VX3044

VPX **OpenVPX**™

3U VPX 3RD GENERATION INTEL® CORE™ I7 SINGLE BOARD COMPUTER

▶ Intel® Core™ i7 – 3612QE – Quad-Core™

▶ Dual Ethernet 10G or 1G

▶ PCI Express Gen 3.0, with Kontron VXFabric™

▶ Up to 16 GB SDRAM with ECC and 32 GB Soldered SATA NAND Flash

▶ Extended Life Cycle, Air-Cooled and Conduction-Cooled Versions

POSSIBILITIES START HERE **Kontron**

PRODUCT OVERVIEW

VX3044 is the Kontron 3U VPX rugged Single Board Computer equipped with multiple Ethernet 10G. This SBC implements a new architecture poised to address specific applications and offer the ultimate performance for the Military, Aerospace and Transportation markets.

Based on Intel®'s high performance computing architecture, and supported by Kontron Long Term Supply (LTS) services, VX3044 offers the best feature set.

TARGET APPLICATIONS

High Performance Embedded Computing (HPEC)

Used in clusters, VX3044 provides the highest computing density in 3U VPX form factor. Backed up by a powerful I/O backbone (gen3 PCIe and Ethernet 10G), switch boards for PCIe (VX3905) and ETHERNET (VX3910) plus turnkey pre-installed OS . VX3044 solutions complete the quickest route from the lab to the field for HPEC applications.

STANDARDS

▶ 3U VPX VITA 46, OpenVPX VITA 65, VPX REDI VITA 48

▶ Single CPU: compatible with all existing legacy application x86 codes

SWAP-C

▶ Four Execution Threads: compact 4-way SMP solution for parallel computing tasks at low power, low size

▶ Turbo Boost: overclocked operation of a single-threaded workload in the same power envelope

▶ Integrated Graphics Controller with three simultaneous DisplayPorts: for all HMI applications

SAFETY CRITICAL

▶ Two channels of DDR3 soldered memory with ECC: performance and security

▶ 1 Mb of permanent Ferroelectric Random Access Memory (F-RAM) allowing permanent retention of application key operational data

▶ 8 MB of System Flash with Recovery BIOS Image and permanent storage of BIOS parameters

CONNECTIVITY

▶ 8 lanes of gen3 PCIe to the backplane: I/O extensions at peak bandwith. Designed for PCIe Gen3 8GB/s

▶ 4 SATA ports to the backplane: for secure RAID storage applications

VERSATILITY

VX3044 boards is available in Standard Air- (SA) and Rugged Conduction-cooled (RC) versions and is compatible with 1"(5HP) slot pitch.

COMPATIBILITY: CERTIFIED SOLUTION

VX3044 boards is compatible with all Kontron VPX building blocks (Payload boards, carriers, switches, backplanes, OS and drivers) and offer backward compatibility with the previous product generations (VX303x SBCs).

Write the code once, run on all the product line. VX3044 is proposed with Kontron VXFabric™ technology which implements TCP/IP protocol over the PCI Express infrastructure.

With 8x PCIe 3.0, running at 8GB/s (theoretical), applications developed previously with VXFabric on VX3030 or VX3035 will enjoy a TCP/IP on PCIe bandwith exceeding 4 GB/s (measured) without any code change.

LONG TERM SUPPLY (LTS)

The VX3044 SBC is part of the Kontron Extended Life Cycle product family, which offers a 15-year life cycle organization on top of Intel® embedded product line silicon life cycle. Available in Kontron 3U VPX development systems, along with 3U VPX carriers and 3U VPX Ethernet plus PCIe switches, the VX3044 is the ideal candidate for long term programs in search of compact high performance parallel computing solutions.

EXAMPLE OF TARGET APPLICATIONS

PROCESSOR		Third Generation Intel® Core™ i7 processor (22-nanometer silicon technology): ► Intel® Core™ i7-3612QE Processor (6M cache, 4 execution cores, 8 threads) ► Quad Core, 35W–2.1 GHz ► Integrated Graphics Core, Intel® HD graphics 4000
ONBOARD CONTROLLER	Platform Controller Hub	Mobile Intel® QM77 Express Chipset: ► Up to 6 Gb/s integrated Serial ATA host controllers ► USB 2.0 & 3.0 host interface
	Graphics	Integrated Graphics Core, Intel® HD graphics 4000 Up to 3 simultaneous graphics heads: ► One mini DisplayPort on front panel ► Two DisplayPorts available on VPX backplane.
	Gigabit Ethernet	► One i82599 10/1 Gigabit Controller connecting two SerDes links (10GBASE-KR or 1000BASE-BX) on VPX backplane ► 10GBASE-KR links can be used for backplane board interconnect and/or for SFP+rear cage according SFI specification (redriver recommended) ► One i82579 PHY connected on front panel or VPX backplane (user selection) for 1000BASE-T operation
	Watchdog	PLD-based, timeout ranging from 2 μs to 510s, IRQ, Reset, dual-stage
	System CPLD	One CPLD Board controller for power sequencing, reset handling, monitoring, failure detection, VPX I2C communication. Provides configuration/status registers on LPC interface
	RTC	Separated low power RTC with optional onboard battery
	SIO	SIO1028 provides two serial lines
MEMORY	System Memory	Up to 16 GB dual channel DDR3 SDRAM running at 1600 MHz, with ECC, soldered
	Flash (uEFI BIOS)	8 MB FLASH, with recovery image and uEFI BIOS settings
	EEPROM	One serial 256 Kbit EEPROM dedicated to system data One serial 256 Kbit EEPROM dedicated to application data
	NAND Flash Option	Up to 32 GB SATA Nand Flash storage
FRONT INTERFACES 4HP (0,8") OR 5HP (1")	Graphics	1x mini DisplayPort connector
	USB	1x USB 2.0 ports, 4-pin standard USB connectors
	Gigabit Ethernet	1x RJ-45 connectors: Ethernet 1000BASE-T *Note:* This port is configurable from the BIOS to be routed to the VPX P1 connector instead of the front connector
	Serial	1x RJ-12 connector: EIA-232/EIA-485 UART interface for CPU
	LEDs	5 LEDs reporting the board CPU health status and activity
	Reset	Reset push button
ONBOARD INTERFACES	CPU Debug Interface	XDP port for CPU extended debug port connection (only available on a debug connector and need additional test board for XDP access)
	XMC Slot	One 8x PCIe to the XMC slot, x8d VITA 46.9 XMC I/O routing, plus 4 single ended pins With thermal limitation on SA Version, Contact us for more details
VPX INTERFACE	Slot Profiles	SLT3-PAY-2F2U-14.2.3 SLT3-PAY-1F1F2U-14.2.4 SLT3-PAY-1F1U-14.2.10

	Rear I/O via P0/P1/P2	The VX3044 supports:
		► 1 x8 gen3 PCIe, non transparent capability, on P1
		   1x1 additional PCIe interface, gen2, on P2
		► 2 SATA 3 links on P1
		   2 additional SATA 2 links on P2
		► 2 USB 2.0 and 1 USB 3.0 links on P1
		   2 additional USB 2.0 links on P2
		► 2 SerDes 10GBASE-KR, SFP+/SFI or 1000BASE-BX on P1
		► 1 1000BASE-T on P1, optional 2nd 1000BASE-T on P2
		► 3 User GPIOs on P1, including OpenVPX GDISCRETE1, and MASKABLE RESET and 3 additional GPIOs on P0
		► 2 DisplayPort on P2

	Supervisory Functions	► Non Maskable RESET, ► NVMRO, SMB 0 and SMB 1 interfaces for Status, Start , Reset. Compatible with Kontron CMB (Monitoring Board), temperature and voltage sensors on the board ► PCIe optional use of common reference clock feature
	Power Supplies	On P0: VS1=12V, VS3=5V, 3.3V_AUX optional, +12V_AUX and VS2 (3.3V) not connected

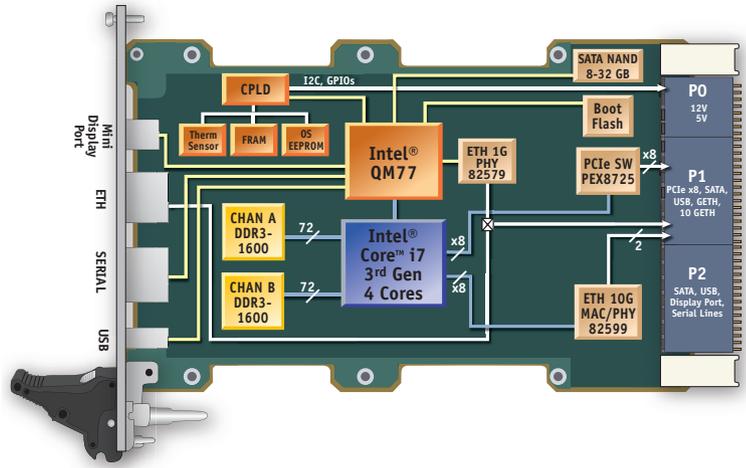## ▶ MEASURED PERFORMANCE

MEASURED BANDWIDTH VX3042 & VX3044	
5.6 GBytes/sec	PCIe on VPX backplane (DMA raw mode)
3.9 GBytes/sec	TCP/IP on PCIe on VPX backplane (VXFabric™)
1.1 GBytes/sec	10 GETH link on VPX backplane (9.2 Gb/s)

MEMORY BANDWIDTH - VX3044	
Read	17.2 GBytes/sec
Write	15.1 GBytes/sec

AVERAGE POWER CONSUMPTION	
VX3044-SA	44W
Conditions	CPU load = 75%, CPU Temp = 70°C - Turbo Off

▶ ENVIRONMENTAL SPECIFICATION

	SA - STANDARD COMMERCIAL (1" single height passive module heat sink, forced air)	RA - RUGGED AIR-COOLED (Optional)	RC - RUGGED CONDUCTION-COOLED (Depending on processor frequency)
CONFORMAL COATING	Optional	Standard	Standard
AIRFLOW	26 cfm	TBD	NA
TEMPERATURE	VITA 47-Class AC1	VITA 47-Class AC3	VITA 47-Class CC3, CC4 option
COOLING METHOD	Convection	Convection	Conduction
OPERATING	0° to +55°C	-40° to +71°C	-40° to +71°C, +85°C option
STORAGE	-45° to +85°C	-45° to +100°C	-45° to +100°C
VIBRATION SINE (OPERATING)	20-500 Hz - 2g	5-2,000 Hz - 3g	20-2,000 Hz - 5g
RANDOM	VITA 47-Class V1	VITA 47-Class V2	VITA 47-Class V3
SHOCK (OPERATING)	20g/11 ms Half Sine	40g/11 ms Half Sine	40g/11 ms Half Sine
ALTITUDE (OPERATING)	–1,500 to 60,000 ft	–1,500 to 60,000ft	–1,500 to 60,000 ft
RELATIVE HUMIDITY	90% without condensation	95% without condensation	95% without condensation

▶ ORDERING INFORMATION

ARTICLE	ORDER CODE	DESCRIPTION
VX3044	VX3044-SA48-2010300 Fast Track Order Code, build to stock version	3U Single slot 5 HP (1") VPX SBC, 2.1 GHz Intel® Quad Core i7-3612QE SV Processor; 8 GB DDR3-SDRAM, 32 GB Sata Flash (MLC) on board, FRAM; I/O: 2x10 GbE, 3xUSB (1xUSB3), 4xSATA, PCIe x8 gen3; Air-Cooled VITA 47 Class AC1 (0°C to +55°C).
VX3044	VX3044-RC48-300D100 Fast Track Order Code, build to stock version	3U Single slot VPX SBC / 2.1 GHz Intel® Quad Core i7-3612QE SV Processor with on-board XMC slot; 8 GB DDR3-SDRAM, 16 GB Sata Flash (SLC), FRAM; I/O: 2x10 GbE, 3xUSB (1xUSB3), 4xSATA, PCIe x8 gen3; Front DisplayPort, 5 HP (1") if XMC installed, 4 HP (0.8") otherwise. Rugged Conduction-Cooled: VITA 47 Compliant, Class CC3 (-40°C to +71°C); Class CC4 (-40°C to +85°C) available upon request; specific conditions may apply; please contact us.
VX3044	VX3044-RC48-300N000	3U Single slot 4 HP (0.8") VPX SBC / 2.1 GHz Intel® Quad Core i7-3612QE SV Processor; 8 GB DDR3-SDRAM, 16 GB Sata Flash (SLC), FRAM; I/O: 2x10 GbE, 3xUSB (1xUSB3), 4xSATA, PCIe x8 gen3; Rugged Conduction-Cooled: VITA 47 Compliant, Class CC3 (-40°C to +71°C); Class CC4 (-40°C to +85°C) available upon request, specific conditions may apply, please contact us.

▶ CORPORATE OFFICES

EUROPE, MIDDLE EAST & AFRICA

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: + 49 821 4086 0
Fax: + 49 821 4086 111
info@kontron.com

NORTH AMERICA

14118 Stowe Drive
Poway, CA 92064-7147
USA
Tel.: + 1 888 294 4558
Fax: + 1 858 677 0898
info@us.kontron.com

ASIA PACIFIC

1~2F, 10 Building, No. 8 Liangshuihe 2nd Street,
Economical & Technological Development Zone,
Beijing, 100176, P.R.China
Tel.: +86 10 63751188
Fax: +86 10 83682438
info@kontron.cn

www.kontron.com