



# SBC324

## 3U VPX 2<sup>nd</sup> Generation Intel® Core™ i7 based Single Board Computer

### Features

- 3U OpenVPX Single Board Computer
- 2<sup>nd</sup> Generation Intel Core i7 dual and quad core processors
- Dual-channel DDR3 (up to 8 GB) @ 1333 MHz
- Up to 32 GB NAND Flash
- 512 kB MRAM (non-volatile storage)
- Multiple PCIe fabric backplane configurations
  - x16 PCIe GEN 2 option (no XMC)
  - 4x PCIe GEN 2 with NTB capability, also GEN 1 x1 PCIe
- 1x XMC Site with I/O
- 2x 10/100/1000BaseT
- HD Audio
- 2x RS-232/422 COM ports
- 1x PS/2 Keyboard and mouse
- 2x SATA (6 Gb/s)
- 1x VGA
- 4x USB 2.0
- 6x Single-Ended GPIO (5V tolerant)
- Watchdog, Timers, Sensors
- BMM (Board Management Microcontroller), ETI, TPM
- VITA65 OpenVPX Compatible
  - MOD3-PAY-2F2T-16.2.5-3
  - MOD3-PAY-2F-16.2.7-1
- Deployed Test Software
- Windows®, Linux® and Real-Time OS support
- Five Levels of Ruggedization

The SBC324 Rugged Single Board Computer (SBC) from GE Intelligent Platforms features the high performance, highly integrated 2<sup>nd</sup> Generation Core i7 processor platform from Intel.

2<sup>nd</sup> Generation Core i7 with fully integrated graphics and memory controller plus dual and quad core processing up to 2.5 GHz offers better performance per watt — all in one device. Coupled with the Intel QM67 chipset, this provides an unmatched level of I/O bandwidth for both on-board and off-board functions.

### Features of the 2<sup>nd</sup> Gen Core i7 processor

- Intel® vPro technology:
  - Intel® VT adds hardware assisted performance acceleration
  - Intel® TXT is a hardware based security foundation to build and maintain a chain of trust, to protect the platform from software based attacks
- Advanced Vector Extensions (AVX) signal processing
  - Intel's AVX doubles the vector register size from 128 to 256 bits for up to a 2x FLOP improvement

- Advanced Encryption Standard (AES)
- Intelligent performance on-demand with Intel Turbo Boost Technology
- Hyper-Thread Technology – Up to 4 processing cores (2 threads per core) – provides increased performance and processing efficiency

In addition to a comprehensive range of onboard IO features, the SBC324 also offers an on-board XMC mezzanine expansion site for enhanced system flexibility. Memory resources include up to 8 GB DDR3 SDRAM with ECC, 32 GB NAND Flash, and optional hard drive via XMC.

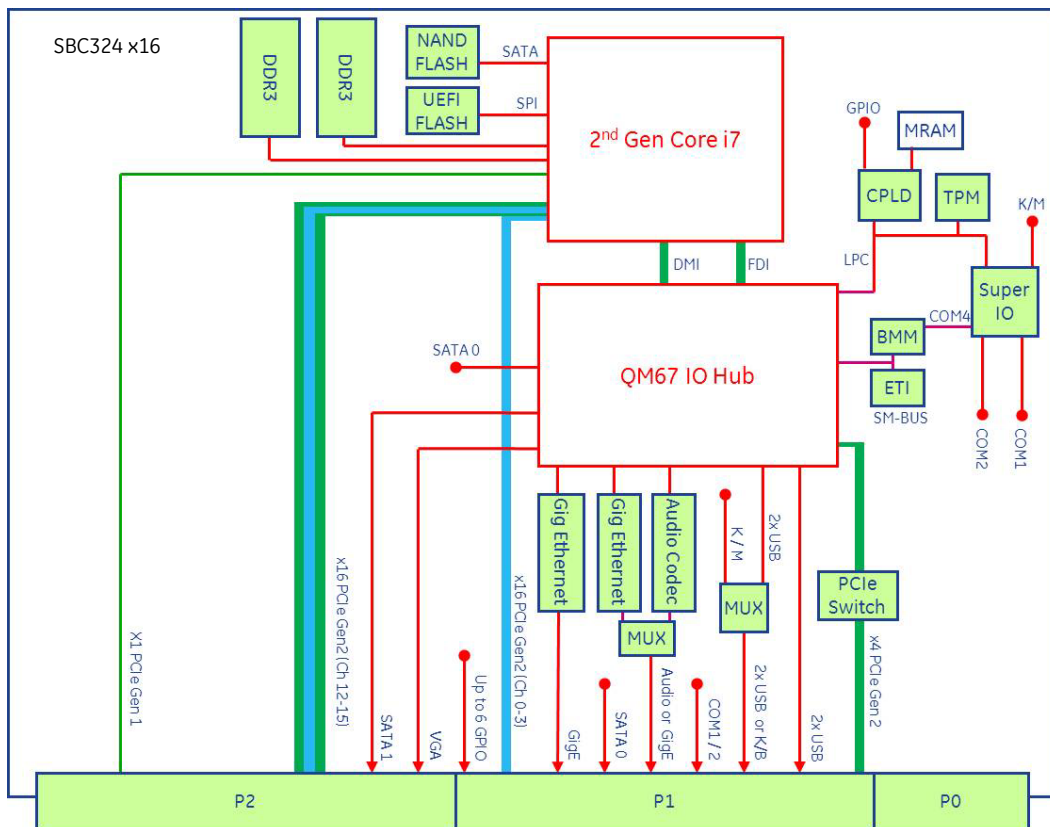
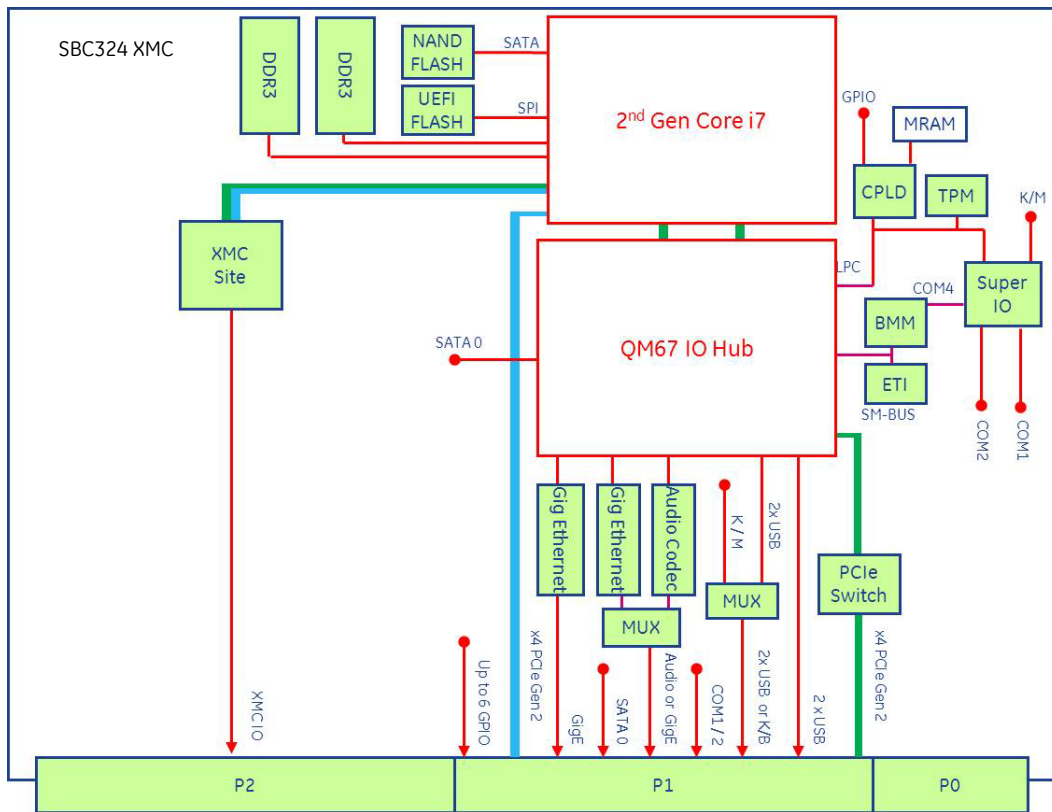
The SBC324 is designed to meet the requirements of a wide range of applications from industrial through to fully rugged Defense and Aerospace programs. It offers extended temperature capability and a range of air and conduction cooled build levels.

A rich software choice is planned for the SBC324, including comprehensive Deployed Test Software (BIT and BCS) plus OS support for Windows 7, Open Linux, VxWorks®, LynxOS® and LynxOS-SE®



# SBC324 - 3U VPX 2<sup>nd</sup> Generation Intel Core based Single Board Computer

## Block Diagram



# SBC324 - 3U VPX 2<sup>nd</sup> Generation Intel Core based Single Board Computer

## Specifications

### Processor

- Intel 2<sup>nd</sup> Gen. Core i7 Processor, options include but are not limited to
  - i7-2715QE (Quad core) @ 2.1 GHz (45W)
  - i7-2655LE (Dual core) @ 2.2 GHz (25W)
  - i7-2610UE (Dual core) @ 1.5 GHz (17W) (Actual speed/power depends on environment)
- 32nm monolithic die processing technology
- Last Level Cache
  - 6 MB (Quad i7)
  - 4 MB (Dual i7)

### SDRAM

- Maximum memory configuration of up to 8 GB DDR3 SDRAM @ 1333 MHz soldered with ECC

### Flash Memory

- Soldered NAND flash array up to 32 GB

### Ethernet

- Dual Gigabit Ethernet interface via Intel's 82574
- Gigabit Ethernet controllers – routed to VPX P1

### USB Ports

- Up to 4x USB 2.0 ports routed to VPX P1
- 2x ports available if GPIO and PS/2 are utilized

### Fabric Interface

- Allows high speed PCI Express connections to other cards in the system
  - x4 PCIe VPX P1; configurable as Non-Transparent (NTB) for peer-to-peer capability
  - x4 / x16 PCIe (split across P1/P2), x16 available without XMC
  - Also GEN 1 x1 PCIe

### Keyboard and Mouse

- 1x PS/2 port routed to P1, multiplexed signal with GPIO

### OpenVPX Profile

- Module Profile: MOD3-PAY-2F2T-16.2.5-3
- Module Profile: MOD3-PAY-2F-16.2.7-1

### Serial Ports

- Two 16550 compatible full duplex async serial ports
  - COM1 routed to VPX P1 RS-232/422
  - COM2 routed to VPX P2 RS-232/422
- Ports feature independent 16-byte FIFO supporting baud rates up to 115 Kbaud

### Serial ATA

- 2x SATA Revision 3.0 capable (6 Gb/s)
- One routed to VPX P1; the other to VPX P2
- SATA port on P2 is a multiplexed signal with XMC IO

### Audio

- High Definition Audio Codec
- Stereo line in and stereo line out

### Video Controller

- 1x VGA port routed to VPX P2; multiplexed signal with XMC IO

### General Purpose I/O

- Up to 6x GPIO (P1 rear IO), TTL 5V tolerant GPIO each capable of generating an interrupt.

### XMC Expansion Slot

- x8 PCIe XMC site (P2 rear IO)
- 8 differential pairs, plus 12 differential pairs, plus 24 single-end signals

### NVRAM / RTC / Watchdog / ETI / TPM / BMM

- 512kB non-volatile RAM (MRAM)
- Real-time clock in CPLD (software programmable)
- Watchdog timer (software programmable)
- Elapsed Time Indicator (record power cycles and on-time)
- TPM (Trusted Platform Module)
- Baseboard Management Controller

### LED

- 1x power
- 4x BIT status (software control)

### Power Requirements

- +5V / 3.3V required
- +/-12V for XMC/PMC module only

### Temperature Sensor

- Onboard ambient temperature; CPU

Note: The SBC324 is designed to provide flexibility and scalability to the user. Use of the XMC I/O affects the availability of other I/O features. Due to the nature of multiplexed signals, I/O configurations also may be limited. Please contact your GE Intelligent Platforms representative for viable configurations.

	SBC324-xxxx0xxx	SBC324-xxxx1xxx
XMC IO	1	-
x16 PCIe	-	1
x4 PCIe	2	1
x1 PCIe	-	1
COM	2	2
USB	2	2
K / M	-	Either / or 1
GigE	2	1
Audio	-	1
SATA	1	2
VGA	-	1
GPIO	6	2

## 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 <sup>2</sup> /Hz*	0.002g <sup>2</sup> /Hz*	0.04g <sup>2</sup> /Hz**	0.1g <sup>2</sup> /Hz**	0.1g <sup>2</sup> /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

## About GE Intelligent Platforms

GE Intelligent Platforms, a General Electric Company (NYSE: GE), is an experienced high-performance technology company and a global provider of hardware, software, services, and expertise in automation and embedded computing. We offer a unique foundation of agile, advanced and ultra-reliable technology that provides customers a sustainable advantage in the industries they serve, including energy, water, consumer packaged goods, government and defense, and telecommunications. GE Intelligent Platforms is a worldwide company headquartered in Charlottesville, VA and is part of GE Home and Business Solutions. For more information, visit [defense.ge-ip.com](http://defense.ge-ip.com).

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