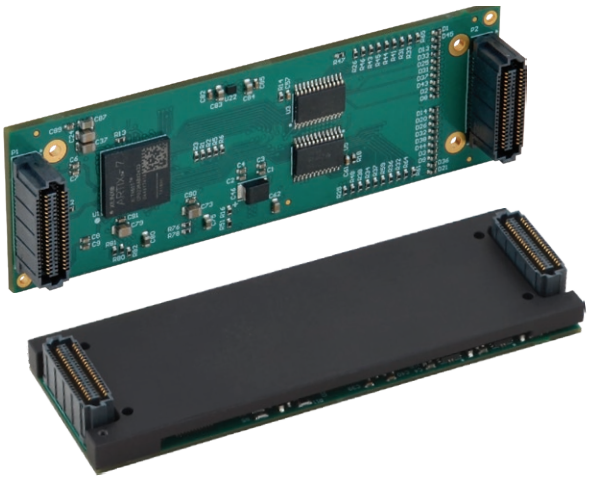
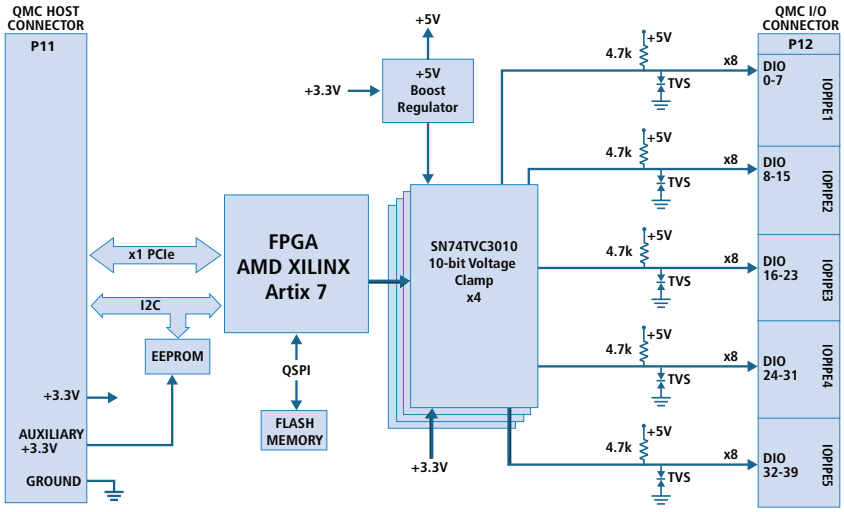
VITA 93 QMC Modules

QMC470 Series TTL Level Digital I/O





40 bidirectional input/output channels ◆ TTL/CMOS Digital I/O ◆ Programmable Interrupts ◆ PCIe Bus Interface

Description

QMC mezzanine modules plug into a carrier card to interface connected I/O and provide a variety of signal processing functions. Acromag QMC470 modules offer 40 general-purpose, bidirectional I/O points to economically monitor and control a large quantity of digital devices. A PCIe bus interface provides communication to the carrier and host computer.

Each channel has interrupt capability for detecting change-of-state, positive (low-to-high) or negative (high-to-low) input level transitions. Debounce eliminates interrupts from noise and switching transients for error-free edge detection.

QMC470 outputs are full-featured. They provide closed-loop readback status monitoring. TTL level thresholds and 15mA sink capability allow a direct interface to standard relay racks. For safety, outputs go to a failsafe state upon power-up/reset without any instantaneous toggling to prevent false alarms.

QMC modules adhere to the VITA 93 standard for small form factor (SFF) mezzanine modules. Two high-performance 80-pin connectors provide separate field I/O and PCIe bus host interfaces. Modules can deploy on a variety of carrier card platforms including PCIe expansion cards, 3U/6U Eurocards such as VPX and CompactPCI, VNX+ SFF cards, and many other architectures. The rugged design is well-suited for use in laboratory, industrial, defense, and aerospace applications.

QMC modules have a much smaller footprint than PMC/XMC modules. Single-width QMC modules are only 26 x 78.25mm which facilitates mixing and matching of multiple functions on a single carrier card for high-density I/O solutions. They are ideal for computing systems with strict size, weight, power, and cost (SWAP-C) limitations.

An Intelligent Platform Management Interface (IPMI) facilitates system management. The QMC EEPROM holds module information and sensor data that is accessible by a smart carrier card with an IPMC controller over an I2C interface.

Key Features & Benefits

- 40 bidirectional input/output channels
- TTL-compatible inputs
- CMOS-compatible open-drain outputs
- Interrupt support for each channel
- Programmable event interrupts (change-of-state, low-to-high, high-to-low)
- Programmable debounce
- Input hysteresis
- Electronic overvoltage protection on individual channels
- Software configured (no jumpers/switches) allowing "on-the-fly" changes without removing modules
- Output readback registers - Eliminates the need for additional input channels to verify the output channel state
- Extended temperature range and support for conduction-cooled systems

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VITA 93 QMC Modules

ISO9001
AS9100
MADE IN USA

Performance Specifications

Digital Inputs

Input channel configuration
40 buffered inputs with programmable debounce circuitry.

Input signal voltage range
-0.25V to +5.25V DC.

Input low voltage range
0.8V max to 0.25V below common ground.

Input high voltage range
2.2V min to 0.25V above +5V supply max.

Input threshold
1.5V typical.

Input transition rise or fall time
5.5ns maximum.

Input response time
1.5ns typical.

Digital Outputs

Output channel configuration
40 open-drain CMOS outputs.

Output low voltage range
0.1V DC typical, 0.4V DC maximum at 12mA.

Output high voltage range
4.8V DC at -10µA.

Output "ON" current range
0 to 15mA DC (for $V_{OL} \leq 0.5V$).

Output RDS ON resistance
12.5Ω maximum (25°C).

Output pull-ups
4.7kΩ integrated pull-ups installed on board.

PCI Express Base Specification

Conforms to revision 2.1.

Lanes
1 lane in each direction.

Bus Speed
2.5 Gbps (Generation 1).

Memory
256k space: Base address register 0.
1M space: Base address register 2.

Environmental

Operating temperature range
Air-cooled: 0 to 70°C (200 LFM airflow).
Conduction-cooled: -40°C to +85°C.

Storage temperature
-55 to 125°C.

Relative humidity
5 to 95% non-condensing.

Power
+3.3 VDC (±5%): 0.40 A typical.
+3.3 VDC AUX (±5%): 0.10 A typical.
+12 VDC (±5%): Not used.

MTBF (Mean Time Between Failure)
Contact factory.

Physical

Size
Length: 78.25mm (3.08 in)
Width: 26.00mm (1.02 in).
Height: 11.00mm (0.43 in).

Weight
Unit weight: 8.9g (0.31 oz).

Ordering Information

QMC Modules

QMC471-1111
Digital I/O, Air-cooled

QMC472-1111
Digital I/O, Conduction-cooled

Carrier Cards

See Acromag.com/QMC-Carriers for a full list of QMC carrier cards.

Software *(see software documentation for details)*

USW-API
Universal Embedded Design Suite with software support for VxWorks®, Windows®, and Linux®.

QMC Module shown with attatched heatsink. Heatsink optionally sold with QMC Modules.

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