BittWare
a **molex** company

IA-840F
PCIe FPGA Board

Agilex™ FPGA card with QSFP-DD and MCIO
3x 200GbE with up to 128GBytes DDR4 SDRAM

BittWare's IA-840F is an Intel® Agilex™-based FPGA card designed to deliver up to 40% higher performance for data center, networking and edge compute workloads. BittWare maximized I/O features on the card using the Agilex chip's unique tiling architecture with three QSFP-DDs (3× 200G), PCIe Gen4 x16, and two MCIO PCIe expansion ports for diverse applications. The card also supports Intel oneAPI™, which enables an abstracted development flow for dramatically simplified code re-use across multiple architectures.

The IA-840F supports Intel's OneAPI open standards-based unified programming model

key features

| QSFP-DDs for 3x 200G | Intel OneAPI support | Intel Agilex™ FPGA with up to **2.6M Logic Elements** |

10nm FPGA with 2.6M LEs and 13K memory blocks

2x 32GB banks DDR4 SDRAM

Board Management Controller for system monitoring and control

USB for BMC, FPGA JTAG, and FPGA UART

MCIO Expansion Ports

Optimize the IA-840F for your application with PCIe expansion:
· 4 Gen4 x4 root ports
· 2 Gen4 x8 endpoints
· 1 Gen4 x16 root port
· 1 Gen4 x16 endpoint
Inquire about customized Molex connectors/cables as required for your application.

QSFP-DDs for 3x 200GbE

PCIe Gen4 x16 interface

2x DIMM sites each supporting up to 32GB DDR4 SDRAM

Additional Services

Take advantage of BittWare's range of design, integration, and support options

Customization
[Additional specification options or accessory boards](#) to meet your exact needs.
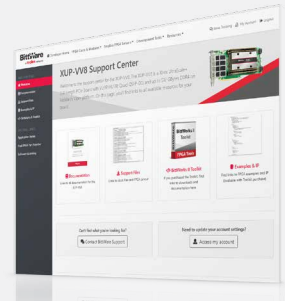
Server Integration
Available pre-integrated in our [TeraBox servers](#) in a range of configurations.

Application Optimization
Ask about our services to help you port, optimize, and benchmark your application.

Service and Support
BittWare Developer Site provides online documentation and issue tracking.

Board Specifications

FPGA	• Intel Agilex
	   • AGF027 in an R2581A package
	   • Core speed grade -2: I/O speed grade -2
	• Contact BittWare for other Agilex FPGA options

On-board Flash	• 2Gbit Flash memory for booting FPGA
External memory	• 2x 288-pin DIMM slots, each supporting up to 32GB (default 16GB) DDR4 SDRAM modules (up to 64GB total) • 2x banks on-board DDR4, up to 32GB each
Host interface	• x16 Gen4 interface direct to FPGA, connected to PCIe hard IP
QSFP-DD cages	• 3 QSFP-DD cages on front panel connected directly to FPGA via 24 transceivers • User programmable low jitter clocking supporting 10/25/40/100GbE • Each QSFP-DD can be independently clocked • Jitter cleaner for network recovered clocking • Multi-rate hard MAC+FEC for 10/25/100GbE (4x HardIP) • Fully backward compatible with QSFP28s
MCIO	• Two x8 connectors supporting 4x Gen4 x4 PCIe root complexes, 2x Gen4 x8 endpoints, or 1x Gen4 x16 root complex or endpoint
External clocking	• 1 PPS and 10MHz ref clk front panel inputs (optional)
USB	• USB access to BMC, USB-JTAG, USB-UART

Board Management Controller	• Voltage, current, temperature monitoring • Power sequencing and reset • Field upgrades • FPGA configuration and control • Clock configuration • Low bandwidth BMC-FPGA comms with SPI link • USB 2.0 • PLDM support • Voltage overrides
Cooling	• Standard: dual-slot passive heatsink • Optional: triple-slot active heatsink (with fans) • Optional: dual-slot liquid cooling
Electrical	• On-board power derived from PCIe slot 12V and two AUX connectors • Power dissipation is application dependent • Typical max power consumption TBD
Environmental	• Operating temperature: 5°C to 35°C
Quality	• Manufactured to IPC-A-610 Class 2 • RoHS compliant • CE, FCC and ICES approvals
Form factor	• Standard-height, dual-slot PCIe card • 4.376 x 10.5 inches (111.15 x 266.7 mm)

Development Tools

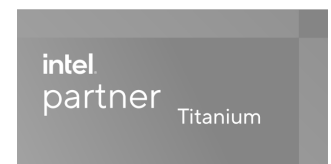|	
System development	BittWare SDK including PCIe driver, libraries, and board monitoring utilities
Application development	Supported design flows - Intel FPGA oneAPI Base Toolkit, Intel High-Level Synthesis (C/C++) and Quartus Prime Pro (HDL, Verilog, VHDL, etc.)

To learn more, visit **www.BittWare.com**

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