

DATA SHEET

MODULETEK – QSFP28-SR4-C10 100G QSFP28 SR4 Optical Transceiver

QSFP28-SR4-C10 Overview

ModuleTek's QSFP28-SR4-C10 QSFP28 SR4 optical transceivers are based on 100G Ethernet IEEE 802.3bm standard. QSFP28 SR4 offers 4 independent transmit and receive channels, each capable of 25G for an aggregate bandwidth of 100G.

Product Features

- Hot-pluggable QSFP28 form factor
- 4x25Gbps 850nm VCSEL laser
- Up to 103.1Gbps
- QSFP28 MSA compliant
- Up to 70m on OM3 Multimode Fiber and 100m on OM4 Multimode Fiber.
- Single 1X12 MPO receptacle
- RoHS Compliant
- Operating temperature range: 0°C to 70°C.

Applications

- 100GBASE-SR4 100G Ethernet

Ordering Information

Part Number	Description
QSFP28-SR4-C10	100G QSFP28 850nm MPO Connectors, Up to 70m(OM3) or 100m(OM4) on MMF

For More Information:

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General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Bit Error Rate	BER			10 ⁻¹²		
Operating Temperature	T _{OP}	0		70	°C	1
Storage Temperature	T _{STO}	- 40		85	°C	2
Input Voltage	V _{CC}	3.14	3.3	3.46	V	
Maximum Voltage	V _{MAX}	- 0.5		4	V	3

Notes:

1. Case temperature
2. Ambient temperature
3. For electrical power interface

Optical Characteristic – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Average Launch Power (per lane)	P	- 8.4		2.4	dBm	
Optical Center Wavelength	λ _C	840		860	nm	
Extinction Ratio	ER	2			dB	
RMS Spectral Width	Δλ			0.65	nm	
Relative Intensity Noise	RIN			- 128	dB/Hz	
Launch Power of OFF Transmitter	P _{OUT_OFF}			- 30	dBm	1
Transmitter Eye Mask			Compliant with IEEE 802.3bm			

Notes:

1. Average

Optical Characteristics – Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ _C	840		860	nm	
Optical Input Power (per lane)	P _{IN}	- 10.3		2.4	dBm	1
Damage Threshold	P	3.4			dBm	
Stressed Receiver Sensitivity in OMA, per lane				- 5.2	dBm	
Receiver Reflectance	TR _{RX}			- 12	dB	
LOS Assert	LOS _A	- 30			dBm	
LOS De-Assert	LOS _D			- 13	dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Average, Informative

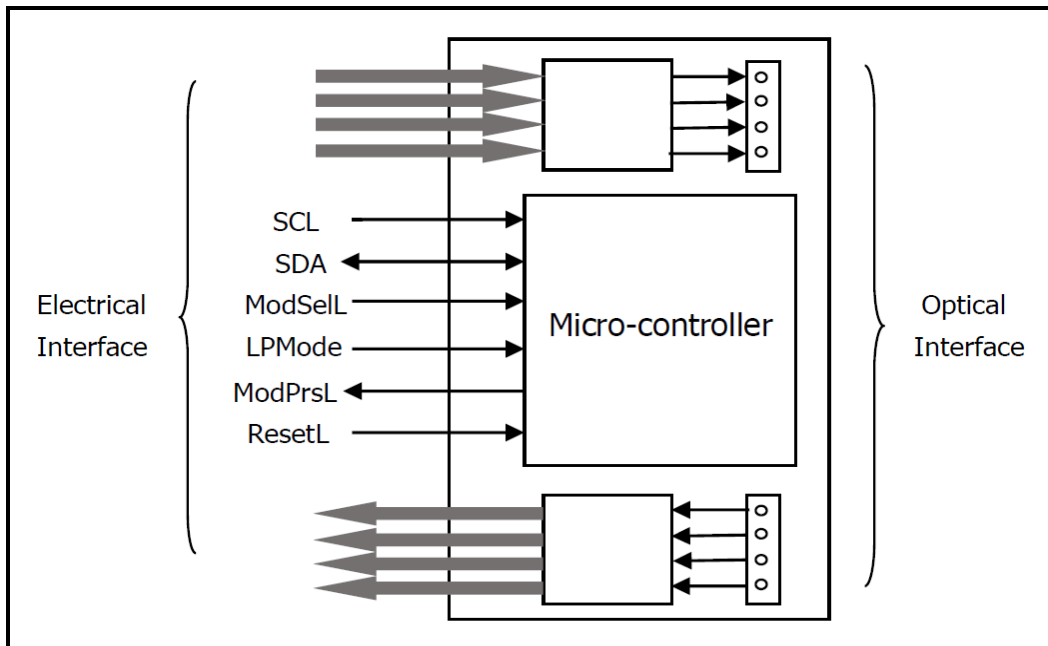
Electrical Characteristics – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate Per Channel	DR		25.78125		Gb/s	
Differential Data Input Swing	V _{IN_PP}	180		1200	mV	
Transmit disable voltage	V _D	V _{CC} -1.3		V _{CC}	V	
Transmit enable voltage	V _{EN}	V _{EE}		V _{EE} +0.8	V	

Electrical Characteristics – Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate Per Channel	DR		25.78125		Gb/s	
Differential Data Output Swing	V _{out_pp}	400		800	mV	
Single Ended Voltage Tolerance	V	- 0.35		3.3	V	
Data Output Rise Time (20%-80%)	T _R	12			ps	
Data Output Fall Time (20%-80%)	T _F	12			ps	

Block Diagram of Transceiver



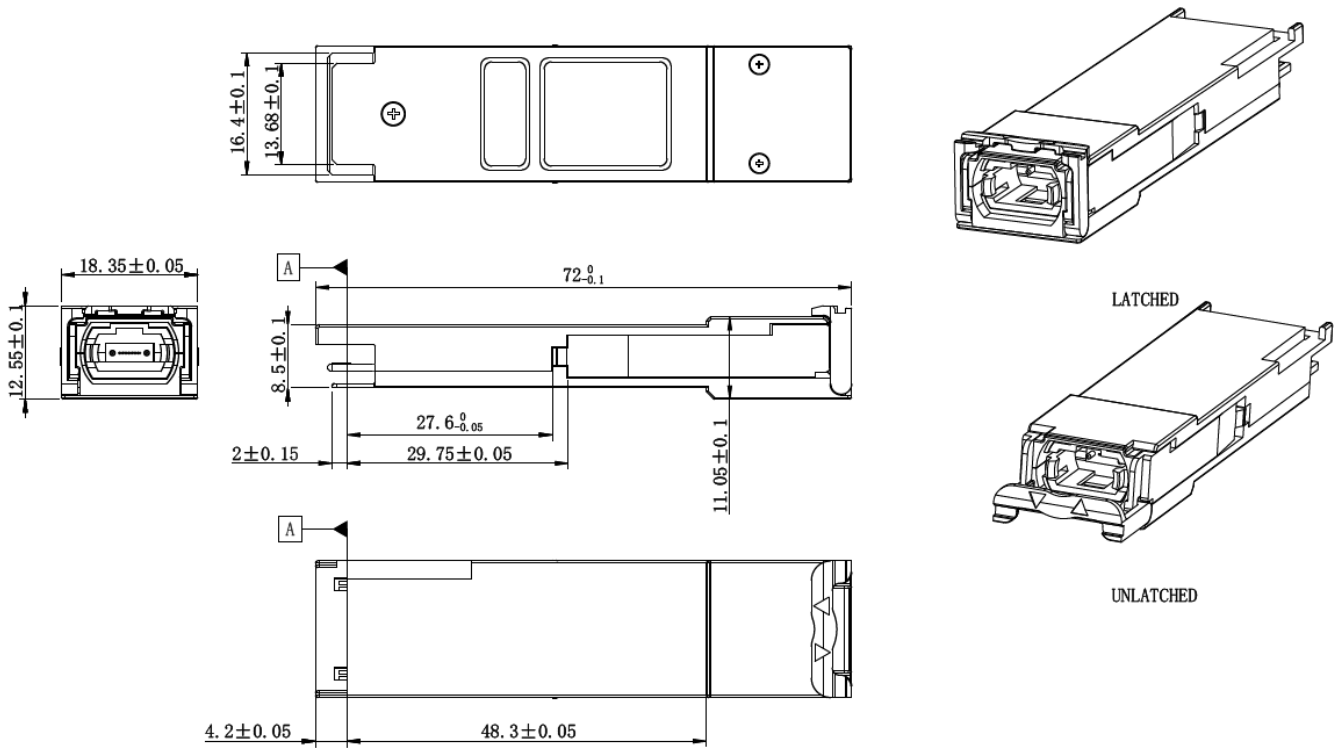
The QSFP28-SR4 has miniature optical engine embedded into QSFP28 module. The engines interconnect 4 independent transmit/receive lanes.

A functional block diagram of the engine is shown in the above Figure. The transmitter sections consist of a 4-channel VCSEL array, a 4-channel input buffer and laser driver.

An on board micro-controller provides control, diagnostic and monitoring for the cable functions, as well as the external I2C serial communication interface.

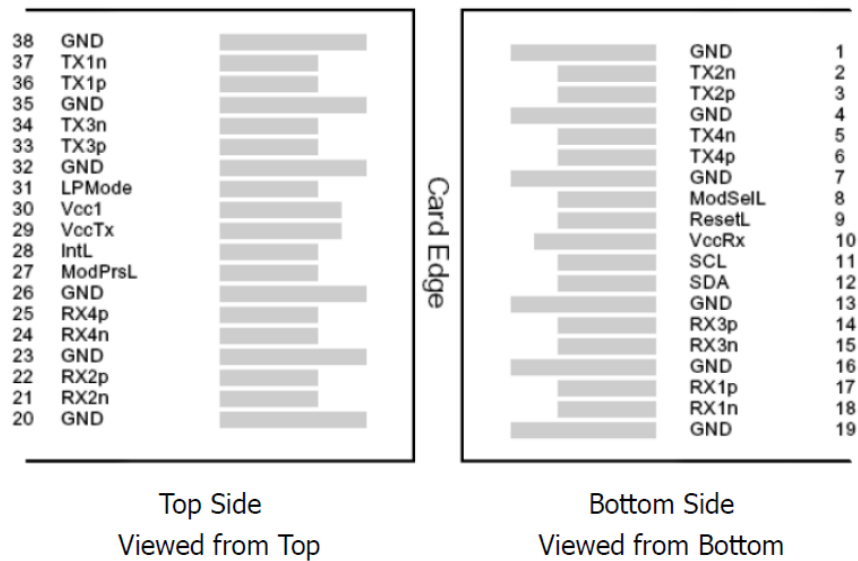
The Receiver section consists of a 4-channel PIN photodiode array, a 4-channel TIA array, and a 4-channel output buffer.

Dimensions



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

Electrical Pad Layout



Pin Assignment

PIN #	Symbol	Description	Remarks
1	GND	Ground	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	V _{cc} Rx	+3.3V Power Supply Receiver	
11	SCL	2-wire Serial Interface Clock	
12	SDA	2-wire Serial Interface Data	
13	GND	Ground	
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	V _{cc} Tx	+3.3V Power Supply transmitter	
30	V _{cc1}	+3.3V Power Supply	
31	LPMODE	Low Power Mode	
32	GND	Ground	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	

35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

References

1. IEEE standard 802.3bm. IEEE Standard Department.
2. QSFP28 4X PLUGGABLE TRANSCEIVER – SFF-8665