



# DAMC-FMC25

AMC Dual High Pin Count  
FMC Carrier Board

**μTCA**<sup>®</sup>

**MTCA.4 Series**

The DAMC-FMC25 is a full-size standard AMC board designed to host up to two High-Pin Count (HPC) FMC mezzanine cards.

On-board Virtex-5 FPGA and Spartan-6 FPGA provided with DDR2 RAM memories.

Designed as MTCA.4 carrier, the DAMC-FMC25 provides management of Rear Transition Module (RTM) boards via fast links.

## Features

- Double-width AMC board
- MTCA.4 carrier
- Two HPC FMC Mezzanine slots
- Data processing on Virtex-5 FPGA
- Board Management on Spartan-6 FPGA
- uRTM D1.1 connectivity
- PCI-e (x4) communication on AMC
- Four low-latency links on AMC
- RocketIO channels to FMCs and to RTM
- 256 MB (on Virtex-5) and 128 MB (on Spartan-6) DDR2 Memories
- MicroSD Card Slot
- Dual SPI memories for each FPGA and I<sup>2</sup>C EEPROM
- External Clock input on front panel

## Applications

- AMC carrier board for HPC FMC
- Research & Development
- Accelerator Controls
- Automation Industry
- Telecommunications

The DAMC-FMC25 is a general purpose carrier board with the ability to host two FPGA Mezzanine Cards (FMC) with High Pin Count (HPC) connectors. The AMC board is designed as a double-width mid-size MTCA.4 carrier.

A Virtex-5 FPGA allows to perform high demanding computations with a high data throughput between FMCs, uRTM and PCI express on the MTCA backplane.

Standard version of the board mounts a Virtex-5 XC5VFX70T (1136-pin) and a Spartan XC6SLX45T (484-pin) FPGAs provided respectively with 256 MB and 128 MB DDR2 memories.

The local DDR2 memories can be used in order to store data that cannot or does not need to be sent via PCI-e during acquisition.

The module management is performed

by a ATxmega128A1\_AU controller directly interfaced to the AMC backplane with an I<sup>2</sup>C bus connection.

Fast links to both FMC slots – i.e. 77 differential pairs and 2 GTX @ 6.5 Gbps on each one – allow to install high performance and high density FPGA Mezzanine Cards – e.g. fast and/or high resolution digitizers or fast links.





Fast links are also dedicated to the MTCA.4 standard use of the board with 42 differential pairs and 2 GTX @ 6.5 Gbps to the uRTM Zone-3 connector.

AMC backplane connections available are Low-Latency Links (4 lanes), PCI-e 1.0 (4 lanes) and MLVDS (4 lanes).

Commercially available versions of the DAMC-FMC25 board mount “-2” or “-1” speed grade Virtex-5 (transceiver speed is limited to 4.25 Gbps on “-1” devices). Visit our website [www.caenels.com](http://www.caenels.com) for up to date information on the product.

#### About CAEN ELS

CAEN ELS is a leading company in the design of power supplies and state-of-the-art complete electronic systems for the Physics research world, having its main focus on dedicated solutions for the particle accelerator community.

-  Magnet Power Supply Systems
-  Beamline Electronic Instrumentation
-  Precision Current Transducers
-  MTCA.4 – MicroTCA for Physics

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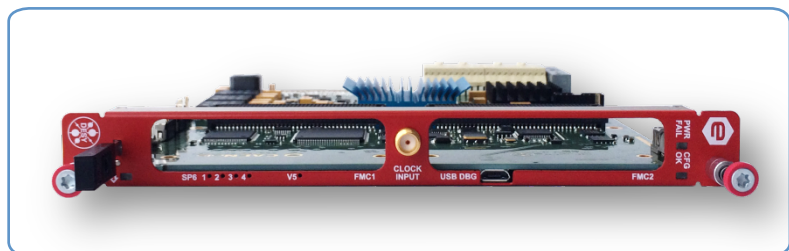
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## Technical Specifications

## DAMC-FMC25

Board Size	Double-Width – Mid-Size	
Standard	MicroTCA.4 Module Management	AMC.0, AMC.1 IPMI Version 1.5, MMC V1.0
Compatibility	Zone3 Classification AMC – Backplane Support	Class D1.1 Full
FMC Carrier	2 High Pin Count (HPC) – VITA 57.1	
FPGAs	Xilinx Virtex-5  Xilinx Spartan-6	XC5VFX70T-1FFG1136C (“-1” version) XC5VFX70T-2FFG1136C (“-2” version) XC6SLX45T-3FGG484C
RAM Memories	256MB DDR2 for Virtex-5 128MB DDR2 for Spartan-6	
Storage	Virtex-5 Firmware Spartan-6 Firmware Identification Data Mass Storage	2 x SPI Flash 2 x SPI Flash 1 x I2C EEPROM 1 x MicroSD Card Slot
MMC Device	ATXmega128A1-AU	
FMC Connections	FMC1 FMC2	77 diff. pairs, 2 GTX (up to 6.5 Gbps) 77 diff. pairs, 2 GTX (up to 6.5 Gbps)
RTM Connections	42 diff. pairs, 2 GTX (up to 6.5 Gbps)	
Clock	External Input (SMA connector) FMC1, FMC2 RTM AMC (TCLKA, TCKLB) On-board generator (10-280 MHz)	
Backplane Links	Low Latency Links PCI-e MLVDS	4 lanes, AMC ports 12-15, up to 6.5 Gbps 4 lanes, AMC ports 4-7, PCIe gen. 2* 4 lanes, AMC ports 17-20
Front Panel	2 x HPC 1 x SMA, single-ended, 50 Ω, AC Micro USB (FPGA and MMC) for Debug	
Other Features	2 on-board temperature sensors Standard LEDs managed by IPMI 4 user configurable LEDs	
Operating Temperature	0 ... 50 °C	

\* Using 3rd Party IP Core. Virtex-5 Built-In IP core supports Gen. 1 only



**DAMC-FMC25 Board**

## Ordering Options

DAMCFMC251XA	<b>DAMC-FMC25-1</b>	Dual HPC (High Pin Count) AMC Carrier Board – MTCA.4 – “-1” Speed Grade Virtex-5
DAMCFMC252XA	<b>DAMC-FMC25-2</b>	Dual HPC (High Pin Count) AMC Carrier Board – MTCA.4 – “-2” Speed Grade Virtex-5