

IC-e6-cPCIa MPC7447A/7448 cPCI 3U SBC

IC-e6-cPCIa is a 3U/cPCI Single Board Computer, based on the Freescale MPC7447A or MPC7448 processor. It is designed to provide the highest level of performance and integration available today. These processors are software compatible with Freescale MPC7xx processors family.

The MPC7448 is a high-performance embedded e600 core. These low power processors are ideal for application in the fields of defense, automation, network and imaging.

IC-e6-cPCIa can be used in conjunction with IC other 3U/cPCI boards to implement many highly integrated applications :

- Leading-edge computing
- Embedded network control
- Signal processing, etc.

Description

IC-e6-cPCIa is powered by a MPC7447A or a MPC7448, being part of the PowerPC processor family. These processors feature a high-frequency super scalar PowerPC core capable of issuing four instructions per clock cycle into 11 independent execution units : four integer units, one double-precision floating point unit, four AltiVec units, load/store and branch processing units. This e600 (7474A) core provides 2310 Dhrystone MIPS @ 1GHz and 3200 Dhrystone MIPS @ 1,4GHz with the MPC7448. Owing to the Dynamic Frequency Switching, the core frequency can be changed "on the fly" to reduce the power consumption.

IC-e6-cPCIa implements a DiscoveryTMIII chipset to fill out the processor. This solution includes major enhancements such as : data streaming on MPX bus, read memory latency and cache coherency improvements. The MV64460 indeed, adds 2 Mbits of high speed burst SRAM, two XOR DMA (useful for RAID, SCSI) and four IDMA engines.

IC-e6-cPCIa integrates many communication functions : two Giga Ethernet channels, two multi-purpose serial controllers. An USB2 controller combined with a hub function provide two high/full speed ports.

A 64-bit PCI or PCI-X controller allows the **IC-e6-cPCIa** to receive a PMC board in compliance with PCI 2.2 or PCI-X.

IC-e6-cPCIa can run as host or peripheral board. The boot software will configure automatically the PCI bridge.

IC-e6-cPCIa uses a new power management. The processor clock can be changed dynamically following the temperature information monitored by a sensing diode included in the die. This board is available in standard, extended and **Conduction-cooled** grades.

IC-e6-cPCIa runs with VxWorks, Linux and major RTOS.

Extended grade



Conduction cooled-grade



Main features

Processor Unit

- ▶ MPC7447A running at 1 GHz with :
 - L1 caches : 32KB Inst. and 32KB Data with parity.
 - 512KB of L2 integrated cache with ECC.
- ▶ Or MPC7448 running at 1.27 or 1.4 GHz with :
 - L1 caches : 32KB Inst. and 32KB Data with parity.
 - 1 MB of L2 integrated cache with ECC.
- ▶ 256 or 512MB SDRAM-DDR with ECC.
- ▶ 64MB or 128MB soldered Mirror Flash.
- ▶ Up to 1 GB soldered Nand Flash.
- ▶ 256KB (128-bit access wide) of high speed SRAM.
- ▶ 128KB of backup SRAM (non-volatile memory).
- ▶ PPC Real Time clock and four 32 bit-timers.
- ▶ Calendar clock with supercap backup.
- ▶ Temperature sensor and monitoring.

I/O subsystem

- ▶ Marvell DiscoveryTM III system controller :
 - Two Ethernet 10/100/1000TX ports with :
 - Support for Jumbo frames.
 - Address filtering, broadcast reject & promiscuous mode (unicast, multicast, etc).
 - Virtual Cable tester providing a remote identification of potential cable malfunctions as cable opens, impedance,...
 - Routed on rear J2connector.
 - One multi-purpose serial interfaces on J2.
- ▶ One optional USB2 controller with an internal hub providing two high/full speed ports routed on J2.
- ▶ 4 GPIO on J2.
- ▶ One 32/64-bit PMC slot with Pn4 (46 IO) routed on J2.

Accessories

- ▶ Engineering kit for debug : JTAG/COP and console.
- ▶ Rear Transition Module providing on a rear panel : 2 Giga RJ45, 2 USB2, one RS232 port and one on-board high density connector for the PMC IO.

IC-e6-cPCla

MPC7447A/7448 cPCI-3U SBC

On-board firmware

The basic firmware takes in charge Freescale's new MPC7447A/7448 and the Marvell chipset DiscoveryIII initialization. This on-board firmware, based on the open-source UBOOT, is a comprehensive set of software stored in a secured flash.

UBoot

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

The firmware allows loading files from Ethernet via Bootp, running files in RAM or flashing them. In addition, it allows some monitor functions as : display or modify the RAM data. To end with, it enables the user to perform maintenance tests.

IC_Bios

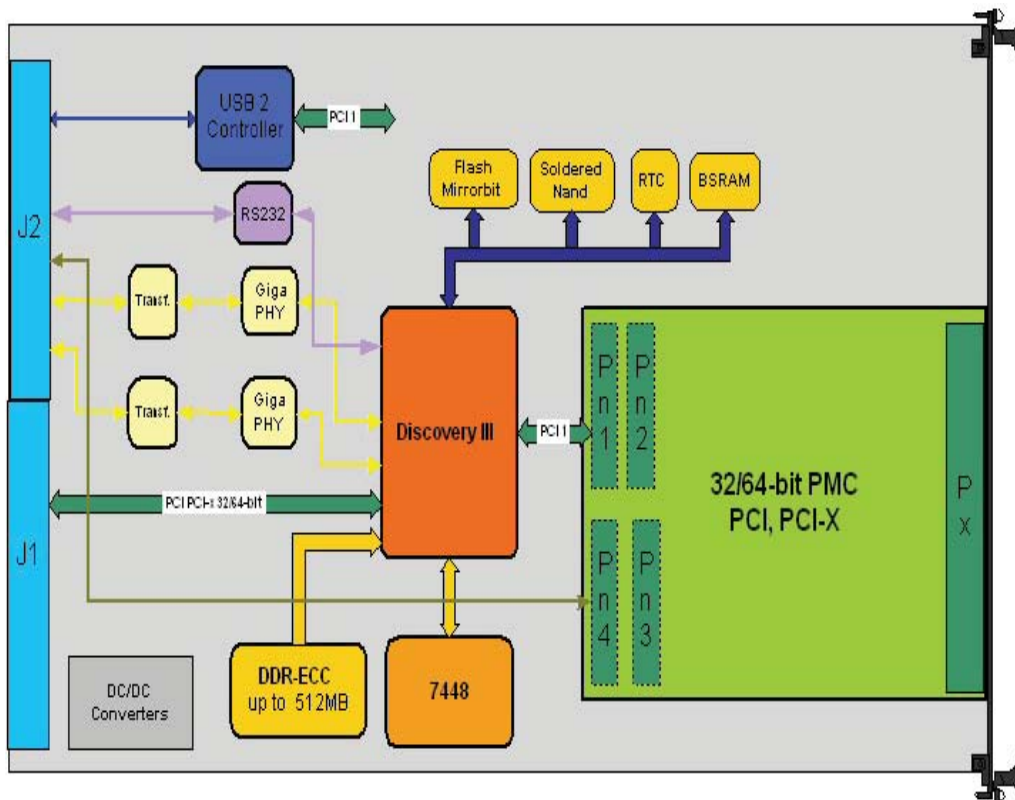
This module allows the user's access to the specific IC-e6-cPCla hardware resources via an easy-to-use API. This module is used as a library with Vxworks and as a dynamically loaded library module for Linux.

IC-BSP basic

These BSPs products are based on the standard distribution of the OS editor. They take in charge hardware initialization, interrupt handling and generation, hardware clock and timer services, memory management, PCI management, mapping of memory spaces, serial ports, MAC driver for Gigabit ports.

Interface Concept provides BSP for VxWorks® and Linux® operating systems. Other RTOS (LynxOS, Integrity...) can be ported on request.

Block Diagram



Environnement Specifications:

Please refer to information below.

Ordering Information:

Please consult the **IC-e6-cPCla datasheet** at www.interfaceconcept.com (listing all products reference and environment grades availability).

This document supersedes any earlier documentation relating to the products referred to herein. The information contained in this document is current at the date of publication. It may subsequently be updated or withdrawn without notice.

