IC-ARM-VPX3b

3U VPX LX2080A/LX2160 Arm®-based Single Board Computer

- *3U VPX*
- *NXP LX2080A/LX2160A Arm® processor*
- *VITA 65 Slot Profile SLT3-PAY-1F4F2U-14.2.14 (partial)*
- *Data Plane: 10G or PCIe Gen3 interfaces*
- *Expansion plane PCIe Gen3*

Overview

Designed for applications requiring high processing and communication performance together with low power, the **IC-ARM-VPX3b** is a complete and versatile Single Board Computer dedicated to 3U VPX compact systems.

The **IC-ARM-VPX3b** partially complies with the VITA 65.0 OpenVPX Slot profile SLT3-PAY-1F4F2U-14.2.14.

This board provides the defense and industrial embedded electronic markets with the latest technological innovations through the NXP Layerscape® LX2160A multicore communication processor.

Description

The **IC-ARM-VPX3b** is equipped with a NXP Layerscape® LX2080A or LX2160A multicore communication processor with up to 16 cores up to 2.2GHz, two large banks of DDR4 with ECC support, local storage and 10/40G Ethernet interfaces for high bandwidth connections.

The processor hardware accelerator and large caches provides outstanding computing performance to the **IC-ARM-VPX3b** with powerful packet processing offload and Ethernet controllers.

For applications requiring optimized power dissipation, the **IC-ARM-VPX3b** is proposed with the low power Layerscape® family member processor referenced as LX2080A. This processor features 8 Arm® Cortex®-A72 32/64 bit cores, running at 1.8 GHz, 2.0GHz or 2.2GHz.

The **IC-ARM-VPX3b** features up to 32GB of DDR4-ECC and a variety of storage solutions (M.2 slot, eMMC, F-RAM, which provide flexibility for system designers to meet the topology demands of large centralized systems and handle scenarios with heavy traffic on specific backplane segments.

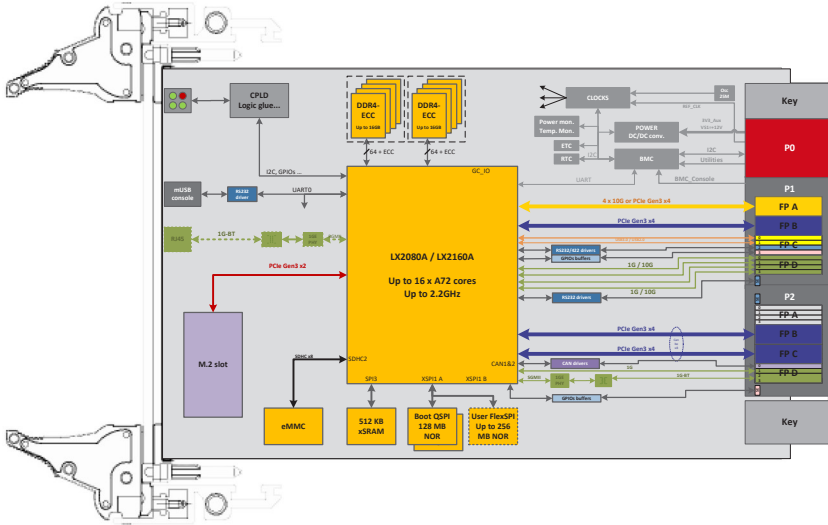Furthermore, the board offers a significant number of security features.

The **IC-ARM-VPX3b** is compliant with the VITA 46.0 standard 3U module definitions.

It is available in air-cooled and conduction-cooled versions.

Block Diagram

The **IC-ARM-VPX3b** is compliant with VITA 65.0 Slot Profile SLT3-PAY-1F4F2U-14.2.14.
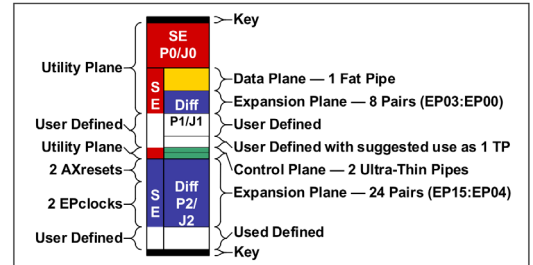

Figure 14.2.14-1 SLT3-PAY-1F4F2U-14.2.14

Main features

NXP Layerscape® LX2080A/LX2160A
- up to 2.2 GHz
- Up to 32 GB DDR4-ECC
- 128MB Quad SPI NOR Flash
- 512 KB F-RAM
- eMMC
- All protected by NVMRO

Board Management Controller
- PCI µ-controller for System Management (per VITA 46.11)
- RTC with supercap backup
- Elapse Time Counter
- DC and Thermal monitoring

M.2 slot socket
- 1 * PCIe Gen2/3 x4 port

Accessories
- Engineering kit for debug: JTAG/COP, console
- 3U Rear Transition Module

VPX connector interfaces
- **Data Plane (P1)**
  - 4 * 10GBASE-R or
  - 1 * PCIe Gen2/3 x4 port
- **Expansion Plane**
  - 1 * PCIe Gen2/3 x4 port (P1)
  - 2 * PCIe Gen2/3 x4 ports (P2)
    or
  - 1 * PCIe Gen2/3 x8 port (P2)
- **Control Plane (P1)**
  - 2 * 10GBASE-R/1000BASE-X
- **User-defined plane**
  - 1 * 1000BASE-T (P2)
  - 1 * 1000BASE-KX (P2)
  - 2 * 10GBASE-R/1000BASE-X (P2)
  - 2 * CAN Bus
  - 4 * GPIOs (P1)
  - 4 * GPIOs (P2)
- **Serial ports (P1)**
  - 1 * RS232 UART (console)
  - 1 * RS232 / RS422 UART
- **USB (P1)**
  - 1 * USB2.0 / USB 3.1
  - 1 * USB2.0

Software Features

BMC

- VITA46.11 IPMC
  - TIER-2 IPMI
  - Redundant IPMB

- Power-on Built-In Test
  - On-board hardware components
  - Add-on cards (XMC, FMC)
  - Accessible from the OS

- Human Machine Interface
  - Devices management
  - Health management
  - Password
  - Log

- Over-temperature board protection

Firmware

- U-Boot Firmware
  - Integrated and tested by IC R&D team

- Boot options
  - U-Boot shell
  - Storage devices (HDD, USB, CD, DVD)
  - Network

- Power-on Built-In Tests (PBIT)
  - On-board hardware components
  - Add-on connectivities (VPX PCIe, XMC PCIe, SATA disks, USB devices...)
  - Results accessible from the OS

OS Support

- Supported Linux distributions
  - Yocto

- BSP Features
  - Standard or Preemp-RT kernel (Yocto only)
  - BMC drivers
  - IC Control Node driver
  - Board information (P/N, S/N, PBIT results...)
  - IBIT/CBIT (Integrated/Continuous)
  - Other utilities

Please consult us for other Linux distributions and VxWorks®.

Rear Transition Module

RTM135
3U VPX, 1" pitch wide according to VITA 46.0
Designed to be used with **IC-ARM-VPX3b** SBC with LVCMOS or RS-232 CPU console port on backplane

- Front panel accesses:
  - CPU console port
  - BMC console port
  - 2 * QSFP+ connectors
  - 1 * SFP+ connector
  - 1 * RJ45 for 1GBASE-T port
- Internal accesses:
  - 1 * M.2 Socket (x4 M-Keyed slot)
  - 1 * eUSB slot (USB 3.0 support)
  - 1 * Vertical USB type A (USB 2.0 only)
  - 2 * ARF-6 connectors for 4 Lanes each
  - 1 * HE10-10 connector for 8 CPU's GPIOs
  - 1 * HE10-10 connector for 1 RS-232 port
  - 1 * HE10-10 connector for 1 RS-422/485 port
  - 1 * HE10-8 connector for 2 CAN ports

RTM135

Grades

Please consult the product user's manual for detailed grade information.

Criterion	Coating	Operation Temperature	Rec. Airflow	Oper. HR% no cond.	Storage Temperature	Sinusoidal Vibration	Random Vibration	Shock 1/2 Sin. 11ms
Standard	Optional	0 to 55°C	2.4 m/s (LX2160A)	5 to 90%	-45 to 85°C	2G [20..2000]Hz	0.002g2 /Hz [10..2000]Hz	20G
Extended	Yes	-20 to 65°C	3.5 m/s (LX2160A)	5 to 95%	-45 to 85°C	2G [20..2000]Hz	0.002g2 /Hz [10..2000]Hz	20G
Rugged	Yes	-40 to 75°C or 85° C (*)	TBD m/s	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g2 /Hz [10..2000]Hz	40G
Conduction-Cooled 71°C	Yes	-40 to 71°C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g2 /Hz [10..2000]Hz	40G
Conduction-Cooled 85°C	Yes	-40 to 85° C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.1g2 /Hz [10..2000]Hz	40G

(*) : Temperature grades are subject to availability according to IC products. Please consult us.

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