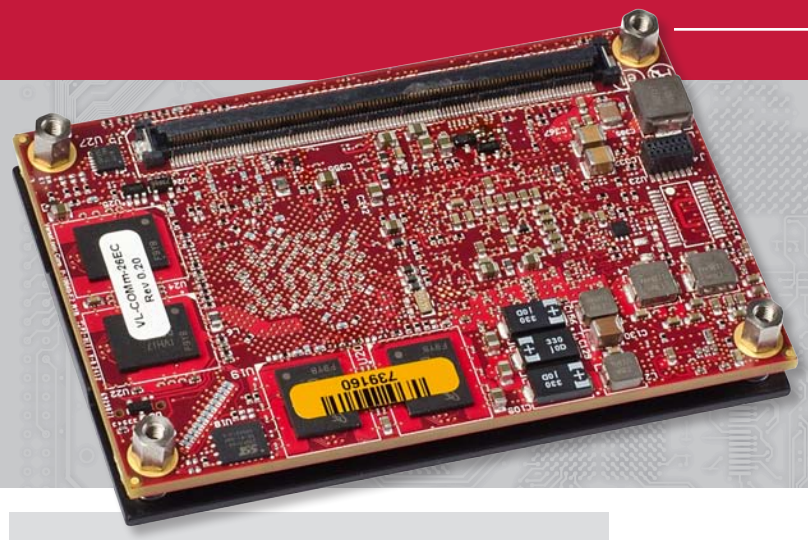
VERSALOGIC CORPORATION

# VL-COMm-26

## COM Express Mini CPU Module



- Extremely small COM Express™ mini form factor
- Intel® Atom™ E6x0T processor
- Industrial temp. (-40° to +85°C)
- Class 3 manufacturing (optional)
- Wide input voltage (8V–17V)
- On-board Trusted Platform Module (optional)

## Highlights

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

**Intel Atom E6x0T Processor**
1.6 GHz performance. Low power consumption.

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

**Class 3 Manufacturing** (optional)
For applications where extreme reliability is essential.

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

**Trusted Platform Module** (optional)
On-board security option defends against attacks from unauthorized hardware and software.

**Fanless Operation**
No moving parts required for CPU cooling.

**Wide Input Voltage Range**
Accepts 8 to 17 volts (12V typ.).

**High-performance Video**
Graphics core supports MPEG-4/H.264 and MPEG-2 encoding and decoding.

**Network**
Gigabit Ethernet (GbE) with remote boot support.

**RAM**
Up to 2 GB soldered-on DDR2 RAM.

**I/O Interfaces**
SATA, PCIe, USB host/client, serial, HD audio, LPC, SMBus, and CAN.

**Flash Memory**
On-board microSD™ socket and SDIO interface for plug-in flash storage.

RoHS

## Overview

The VL-COMm-26 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-26 has been engineered to meet the military and medical industries' requirements for smaller, lighter, and lower power embedded systems while adhering to stringent regulatory standards. The VL-COMm-26 is manufactured to IPC-A-610 Class 2 standards. For extremely-high-reliability applications, IPC-A-610 Class 3 (modified) versions are available. This embedded computer module, equipped with an Intel Atom E6x0T processor, is designed to withstand extreme temperature, impact, and vibration.

## Details

Driven by an Intel Atom E6x0T processor, the VL-COMm-26 provides significant performance and lower power consumption (7W–8W typical) in a very compact package. The VL-COMm-26 provides compatibility with a broad range of standard x86 application development tools for reduced development time.

The VL-COMm-26 utilizes advanced Intel technologies to maximize performance. Intel Hyper-Threading Technology (Intel HT Technology) provides two processing threads per physical core which allows applications to work in parallel and complete tasks sooner. Intel Virtualization Technology allows one VL-COMm-26 system to function as multiple "virtual" platforms. This enables computing activities to be isolated into separate partitions for increased application flexibility and reliability. Enhanced Intel SpeedStep® Technology enables high performance while meeting the power-conservation needs of embedded systems by switching voltage and frequency levels in response to processor load.

The integrated Intel GMA600 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 Type 10 pin-out provides industry-standard system interfaces including Gigabit Ethernet with network boot capability, seven USB ports, three x1 PCIe lanes, two serial interfaces, Intel High-Definition Audio (HDA), LPC, and SMBus to the carrier board. An auxiliary board-to-board connector provides two additional serial interfaces and a CAN interface. Dual SATA 3 Gb/s interfaces support high-capacity storage. A microSD socket provides flexible solid-state drive (SSD) options.

For enhanced security, the VL-COMm-26 supports Execute Disable Bit functionality. This hardware-based security feature reduces exposure to viruses and malicious-code attacks by preventing harmful software from executing and propagating on the network. An optional on-board Trusted Platform Module (TPM) is available for applications that require additional hardware-level security functions.

# VL-COMm-26

## COM Express Mini CPU Module

Designed and tested for industrial temperature (-40º to +85ºC) operation, the rugged VL-COMm-26 also meets MIL-STD-202G specifications for shock and vibration. Soldered-on RAM provides additional ruggedization for use in extremely harsh environments. Heatsink or heat plate versions provide fanless heat dissipation. Thermal monitoring technologies protect the system from thermal failure by reducing power consumption when required to remain within normal thermal operating limits.

A wide input voltage range of 8 to 17 volts (12V typ.) simplifies system power supply requirements. It is fully compatible with 12V automotive-type power systems.

The VL-COMm-26 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 a Trusted Platform Module, conformal coating, BGA underfill, IPC Class 3 (modified) construction, BIOS/splash screen configuration, application-specific testing, BOM revision locks, special labeling, etc.

As a mate to the VL-COMm-26, VersaLogic can design and manufacture carrier boards that meet your exact requirements for an embedded system. Please contact a VersaLogic Sales Engineer for more information.

## Ordering Information

| Model | Processor | Speed | RAM | Cooling |
|---|---|---|---|---|
| VL-COMm-26EAP* | Atom E620T | 0.6 GHz | 512 MB | Heat plate |
| VL-COMm-26EBP | Atom E640T | 1.0 GHz | 1 GB | Heat plate |
| VL-COMm-26ECP | Atom E680T | 1.6 GHz | 1 GB | Heat plate |
| VL-COMm-26EDP* | Atom E680T | 1.6 GHz | 2 GB | Heat plate |
| VL-COMm-26EAK* | Atom E620T | 0.6 GHz | 512 MB | Heatsink |
| VL-COMm-26EBK | Atom E640T | 1.0 GHz | 1 GB | Heatsink |
| VL-COMm-26ECK | Atom E680T | 1.6 GHz | 1 GB | Heatsink |
| VL-COMm-26EDK* | Atom E680T | 1.6 GHz | 2 GB | Heatsink |

** Special order*

## Accessories

| Part Number | Description |
|---|---|
| **Carrier Boards** | |
| VL-BBm-10E-xxxx | Carrier board, 5 mm board spacing, AUX connector, Class 2 |
| **Solid-State Storage (Flash Memory)** | |
| VL-F41-xxxx | microSD card (SDIO), SLC, industrial temp. |
| **Hardware** | |
| VL-HDW-405 | Secondary mounting plate. Simplifies installation in many situations. Attaches to heat plate models. |
| **Miscellaneous** | |
| VL-HDW-401 | Thermal compound paste (1.75g) |

## Specifications

| | | |
|---|---|---|
| **General** | Form Factor | COM Express mini (Type 10): 55 mm x 84 mm (2.17" x 3.31") |
| | Processor | Intel Atom E6x0T platform. 512K 8-way L2 cache. Intel Hyper-Threading Technology (HT), Virtualization Technology (VT), Enhanced SpeedStep Technology, Thermal Monitoring Technologies, and Execute Disable Bit. |
| | Chipset | Intel EG20T Platform Controller Hub (PCH) |
| | Battery | Connection for 3.0V RTC backup battery |
| | Power Requirements (@ +12V) § | Model / Idle / Typical / Max. / S3<br>VL-COMm-26EAx: 7.2W / 7.4W / 7.6W / 3.0W<br>VL-COMm-26EBx: 7.3W / 8.0W / 8.7W / 3.0W<br>VL-COMm-26ECx: 7.3W / 8.4W / 9.5W / 3.0W<br>VL-COMm-26EDx: 7.3W / 8.4W / 9.5W / 3.0W |
| | Input Voltage | 8V–17V (nominal 12V operation) |
| | System Reset & Hardware Monitors | All voltage rails monitored. Watchdog timer with programmable timeout (1 µS to 10 min.). |
| | Manufacturing Standards | Standard: IPC-A-610 Class 2<br>Custom: IPC-A-610 Class 3 (modified) |
| | Regulatory Compliance | RoHS compliant |
| **Environmental** | Operating Temperature | -40° to +85°C. Derate -1.1°C per 305m (1,000 ft.) above 2,300m (7,500 ft.). ¤ |
| | Storage Temperature | -40° to +85°C |
| | Cooling | Fanless. Heatsink or bolt-down heat plate. |
| | Airflow Requirements | Heat plate models: -40° to +85°C (*Heat plate must be kept below 90°C*) — Zero airflow<br>Heatsink models: -40° to +60°C — Zero airflow; +60° to +85°C — 300 LFM |
| | Altitude ¤ | Operating: To 15,000 ft. (4,570m)<br>Storage: To 40,000 ft. (12,000m) |
| | 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 |
| **Security** | TPM (optional) | Support for Intel Trusted Platform Module 1.2 devices |
| **Memory** | System RAM | Up to 2 GB soldered-on DDR2 SDRAM. 800 MT/s. |
| **Video** | General | Intel GMA600 high-performance graphics core. Advanced 2D/3D graphics. Hardware-accelerated video encode and decode. |
| | VRAM | Up to 256 MB + 384 MB shared DRAM |
| | Desktop Display Interface π | SDVO supports a variety of signaling interfaces including VGA and DVI. Up to 1920 x 1080 (50 Hz) or 1280 x 1024 (85 Hz). |
| | OEM Flat Panel Interface π | Single-channel LVDS interface. 18/24-bit. Up to 1280 x 768 (60 Hz). |
| **Mass Storage** | Rotating Drives / Flash / Solid-State Drives ‡ | Two SATA 3 Gb/s ports π<br>microSD socket supports up to 32 GB. SDIO interface supports SD, SDIO, and MMC. |
| **Network Interface** | Ethernet † π | One autodetect 10BaseT/100BaseTX/1000BaseT port. Network boot option. |
| **Type 10 I/O Interfaces** | USB ‡ | Six host and one client USB 2.0 ports |
| | COM 3 / 4 # | CMOS levels. 16C550 compatible. 1 Mbps max. |
| | Audio | Intel High-Definition Audio (HDA) CODEC |
| | PCIe | Three x1 PCIe (Gen 1) lanes |
| | SMBus | 1 MHz |
| | LPC | 33 MHz |
| | Control | Wake, reset, and power |
| **Auxiliary I/O Interfaces** | CAN † | 2-wire CAN port |
| | COM 1 # | CMOS levels. 16C550 compatible. 1 Mbps max. Handshake lines. |
| | COM 2 # | CMOS levels. 16C550 compatible. 1 Mbps max. |
| **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*

*¤ Extended altitude specifications available upon request*

*π Available via Type 10 I/O connector*

*# COM1 and COM2 ports are available only when the auxiliary board-to-board connector is used*

*¥ 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.*

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