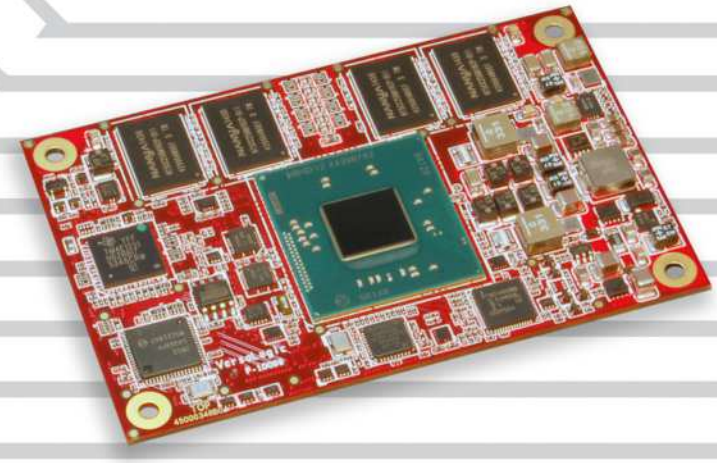
VL-COMm-33

COM Express Mini CPU Module



55 x 84 mm

(2.17 x 3.31")

Overview

The VL-COMm-33 is an extremely small and rugged Computer on Module (COM) based on the industry-standard COM Express mini form factor. Roughly the size of a credit card, the VL-COMm-33 has been engineered to meet the requirements of aviation, defense, industrial control, and medical applications while adhering to stringent regulatory standards. The VL-COMm-33 is manufactured to IPC-A-610 Class 2 standards. Equipped with an Intel Atom "Bay Trail" E38xx processor, it is designed to withstand extreme temperature, impact, and vibration.

Available in single, dual, and quad core versions, the COMm-33 provides extreme performance for its size. It does so at moderate power consumption (3.5 to 7.25W typical), in a very small package. The COMm-33 provides compatibility with a broad range of standard x86 application development tools for reduced development time.

The VL-COMm-33 utilizes advanced Intel technologies to maximize performance. Intel Virtualization Technology allows one VL-COMm-33 system to function as multiple "virtual" platforms. This enables computing activities to be isolated into separate partitions for increased application flexibility and reliability. Intel 64 architecture delivers 64-bit computing when combined with supporting software.

Highlights

- Intel® Atom™ Bay Trail E38xx processor
- Extremely small COM Express™ mini form factor
- Industrial temp. (-40° to +85°C)
- Wide input voltage (4.75V–20V)
- On-board RAM
- On-board eMMC Flash storage (optional)

VERSALOGIC CORPORATION

Overview *...continued*

The integrated Intel Gen-7 graphics core provides hardware-accelerated MPEG-4/H.264 and MPEG-2 video encoding and decoding. A standard LVDS output supports flat panel displays. An SDVO output supports a variety of signaling interfaces including VGA and DVI.

The standard COM Type 10 pin-out provides industry-standard system interfaces that include Gigabit Ethernet with network boot capability, a single USB 3.0/2.0 and six USB 2.0 ports, two serial ports, Intel High-Definition Audio (HDA), LPC, I2C, SPI, and SMBus to the carrier board. A dual SATA 3 Gb/s interface supports high-capacity storage. Optional on-board eMMC memory supports up to 8 GB of Flash.

Designed and tested for industrial temperature (-40° to +85°C) operation, the rugged VL-COMm-33 also meets MIL-STD-202G specifications for shock and vibration. Soldered-down RAM provides additional ruggedization for use in extremely harsh environments.

The VL-COMm-33 is supported by a variety of thermal heat dissipation solutions, including a standard heat plate, heat sink, fan for heat sink, heat pipe, and other cooling / mounting solutions.

A wide input voltage range of 4.75 to 20 volts simplifies system power supply requirements. It is fully compatible with 12V automotive-type power systems.

The VL-COMm-33 is backed by a five-year warranty, 5+ year off-the-shelf availability guarantee, and expert US-based technical support. Product Life Extension options support availability through the year 2025.

The VL-COMm-33 is compatible with a variety of popular x86 operating systems including Windows, Windows Embedded, Linux, and VxWorks.

Product customization is available, even in low quantities. Options include conformal coating, splash screen configuration, application-specific testing, BOM revision locks, special labeling, etc.

A compatible carrier card is required for operation of this COM module. Contact VersaLogic for custom designed carrier boards that meet your exact requirements. Please contact a VersaLogic Sales Engineer for more information. ■

Features

1 Intel Atom "Bay Trail" Processor
High performance CPU in quad-, dual- or single-core versions. Low power consumption.

2 RAM
Up to 4 GB soldered-down RAM.

COM Express Mini Form Factor
Extremely small (55 mm x 84 mm) with Type 10 pin-out.

Industrial Temperature Operation
Rated -40° to +85°C for harsh environments.

MIL-STD-202G
Qualified for high shock/vibration environments.

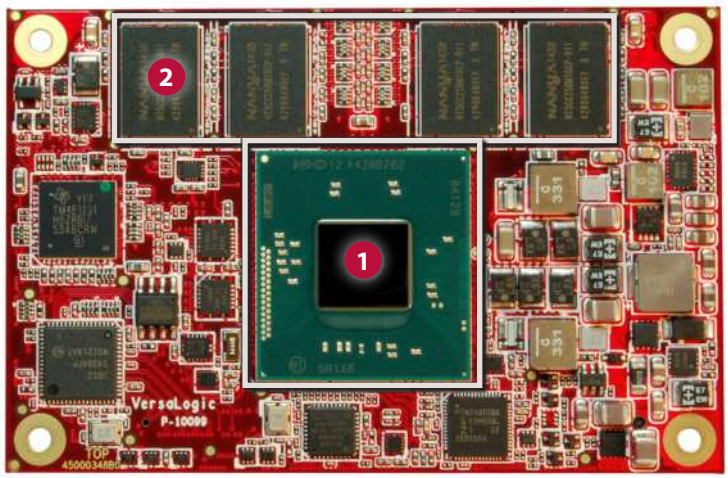
High-performance Video
Integrated Intel Gen 7 graphics core supports DirectX 11, OpenGL 4.0, and H.264, MPEG-2 encoding/decoding. LVDS video output.

Network
Gigabit Ethernet (GbE) with remote boot support.

Wide Input Voltage Range
Accepts 4.75 to 20 volts (nominal 12V input)

I/O Interfaces
SATA, PCIe, USB 3.0, USB 2.0, GPIO, serial, HD audio, LPC, SMBus SPI, and I2C.

Flash Memory
Up to 8 GB of on-board eMMC flash storage.



VL-COMm-33

COM Express Mini CPU Module

Specifications

General					
Form Factor	COM Express mini (Type 10)				
Board Size	55 mm x 84 mm (2.17" x 3.31")				
Weight	31 grams (1.09 oz.)				
Processor	Intel Atom E38xx platform. 512K 8-way L2 cache per core. Intel 64-bit instructions, Virtualization Technology (VT), and new AES instructions.				
Power Requirements (@ +12V) §	*Model*	*Idle*	*Typical*	*Max.*	*S3*
	VL-COMm-33EAP	2.5W	3.5W	4.5W	0.4W
	VL-COMm-33EBP	3.5W	5.6W	8.0W	0.4W
	VL-COMm-33EDP	3.5W	7.3W	11.0W	0.4W
Input Voltage	4.75V–20V (nominal 12V operation)				
System Reset & Hardware Monitors	Voltage rails monitored. Watchdog timer with programmable timeout (1 µS to 10 min.).				
Manufacturing Standards	IPC-A-610 Class 2				
Regulatory Compliance	RoHS (2002/95/CE)				

Environmental		
Operating Temperature	-40° to +85°C. Derate -1.1°C per 305m (1,000 ft.) above 2,300m (7,500 ft.). ¤ CPU die must be kept below 90°C	
Storage Temperature	-40° to +85°C	
Cooling	Thermal solution required. CPU die must be kept below 90°C. See heat plate, heat sink, fan, and heat pipe options.	
Airflow	All models: 100 LFM (30 LMM) LFM = Linear Feet per Minute LMM = Linear Meters per Minute	
Altitude ¤	Operating	To 4,570m (15,000 ft.)
	Storage	To 12,000m (40,000 ft.)
Thermal Shock	5°C/min. over operating temperature	
Humidity	Less than 95%, noncondensing	
Vibration, Sinusoidal Sweep ¥	MIL-STD-202G, Method 204, Modified Condition A: 2g constant acceleration from 5 to 500 Hz, 20 min. per axis	
Vibration, Random ¥	MIL-STD-202G, Method 214A, Condition A: 5.35g rms, 5 min. per axis	
Mechanical Shock ¥	MIL-STD-202G, Method 213B, Condition G: 20g half-sine, 11 ms duration per axis	

Memory	
System RAM	2 GB or 4 GB of soldered-on DDR3L SDRAM. 1333 MT/s.

Video	
General	Integrated high-performance video. Intel Gen-7 graphics core with 4 Execution Units and Turbo Boost. Supports DirectX 11, OpenGL 4.0, VP8, MPEG2, H.264, and VC1.
VRAM	Up to 224 MB shared DRAM
Desktop Display Interface Δ	1x DDI (Digital Display Interface) with support for ▪ 1.1. Multiplexed with HDMI/DVI ports. Supports Hot-Plug detect. ▪ Multiplexed with DisplayPort (DP)/DVI. Supports Hot-Plug detect ▪ Multiplexed with HDMI/DP ports. Supports Hot-Plug detect.
OEM Flat Panel Interface Δ	Single-channel LVDS interface. 18/24-bit. Up to 1920 x 1200 (60 Hz).

Mass Storage	
Rotating Drive / Flash / Solid-State Drives ‡	Two SATA 3 Gb/s ports Δ
	Optional eMMC 4.5 onboard flash up to 8 GB MLC

Network Interface	
Ethernet † Δ	One autodetect 10BaseT/100BaseTX/1000BaseT port. Network boot option.

Type 10 I/O Interfaces	
USB 3.0/2.0 ‡ Δ	One host port
USB 2.0 ‡ Δ	Six host ports
COM 1 / 2 Δ	Two-wire, CMOS levels. 16C550 compatible.
GPIO Δ	4 lines multiplexed with the SD card interface
Audio Δ	High Definition Audio (HDA)/digital audio interface with support for multiple codecs.
PCIe Δ	Three PCIe (Gen 2) lanes
SMBus Δ	1 MHz
LPC Δ	33 MHz
SPI Δ	Supports alternative BIOS flash device only.
I2C Δ	Fast mode multi-master I²C Bus
Control Δ	Wake, reset, and power

Software	
BIOS	AMI Aptio UEFI BIOS with OEM enhancements. Field reprogrammable.
Sleep Mode	ACPI 3.0. Support for S3 suspend state.
Operating Systems	Compatible with most x86 operating systems including Windows, Windows Embedded, Linux, and VxWorks

§ Represents operation at +25°C and +12V supply running Windows XP with LVDS display, SATA, GbE, COM, and USB keyboard/mouse. Typical power computed as the mean value of Idle and Maximum power specifications. Maximum power measured with 95% CPU utilization.

† IEEE 1588 Precision Time Protocol (PTP) compatible

‡ Bootable storage device

Δ Available via Type 10 I/O connector

¤ Extended altitude specifications available upon request

¥ MIL-STD-202G shock and vibe levels are used to illustrate the extreme ruggedness of this product in general. Testing to higher levels and/or different types of shock or vibration methods can be accommodated per the specific requirements of the application. Contact a VersaLogic Sales Engineer for further information.

Specifications are subject to change without notification. Intel and Atom are trademarks of Intel Corp. microSD is a trademark of SD-3C, LLC. Embedded Processing Unit is a trademark of VersaLogic Corp. All other trademarks are the property of their respective owners.

Tailor COMm-33 to Your Exact Requirements

Customization options are available in quantities as low as 100 pieces.

- Conformal Coating
- Custom Testing
- Custom Labeling
- BIOS Modifications
- Software and Drivers
- Revision Locks
- Environmental Screening
- Application-Specific Testing
- And more –

Ordering Information

Model	Processor	CPU Cores	Speed	RAM	eMMC Flash
VL-COMm-33EA	Atom E3815	1	1.46 GHz	2 GB	None
VL-COMm-33EB	Atom E3827	2	1.75 GHz	2 GB	4 GB
VL-COMm-33ED	Atom E3845	4	1.91 GHz	4 GB	8 GB

Accessories

Part Number	Description
Hardware	
VL-HDW-410A	55 x 84 x 6 mm Heat plate to mount to VL-COMM-33 module. Includes thermal interface material, mounting screws (4), and thermal compound paste (Arctic Silver).
VL-HDW-410B	55 x 84 x 6 mm Heat plate that mounts to VL-COMM-33 module. Includes thermal interface material. Does not include thermal paste or mounting screws.
VL-HDW-406	55 x 84 x 15.5 mm Passive heat sink. Mounts to HDW-410 heat plate.
VL-HDW-411	12V Cooling fan for optional use with HDW-406 heat sink.
VL-HDW-405	75 x 84 x 2 mm Mounting adaptor plate, flat. Simplifies installation in many situations. Attaches to HDW-410 heat plate.
VL-HDW-408	Heat pipe connector plate. Mounts to HDW-410 heat plate.
VL-HDW-401	Thermal compound paste (Arctic Alumina)

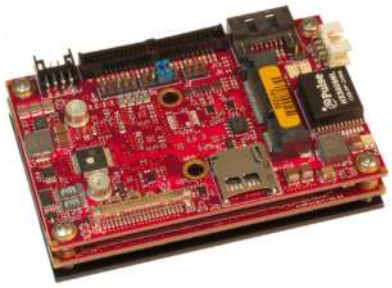
Call VersaLogic Sales at (503) 747-2261 for more information!

Take the Risk out of Embedded Computing

Whether it's selecting the optimum solution for your application, sharing expertise during development, or on-time delivery of defect-free products, VersaLogic is here to make sure your project goes smoothly from initial concept through the extended life of your program. Contact us today to learn more.

ISO 9001:2008 Certified

Bay Trail Computer
A Complete Embedded Processing Solution
– Available Off-the-Shelf! –



Based on the VL-COMm-33, the Hawk is an extremely small and rugged complete embedded computer—available fully assembled and tested off-the-shelf! Roughly the size of a credit card and less than one inch thick, the Hawk is the embedded industry's smallest, lightest, ultra-rugged embedded x86 computer. This complete embedded computer is designed to withstand extreme temperature, impact, and vibration.

Model	Processor	CPU Cores	Speed	RAM	eMMC Flash	Cooling
VL-EPU-3310-EAP	Atom E3815	1	1.46 GHz	2 GB	None	Heat plate
VL-EPU-3310-EBP	Atom E3827	2	1.75 GHz	2 GB	4 GB	Heat plate
VL-EPU-3310-EDP	Atom E3845	4	1.91 GHz	4 GB	8 GB	Heat plate

Highlights

- A complete x86 embedded computer
- -40° to +85°C Operating Temperature
- Extremely small (55 x 84 x 22 mm)
- Shock & vibration per MIL-STD-202G
- 4th Generation Intel® Atom™ processor ("Bay Trail")
  - E3845 (quad core) or
  - E3827 (dual core) or
  - E3815 (single core)
- Up to 4GB DDR3L soldered-on RAM
- Gigabit Ethernet
- LVDS video output
- Mini PCIe Socket / with mSATA support
- USB 2.0 ports
- Serial I/O
- SATA
- Wide Input Voltage Range - 8 to 17 volts
- Fanless operation

For more information, visit: www.versalogic.com/hawk

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