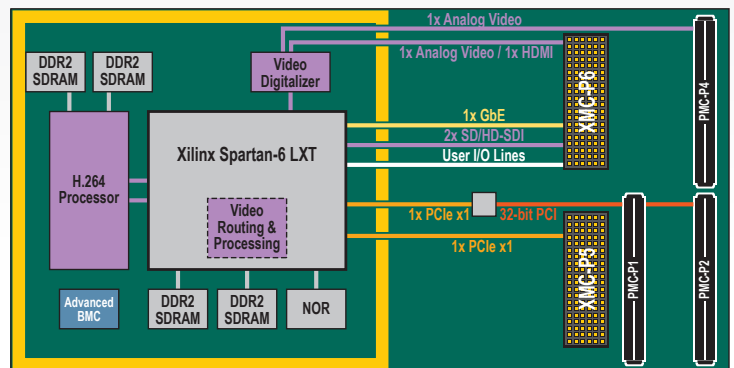
The video coding functionality provided by the VCP-8166 is designed to guarantee smooth real-time, low-latency coding for up to two full HD channels in parallel. For lower resolutions, up to three video channels can be processed at the same time. The streams can come from the two HD/SD-SDI inputs and from either the analog or the HDMI inputs. Compressed video is forward to other components of the system via PCI or PCIe. The BuiltSAFE VCP-8166 is supplied with Mercury's video API which enables the control of various parameters of the compression algorithm.

For integration in 3U OpenVPX based systems, Mercury provides the BuiltSAFE VVC-6331 video carrier board which accommodates the VCP-8166.

Mercury Systems is a leading commercial provider of secure sensor and mission processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.

BuiltSAFE for Avionics

Mercury's expertise and experience in safety certifiable solutions has been built on successful execution of dozens of programs over three decades. This domain knowledge is the foundation of our BuiltSAFE portfolio of open architecture modules, systems and software for a avionics, communications, video servers, and mission computing.



Technical Specifications

Compliance

- Air-cooled PMC ^(A)
- Conduction-cooled PMC ^(B)
- Air-cooled XMC (VITA 42) ^(C)
- Conduction-cooled XMC (VITA 42) ^(D)
- ITU-T H.264/ISO/IEC 14496-10 (AVC)
- SMPTE 259M/SMPTE 274M/SMPTE 292M/SMPTE 296M



Power Consumption

Minimum	typical	maximum	units
-	16	18	Watts

Memory

Dual 128 MB DDR2 SDRAM at 1 GB/s peak for FPGA
 Dual 128 MB DDR2 SDRAM at 1 GB/s peak for H.264 processor
 128 MB Flash (NOR)
 512 KB Flash (SPI)

FPGA/User-Programmable/User I/O Lines

Xilinx Spartan-6 LX100T FPGA
 2x user-specific I/O lines on XMC-P6

Encoder Performance

2x 1080p30, 2x 720p60, 3x 720p30, 3x 480p30
 Simultaneous encoding
 Interlaced formats are supported

Inputs

2x SD/HD-SDI on XMC-P6
 1x HDMI 1.3 on XMC-P6
 1x Analog video (PAL, RGB, monochrome CVBS) on XMC-P6/PMC-P4

Switches / Bridges

1x PCIe x1 to PCI bridge ^(A) ^(B)

Buses

One 32-bit PCI 3.0 bus at 33/66 MHz on PMC-P1/P2 ^(A) ^(B)
 High-Speed Links / Connections
 1x PCIe x1 on XMC-P5 (VITA 42.3) ^(C) ^(D)

(A) Applies to "A" model
 (B) Applies to "B" model
 (C) Applies to "C" model
 (D) Applies to "D" model

Development/Debug

Onboard JTAG test port
 Rear I/O transition module
 Xilinx ChipScope Pro FPGA debugging tool

Ruggedization Levels

Level	Description	Cooling Type	Operating Temperature	Vibration (1 hour per axis)	Operating Shocks
A3	Rugged AC	Forced air*	-40°C to 70°C [AC3]	5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.04 g ² /Hz, 1000-2000Hz: decrease at 6 dB/octave [V2]	20g, 11ms saw-tooth, three axes [OS1]
C4	Extended range CC	Conduction	-40°C to 85°C [CC4]	5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.1 g ² /Hz, 1000-2000Hz: decrease at 6 dB/octave	40g, 11ms saw-tooth, three axes

* The required air-flow is defined separately for each product

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Advanced Board Management Controller

Advanced power management
 Voltage and current monitoring
 Temperature monitoring (thermal sensors on critical positions)

Environmental Specifications

Condition	Limits, standards	Comments
Non-operating temperature	-55°C to 105°C [C4]	
Humidity	95%	
Altitude	-1,500 to 60,000 feet	May require conformal coating
Fungus resistance	No nutrient materials	
Workmanship	IPC-A-160 class 3	
Soldering	IPC J-STD-001 class 3	
PCB Manufacturing	IPC-A-600 class 3	
Conformal coating	IPC-CC-830	Optional
Materials	REACH compliant	ROHS variants as an option
Flammability	UL 94 Class V-0	
Quality	EN 9100:2008	

Product Ordering

VCP-8166AA	Air-cooled H.264/AVC Codec PMC
VCP-8166BA	Conduction-cooled H.264/AVC Codec PMC
VCP-8166CA	Air-cooled H.264/AVC Codec XMC
VCP-8166DA	Conduction-cooled H.264/AVC Codec XMC
DGW-31160A	VxWorks® 653 driver for VCP-8166
DGW-31160B	VxWorks® driver for VCP-8166
DGX-31160L	Linux® driver and video API library for VCP-8166
SWW-31150B	Video API library for VCP-8166

Related Hardware Products

RTM-6487A0	Rear I/O Transition Module for video boards (8x SMB, 3x micro HDMI, 2x VGA, 2x mini Stereo Jack, 1x CameraLink, 1x RJ45, 1x mini USB)
VVC-6331	3U OpenVPX video PMC/XMC carrier board for VCP-8166