SFP56-64GFC-SW-OPC

MSA and TAA 64GBase-SW Fibre Channel SFP56 (MMF, 850nm, 100m, LC, DOM)

Features

- Supports 16GFC, 32GFC, and 64GFC Data Rates
- Up to 100m Transmission on Multi-Mode Fiber
- VCSEL Laser and PIN Receiver
- Single 3.3V Power Supply
- Power Dissipation of 1.5W
- LC Connector
- Hot-Pluggable
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free

Applications:

- 64GBase Fibre Channel
- Access and Enterprise

Product Description

This MSA compliant SFP56 transceiver provides 64GBase-SW Fibre Channel throughput up to 100m over multi-mode fiber (MMF) using a wavelength of 850nm via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow 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
Maximum Supply Voltage		Vcc	-0.3		4	V	
Storage Temperature		Tstg	-40		85	℃	
Operating Case Temperature		Tc	0		70	℃	
Signaling Rate	**64GFC**			28.9		GBd	
	32GFC			28.05		GBd	
	16GFC			14.025		GBd	
Transmission Distance	**64GFC**				70 (OM3) 100 (OM4/OM5)	m	
	32GFC				20 (OM2) 70 (OM3) 100 (OM4)	m	
	16GFC				35 (OM2) 100 (OM3) 125 (OM4)	m	
Bit Error Rate	**64GFC**		10^{-10}	$1.31x10^{-4}$			1
	32GFC			10^{-12}			2
Coupled Fiber			Multi-Mode Fiber				3

Notes:

1. PRBS31Q for 64GFC.
2. PRBS31 for 32GFC/13GFC.
3. 50/125μm MMF.

64G Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Voltage	Vcc	3.135	3.3	3.465	V	
Module Supply Current	Icc		400		mA	
Transmitter						
Differential Input Voltage Tolerance		900			mV	
Differential Termination Resistance Mismatch				10	%	
Differential Return Loss SDD11	SDD11, SDD22 (dB) $\begin{cases} -9.5+0.368 \cdot f & 0.01 < f < 8\text{GHz} \\ -4.75+7.4 \cdot \log_{10}(f/14.025\text{GHz}) & 8 < f \leq 21\text{GHz} \end{cases}$				dB	
Differential-Mode to Common-Mode Conversion SCD11	SDC22, SCD11 (dB) < $\begin{cases} -22 + 20 \cdot f/25.78\ \text{GHz} & 0.01 < f < 12.89\text{GHz} \\ -15 + 6 \cdot f/25.78\ \text{GHz} & 12.89 < f < 21\ \text{GHz} \end{cases}$				dB	
Input Equalization				10	dB	
Receiver						
Differential Voltage (Pk-Pk)				900	mV	
Differential Voltage With Transmitter Disabled (Pk-Pk)				35	mV	
Common-Mode Noise (RMS)				17.5	mV	
Differential Termination Resistance Mismatch				10	%	1
Differential Return Loss SDD22	SDD11, SDD22 (dB) $\begin{cases} -9.5+0.368 \cdot f & 0.01 < f < 8\text{GHz} \\ -4.75+7.4 \cdot \log_{10}(f/14.025\text{GHz}) & 8 < f \leq 21\text{GHz} \end{cases}$				dB	
Common-Mode to Differential-Mode Conversion SDC22	SDC22, SCD11 (dB) < $\begin{cases} -22 + 20 \cdot f/25.78\ \text{GHz} & 0.01 < f < 12.89\text{GHz} \\ -15 + 6 \cdot f/25.78\ \text{GHz} & 12.89 < f < 21\ \text{GHz} \end{cases}$				dB	
Source Transition Time (20-80%)		9.5			ps	
Eye Width at 10^{-5} Probability EW5		0.265			UI	
Eye Height at 10^{-5} Probability EH5		70			mV	
Vertical Eye Closure (VEC)				12	dB	
Output Emphasis				5	dB	
Low-Speed Signals						
Tx_Fault, Rx_LOS Output Voltage	VOL	-0.3		0.4	V	2
Tx_Disable, RS0, RS1 Input Voltage	VIL	-0.3		0.8	V	
	VIH	2.0		Vcc+0.3	V	

Notes:

1. At 1MHz.
2. At 0.7mA.

32G Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Voltage	Vcc	3.135	3.3	3.465	V	
Module Supply Current	Icc		400		mA	
Transmitter						
Differential Termination Resistance Mismatch				10	%	
Differential Return Loss SDD11	SDD11, SDD22 (dB)	$\begin{cases} -11 & 0.05 < f < 4GHz \\ -6.0+9.2\cdot\log_{10}(f/14.025GHz) & 4< f \leq 28.05GHz \end{cases}$			dB	
Common-Mode to Differential-Mode Conversion SDC11	SDC11, SCD11 (dB) <	$\begin{cases} -22 +14 \cdot f/28.05GHz & 0.05 < f < 14.025GHz \\ -18 + 6 \cdot f/28.05GHz & 14.025 < f < 28.05GHz \end{cases}$			dB	
Differential-Mode to Common-Mode Conversion SCD11	SDC11, SCD11 (dB) <	$\begin{cases} -22 +14 \cdot f/28.05GHz & 0.05 < f < 14.025GHz \\ -18 + 6 \cdot f/28.05GHz & 14.025 < f < 28.05GHz \end{cases}$			dB	
Input Equalization				10	dB	
Receiver						
Differential Voltage (Pk-Pk)				900	mV	
Common-Mode Noise (RMS)				17.5	mV	
Differential Termination Resistance Mismatch				10	%	1
Differential Return Loss SDD22	SDD11, SDD22 (dB)	$\begin{cases} -11 & 0.05 < f < 4GHz \\ -6.0+9.2\cdot\log_{10}(f/14.025GHz) & 4< f \leq 28.05GHz \end{cases}$			dB	
Common-Mode to Differential-Mode Conversion SDC22	SDC11, SCD11 (dB) <	$\begin{cases} -22 +14 \cdot f/28.05GHz & 0.05 < f < 14.025GHz \\ -18 + 6 \cdot f/28.05GHz & 14.025 < f < 28.05GHz \end{cases}$			dB	
Differential-Mode to Common-Mode Conversion SCD22	SDC11, SCD11 (dB) <	$\begin{cases} -22 +14 \cdot f/28.05GHz & 0.05 < f < 14.025GHz \\ -18 + 6 \cdot f/28.05GHz & 14.025 < f < 28.05GHz \end{cases}$			dB	
Common-Mode Return Loss SCC22				-2	dB	
Source Transition Time (20-80%)		9.5			ps	
Vertical Eye Closure				4	dB	
Eye Width at 10^{-6} Probability EW6		0.65			UI	
Eye Height at 10^{-6} Probability EH6		250			mV	
Output Emphasis				5	dB	
Low-Speed Signals						
Tx_Fault, Rx_LOS Output Voltage	VOL	-0.3		0.4	V	2
Tx_Disable, RS0, RS1 Input Voltage	VIL	-0.3		0.8	V	
	VIH	2.0		Vcc+0.3	V	

Notes:

1. At 1MHz.
2. At 0.7mA.

16G Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Voltage	Vcc	3.135	3.3	3.465	V	
Module Supply Current	Icc		400		mA	
Transmitter						
Common-Mode Voltage (RMS)				30	mV	
Common-Mode Voltage (Spectral Peak) (RMS)				20	mV	
Input Equalization				10	dB	
Receiver						
Output Emphasis				5	dB	
Low-Speed Signals						
Tx_Fault, Rx_LOS Output Voltage	VOL	-0.3		0.4	V	1
Tx_Disable, RS0, RS1 Input Voltage	VIL	-0.3		0.8	V	
	VIH	2.0		Vcc+0.3	V	

Notes:

1. At 0.7mA.

64GFC Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength		840	850	860	nm	
RMS Spectral Width				0.6	nm	
TDECQ				5.5	dB	
TDECQ-10log10(Ceq)				5.5	dB	
OMAouter		-4.5		3	dBm	
OMA_{outer} Extinction Ratio		3			dB	
Launched Power in OMA_{outer} Minus TDECQ		-5.9			dBm	
Average Launch Power		-7.5		4	dBm	
$RIN_{12}OMA$				-128	dB/Hz	
Transition Time (20-80%)				34	ps	
Encircled Flux		≥86% at 19μm, ≤30% at 4.5μm				
Receiver						
Damage Threshold		5			dBm	
Average Receive Power		-9.4		4	dBm	1
Receiver Power (OMA_{outer})				3	dBm	
Return Loss of Receiver		12			dB	
Receiver Sensitivity (OMA_{outer})				-7	dBm	
Stressed Receiver Sensitivity (OMA_{outer})				-2.4	dBm	
LOS De-Assert				-14	dBm	
LOS Assert		-30		-17	dBm	

Notes:

1. The receiver should be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this received power.

32GFC Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength		840	850	860	nm	
RMS Spectral Width				0.570	nm	
Average Launch Power		0.240 (-6.2)		1.585 (2)	mW (dBm)	
Optical Modulation Amplitude		0.476 (-3.2)			mW (dBm)	
Vertical Eye Closure Penalty (VECPq)				3.13	dB	
$RIN_{12}OMA$				-129	dB/Hz	
Encircled Flux		≥86% at 19µm, ≤30% at 4.5µm				
Receiver						
Average Receive Power				1.585 (2)	mW (dBm)	
Unstressed Receiver Sensitivity (OMA)				0.095 (-10.2)	mW (dBm)	
Return Loss of Receiver		12			dB	
Rx Jitter Tracking Test (OMA)		0.295(-5.3)			mW(dBm)	
Rx Jitter Tracking Test, Jitter Frequency, and Pk-Pk Amplitude		(500,1)(100,5)			(kHz,UI)	
Receiver Electrical 3dB Upper Cutoff Frequency				32	GHz	
Stressed Receiver Sensitivity (OMA)				0.263 (-5.8)	mW (dBm)	
LOS De-Assert				-14	dBm	
LOS Assert		-30		-17	dBm	

16GFC Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength		840	850	860	nm	
RMS Spectral Width				0.59	nm	
Average Launch Power		-7.8		0	dBm	1
Optical Modulation Amplitude		0.331 (-4.8)			mW (dBm)	
Vertical Eye Closure Penalty (VECPq)				2.56	dB	
$RIN_{12}OMA$				-128	dB/Hz	
Encircled Flux		≥86% at 19µm, ≤30% at 4.5µm				
Receiver						
Average Received Power				0	dBm	
Unstressed Receiver Sensitivity (OMA)				0.089 (-10.5)	mW (dBm)	
Return Loss of Receiver		12			dB	
Rx Jitter Tracking Test (OMA)		0.214(-6.7)			mW(dBm)	
Rx Jitter Tracking Test, Jitter Frequency, and Pk-Pk Amplitude		(840,1)(168,5)			(kHz,UI)	
Receiver Electrical 3dB Upper Cutoff Frequency				18	GHz	
Stressed Receiver Sensitivity (OMA)				0.17 (-7.7)	mW (dBm)	
LOS De-Assert				-14	dBm	
LOS Assert		-30		-17	dBm	

Notes:

1. Maximum average launch power shall be the less of the value listed here or the Class 1 laser safety limits (CDRH and EN 60825).

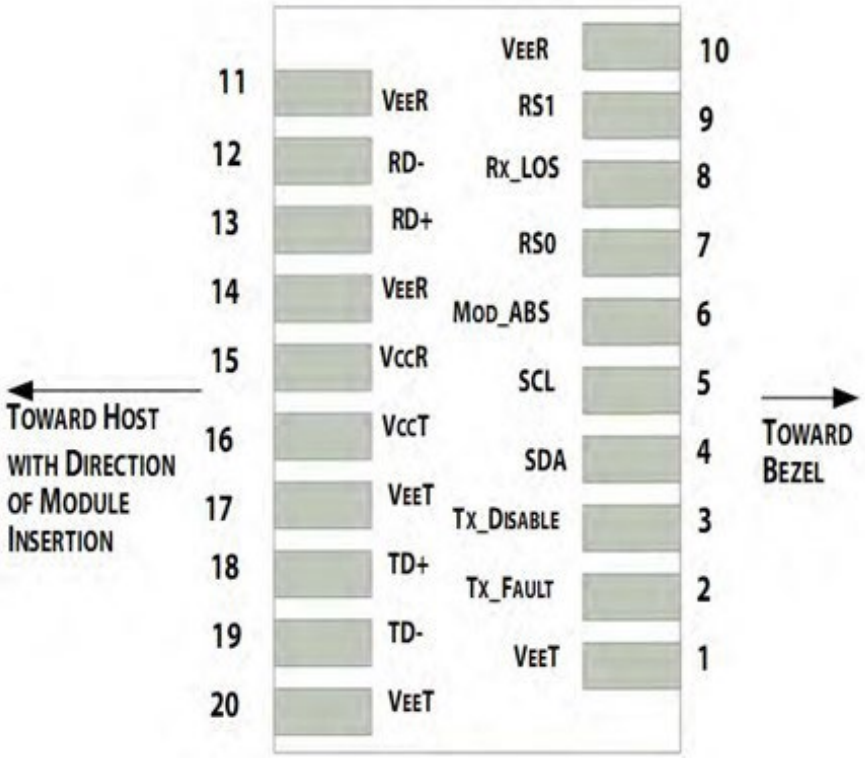
Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault.	
3	Tx_Disable	Transmitter Disable. Logic 1 disables laser output.	
4	SDA	2-Wire Serial Interface Data Line.	
5	SCL	2-Wire Serial Interface Clock Line.	
6	MOD_ABS	Module Absent. Grounded within the module.	2
7	RS0	Rate Selection 0. Rx Signaling Rate.	3
8	Rx_LOS	Loss of Signal Indication. “Logic 1” indicates loss of signal.	
9	RS1	Rate Selection 1. Tx Signaling Rate.	3
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	1
12	RD-	Inverse Receiver Data Out. AC Coupled.	
13	RD+	Received Data Out. AC Coupled.	
14	VeeR	Receiver Ground (Common with Transmitter Ground).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground (Common with Receiver Ground).	1
18	TD+	Transmitter Data In. AC Coupled.	
19	TD-	Inverse Transmitter Data In. AC Coupled.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

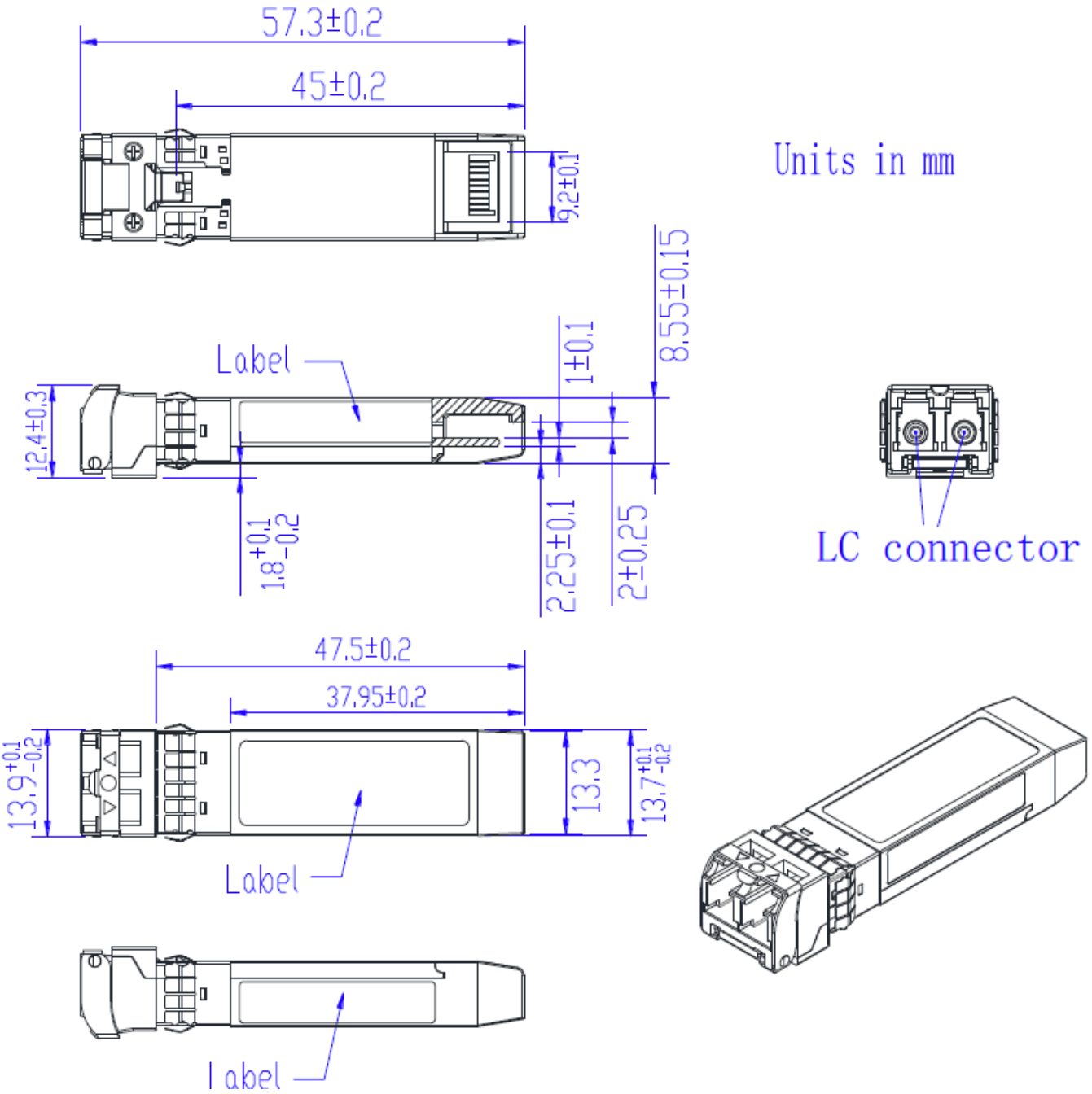
Notes:

1. The circuit ground is internally isolated from the chassis ground.
2. MOD_ABS is pulled low in the module to indicate that the module is plugged in.
3. The signal is internally pulled down per SFF-8431 Rev. 4.1.

Electrical Pin-Out Details



Mechanical Specifications



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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