

40GBase-SR4 100m QSFP+ Optical Transceiver

ESTRSCQ002

Product Features

- 4 10.2Gbps per module, bi-directional operation
- 4 10Gb/s 850nm VCSEL array
- 4 channels PIN photo detector array
- DDM function implemented
- Up to 100m on OM3 MMF and 150m on OM4 MMF
- Single +3.3V power supply

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	T _s	-40	85	°C
Supply voltage	V _{CC3}	0	3.6	V
Relative humidity	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating case temperature	T _c	0		70	°C	C
Operating case temperature	T _c	-40		85	°C	I
Power supply voltage	V _{CC3}	3.135	3.3	3.465	V	
	I _{CC3}			600	mA	
Power dissipation	P _d			2	W	
Data rate			40		Gbps	
Transmission distance				100	m	OM3
				150	m	OM4

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input differential impedance			100		Ω	
Differential data input swing		180		700	mV	
Differential data output swing				900	mV	

Control and Status I/O Timing Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Initialization time	t_init			2000	ms	
Reset init assert time	t_reset_init			2	us	
Serial bus hardware ready time	t_serial			2000	ms	
Reset assert time	t_reset			2000	ms	
LPMODE assert time	ton_LPMODE			100	us	
LPMODE deassert time	toff_LPMODE			300	ms	
IntL assert time	ton_IntL			200	ms	
IntL deassert time	toff_IntL			500	us	
Rx LOS assert time	ton-los			100	ms	
Tx fault assert time	ton_Txfault			200	ms	
Flag assert time	ton_flag			200	ms	
Mask assert time	ton_mask			100	ms	
Mask deassert time	toff_mask			100	ms	
Power override or power set assert time	ton_Pdown			100	ms	
Power override or power set deassert time	toff_Pdown			300	ms	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Center wavelength	λ_c	840	850	860	nm	
RMS spectral width				0.65	nm	
Optical power for TX distance				-30	dBm	
Average launch power, each lane	P	-7.6		2.4	dBm	
Optical modulation amplitude (OMA), each lane	OMA	-5.6		3	dBm	
TDP per lane	TDP			3.5	dB	
Extinction ratio	ER	3				

Signaling rate, each lane			10.3		Gbps	
Optical eye mask	Compliant with IEEE802.3ba (hit ratio=1x10E-12)					
Optical return loss tolerance				12	dB	
Encircled flux		≥86% at 19μm ≤30% at 4.5μm				
Eye mask margin	Compliant with IEEE802.3ba (hit ratio=1x5E-5)					
Average launch power of OFF transmitter, each lane	MAX		-30		dBm	
Receiver						
Center wavelength	λ _r	840	850	860	nm	
Average receiver sensitivity (AVG, EOL)				-9.5	dBm	
Stressed receiver sensitivity (OMA, EOL)				-5.4	dBm	
Saturation power (EOL)		2.4			dBm	
Damage threshold		3.4			dBm	
Max. input power		3.4			dBm	
LOS assert	LOS_A	-30			dBm	
LOS dessert	LOS_D			-12	dBm	
LOS hysteresis		0.5			dB	
Receiver reflectance				-12	dB	
Signaling rate, each lane			25.78		Gbps	

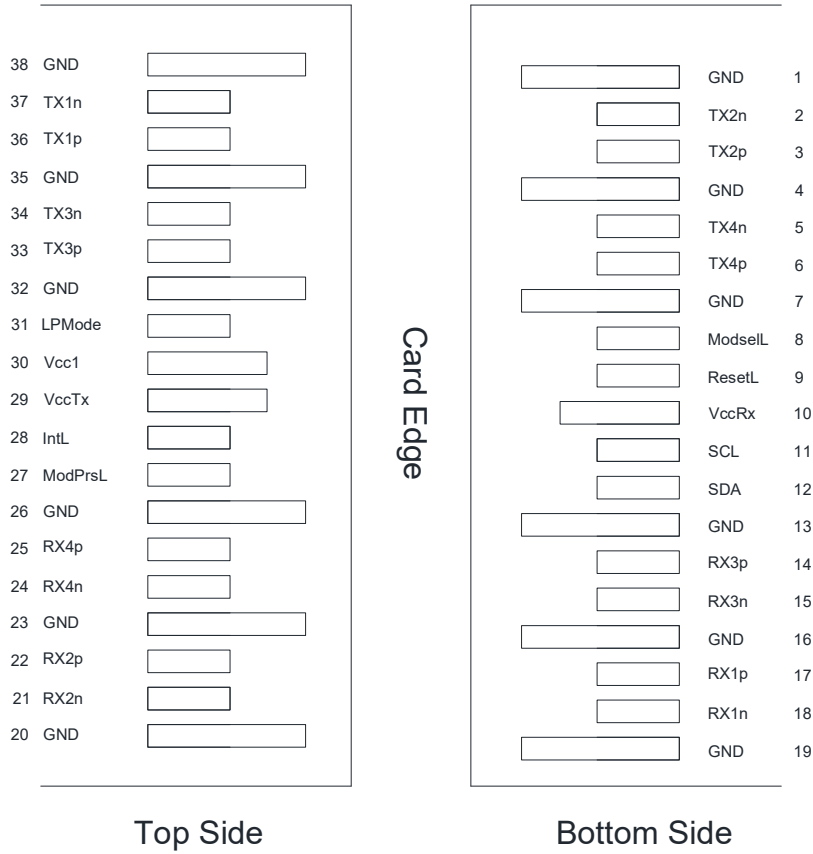
Pin Descriptions

Pin	Symbol	Descriptions	Note
1	GND	Ground	1
2	Tx2n	Transmitter inverted data input	
3	Tx2p	Transmitter non-inverted data input	
4	GND	Ground	1
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	VccRx	+3.3V power supply receiver	2
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	1
17	Rx1p	Receiver non-inverted data output	
18	Rx1n	Receiver inverted data output	1
19	GND	Ground	1
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	1
27	ModPrsL	Module present	
28	IntL	Interrupt	
29	VccTx	+3.3V power supply transmitter	2
30	Vcc1	+3.3V power supply	2
31	LPMODE	Low power mode	
32	GND	Ground	1
33	Tx3p	Transmitter non-inverted data input	
34	Tx3n	Transmitter inverted data input	
35	GND	Ground	1
36	Tx1p	Transmitter non-inverted data input	
37	Tx1n	Transmitter inverted data output	
38	GND	Ground	1

Note:

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. VccRx, Vcc1 and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. VccRx, Vcc1 and VccTx may be internally connected within the QSFP+ Module in any combination. The connector pins are each rated for a maximum current of 500 mA.



Optical Interface Lanes and Assignment

