40G QSFP+ SR4 850nm 400M MPO MMF Fiber Optic Transceiver

Zion Code and Description

Zion Code	Zion Description
7212030	40G QSFP+ SR4 850nm 400M MPO MMF Fiber Optic Transceiver

Applications

- 40GBASE-SR4 40G Ethernet Links; InfiniBand SDR, DDR and QDR applications
- Sever-Server Clusters, Super-computing interconnections

Features

- Up to 11.2Gbps per channel bandwidth; Aggregate bandwidth of > 40Gbps
- QSFP MSA compliant
- High Reliability 850nm VCSEL technology
- 7252031: Maximum link length of 300m links on OM3 multimode fiber
- 7252032: Maximum link length of 400m links on OM4 multimode fiber
- MPO connector
- Hot pluggable electrical interface
- Compliant with QSFP+ MSA: SFF-8436
- Power Dissipation< 1.5W
- Single +3.3V power supply operating
- Commercial Temperature range 0°C to 70°C
- RoHS Compliant Part

Description

The 40 QSFP+ SR4 300M/400M is a 4x10G hot-pluggable optical transceiver module. It is designed for 300M/400M optical communication applications over multimode fiber using a wavelength of 850nm via MPO connectors.
It is compliant with QSFP+ MSA, IEEE 802.3bm 40GBASE-SR4 standard.
It is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP Multi-Source Agreement (MSA). It has been designed to meet the harshest external operating conditions including temperature, humidity and EMI interference. With these features, this easy to install, hot swappable transceiver is suitable to be used in various applications, such as high-performance computing networks, enterprise core and distribution layer applications, data centers.

Main product parameters

Form Factor	QSFP+	Max Data Rate	41.2 Gbps (4×10.3 Gbps)
Wavelength	850nm	Max Cable Distance 1	300m on OM3 MMF
Max Cable Distance 2	400m on OM4 MMF	Connector type	MPO/MTP
Fiber cable Type	MMF	Vendor Name	Zion Communication/fibre-com
Transimitter Type	VCSEL 850nm	Receiver Type	PIN
Transmit Power	- 7.6 ~ +2.4 dBm	Max Receiver sensitivity	- 5.4 dBm
Overload Power	2.4 dBm	Extinction Ratio	3.0 dB
DDM	Supported	Operating Temp.	0°C to 70°C (32°F to 158°F)

Zion Communication's Hot 40G transceiver types

Zion Code	Zion Description
7212010	40G QSFP+ SR4 850nm 150M MPO MMF Fiber Optic Transceiver
7212020	40G BiDi QSFP+ SR4 850nm & 900nm 100M LC MMF Fiber Optic Transceiver
7212030	40G QSFP+ SR4 850nm 400M LC MMF Fiber Optic Transceiver
7212050	40G QSFP+ LR4 CWDM 2KM LC SMF Fiber Optic Transceiver
7212060	40G QSFP+ LR4 CWDM 10KM LC SMF Fiber Optic Transceiver
7212070	40G QSFP+ ER4 CWDM 40KM LC SMF Fiber Optic Transceiver
7212080	40G QSFP+ PSM4 1310nm 2KM MPO SMF Fiber Optic Transceiver
7212090	40G QSFP+ PSM4 1310nm 10KM MPO SMF Fiber Optic Transceiver

Detailed product specifications

1 Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature (°C)	T_S	-40		85	°C
Max. Supply Voltage	$V_{CC}T$, R	-0.5		3.6	V
Relative Humidity	RH	0		85	%

2 Recommended Operating Environment

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Case operating Temperature	T_C	0		70	°C	
Supply Voltage	$V_{CCT, R}$	3.14	3.3	3.46	V	
Supply Current	I_{CC}			350	mA	
Transmission Distance	TD			100	m	OM3
				150	m	OM4

3 Electrical Characteristics (TOP = 0 to 70 °C, VCC = 3.13 to 3.47 Volts)

Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Note**
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			350	mA	
Transmit turn-on-time				2000	ms	1
Transmitter						
Single Ended Output Voltage Tolerance	Vin T	-0.3		4	V	
Input differential impedance	Rin		100		Ω	
Differential data input swing	Vin.pp	180		1200	mVpp	2
Differential input threshold			50		mV	
AC common mode input voltage tolerance (RMS)		15			mV	
Differential input return loss	Per IEEE P802.3ba,Section 86A.4.1.1				dB	3
J2 Jitter Tolerance	Jt2	0.17			UI	
J9 Jitter Tolerance	Jt9	0.29			UI	
Data Dependent Pulse Width Shrinkage	DDPWS	0.07			UI	
Eye mask colordinates {X1, X2 ,Y1, Y2}			0.11 , 0.31 95 , 350		UI mV	4

Receiver						
Single Ended Output Voltage Tolerance		-0.3		4	V	
Differential data output swing	Vout,pp	0		800	mVpp	5,6
AC common mode output voltage (RMS)				7.5	mV	
Termination mismatch at 1 MHx				5	%	
Differential output return loss	Per IEEE P802.3ba,Section 86A.4.2.1				dB	
Common mode output return loss	Per IEEE P802.3ba,Section 86A.4.2.1				ps	
J2 Jitter output	Jo2			0.42	UI	
J9 Jitter output	Jo9			0.65	UI	
Eye mask colordinates #1 {X1, X2 ,Y1, Y2}			0.29, 0.50 150 , 425		UI mV	4
Power Supply Ripple Tolerance	PSR	50			mVpp	

Note:
1. From power-on and end of any fault conditions.
2. After internal AC coupling. Self-biasing 100Ω differential input.
3. 10 MHz to 11.1 GHz range
4.Hit ratio = 5 x $10E^{-5}$.
5.AC coupled with 100Ω differential output impedance.
6. Settable in 4 discrete steps via the I2C interface.

4 Optical Parameters(TOP = 0 to 70 °C, VCC = 3.14 to 3.46 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Transmitter						
Center Wavelength	λ0	840		860	nm	
Average Launch Power, each Lane		-7.6		0.5	dBm	
Spectral Width (RMS)	σ			0.65	nm	
Optical Extinction Ratio	ER	3			dB	
Average launch Power off each lane	Poff			-30	dBm	
Optical Modulation Amplitude, each Lane	OMA	-4		3.5	dBm	
Transmitter and Dispersion Penalty each lane	TDP			3.5	dB	
Optical Return Loss Tolerance	ORL			12	dB	
Output Eye Mask	Compliant with IEEE 802.3ba					
Receiver						
Receiver Wavelength	λin	840		860	nm	
Rx Sensitivity per lane	RSENS			-9.5	dBm	1
Input Saturation Power (Overload)	Psat	2.4			dBm	
Receiver Reflectance	Rr			-12	dB	
LOS De-Assert	LOS_D			-12	dBm	
LOS Assert	LOS_A	-30			dBm	
LOS Hysteresis	LOS_H	0.5			dB	

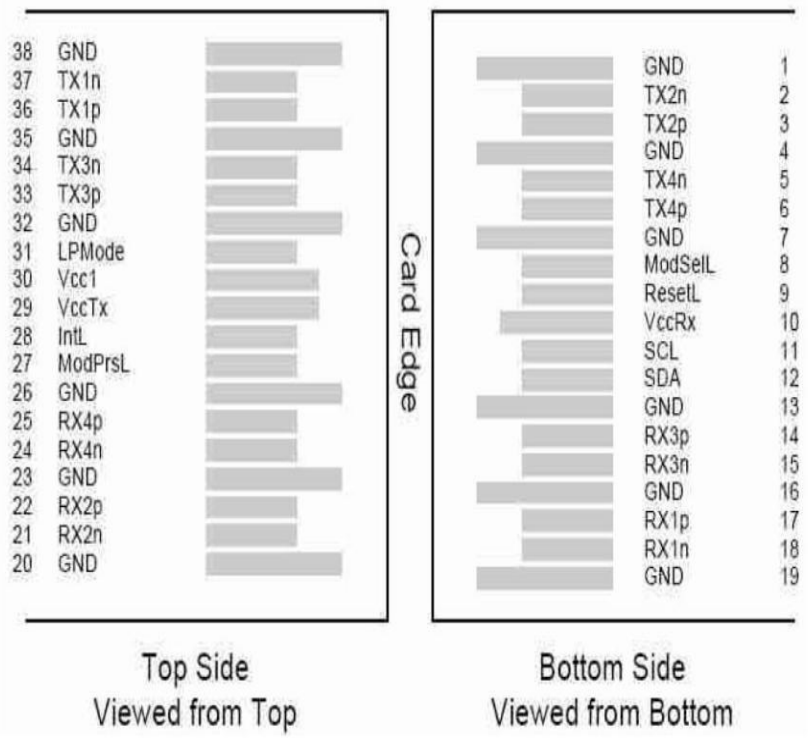
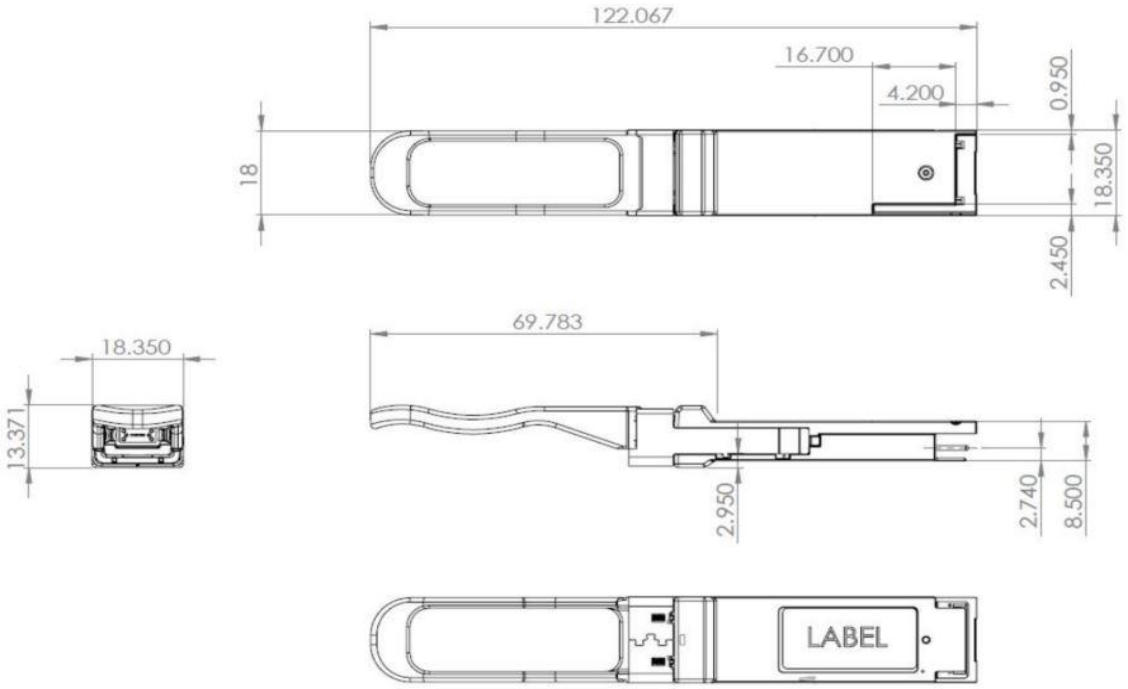
Note: Measured with a PRBS 2^{31}-1 test pattern, @10.325Gb/s, BER<10^{-12}.

5 Diagnostic Monitoring Interface

Digital diagnostics monitoring function is available on all QSFP+ SR4. A 2-wire serial interface provides user to contact with module. The structure of the memory is shown in flowing. The memory space is arranged into a lower, single page, address space of 128 bytes and multiple upper address space pages. This structure permits timely access to addresses in the lower page, such as Interrupt Flags and Monitors. Less time critical time entries, such as serial ID information and threshold settings, are available with the Page Select function. The interface address used is A0xh and is mainly used for time critical data like interrupt handling in order to enable a one-time-read for all data related to an interrupt situation. After an interrupt, IntL has been asserted, the host can read out the flag field to determine the affected channel and type of flag.

Byte Address	Description	Type
0	Identifier(1 Byte)	Read Only
1-2	Status (2 Bytes)	Read Only
3-21	Interrupt Flags (31 Bytes)	Read Only
22-33	Module Monitors (12 Bytes)	Read Only
34-81	Channel Monitors (48 Bytes)	Read Only
82-85	Reserved (4 Bytes)	Read Only
56-97	Control (12 Bytes)	Read Only
98-99	Reserved (2 Bytes)	Read Only
100-106	Module and Channel Masks (7 Bytes)	Read Only
107-118	Reserved (12 Bytes)	Read Only
119-122	Reserved (4 Bytes)	Read Only
123-126	Reserved (4 Bytes)	Read Only
127	Page Select Byte	Read Only

6 Pin Assignment



7 Diagram Mechnical Drawing