

SFP-1GB-FX-I-SGMII-OPC

MSA and TAA 100/1000Base-FX SFP Dual-Rate Transceiver (MMF, 1310nm, 500m, LC, DOM, -40 to 85C, SGMII)

Features

- Built-In PHY Supporting SGMII Interface
- Built-In High Performance MCU Supporting Easier Configuration
- Dual-Rate of 100Base-FX/1000Base-LX Operation
- 1310nm FP Laser and PIN Photo-Detector
- Up to 2km Transmission with MMF at 125Mbps
- Up to 550m Transmission with MMF at 1.25Gbps
- Standard Serial ID Information Compatible with SFP MSA
- Duplex LC Connector
- 3.3V Single Power Supply
- Operating Temperature: -40 to 85 Celsius
- RoHS Compliant and Lead-Free

**Applications:**

- 1000Base-LX Ethernet
- 1x Fibre Channel
- Access and Enterprise

Product Description

This MSA compliant SFP transceiver provides 100/1000Base-FX throughput up to 500m over multi-mode fiber (MMF) using a wavelength of 1310nm via an LC connector with SGMII. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. It is guaranteed to be 100% compatible with the equivalent MSA compliant transceiver. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

OptioConnect's transceivers are RoHS compliant and lead-free.

Absolute Maximum Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage		V _{CC}	-0.5		3.6	V	
Storage Temperature		T _{stg}	-40		85	°C	
Operating Case Temperature		T _c	-40		85	°C	
Relative Humidity		RH	5		95	%	
Data Rate	1000Base			1250		Mbps	
	100Base			125			

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		V _{CC}	3.13	3.3	3.47		
Power Supply Current		I _{CC}			350	mA	1
Power Dissipation		P _{DISS}			1.5	W	
Transmitter							
Differential Data Input Swing		V _{IN}	200		2100	mV	2
Input Differential Impedance		Z _{IN}	80	100	120	Ω	
Tx_Disable	Disable		2.0		V _{CC}		
	Enable		V _{EE}		V _{EE} +0.8		
Tx_Fault	Fault		2.0		V _{CC}		
	Normal		V _{EE}		V _{EE} +0.5		
Receiver							
Differential Data Output Swing		V _{OUT}	370		2000	mV	2
LOS	High		2.0		V _{CC} +0.3	V	
	Low		V _{EE}		V _{EE} +0.5		

Notes:

1. The maximum power supply current after the module is work stable.
2. PECL logic. Internally AC coupled.

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Center Wavelength		λC	1260	1310	1360	nm	
Average Output Power	1000Base	POUT	-11.5		-3	dBm	1
	100Base	POUT	-20		-14		1
POUT @Tx_Disable Asserted		POUT			-45	dBm	1
Spectral Width (RMS)	1000Base	σ			4	nm	
	100Base				7.7		
Extinction Ratio		EX	9			dB	
Rise/Fall Time (20-80%)	1000Base	Tr/Tf			0.26	ns	2
	100Base				3		
Total Jitter Rate TP2	1000Base	JT			0.481	UI	3
	100Base				0.4		
Deterministic Jitter at TP2	1000Base	JD			0.250	UI	3
	100Base				0.305		
Output Optical Eye		Compatible with IEEE 802.3ah-2004					4
Receiver							
Center Wavelength		λC	1260	1310	1570	nm	
Receiver Sensitivity	1000Base				-22	dBm	5
	100Base				-28		6
Receiver Overload	1000Base		-3			dBm	5
	100Base		-8				6
Return Loss			12			dB	
LOS De-Assert	1000Base	LOSD			-23	dBm	
	100Base				-23		
LOS Assert	1000Base	LOSA	-45			dBm	
	100Base		-45				
LOS Hysteresis			0.5		4.5	dB	
Total Jitter at TP4 (SGMII)		JT			0.749	UI	3
Deterministic at TP4 (SGMII)		JD			0.462	UI	

Notes:

1. The optical power is launched into 62.5/125 μ m SMF.
2. Unfiltered, measured with 8B/10B code for 1.25Gbps and 4B/5B code for 125Mbps.
3. Meets the specified maximum output jitter requirements if the specified maximum input jitter is present.
4. Measured with 8B/10B code for 1.25Gbps and 4B/5B code for 125Mbps.
5. Measured with 8B/10B code for 1.25Gbps, worst-case extinction ratio, and $BER \leq 1 \times 10^{-12}$.
6. Measured with 4B/5B code for 125Mbps, worst-case extinction ratio, and $BER \leq 1 \times 10^{-12}$.

Pin Descriptions

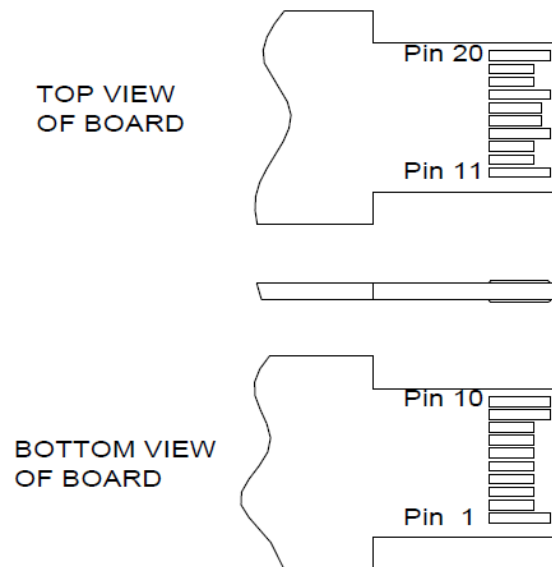
Pin	Symbol	Name/Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground.	1	
2	Tx_Fault	Transmitter Fault Indication.	3	1
3	Tx_Disable	Transmitter Disable.	3	2
4	MOD-DEF2	Module Definition 2.	3	3
5	MOD-DEF1	Module Definition 1.	3	3
6	MOD-DEF0	Module Definition 0.	3	3
7	Rate Select	Not Used.	3	
8	LOS	Loss of Signal.	3	4
9	VeeR	Receiver Ground.	1	
10	VeeR	Receiver Ground.	1	
11	VeeR	Receiver Ground.	1	
12	RD-	Inverse Received Data Out.	3	5
13	RD+	Received Data Out.	3	5
14	VeeR	Receiver Ground.	1	
15	VccR	Receiver Power.	2	
16	VccT	Transmitter Power.	2	
17	VeeT	Transmitter Ground.	1	
18	TD+	Transmit Data In.	3	6
19	TD-	Inverse Transmit Data In.	3	6
20	VeeT	Transmitter Ground.	1	

Notes:

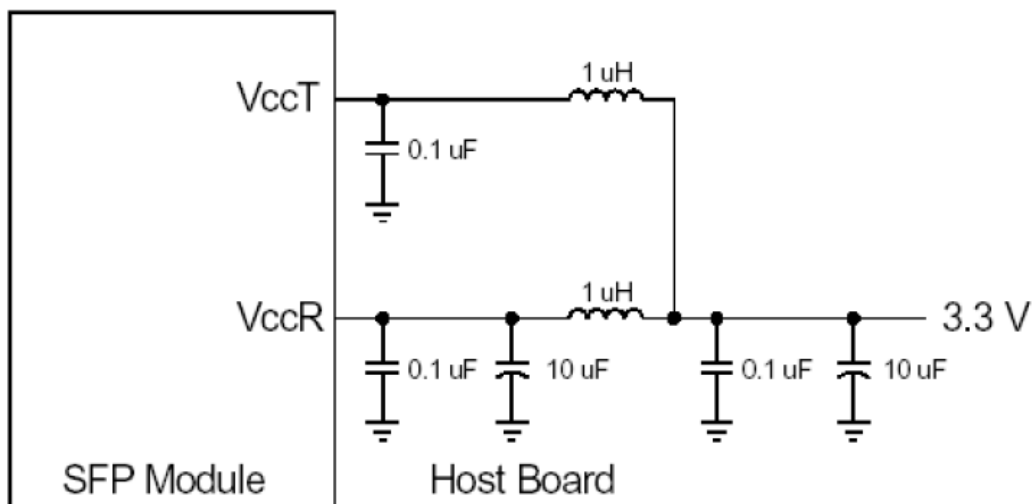
1. Tx_Fault is an open collector output which should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. "Logic 0" indicates normal operation. "Logic 1" indicates a laser fault of some kind. In the "low" state, the output will be pulled to <0.8V.
2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ to 10kΩ resistor. Its states are:
 - Low (0V to 0.8V): Transmitter On
 - (>0.8 and <2V): Undefined
 - High (2.0V to 3.465V): Transmitter Disabled
 - Open: Transmitter Disabled.
3. MOD-DEF0, 1, & 2. These are the module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
 - MOD-DEF0 is grounded by the module to indicate that the module is present.
 - MOD-DEF1 is the clock line of 2-wire serial interface for optional serial ID.
 - MOD-DEF2 is the data line of 2-wire serial interface for optional serial ID.

4. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7k Ω to 10k Ω resistor on the host board to a voltage between 2.0V and Vcc+0.3V. "Logic 0" indicates normal operation. "Logic 1" indicates loss of signal or link down with partner I. In the "low" state, the output will be pulled to less than 0.8V.
5. These are the differential receiver outputs. They are internally AC coupled 100 Ω differential lines which should be terminated with 100 Ω (differential) at the host with SGMII interface.
6. These are the differential transmitter inputs. They are AC coupled, differential lines with 100 Ω differential termination inside the module.

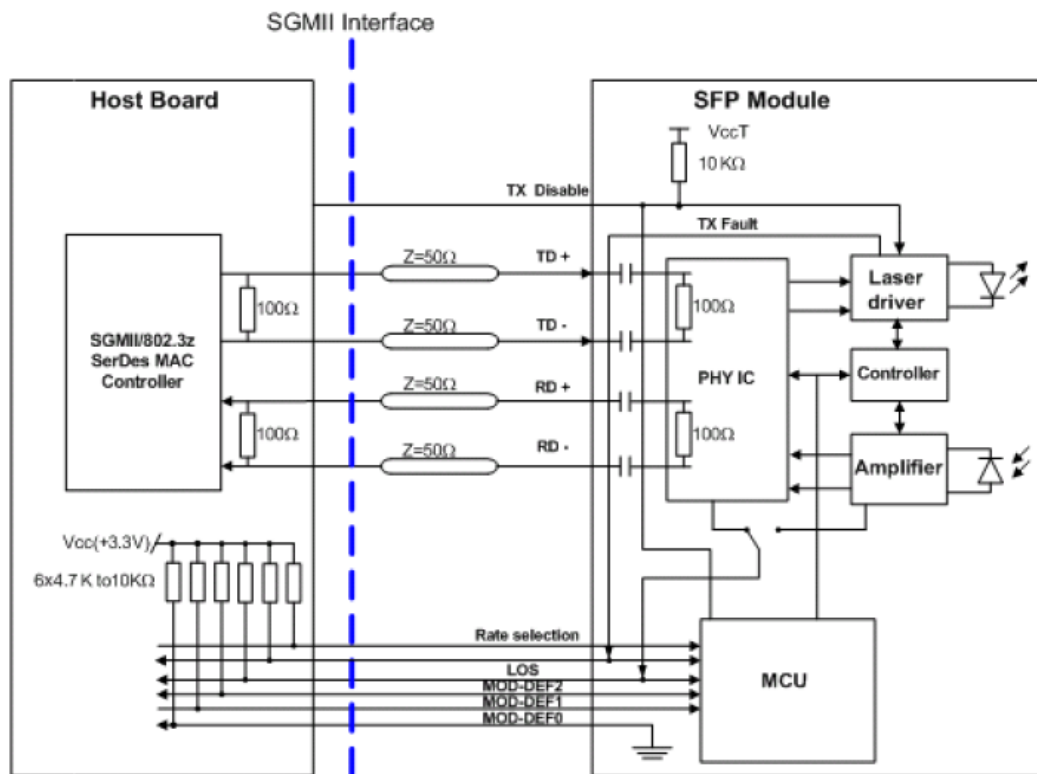
Pin Definitions



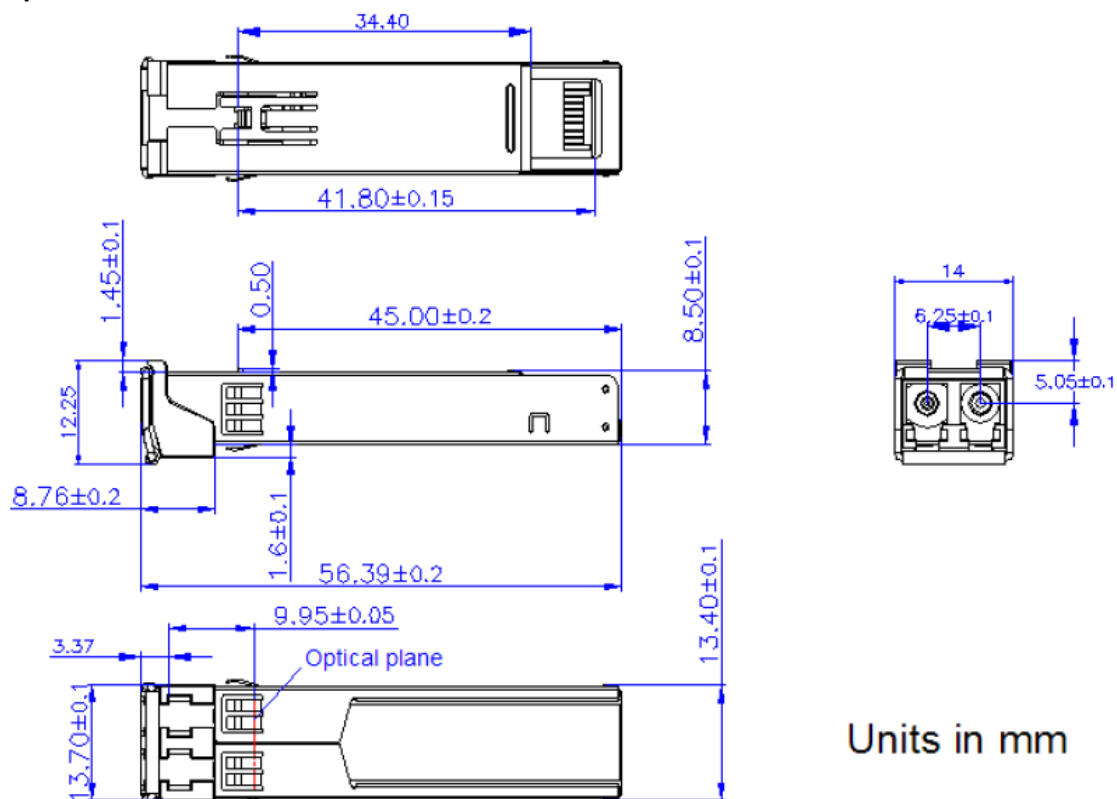
Recommended Host Board Power Supply Circuit



Recommended Interface Circuit



Mechanical Specifications



Units in mm

OptioConnect

Innovation for the Future of High-Speed Networking

Who We Are

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

What We Do

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

Smarter Networks by Design

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

Our Team

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

Our Mission

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

Let's Connect

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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