

FMC-SFP+

V1.2 5/17/17



FMC Module with Four SFP+ Ports

FEATURES

- Four SFP+ ports
- Up to 5 Gbps per port
- Programmable low jitter clock supports 0.16 to 350 MHz range with 1PPM step
- Spread-spectrum clock support
- 10 MHz, 0.5 PPM reference
- FMC (ANSI/VITA57) Module

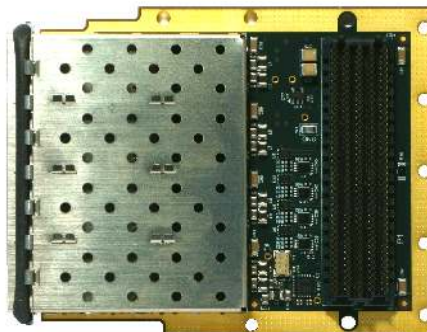
(Note: module extends beyond FMC form-factor on the face plate. See mechanical requirements.)

APPLICATIONS

- Remote Radio Head receiver
- OBSAI and CPRI interface
- Serial FPDP and SRIO fiber optic ports

SOFTWARE

- VHDL FrameWork Logic
- C++ Libraries and example code
- Examples for Innovative Integration cards for Windows and Linux.



DESCRIPTION

FMC-SFP+ provides four SFP+ ports on a standard FMC module with programmable clock and support features. Fiber optic links to remote IO, such as Remote Radio Head applications, from host processing and FPGA cards support up to 5 Gbps bit rates.

The SFP+ ports are compatible with SFF-xxxx transceivers, supporting both copper and fiber optic links. The four ports are fully independent on the module. SFP+ monitoring and control signals are mapped to the FMC interface for detection, loss-of-signal, rate control and I2C control port.

A flexible reference clock for on the FMC-SFP+ is fully programmable over the 0.16 to 350 MHz range. The clock can be programmed for all common rates for standards such as OC-12, OBSAI, CPRI, GbE, sFPDP and SONET. The clock has jitter performance of less than 1 ps RMS max, allowing it to meet the most stringent requirements for these applications. An on-card 10MHz with 0.5 PPM stability is used as the PLL reference.

The FMC-SFP+ is fully electrically compatible with FMC (ANSI/VITA 57) specifications for IO module. Mechanically, the module will fit FMC sites, but protrudes from the face plate for the SFPs. The module is compatible with FMC HPC sites (4 SFP ports) or LPC (1 SFP port). The module consumes <500 mW exclusive of SFP+ modules.

The FMC is provided with VHDL code illustrating the interfaces. Specific FPGA and platform support is provided for Innovative's VPX-COP and PEX-COP FPGA cards.

Software libraries and examples for C++ host development are provided. Application examples demonstrating the module features are provided for Innovative Integration platforms in for Windows, Linux and VxWorks.

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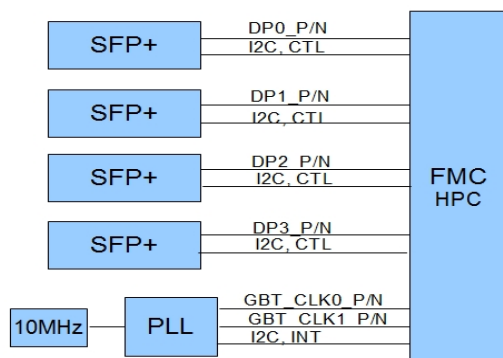
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FMC-SFP+

ORDERING INFORMATION

Product	Part No.	Description
FMC-SFP+	80285-0- <ER>	FMC module with four SFP+ ports, programmable clock, and high stability reference <ER> is environmental rating.
Logic Development Package		
FMC-SFP+ Logic Support	55031	FMC-SFP+ FrameWork Logic board support package for RTL. One year technical support
Host Cards		
PEX-COP	80284	FPGA co-processor with FMC site for PCI Express desktop/rackmount applications.
VPX6-COP	80262	FPGA co-processor with FMC site for 3U VPX applications. Available rated for wide-temperature and vibration/shock with conduction-cooling.



FMC-SFP+

Operating Environment Ratings

Modules rated for operating environment temperature, shock and vibration are offered. The modules are qualified for wide temperature, vibration and shock to suit a variety of applications in each of the environmental ratings L0 through L4 and 100% tested for compliance.

Environment Rating <ER>		L0	L1	L2	L3	L4
Environment		Office, controlled lab	Outdoor, stationary	Industrial	Vehicles	Military and heavy industry
Applications		Lab instruments, research	Outdoor monitoring and controls	Industrial applications with moderate vibration	Manned vehicles	Unmanned vehicles, missiles, oil and gas exploration
Cooling		Forced Air 2 CFM	Forced Air 2 CFM	Conduction	Conduction	Conduction
Operating Temperature		0 to +50C	-40 to +85C	-20 to +65C	-40 to +70C	-40 to +85C
Storage Temperature		-20 to +90C	-40 to +100C	-40 to +100C	-40 to +100C	-50 to +100C
Vibration	Sine	-	-	2g 20-500 Hz	5g 20-2000 Hz	10g 20-2000 Hz
	Random	-	-	0.04 g ² /Hz 20-2000 Hz	0.1 g ² /Hz 20-2000 Hz	0.1 g ² /Hz 20-2000 Hz
Shock		-	-	20g, 11 ms	30g, 11 ms	40g, 11 ms
Humidity		0 to 95%, non-condensing	0 to 100%	0 to 100%	0 to 100%	0 to 100%
Conformal coating			Conformal coating	Conformal coating, extended temperature range devices	Conformal coating, extended temperature range devices, Thermal conduction assembly	Conformal coating, extended temperature range devices, Thermal conduction assembly, Epoxy bonding for devices
Testing		Functional, Temperature cycling	Functional, Temperature cycling, Wide temperature testing	Functional, Temperature cycling, Wide temperature testing Vibration, Shock	Functional, Temperature cycling, Wide temperature testing Vibration, Shock	Functional, Testing per MIL- STD-810G for vibration, shock, temperature, humidity

Minimum lot sizes and NRE charges may apply. Contact sales support for pricing and availability.

FMC-SFP+

Standard Features

SFP+ Ports	
Ports	4 (FMC HPC required) 1 (FMC LPC)
Type	SFP+
Specification	SFF-8074
Bit Rate	Up to 5 Gbps (dependent on host card)
Interface	Per port : I2C bus Status feedback of presence, LOS Control for rate select, enable

Clock	
Device	Programmable PLL
References	10 MHz, 0.5 PPM or FMC Clock 0 input
Output Range	0.16 to 350 MHz
Tuning Resolution	1 PPM
Device	Silicon Labs SI5338
Outputs	2 pairs to GBT_CLK 0 and 1 on FMC
Output Type	LVDS 2.5V

FMC Interface	
Differential Pairs	8 total (Tx/Rx pair for each SFP+)
Single-ended signals	22 LVCMOS (VADJ)
Clocks	2 GBT serial reference clocks from PLL FMC clock 0 input for reference

Power	
Consumption	750mW EXCLUDES SFP+ modules
Power Control	FMC power enable
Heat Sinking	Conduction cooling supported (VITA57 subset)

Physicals	
Form Factor	FMC with extended length
Size	69 x 87 mm
Weight	80g
Hazardous Materials	Lead-free and RoHS compliant

FMC-SFP+

Logic Tools

All FMC modules are supplied with example interface code (VHDL) illustrating the module interface and controls. For Innovative cards, the FMC support includes a specific design for each card.

The logic support includes example code, constraints, and a simulation testbench. Application logic uses this code as a starting point for integrating the FMC into target hardware.

Compatible Host Cards

FMC IO modules are supported on a variety of IO platforms, including these Innovative cards.

Cardsharp (80332)

Combines an Zynq Z7045 SoC with FMC IO module in a compact, stand alone design

Powerful, dual, floating-point Arm A9 CPU performance

Rugged, XMC form factor: 149 x 74 mm

Self-bootable, stand-alone operation

Able to operate diskless and headless

Runs Linux applications



PEX6-COP (80284)

Virtex6 FGPA core with 2GB DRAM, 36MB SRAM

FMC site with 80 differential pairs and 10 high speed serial lanes

Supports wide-temperature and vibration with conduction cooling

Multi-card timing and communications support



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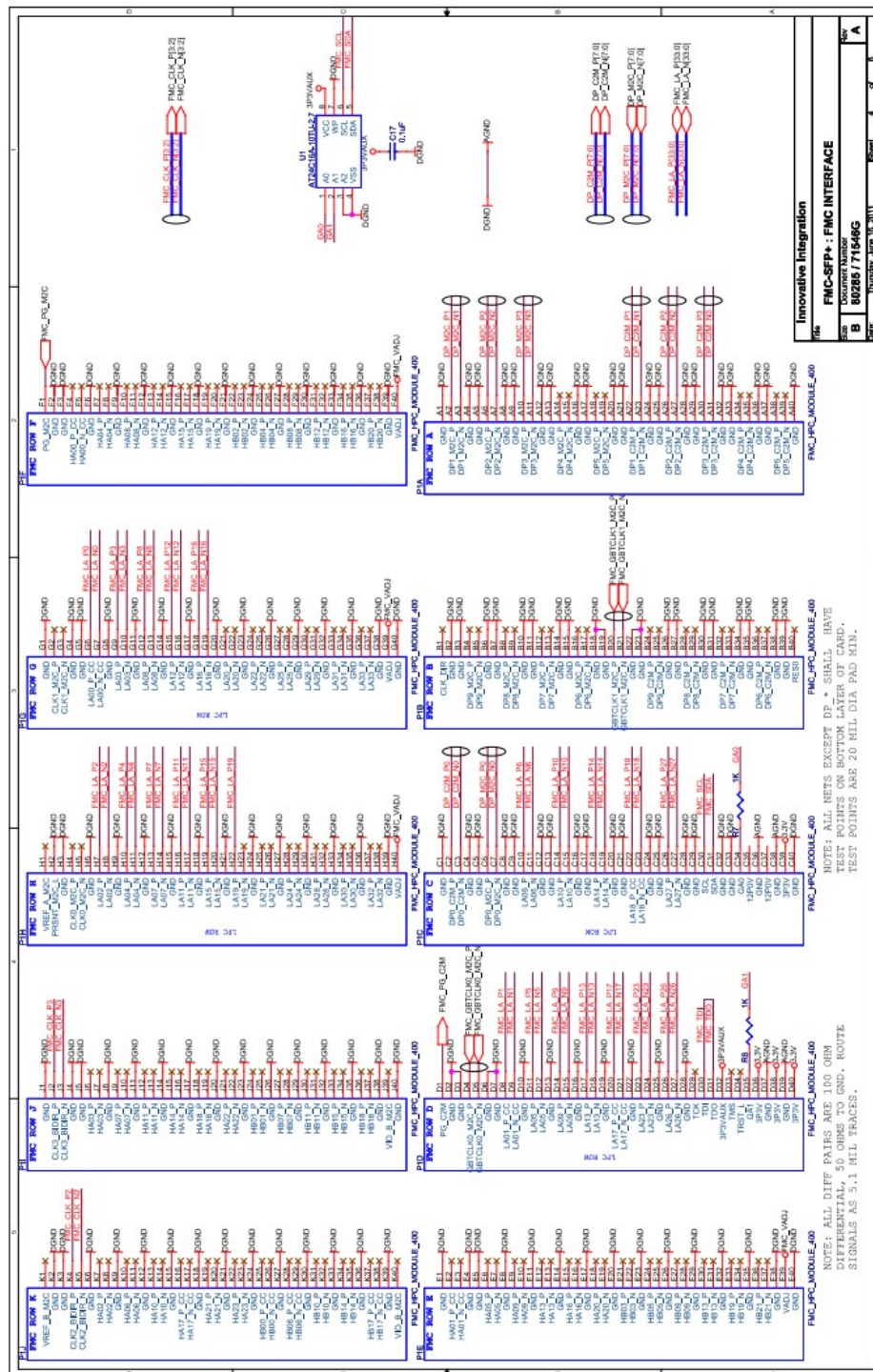
FMC Connector



Manufacturer: [SAMTEC](#)
Newark Part No.: 79X1313
Manufacturer Part No ASP-134488-01

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FMC-SFP+



FMC L Interface



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