Hot Pluggable, Duplex LC,
+3.3V 850nm VCSEL-LD

800G OSFP 2xDR4 Optical Transceiver (STC-40011) Datasheet

- Optical Interface: 106.25 Gbps (PAM4) x 8
- Electrical Interface: 106.25 Gbps (PAM4) x 8
- Case temperature range of 0°C to +70°C

Applications:

- 8 x 100GbE applications
- 2 x 400GbE applications
- 4 x 200GbE applications

Features:

- Hot-pluggable Type 2 OSFP form factor
- Supports 850Gb/s aggregate bit rate
- Power dissipation <15W
- Single 3.3V power supply
- Aligned with IEEE 802.3bs
- RoHS-6 compliant
- I2C management interface
- CMIS 5.2 management interface compliant
- DUAL MPO-12, APC receptacles

Description:

SWEDISH TELECOM OPTO's STC-40011 OSFP 2xDR4 transceiver modules are designed for use in (2 x 400) Gigabit Ethernet links on up to 500m of single mode fiber. They are compliant with the OSFP MSA, IEEE 802.3bs and IEEE P802.3ck Digital diagnostic functions are available via the I2C interface, as specified by the OSFP MSA. The optical transceiver is RoHS compliant.

► Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum supply voltage	Vcc	-0.3	3.3	3.6	V	
Storage temperature	Ts	-40		85	℃	
Relative humidity	RH	0		85	%	Non-condensing
Damage threshold, each lane	THd	5			dBm	

► Operating Environments

Electrical and optical characteristics below are defined under this operating environment, unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	VCC	3.135	3.3	3.465	V
Case temperature	Tcase	0		70	℃
Data rate, each lane			106.25		Gbit/s
Data rate accuracy		-100		100	ppm
Link distance with G.652		2		500	m

► Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power dissipation	P			15	W	
Supply current	ICC			4.55	A	
Transmitter						
Data rate, each lane		53.125±100 ppm.			GBd	
Overload differential voltage pk-pk		900			mV	
Common mode voltage		-350		2850	mV	
Single-ended voltage tolerance range		-0.4		3.3	V	
Receiver						
Data rate, each lane		53.125±100 ppm.			GBd	
Differential voltage, pk-pk	Vpp			900	mV	
Common mode voltage (Vcm)	Vcm	-350		2850	mV	
Common mode noise, RMS				17.5	mV	
Transition time		8.5			ps	

► Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Data rate, each Lane		53.125 ± 100 ppm			GBd	
Modulation format		PAM4				
Line wavelengths		1304.5		1317.5	nm	
Average launch power, each lane	PAVG	-2.9		4	dBm	1
Optical modulation amplitude (OMA), each lane	OM A	-0.8		4.2	dBm	2
Extinction ratio (ER)	ER	3.5			dB	
Side-mode suppression ratio (SMSR)	SM SR	30			dB	
Launch power in OMA minus TDECQ, each lane		-2.2			dBm	
Transmitter and dispersion eye				3.4	dB	
closure for PAM4, each Lane (TDECQ)	TDE CQ					
Optical return loss tolerance				21.4	dB	
Transmitter reflectance				-26	dB	3
RIN21 .4OMA				-136	dB/Hz	
Average launch power of OFF transmitter, each Lane				-15	dBm	
Receiver						
Data rate, each Lane		53.125 ± 100 ppm			GBd	
Modulation format		PAM4				
Damage threshold, each lane		5.0			dBm	4
Line wavelengths		1304.5		1317.5	nm	
Average receiver power, each lane		-5.9		4	dBm	5
Receiver power, each lane (OMA)				4.2	dBm	
Receiver sensitivity (OMA outer) ,each				-4.4	dBm	6

lane						
LOS assert		-15			dBm	
LOS de-assert				-7	dBm	
LOS hysteresis		0.5			dB	

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Even if the TDECQ < 1.4 dB, the OMAouter (min) must exceed this value
3. Transmitter reflectance is defined looking into the transmitter
4. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level
5. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance
6. Measured with conformance test signal for BER = 2.4 x 10-4.

► PIN Description

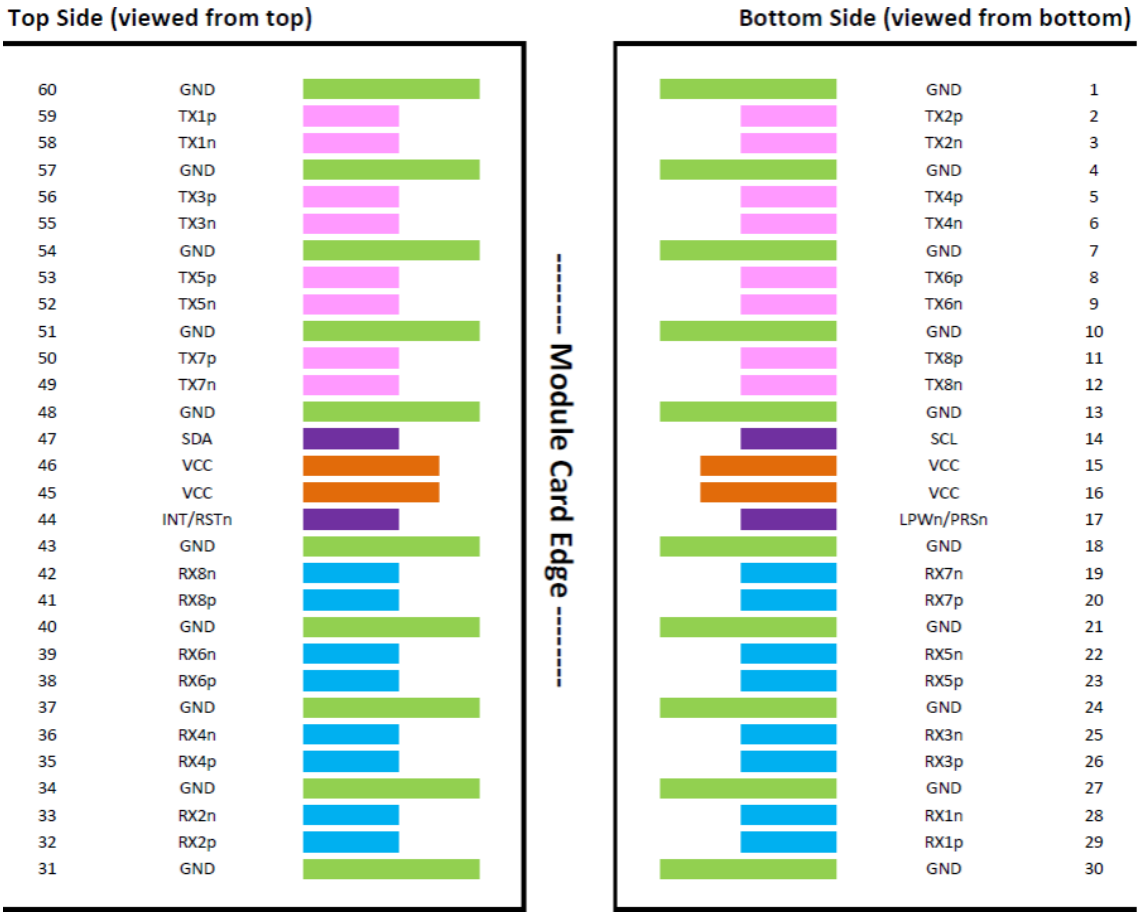


Figure 1 MSA-compliant connector

► OSFP connector pin list

Pin	Name	Logic	Description	Notes
1	GND		Ground	
2	TX2p	CML-I	Transmitter Data Non-Inverted	
3	TX2n	CML-I	Transmitter Data Inverted	
4	GND		Ground	
5	TX4p	CML-I	Transmitter Data Non-Inverted	
6	TX4n	CML-I	Transmitter Data Inverted	
7	GND		Ground	
8	TX6p	CML-I	Transmitter Data Non-Inverted	
9	TX6n	CML-I	Transmitter Data Inverted	
10	GND		Ground	
11	TX8p	CML-I	Transmitter Data Non-Inverted	
12	TX8n	CML-I	Transmitter Data Inverted	
13	GND		Ground	
14	SCL	LVCMOS-I/O	2-wire Serial interface clock	
15	VCC		+3.3V Power	
16	VCC		+3.3V Power	
17	LPWn/PRSn	Multi-Level	Low-Power Mode / Module Present	
18	GND		Ground	
19	RX7n	CML-O	Receiver Data Inverted	
20	RX7p	CML-O	Receiver Data Non-Inverted	
21	GND		Ground	
22	RX5n	CML-O	Receiver Data Inverted	
23	RX5p	CML-O	Receiver Data Non-Inverted	
24	GND		Ground	
25	RX3n	CML-O	Receiver Data Inverted	
26	RX3p	CML-O	Receiver Data Non-Inverted	
27	GND		Ground	
28	RX1n	CML-O	Receiver Data Inverted	
29	RX1p		Receiver Data Non-Inverted	
30	GND		Ground	
31	GND		Ground	
32	RX2p	CML-O	Receiver Data Non-Inverted	
33	RX2n	CML-O	Receiver Data Inverted	
34	GND		Ground	
35	RX4p	CML-O	Receiver Data Non-Inverted	
36	RX4n	CML-O	Receiver Data Inverted	
37	GND		Ground	
38	RX6p	CML-O	Receiver Data Non-Inverted	
39	RX6n	CML-O	Receiver Data Inverted	
40	GND		Ground	

Pin	Name	Logic	Description	Notes
41	RX8p	CML-O	Receiver Data Non-Inverted	
42	RX8n	CML-O	Receiver Data Inverted	
43	GND		Ground	
44	INT/RSTn	Multi-Level	Module Interrupt / Module Reset	
45	VCC		+3.3V Power	
46	VCC		+3.3V Power	
47	SDA	LVCMOS-I/O	2-wire Serial interface data	
48	GND		Ground	
49	TX7n	CML-I	Transmitter Data Inverted	
50	TX7p	CML-I	Transmitter Data Non-Inverted	
51	GND		Ground	
52	TX5n	CML-I	Transmitter Data Inverted	
53	TX5p	CML-I	Transmitter Data Non-Inverted	
54	GND		Ground	
55	TX3n	CML-I	Transmitter Data Inverted	
56	TX3p	CML-I	Transmitter Data Non-Inverted	
57	GND		Ground	
58	TX1n	CML-I	Transmitter Data Inverted	
59	TX1p	CML-I	Transmitter Data Non-Inverted	
60	GND		Ground	

► Mechanical Specifications

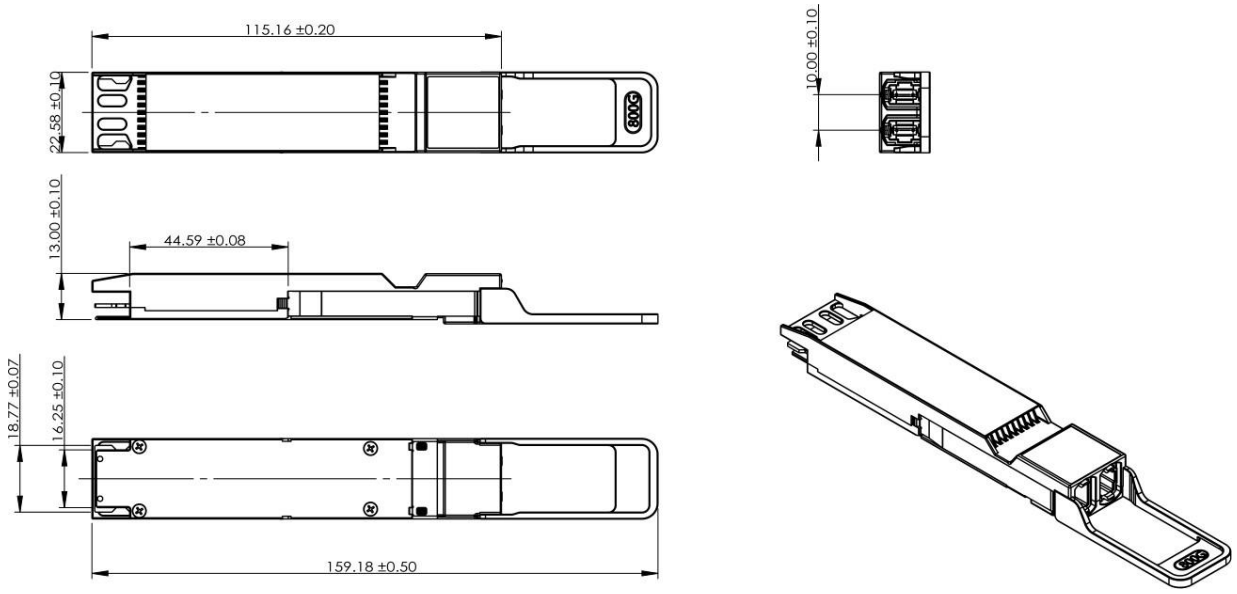
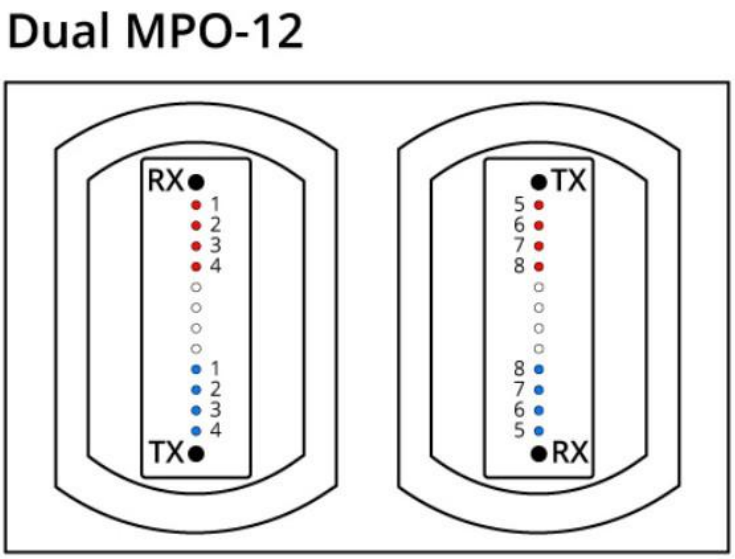


Figure 2 mechanical dimensions



► Document Revision

Version No.	Date	Reviser	Description
V1.0	2024-10-18	Kevin	Template update