40G QSFP+ LR4 10km Optical Transceiver

ESTRSCQ003

Product Features

- QSFP+ MSA package with duplex LC connector
- 4 10Gb/s CWDM transmitter
- 4 10Gb/s PIN receiver
- Up to 10.3Gb/s data links
- Single +3.3V power supply
- Class I laser safety certified
- Used on 9/125µm SMF

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	T_S	-40	85	°C
Supply voltage	V_{CC3}	-0.5	4	V
Relative humidity	RH	5	85	%

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}			800	mA	
Power dissipation	P_D			2.5	W	
Data rate			10.3		Gbps	
Operating distance	D		10		km	

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Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input differential impedance			100		Ω	
Differential data input swing		180		1000	mV	
Differential data output swing		300		850	mV	
Tx_fault, LOS output voltage	High	2.0		V_{CCHOST}	V	
	Low	0		0.8	V	
Tx disable	VIH	2.0		V_{CCHOST}	V	
	VIL	0			V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Center wavelength	λ_0	1264.5		1277.5	nm	
	λ_1	1284.5		1297.5	nm	
	λ_2	1304.5		1317.5	nm	
	λ_3	1324.5		1337.5	nm	
Launch optical power, each lane	P_O	-7		2.3	dBm	
OMA optical power, each lane	P_O	-4		3.5	dBm	
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Extinction ratio	ER	3.5			dB	
Transmitter and dispersion penalty	TDP			2.6	dB	
Pout @TX-disable asserted	Poff			-30	dBm	
Relative intensity noise	$RIN12_{OMA}$			-128	dB/Hz	
Side mode suppression ratio	SMSR	30			dB	
Optical return loss tolerance	ORLT			20	dB	
Receiver						
Center wavelength	λ_0	1264.5		1277.5	nm	
	λ_1	1284.5		1297.5	nm	
	λ_2	1304.5		1317.5	nm	
	λ_3	1324.5		1337.5	nm	
Receiver sensitivity	S			-11.5	dBm	1
Receive power, each lane				3.5	dBm	

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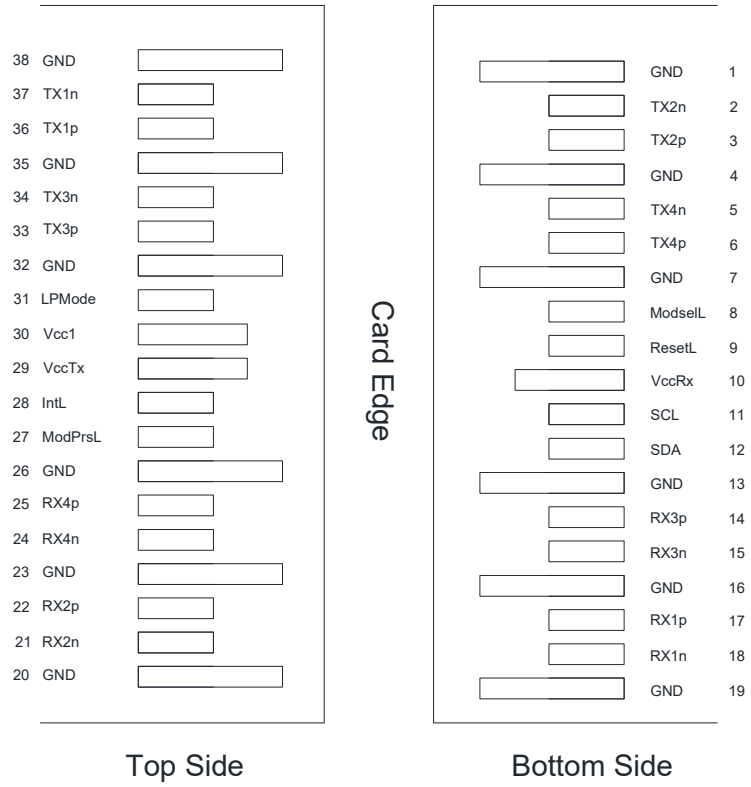
LOS assert	LOS_A	-30			dBm	
LOS dessert	LOS_D			-15	dBm	
LOS hysteresis		0.5			dB	
Receiver overload	P_{OL}	3.5		-12	dBm	1
Optical return loss	ORL	26			dB	

Note:
10.3Gbps, PRBS31, ERROR bit ration 10^-12

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	

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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 input	
38	GND	Ground	1

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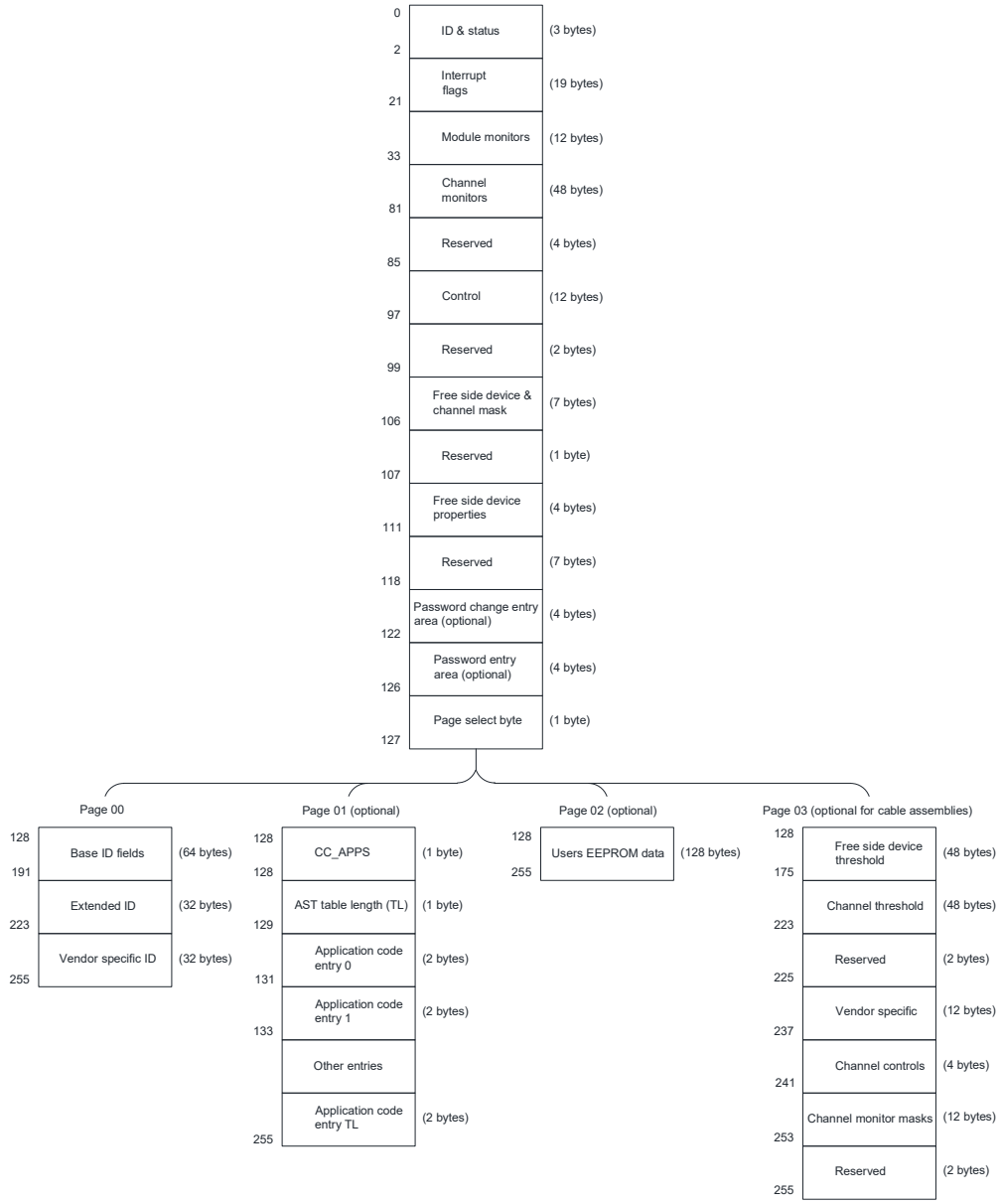
Note:

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.

Digital Diagnostic Memory Map



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