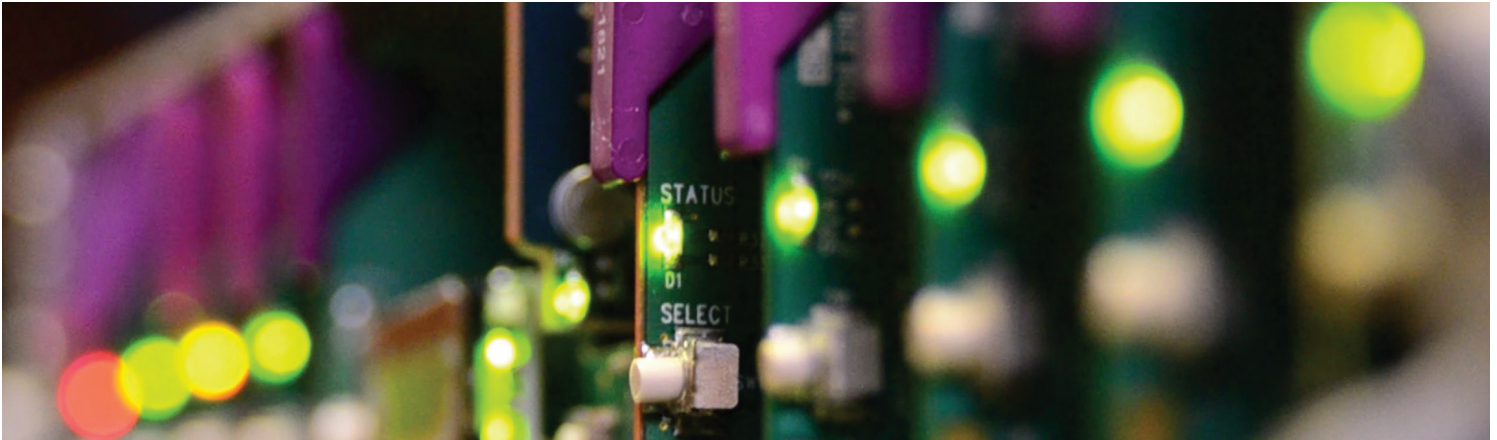


QSFP+ Pluggable Mid-Range Transceiver Module

40 Gb/s Pluggable Optical Transceiver



The QSFP-40G-ESR4 is perfect for high bandwidth, mid-range data communications with 40 Gigabit hot-swappable port for distances up to 300 meters using OM3 fiber.

The QSFP-40G-ESR4 from Grass Valley, a Belden Brand, is a 4-channel pluggable optical transceiver module for mid-range data communication and interconnects applications. The module contains four channels in each direction with 40 Gb/s aggregate bandwidth with each channel operating at up

to 10 Gb/s at distances of up to 300 meters (984 ft.) using OM3 fiber and 400 meters on OM4 multimode fibers. The electrical interface uses a 38-contact edge type connector, compliant with SFF-8436. The optical interface uses a 12-fiber MPO connector.

KEY FEATURES

- Four independent transmitters, and four independent receivers, all operate at 10 Gb/s
- Bidirectional operation, 4x10 Gb/s per direction
- Allows optical interoperability up to 300m (984 ft.) using OM3 MMF or up to 400m (1,312 ft.) using OM4 MMF
- Multimode at 850 nm
- Hot pluggable
- Interoperable with other IEEE-compliant 40GBASE interfaces
- RoHS-6 Compliance

Applications

- 40G Ethernet interconnects

QSFP+ Pluggable Mid-Range Transceiver Module

SPECIFICATIONS

QSFP-40G-ESR4 Quick Specifications

Part Number: QSFP-40G-SR4

Form Factor: QSFP+

TX Optical Wavelength: 850 nm

Distance*1: 300m/984 ft. (OM3),
400m/1,312 ft.*2 (OM4)

Cable Type: MMF

Rate Category: 40GBASE

Interface Type: SR4

Digital Optical Mon. (DOM): Yes

Connector Type: MPO/MTP

Power Consumption: 1.5W

*1 Minimum cabling distance is 0.5 meters (1.64 feet) for -SR4 according to the IEEE 802.3 standard.

*2 Considered an engineered link with maximum 1 decibel loss budget

For specifications parameters definition, please refer to IEEE Std 802.3-2012, IEEE Standard for Ethernet, SECTION SIX, Clause 86 and Annex 86A.

Absolute Maximum Ratings

Parameters	Symbols	Min	Max	Unit	Remarks
Storage temperature	T_s	-20	+85	deg.C	
Storage relative humidity	RH		85		
Supply voltage	V_{cc}	-0.3	+3.6	V	
ESD (HBM)	V_{ESD}	-1000	+1000	V	High speed interfaces
		-2000	+2000	V	Others
Transmitter single end input voltage	$V_{in\ p-p}$		1400	mV _{p-p}	

Recommended Operating Conditions

Parameters	Symbols	Min	Typ.	Max	Unit
Operating case temperature	T_c	0		+70	deg.C
Supply voltage	V_{cc}	3.13	3.3	3.47	V
Supply current	I_{cc}		350	450	mA
Power supply noise tolerance				100	mV _{p-p}
Bit rate	BR		10.3125		Gb/s
Rate tolerance		-100		+100	ppm

Electrical Interfaces

Transmitter Input Specification at TP1

Parameters	Min	Typ.	Max	Unit	Remarks
Single ended input voltage tolerance	-0.3		4	V	
AC common mode input voltage tolerance			15	mV _{rms}	
J2 jitter tolerance			0.17	UI	
J9 jitter tolerance			0.29	UI	
DDPWS			0.07	UI	
Eye mask coordinate: X1, X2, Y1, Y2		0.11, 0.31 95, 350		UI mV	Hit ratio = 5e-5

Receiver Output Specification at TP4

Parameters	Min	Typ.	Max	Unit	Remarks
Single ended output voltage	-0.3		4	V	
AC common mode output voltage			7.5	mV _{rms}	
J2 jitter			0.42	UI	
J9 jitter			0.65	UI	
Output transition time (20% to 80%)	28			ps	
Eye mask coordinate: X1, X2, Y1, Y2		0.29, 0.5 150, 425		UI mV	Hit ratio = 5e-5

SPECIFICATIONS (CONT.)

Optical Interfaces

Transmitter Specification at TP2

(Condition: Tc = 0 to 70° C)

Parameters	Min	Typ.	Max	Unit	Remarks
Optical wavelength	840	850	860	nm	
RMS spectrum width			0.65	nm	
Extinction ratio	3	4.5	7	dB	
Average launched power	-7.6	0.1	2.4	dBm	
Optical modulation amplitude	-5.6	0	2.4	dBm	
Optical return loss tolerance			12	dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}	0.23, 0.34, 0.43, 0.27, 0.35, 0.4				Hit ratio = 5e-5
Average launch power of OFF transmitter, each lane			-30	dBm	

Receiver Specification at TP3

(Condition: Tc = 0 to 70° C)

Parameters	Min	Typ.	Max	Unit	Remarks
Operation wavelength	840	850	860	nm	
Unstressed sensitivity (OMA)*			-11.5	dBm	BER=1e-12
Overload			3	dBm	

* USRS is measured with typical SR4 light source with 1m (3.28 ft.) OM3 fiber

ORDERING

QSFP-40G-ESR4 QSFP+ Pluggable Transceiver Module allows optical interoperability up to 300m (400m) using OM3 (OM4) MMF

