Maipu 40G QSFP+ 10KM Transceiver

QSFP-S1-L768C3

Overview

Maipu QSFP-S1-L768C3 transceiver module designed for 10km optical communication applications. The design is compliant to 40GBASE-LR4 of the IEEE P802.3ba standard. The module converts 4 inputs channels of 10Gb/s electrical data to 4 CWDM optical signals and multiplexes them into a single channel for 40Gb/s optical transmission. Reversely, on the receiver side, the module optically de-multiplexes a 40Gb/s input into 4 CWDM channels signals and converts them to 4 channel output electrical data.

Key Features

- Compliant with 40G Ethernet IEEE 802.3ba 40GBASE
- Duplex LC optical connector
- 1310nm DFB laser transmitter
- RoHS compliant and Lead Free
- Distance up to 10km on single-mode fiber
- Metal enclosure for lower EMI
- Low Power Consumption <1.5W
- Operating case temperature: 0℃ to 70℃

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Maximum Supply Voltage	Vc	-0.5		+4	V	
Storage Temperature	TS	-40		+85	°C	
Operating Humidity	RH	0		85	%	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.30	+3.47	V	
Power Supply Current	Icc			1.05	A	
Case Operating Temperature	Tc	0		+70	°C	
Signaling rate, each lane			10.3125		Gbps	
Operating Distance	Lmax			10	km	
Power Supply Noise				50	mVpp	
Supply Noise Rejection				100	mV	
Receiver Differential Data Output			100		Ohm	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Single Ended Output Voltage Tolerance		-0.3		4	V	
AC Common mode Voltage Tolerance (RMS)		15			mV	
Tx Input Diff Voltage	Vi	90		1600	mV	
Tx Input Diff Impedance	Zi	80	100	120	Ω	
Differential Input Return Loss		See IEEE 802.3ba 86A.4.11			dB	
TX Fault-Low		Vee		Vee+0.8	V	
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 Coordinates {X1, X2, Y1, Y2}			0.11, 0.31, 95, 350		UI, mV	
Receiver						
Single Ended Output Voltage Tolerance1		-0.3		4	V	
AC Common mode Voltage Tolerance(RMS)				7.5	mV	
Termination Mismatch at 1MHz				5	%	
Differential Output Return Loss		See IEEE 802.3ba 86A.4.2.1			dB	
Common- mode Output Return Loss		See IEEE 802.3ba 86A.4.2.2			dB	
Rx Output Diff Voltage	Vo		600	800	mV	
Rx Output Rise and Fall Time	Tr/Tf			35	ps	
J2 Jitter Tolerance	Jr2			0.46	UI	
J9 Jitter Tolerance	Jr9			0.65	UI	
Eye Mask Coordinates {X1, X2, Y1, Y2}			0.29, 0.5, 150, 425		UI, mV	

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Signaling rate, each lane (range)			10.3125		GBd	
Optical Wavelength	L0	1264.5		1277.5	nm	
	L1	1284.5		1297.5	nm	
	L2	1304.5		1317.5	nm	
	L3	1324.5		1337.5	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power				8.3	dBm	
Average Launch Power, each Lane		-7		2.3	dBm	
Optical Modulation Amplitude, each Lane		-4		3.5	dBm	
Difference in launch power between any two lanes (OMA)				6.5	dB	
Transmitter and Dispersion Penalty	TDP			2.6	dB	
Launch power in OMA minus TDP, each lane	Tx-TDP	-4.8			dBm	
Average launch power of OFF transmitter, each lane				-30	dBm	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise				-128	dB/Hz	
Optical return loss tolerance				20	dB	
Transmitter reflectance				-12	dB	
Receiver						
Signaling rate, each lane (range)			10.3125		GBd	
Optical Wavelength	L0	1264.5		1277.5	nm	
	L1	1284.5		1297.5	nm	
	L2	1304.5		1317.5	nm	
	L3	1324.5		1337.5	nm	
Damage threshold		3.3			dBm	
Average power at receiver input, each lane		-13.7		2.3	dBm	
Receive power, each lane (OMA)				3.5	dBm	
Difference in receive power between any two lanes (OMA)				7.5	dBm	
Receiver reflectance				-26	dB	
RX Sensitivity(OMA)				-11.5	dBm	BER@10 E-12
Los De-Assert	LosD			-12	dBm	
Los Assert	LosA	-28			dBm	

Los Hysteresis	LosH	0.5		6	dB	

Order Information

Model	Description
QSFP-S1-L768C3	40G QSFP+, 1310nm, 10Km, LC, Single-mode

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