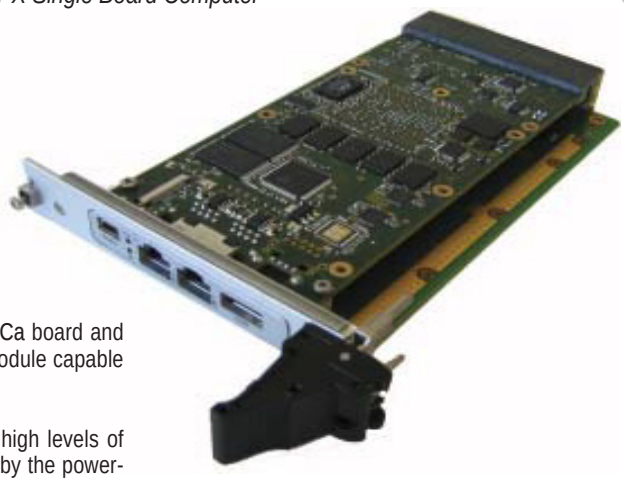
# TIC-PQ3-VPX3a

*PowerPC (MPC8536E) 3U VPX Single Board Computer*



TIC-PQ3-VPX3a is a bundle created from our TIC-PQ3-XMCa board and our VPX 3U XMC carrier to provide an OpenVPX Plug-In-Module capable of operating as a Payload, Peripheral or a Bridge module.

With its MPC8536E processor, the TIC-PQ3-VPX3a offers high levels of performance per watt. This low energy budget is enhanced by the power-saving modes of the advanced energy management capability of the processor.

The flexibility of the TIC-PQ3-VPX3a and its wide range of interfaces make it ideally suited to act as the communication node of a VPX system.

## Description

The TIC-PQ3-VPX3a is powered by an MPC8536E.This processor combines a robust e500 core, built on Power Architecture® technology, with enhanced peripherals and interconnect technology to balance processor performance with I/O system throughput.

The core integrates two 32 KB L1 caches and a 512 KB L2 cache (sharable with high-speed SRAM). The Memory Management Unit supports 32 or 36-bit address access to the physical memory (up to 2 GBytes of DDR2).

The Integrated Security Engine, available with this E version of the MPC8536, allows for single-pass encryption and authentication as required by security protocols such as IPsec.

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The memory resources of the TIC-PQ3-VPX3a include up to 16GBytes of solid-state Nand Flash with access via a SATA interface.

The TIC-PQ3-VPX3a provides two Gigabit Ethernet ports, available on the front panel or on P1 connector, offering IEEE 1588 support.

USB2 port, an RS232 port and status LEDs complete the features available on the front panel.

The VPX P2 connector provides all the remaining interfaces of the processor (USB2, SATA, I2C, RS232, GPIOs...).

The TIC-PQ3-VPX3a can act as a System or non-System Controller module and is compliant with several Payload Slot Profiles of the OpenVPX standard.

## Feature Summary

Processor Unit

- e500 core, up to 1.25 GHz, with:
  - o L1 caches : 32 KB Inst. and 32 KB Data with parity
  - o 512 KB of L2 integrated cache or private SRAM
- 1 GB of DDR2 with ECC (2 GB on request)
- 128 MBytes of mirror Flash
- 512 KBytes of non volatile RAM
- Up to 16 GBytes of Nand Solid-state Disk (exclusive with the second SATA port on P2)
- Integrated security engine supporting DES, 3DES, MD-5, SHA-1/2, AES, RSA, RNG, Kasumi F8/F9 and ARC-4 encryption algorithms.

I/O subsystem

- PCIe links, confi gurable as (1* x8) or (2* x4) on P1 with Root Complex and endpoint capabilities. (1* x4 + 2* x2) possible on demand)
- Two Giga Ethernet ports, available either as 2*1000BT interfaces on front RJ45 connectors or as 2*1000KX (or SGMII) interfaces on P1 (automatic detection)
- One USB2 (High/full speed) on the front bezel and two additionnal channels on P2.
- Temperature sensor
- Two RS232 UART and two SATA ports on P2 (one exclusive with opt. NAND Flash)
- Two I2C bus on P2
- GPIOs on P2

Accessories

- Engineering kit for debug : JTAG/COP and RS232 console.


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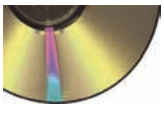



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On Board Firmware

Our basic firmware manages Freescale's new MPC8536E and its internal chipset initialization. This on-board firmware, based on the open-source UBOOT, is an efficient set of software stored in on board secured flash.

UBoot

Enabled by the reset vector when the board is powered up, UBoot initializes the PowerPC and its system controller and performs comprehensive Power-on self-tests (PBIT), before jumping into different applications according to the values stored in memory. When acting as a Monarch PMC, the software executes an enumeration step, otherwise it waits for the PCI startup sequence from the host. In standalone mode the board runs the configured application directly.

IC_Bios

This module allows the user to access the specific TIC-PQ3-VPX3a hardware resources via an easy-to-use API. This module is used as a library with Vxworks and as a dynamically loaded library module for Linux.

IC-BSP basic

These BSP products are based on the standard distribution of the OS editor. They manage hardware initialization, interrupt handling and generation, hardware clock and timer services, memory management, PCI/PCIe management, mapping of memory spaces, serial ports and MAC driver for Gigabit ports. Elma provides BSPs for VxWorks® and Linux® operating systems. Other RTOS (Integrity...) can be ported on request.

**Board Specifications**

VPX 3U / 4HP 0.8" (1" on request) board compliant with 3U module definitions of the VITA 46.0 standard
Compliant with several OpenVPX profiles
SLT3-PAY-1D-14.2.6, SLT3-PAY-2F-14.2.7
SLT3-PER-2F-14.3.1,SLT3-PER-1F-14.3.2
Typical power consumption in full-operational configuration (1 GHz): 12 W

## Environmental Specifications

Visit our website for the environmental specifications of all of our network switching products.
Visit our website at www.elmasystems.com for the environmental specifications of all of our network switching products.

## Ordering Information

Please contact our sales department at (215)-956-1200
or via email at sales@elma.com.