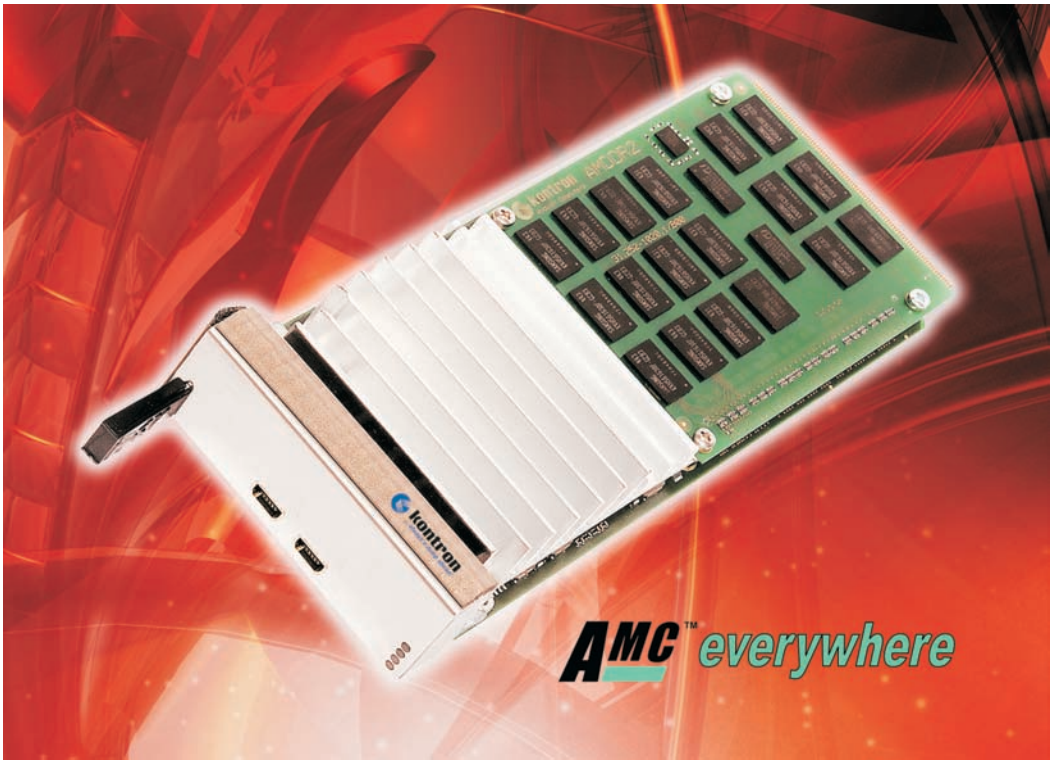
AdvancedMC™

AM4001

Intel® Pentium® M - based AdvancedMC Module



AdvancedMC

Ultra Performance
Up to **2.0 GHz** Intel® Pentium® M processor 760

Ultra Capacity
Up to **4 GB** memory DDR2 400 MHz

Ultra Flexibility
Flexible Gigabit and PCI Express fabric interface

Intel® Communications Alliance Premier Member GOLD

AMC everywhere

First class performance AMC module

Kontron's AdvancedMC processor module AM4001 provides outstanding performance in conjunction with comprehensive AMC interconnect capabilities designed according to the PICMG specifications AMC.0, AMC.1, AMC.2, AMC.3.

Ultra Performance

The AM4001 is a highly integrated CPU board implemented as a single-width, half-height, full-height and extended full-height processor Advanced Mezzanine Card (AMC) module. The design is based on the low-power, high-performance Intel® Celeron® M or Pentium® M processors combined with the high-performance E7320 and 6300ESB server-class chipsets.
The board supports Intel® Celeron® M and Pentium® M processor versions in 90 nm technology and 478 µFCBGA package with frequencies ranging **from 1.0 GHz up to 2.0 GHz** providing front side bus speeds of 400 MHz and 533 MHz.

Ultra Capacity

The board includes a dedicated memory module for up to **4 GB** registered Double Data Rate (DDR2) memory with Error Checking and Correcting (ECC) running at 400 MHz.

Ultra Flexibility

Supporting the PICMG sub-specifications AMC.1/.2/.3 the AM4001 ensures a comprehensive set of interconnecting capabilities to the AMC Carrier.
A x4 PCI Express lane according to AMC.1 guarantees high throughput for I/O intensive applications. The dual Gigabit Ethernet controller realizing the AMC.2 interconnect utilizes a x4 lane PCI Express interface to the E7320 chipset ensuring maximum packet performance.
Two SATA ports compliant to AMC.3 allow flexible usage models of the AM4001 depending on the application requirements.

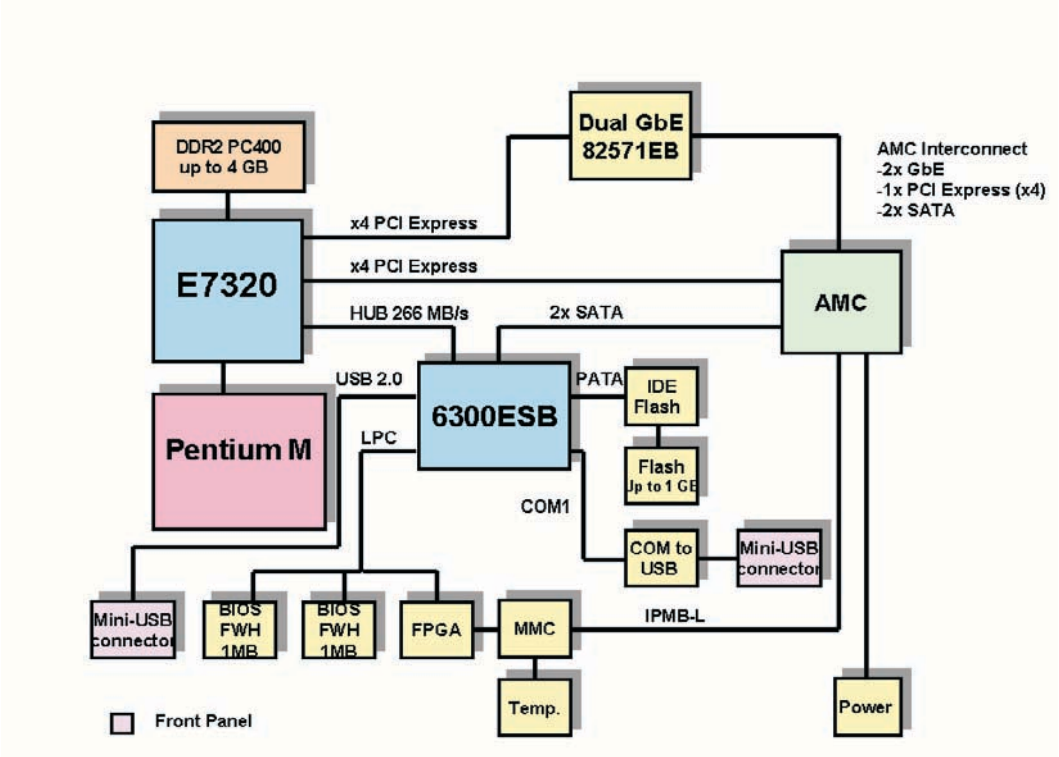
Professional Support

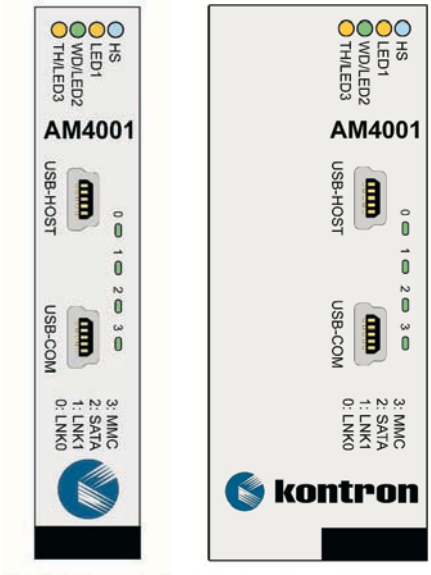
For test purposes and first evaluation steps Kontron offers a complete evaluation kit for the AM4001the AM-EVAL1. The evaluation kit includes s/w support and all accessories needed to run the AM4001.

AMC everywhere

A comprehensive range of 'AMC everywhere' ATCA boards, such as ATCA carrier boards, CPU and hub boards are complementing Kontron's AMC product portfolio including the AM4001 module.
Optimized for high-performance, packet-based telecom systems, the AM4001 is targeted towards, but not limited to telecom applications such as radio network controllers, storage control, routing and switching solutions in ATCA systems.
Beyond the usage in ATCA systems the AM4001 also fits into all applications situated in industrial environments, including I/O intensive applications.

The careful design and selection of high temperature resistant components ensure a high product availability. This, together with a high level of scalability, reliability, and stability, makes this state-of-the-art product a perfect core technology for long-life embedded applications.





Specification

System Processor

Intel® Pentium® M Processor (90 nm), 479-pin µFCBGA package, 2x 32 KB L1 cache and 2 MB L2 cache, 400 or 533 MHz processor system bus:
- Celeron M 373 ULV, 1.0 GHz (ultra low voltage), FSB: 400 MHz, for half-height and full-height AM4001
- Pentium® M 738 LV, 1.4 GHz (low voltage), FSB: 400 MHz, for full-height AM4001
- Pentium M 745, 1.8 GHz, FSB: 400MHz, for full-height AM4001
- Pentium M 760, 2.0 GHz, FSB: 533 MHz, for extended full-height AM4001

The processor is passive cooled with a fanless heatsink. Forced air cooling at a specific flow rate is required.

Memory

System memory:	Up to 4 GB registered DDR2 400 MHz memory with ECC on dedicated memory module
CompactFlash:	Soldered, 512 MB (optional 1 GB) via onboard CompactFlash controller
Flash (BIOS):	Two redundant 1 MB Firmware hubs (FWH)
EPROM:	Serial EEPROM (24LC64) 64 kbit for CMOS data storing (no battery backup)

Onboard Controller

Memory Controller Hub: Intel E7320 chipset
Two x4 PCI Express ports, DDR2 memory controller with RASUM features such as ECC, retry on uncorrectable error, integrated memory scrub engine, memory sparing function

I/O Controller Hub: Intel 6300ESB chipset
SATA 150, PATA 100, USB 2.0, UART, RTC, Interrupt Controller, Timer

Gigabit Ethernet:	Intel 82571EB dual Gigabit Ethernet PCI Express bus controller
Watchdog:	FPGA based Software configurable two-stage Watchdog with programmable timeout ranging from 125 msec to 256 sec in 12 steps.
MMC:	Microcontroller with dual 128 kB Flash and 4 kB RAM
COM to USB:	Serial to USB converter

AMC System Interconnect

PCI Express:	One x4 PCI Express interface AMC fat pipes region port 4-7 (root complex)
Gigabit Ethernet:	Two Gigabit Ethernet 1000BASE-BX (SerDes) ports AMC common options region port 0-1
Serial ATA:	Two Serial ATA 150 ports AMC common options region port 2-3

Front Panel Interfaces

USB interface: One USB 2.0 host port on 5-pin MiniUSB type A/B connector
One USB 1.1 (serial to USB) port on 5-pin MiniUSB type A/B connector

LEDs: Light pipe:
- LED 0 (blue): hot swap
- LED 1 (amber)
- LED 2 (green): general purpose or over temperature
- LED 3 (amber): general purpose or watchdog

Four general purpose LEDs (debug LEDs for POST code)
Alternatively used:
- LED 0/1: Ethernet port 0/1 link signal
- LED 2: SATA and Compact Flash activity
- LED 3: MMC Debug LED

MMC Module Management Controller

Microcontroller with 4 kB RAM:
- Two redundant 128 kB flash chips (one internal, one external)
- Communication capabilities:
  - Keyboard Controller Style (KCS) interface to the onboard processor, local Intelligent Platform Management Bus (IPMB-L) to the carrier
  - serial debug interface for test purposes
- Comprehensive MCC monitor/control support:
  - Processor and chipset supervision such as:
    - Reset Board
    - Flash fail-over mechanism
    - Monitor BIOS POST code
  - Onboard Power Supply Supervision such as:
    - AMC payload power
    - AMC management power
    - Various onboard supply voltages
  - Temperature control for processor, board, chipset, GbE controller

Compliancy

- PICMG AMC.0: Advanced Mezzanine Card Specification R1.0
- PICMG AMC.1: PCI Express and Advanced Switching R1.0
- PICMG AMC.2: Gigabit Ethernet R1.x
- PICMG AMC.3: Storage Interfaces R1.x
- IPMI Intelligent Platform Management Interface Specification, V1.5

- EMC Directive 89/336/EEC, EN 55022, EN 55024 (Europe)
- EN 300 386

Designed to meet:
- FCC 47 CFR Part 15, Subpart B (USA)
- CISPR22
- VCCI (Voluntary Japan Electromagnetic Compatibility requirement)
- UL 60950, 3rd edition (US and Canada)
- EN 60950-1 (Europe)
- LVD 73/23/EEC (Europe)
- Denan Law (Japan Safety)

Power Consumption

1.0 GHz, 1 GB mem:	typ. 20 W,	max. 22 W
1.4 GHz, 1 GB mem:	typ. 24 W,	max. 28 W
1.8 GHz, 2 GB mem:	typ. 34 W,	max. 40 W
2.0 GHz, 2 GB mem:	typ. 38 W,	max. 46 W

General

Dimensions:	181.5 mm x 73.5 mm Single-width, half-height, full-height, extended full-height
MTBF:	216,209 h acc. Bellcore Issue 6, Ground Benign, Controlled, 30°C

Software Support

AMI BIOS, BIOS parameters saved in EEPROM, Boot order defined via MMC
Serial over Lan, IDE over LAN, Support for Linux CGL

Environmental

Operating temp.:	0°C to +55°C
Storage temp.:	-55°C to +85°C
Humidity:	Operational: 5%-90% (non-condensing) Non-Operating: 5%-95% (non-condensing)



AM-EVAL1 - Evaluation Kit for AM4001

- Two copper RJ45 Gigabit Ethernet connectors for 1000 Base-TX support
- One standard PC PCI-Express x16 connector
- Two SATA connectors
- ATX power supply
- 3.5" SATA hard disk
- PCI-Express graphic board

Ordering Information

Product	Description	Order No.
AM4001	AMC processor module, ULV Celeron M 1.0 GHz, 512 MB flash, half-height module	29171
AM4001	AMC processor module, LV Pentium M M 1.4 GHz, 512 MB flask, full-height module	30104
AM4001	AMC processor module, Pentium M 1.8 GHz, 512 MB flash, full-height module	29186
AM4001	AMC processor module, Pentium M 2.0 GHz, 512 MB flash, extendend full-height module	29123
AMDDR2-1GB	1 GB DDR2 400MHz mezzanine memory module	29128
AMDDR2-2GB	2 GB DDR2 400MHz mezzanine memory module	29127
KIT-AM4001	AM4001 User's Manual, Tool-Kit	30078
LIN-BSP-AM4001	Linux Board Support Package	30079
CABLE_MINI-USB-TA	Cable, MiniUSB-A-to-USB-A-Jack, 0.15m for AM4001 USB port to connect USB devices (included in AM-EVAL1-Kit)	29386
CABLE_MINI-USB-TB	Cable, MiniUSB-B-to-USB-A-Jack, 1m for AM4001 USB port support legacy COM port (included in AM-EVAL1-Kit)	29679
AM-EVAL1	AM4001 Evaluation Kit, including graphic card, HDD, cables, installed Linux s/w on HDD	29423

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