



Q28-50GP4-BXD3029-40-OPC

MSA and TAA 50GBase-BX PAM4 QSFP28 Transceiver (SMF, 1309nmTx/1295nmRx, 40km, LC, DOM)

Features

- Compliant with QSFP28 Standard and 50GBASE-ER: SFF-8665 Revision 1.9, SFF-8636 Revision 2.9
- Compliant with IEEE802.3 50GAUI-2 C2M electrical interface
- Bi-directional application
- Single 3.3V Supply Voltage
- Maximum power consumption 4.5W
- EML laser and APD Receiver
- QSFP28 MSA package with single LC connector
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Operating Temperature: 0C to 70C



Applications:

- 50GBase Ethernet
- Access and Enterprise

Product Description

This MSA compliant QSFP28 transceiver provides 50GBase-BX throughput up to 40km over single-mode fiber (SMF) PAM4 using a wavelength of 1309nmTx/1295nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure 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
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	TS	-40		+85	°C
Operating Case Temperature	TC	0		70	°C
Relative Humidity (non-condensing)	RH	5		85	%
Data Rate	DRL		26.5625		GBaud/s
			26.5625x2		Gbit/s
Operating Distance		2		40000	m

Electrical Characteristics

High-Speed Signal: Compliant to 50GAUI-2 C2M (IEEE 802.3cd)

Low-Speed Signal: Compliant to SFF-8679

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	VCC	3.135	3.3	3.465	V	
Steady state current	Isupply			1298.7	mA	
Instantaneous peak current at hot plug	ICC_IP			1800	mA	Per pin
Sustained peak current at hot plug	ICC_SP			1485	mA	Per pin
Maximum Power Dissipation	PD			4.5	W	
Maximum Power Dissipation, Low Power Mode	PDL P			1.5	W	
Two Wire Serial Interface Clock Rate				400	kHz	
Power Noise and Ripple noise tolerance 10 Hz to 10 MHz (peak-to-peak)				66	mVpp	
Rx Differential Data Output Load			100		ohms	
Transmitter (Module Input)						
Differential Data Input Amplitude	VIN,P-P			900	mVpp	1
Differential Termination Mismatch				10	%	
LPMode, Reset and ModSelL	VIL	-0.3		0.8	V	
	VIH	2		VCC+0.3	V	
Receiver (Module Output)						
Differential Data Output Amplitude	VOU T,P-P			900	mVpp	1
Differential Termination Mismatch				10	%	
Output Rise/Fall Time, 20%~80%	TR	12			ps	
ModPrsL and IntL	VOL	0		0.4	V	IOL=4mA
	VOH	VCC-0.5		VCC+0.3	V	IOL=-4mA

Notes:

1. Amplitude customization beyond these specs is dependent on validation in customer system.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Wavelength	λ	1308.09	1309	1310.19	nm	
Side-mode suppression ratio	SMSR	30			dB	
Average launch power	P _{OUT}	0.4		6.63	dBm	
Average launch power of OFF transmitter	P _{OUT_OFF}			-15	dBm	
Outer Optical Modulation Amplitude (OMAOuter)	P _{OUTL}	3.4		7.4	dBm	
Extinction ratio	ER	6			dB	
Launch power in OMAouter minus TDECQ	OMA-TDECQ	2			dBm	
Transmitter and dispersion eye closure for PAM4 (TDECQ)	TDECQ			3.2	dB	1
Transmitter reflectance				-26	dB	
Receiver						
Wavelength	λ	1294.53	1295	1296.59	nm	
Receiver sensitivity (OMAOuter)				Max (-15.1, SECQ - 16.5)	dBm	2
Damage Threshold	P _{damage}	-2.37			dBm	
Overload		-3.37			dBm	
Average Receive Power		-17.6		-3.37	dBm	
Receive power (OMAOuter)	OMA			-2.6	dBm	
Receiver Reflectance	RXR			-26	dB	
LOS assert	LOSA	-30			dBm	
LOS de-assert	LOSD			-20	dBm	
LOS hysteresis	LOSH	0.5			dB	

Notes:

1. Measured with a PRBS215-1 test pattern @53.125Gbps.
2. Measured with a PRBS231-1 test pattern @53.125Gbps, $BER \leq 2.4E-4$. IEEE 802.3cd clause 139 equation 139-2.

Control and Status Timing Requirement

Item	Symbol	Min.	Max.	Unit	Notes
Initialization time	t_init		10	s	1
Reset Init Assert Time	t_reset_init	10		us	
Serial Bus Hardware Ready Time	t_serial		2	s	
Monitor Data Ready Time	t_data		2	s	
Reset Assert Time	t_reset		10	s	1
LPMMode Assert Time	ton_LPMMode		100	ms	
LPMMode De-assert Time	toff_LPMMode		10	s	1
IntL Assert Time	ton_IntL		200	ms	
IntL Deassert Time	toff_IntL		500	us	
Rx LOS Assert Time	ton_los		100	ms	
Flag Assert Time	ton_flag		200	ms	
Mask Assert Time	ton_mask		100	ms	
Mask Deassert Time	toff_mask		100	ms	
Power_over-ride or Power-set Assert Time	ton_Pdown		100	ms	
Power_over-ride or Power-set Deassert Time	toff_Pdown		10	s	1

Notes:

1. Timing not compliant with SFF-8679 V1.8.

Squelch and Disable Timing

Item	Symbol	Min.	Max.	Unit	Notes
Rx Squelch Assert Time	ton_Rxsq		15	ms	
Rx Squelch Deassert Time	toff_Rxsq		350	ms	1
Tx Squelch Assert Time	ton_Txsq		400	ms	
Tx Squelch Deassert Time	toff_Txsq		400	ms	
Tx Disable Assert Time	ton_txdis		100	ms	
TX_Disable Deassert Time	toff_txdis		400	ms	
Rx Output Disable Assert Time	ton_rxdis		100	ms	
Rx Output Disable Deassert Time	toff_rxdis		350	ms	1
Squelch Disable Assert Time	ton_sqdis		100	ms	
Squelch Disable Deassert Time	toff_sqdis		100	ms	

Notes:

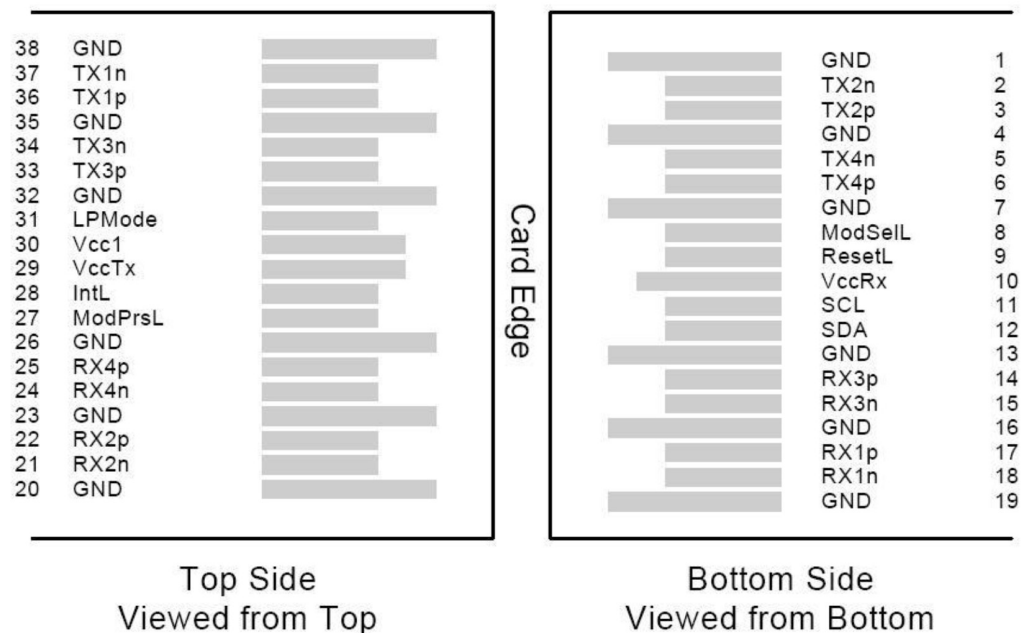
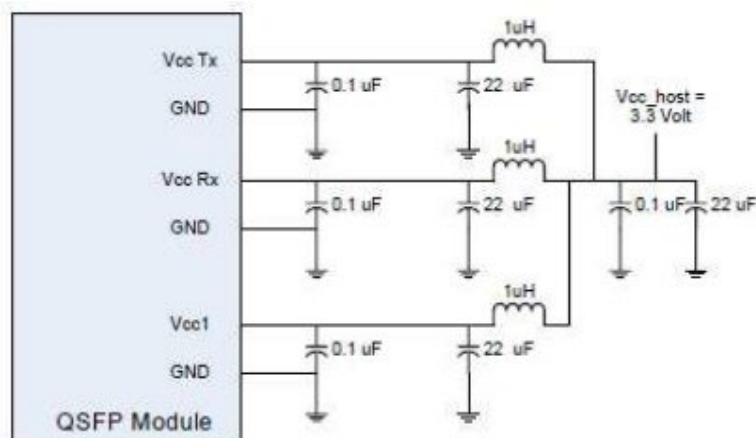
1. Timing not compliant with SFF-8679 V1.8.

Pin Descriptions

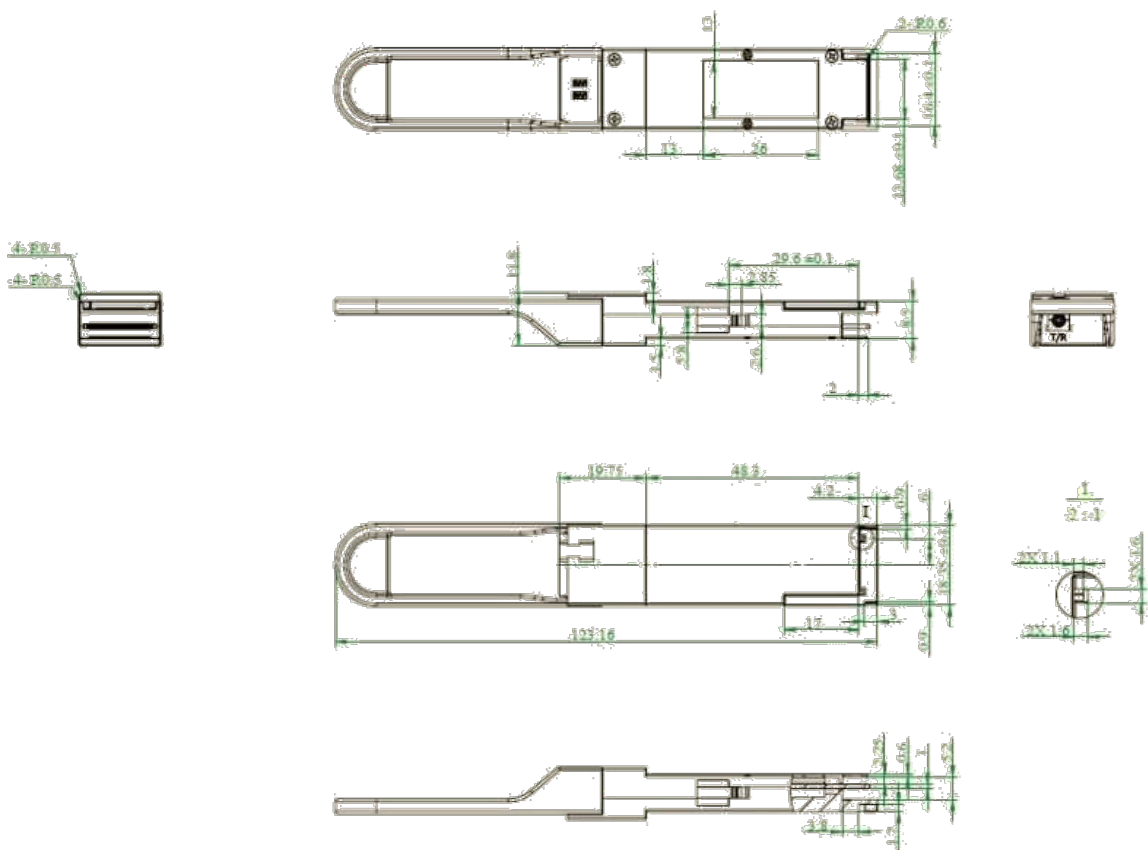
Pin	Logic	Symbol	Descriptions	Plug Sequence	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	3
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	3
7		GND	Ground	1	1
8	LVTTL-I	ModselL	Module Select	3	
9	LVTTL-I	ResetL	Module Reset	3	
10		Vcc Rx	+3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-wire serial interface clock	3	
12	LVC MOS-I/O	SDA	2-wire serial interface data	3	
13		GND	Ground	1	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	3
15	CML-O	Rx3n	Receiver Inverted Data Output	3	3
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	3
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	3
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL/Rx LOS	Interrupt/Rx LOS	3	4
29		Vcc Tx	+3.3V Power supply transmitter	2	2
30		Vcc1	+3.3V Power supply	2	2
31	LVTTL-I	LPMode/TxDis	Low Power Mode/Tx disable	3	4
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	3
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	3
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

Notes:

1. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently.
3. Not used.
4. Dual function pin as specified into SFF-8679.

Electrical Pin-out Details**Recommended Host Board Power Supply Filter Network**

Mechanical Specifications



Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	0 to V _{CC}	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	0.4 to 6.63	±3	dB	Internal
Rx Power	-17.6 to -3.37	±3	dB	Internal

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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