SBC346

4th Generation Intel® Core™ i7-based Rugged 3U VPX Single Board Computer

Features

- Single slot 3U VPX single board computer
- 4th Generation Intel® Core™ i7 quad core processor (6 MB shared cache)
- Two channels of soldered DDR3L SDRAM with ECC up to 16 GB
- Up to 32 GB NAND Flash
- Rear I/O:
  - Up to 3x Gigabit Ethernet ports (either one 1000BASE-T plus two 1000BASE-BX or two 1000BASE-T)
  - 1x VGA port
  - 2x SATA 6 Gb/s ports
  - 2x COM ports
  - Up to 3x USB 2.0 ports
  - Audio (available on some variants)
  - Up to 8x GPIO
- Five levels of ruggedization (convection and conduction cooling variants)
- AXIS and Deployed Test Software
- Microsoft® Windows, Open Linux® and VxWorks® support

The SBC346 Rugged Single Board Computer (SBC) from GE Intelligent Platforms features the high performance, highly integrated 4th Generation Core i7 processor platform from Intel.

The 4th Generation Core i7 offers integrated graphics and memory controller plus quad core processing up to 2.4 GHz all in one device. Coupled with the Mobile Intel QM87 Express Chipset, this provides an unmatched level of I/O bandwidth for both on-board and off-board functions.

Features of the 4th Generation Core i7

- Graphics support for DX11.1, OpenCL 1.2, OpenGL 3.2
- 5 to 15% CPU performance boost over 3rd generation
- Intel TurboBoost Technology
- Intel AVX 2.0 extensions and AES-NI instructions
- Hardware-assisted security features
- Hyper-Threading Technology – two threads per core

The SBC346 is designed to offer maximum PCIe® bandwidth to the backplane with a total of 21 (x4, x16, x1) PCIe lanes across the

P1 and P2 connectors. The x16 link is ideal for connection to ultra-high performance GPGPU modules such as the GRA112.

Memory resources include 16 GB DDR3L SDRAM, up to 32 GB NAND Flash (SSD), 32 MB BIOS Flash and 16 MB BIOS backup Flash.

The SBC346 is designed to meet the requirements of a wide range of applications from industrial through to fully rugged defense and aerospace programs. It offers extended temperature capability and a range of air- and conduction cooled build levels.

A rich software choice is planned for the SBC626, including comprehensive Deployed Test Software (FSP-enabled BIT, and BCS) plus operating system support for Microsoft Windows 7, Open Linux (Fedora), Red Hat® Enterprise Linux, Wind River Linux, and VxWorks. Examples and assistance are also available for integrating 'chain of trust' operation (from power-up to application start), plus Wind River's FSP-enabled VxWorks Boot Loader, into system scenarios.

SBC346 Intel 4th Generation Core i7-based Rugged 3U VPX Single Board Computer

Specifications

Processor
- Intel 4th Generation Core i7 Processor
- i7-4700EQ (Quad Core) @ 2.4 GHz (47W) base frequency, up to 3.4 GHz TurboBoost (Note: CPU speed is dependent on environment, consult manual for details)
- 22 nm monolithic die processing technology
- 6 MB Last Level Cache

SDRAM
- 16 GB DDR3L SDRAM soldered with ECC

Non-Volatile RAM
- 512 kB FRAM

On Board Solid State Disk Drive (SSD)
- Up to 32 GB

BIOS
- 2x 16 MB SPI Flash for BIT and BIOS plus 1x 16 MB SPI Flash for Recovery

Fabric Interface
- x4 PCIe from a Gen 3-capable switch to P1, DMA and configurable as Non-Transparent (NTB) for peer-to-peer capability
- x16 PCIe from Gen 3-capable CPU to P1/P2
- x1 PCIe from a Gen 3-capable switch to P2

Control Plane (Gig Ethernet)
- ETH0 is available as a build option and is driven from QM87 (VPRO-compliant) to P1 as 1000BASE-T
- ETH1 and ETH2 are routed to P1 and are configured as 1000BASE-BX by default. Optionally ETH1 can be configured as 1000BASE-T: ETH2 is then unused.

Management Plane
- Baseboard Management Controller (BMC) in accordance with VITA 46.11

USB Ports
- Three USB 2.0 ports (USB0, USB1, USB2) are routed to P1 connector (two share pins with GPIO lines and are a build option)

Serial Ports
- Two 165C50 compatible async serial ports are available on P1 and P2
- COM1 can be configured as a 4-wire RS-232 port or an RS-422 port with TxD/RxD
- COM2 shares pins with various ancillary signals and can be configured as a 2-wire RS-232 port or a 4-wire RS-232/422 port

Audio
- High Definition Audio Controller and Codec
- Stereo line in and stereo line out
- Available as an option in place of ETH0

Video
- One VGA port routed to P2

SATA
- Two SATA ports (SATA0, SATA1) are always available on P1 and P2. Both ports are 6 Gb/s capable

GPIO
- Up to 8 GPIO pins (5V Tolerant) all of which share pins with other functions – so number is dependent on variant selected
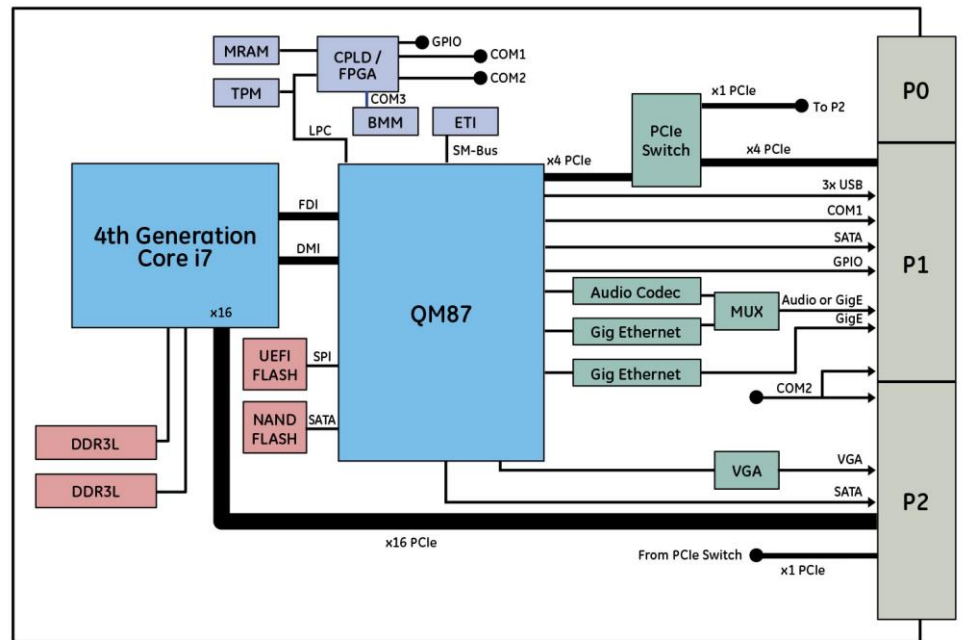
LED
- 3x status LEDs and four BIT status

OpenVPX Profile Compatibility
- MOD3-PAY-2F2T-16.2.5-3 (Board configured for 2x 1000BASE-T ports)
- MOD3-PAY-2F2U-16.2.3-3 (Board configured for 2x 1000BASE-BX ports)

Block Diagram

Power Requirements
- +5V (Vs3) for main power
- +3.3V for P3V3_AUX is required

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Watchdog/ Timers/ TPM / ETI
- Software programmable watchdog
- Timers in PCH (SW programmable)
- TPM (Trusted Platform Monitor)
- ETI (Elapsed Time Indicator)

Temperature Sensor
- Board, CPU and PCIe switch temperature sensors

Other Hardware Feature
- Hardware Write Protection

Transition Module
- SBC340RTM (6U high for use in SCVPX3U starter cage)

Environmental

	Level 1	Level 2	Level 3	Level 4	Level 5
Cooling Method	Convection	Convection	Convection	Conduction	Conduction
Conformal Coating	Optional	Standard	Standard	Standard	Standard
High/Low Temp	0 to +55° C	-20 to +65° C	-40 to +75° C	-40 to +75° C	-40 to +85° C
Operational	(300 ft/m)	(300 ft/m)	(600 ft/m)	At cold wall	At cold wall
Random Vibration	$0.002g^2$/Hz*	$0.002g^2$/Hz*	$0.04g^2$/Hz**	$0.1g^2$/Hz**	$0.1g^2$/Hz**
Shock	20g***	20g***	20g***	40g***	40g***

*With a flat response to 1000 Hz, 6 dB/Oct roll-off from 1000 to 2000 Hz   ** From 10 to 1000 Hz   *** Peak sawtooth 11 ms duration
Note: 1) Processor performance and temperature are inter-dependent. For a given temperature, a maximum speed is achievable, and conversely for a given processor speed a maximum temperature is achievable. Consult the product manual for details. 2) Inter-board data and expansion plane bandwidth will be highly dependent on design for high speed signal integrity at system level. Consult GE for more information.

GE Intelligent Platforms Contact Information

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Global regional phone numbers are listed by location on our web site at **defense.ge-ip.com/contact**

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