

QSFP-40GBASE-IR4-LEG
40GBASE-LR4 QSFP+ SMF
1270NM-1330NM 2KM REACH LC DOM



QSFP-40GBASE-IR4-LEG

40Gbase QSFP+ Transceiver

Features

- 4 CWDM lanes MUX/DEMUX design
- 4 independent full-duplex channels
Up to 11.2Gbps data rate per wavelength
- 4 CWDM channels are 1270, 1290, 1310 and 1330nm
- Single +3.3V power supply
- QSFP+ MSA compliant
- Up to 2km transmission reach
- Operating case temperature: 0°C~70°C
- Maximum 3.5W operation power
- RoHS compliant
- Compliant with IEEE802.3ba
- Compliant with QSFP+ MSA: SFF-8436
- Built-in digital diagnostic functions
- TX: DFB CWDM
- RX: PIN



Applications

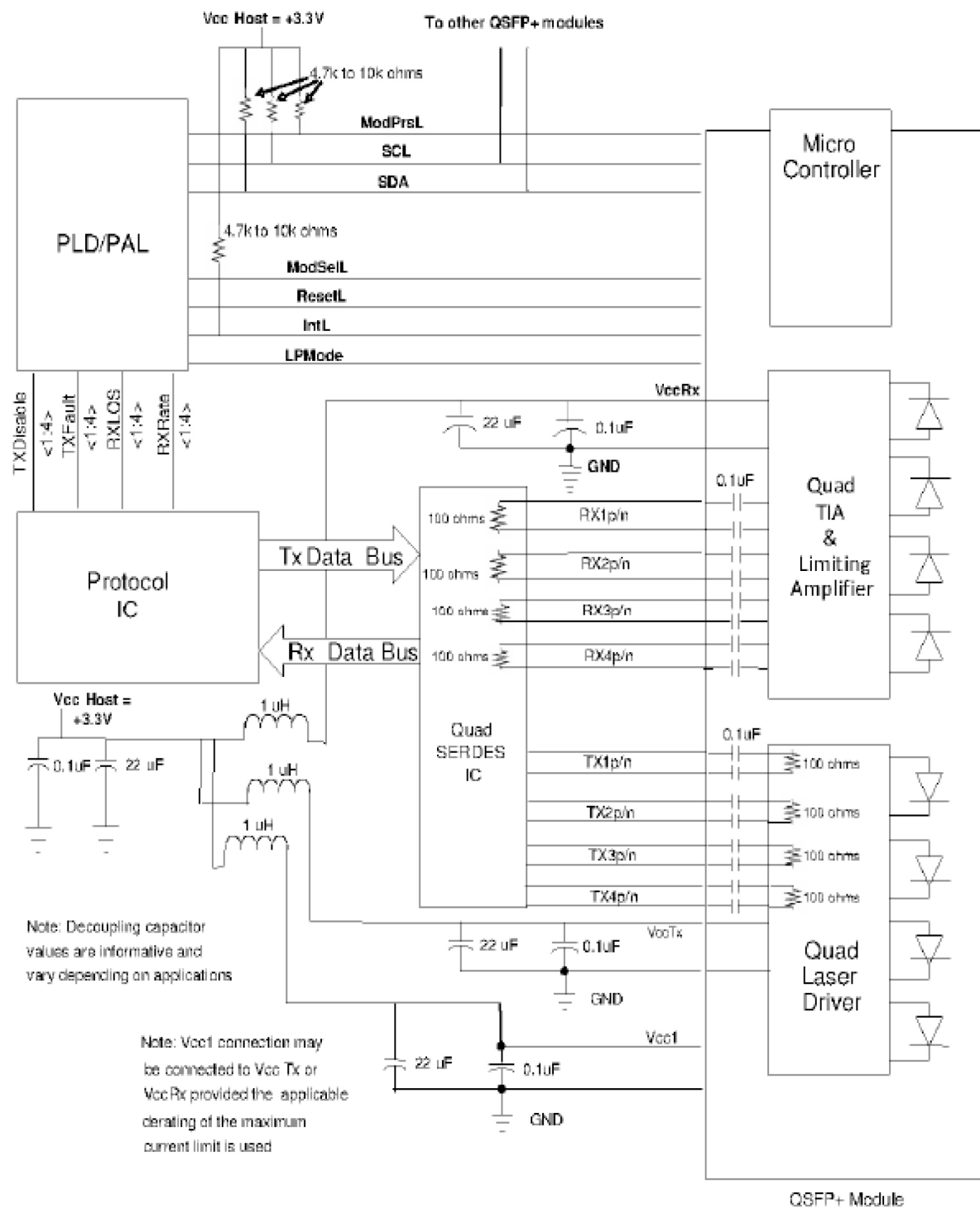
- 40G Ethernet
- Infiniband 4X SDR DDR QDR
- 40G Telecom connections

Product Description

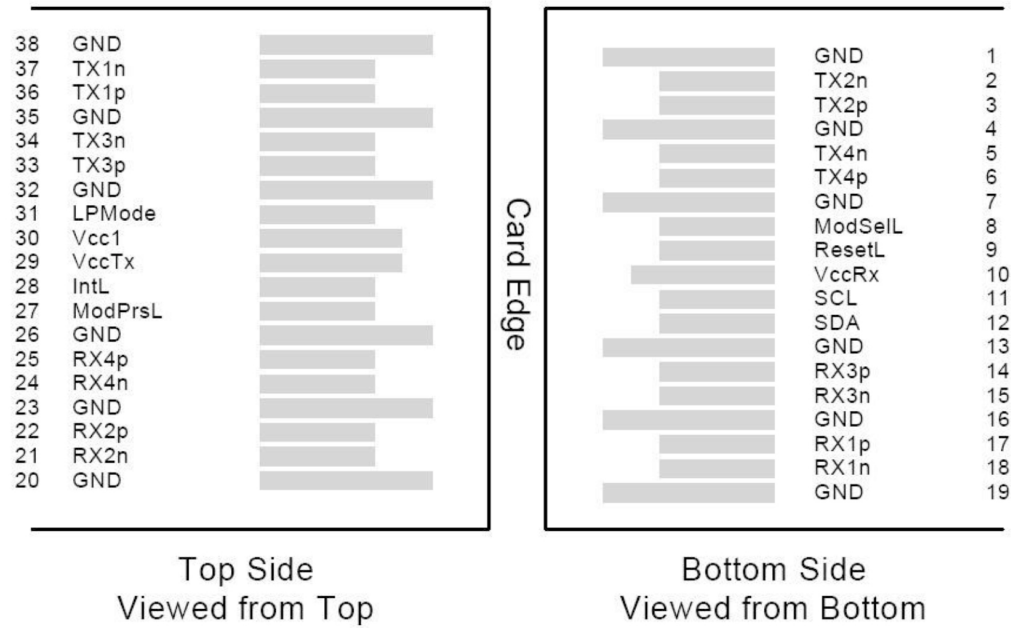
Legrand's QSFP-40GBASE-IR4-LEG Quad Small Form Factor Pluggable (QSFP+) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). The QSFP+ transceivers are high performance, cost effective modules supporting 40 Gigabit Ethernet and up to 2km transmission distance with SMF.

Legrand's QSFP+ transceivers are RoHS compliant and lead-free.

Recommend Circuit Schematic



Electrical Pin-out Details



Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Module Ground	1
2	CML-I	Tx2-	Transmitter inverted data input	
3	CML-I	Tx2+	Transmitter non-inverted data input	
4		GND	Module Ground	1
5	CML-I	Tx4-	Transmitter inverted data input	
6	CML-I	Tx4+	Transmitter non-inverted data input	
7		GND	Module Ground	1
8	LVTTL-I	MODSEIL	Module Select	2
9	LVTTL-I	ResetL	Module Reset	2
10		VCCRx	+3.3v Receiver Power Supply	
11	LVC MOS-I	SCL	2-wire Serial interface clock	2
12	LVC MOS-I/O	SDA	2-wire Serial interface data	2
13		GND	Module Ground	1
14	CML-O	RX3+	Receiver non-inverted data output	
15	CML-O	RX3-	Receiver inverted data output	
16		GND	Module Ground	1
17	CML-O	RX1+	Receiver non-inverted data output	
18	CML-O	RX1-	Receiver inverted data output	

19		GND	Module Ground	1
20		GND	Module Ground	1
21	CML-O	RX2-	Receiver inverted data output	
22	CML-O	RX2+	Receiver non-inverted data output	
23		GND	Module Ground	1
24	CML-O	RX4-	Receiver inverted data output	
25	CML-O	RX4+	Receiver non-inverted data output	
26		GND	Module Ground	1
27	LVTTL-O	ModPrsL	Module Present, internal pulled down to GND	
28	LVTTL-O	IntL	Interrupt output, should be pulled up on host board	2
29		VCCTx	+3.3v Transmitter Power Supply	
30		VCC1	+3.3v Power Supply	
31	LVTTL-I	LPMODE	Low Power Mode	2
32		GND	Module Ground	1
33	CML-I	Tx3+	Transmitter non-inverted data input	
34	CML-I	Tx3-	Transmitter inverted data input	
35		GND	Module Ground	1
36	CML-I	Tx1+	Transmitter non-inverted data input	
37	CML-I	Tx1-	Transmitter inverted data input	
38		GND	Module Ground	1

Note:

1. Module circuit ground is isolated from module chassis ground with in the module.
2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage Temperature	TS	-40		85	°C
Relative Humidity	Rh	0		85	%
Supply Voltage	Vcc	-0.5		4.0	V

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V
Power Supply Current	I _{cc}			100	mA
Case Operating Temperature	T _c	-5		70	°C

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Wavelength	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Transmitter						
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	P _T			8.3	dBm	
Average Launch Power, each Lane		-7		2.3	dBm	
Optical Modulation Amplitude, each Lane	OMA	-6		3.5	dBm	
Difference in launch Power between any two lanes (OMA)				6.5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-6.8			dBm	
TDP, each Lane	TDP			2.6	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	R _{in}			-128	dB/Hz	12dB reflection
Optical Return Loss Tolerance				20	dB	
Transmitter Reflectance	R _T			-12	dB	
Transmitter Eye Mask Definition X1, X2, X3, Y1, Y2, Y3	Specification Values 0.25, 0.4, 0.45, 0.25, 0.28, 0.4					
Average Launch Power OFF Transmitter, each Lane	P _{off}			-30	dBm	

Receiver						
Damage Threshold	TH _d	4.5			dBm	1
Total Average Receive Power				8.3	dBm	
Average Receive Power, each Lane		-11.7		2.3	dBm	
Receiver Reflectance	R _R			-26	dB	
Receive Power (OMA), each Lane				3.5	dBm	
Receiver Sensitivity, each Lane	S _R			-11.5	dBm	
Difference in Receive Power between any Lanes (OMA)				7.5	dBm	
LOS Assert	LOSA	-28			dBm	
LOS Deassert	LOSD			-15	dBm	
LOS Hysteresis	LOSH	0.5			dB	
Receiver Electrical 3 dB upper Cutoff Frequency, each Lane				12.3	GHz	

Note:

1. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.

Electrical Characteristics

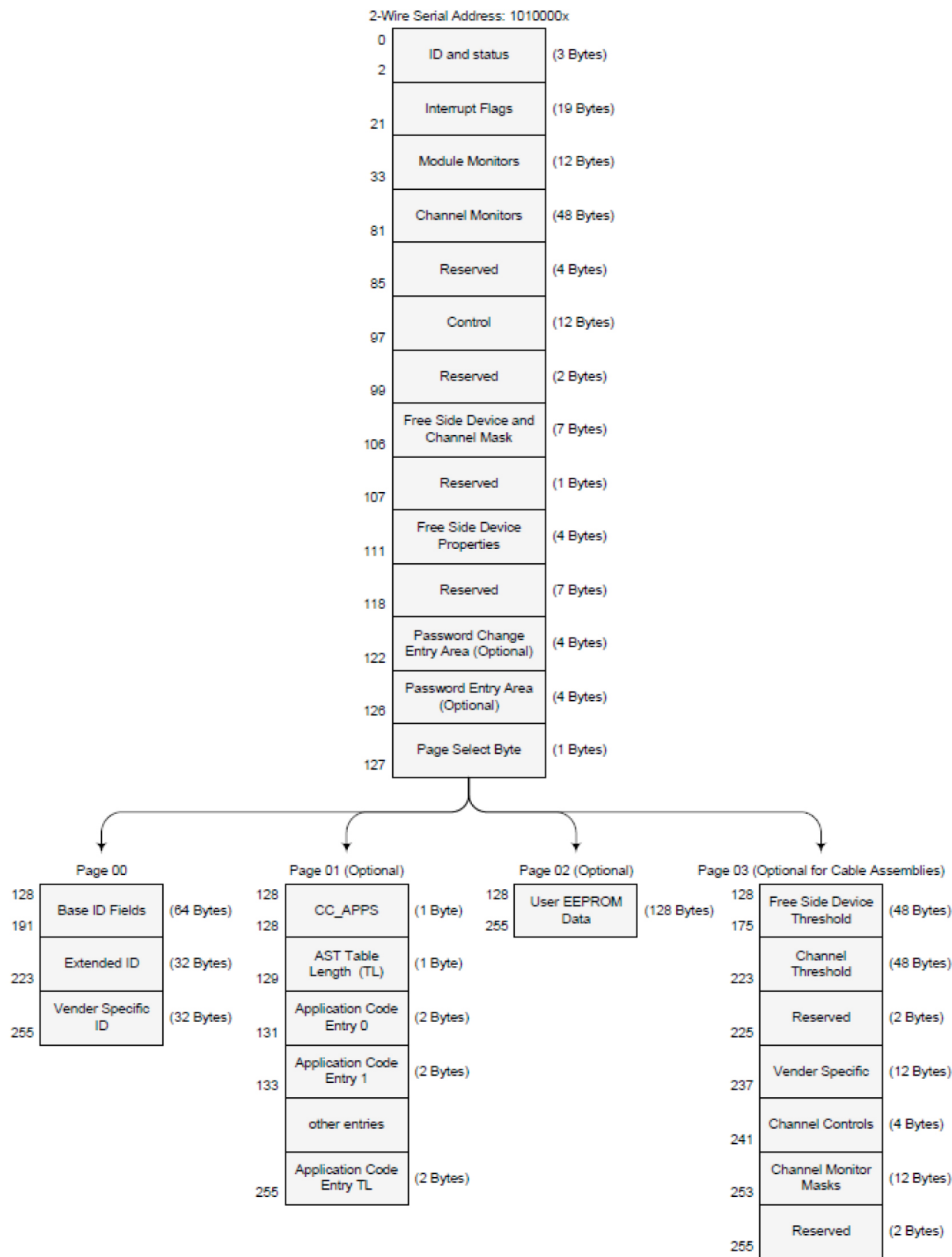
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption (XLPPI)				1.5	W	
Supply Current	ICC		0.75	1.0	A	
Control I/O Voltage, High	VIH	2.0		VCC	V	
Control I/O Voltage, Low	VIL	0		0.7	V	
Inter-Channel Skew	TSK			150	ps	
RESETL Duration			10		us	
RESETL De-assert time				100	ms	
Power on time				100	ms	

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	ZIN	80	100	120	Ω	
Differential Input Return Loss	See IEEE 802.3ba 86A.4.11				dB	10MHz-11.1GHz
J2 Jitter tolerance	Jt2			0.18	UI	
J9 Jitter Tolerance	Jt9			0.26	UI	
Data Dependent Pulse Width Shrinkage	DDPWS			0.07	UI	
Eye Mask Coordinates X1, X2, Y1, Y2	0.1, 0.31, 95, 350					
Receiver (XLPP1)						
Single Ended Output Voltage Tolerance		-0.3		4	V	Preferred to TP1 signal common
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	10MHz-11.1GHz
Common-mode Output Return Loss	See IEEE 802.3ba 86A.4.2.1				dB	10MHz-11.1GHz
Rx Output Diff Voltage	Vo		600	800	mV	
Rx Output Rise and Fall Time	Tr/Tf			35	ps	20% to 80%
J2 Jitter Tolerance	Jr2			0.46	UI	
J9 Jitter Tolerance	Jr9			0.63	UI	
Eye Mask Coordinates X1, X2, Y1, Y2	0.29, 0.5, 150, 425				UI mV	

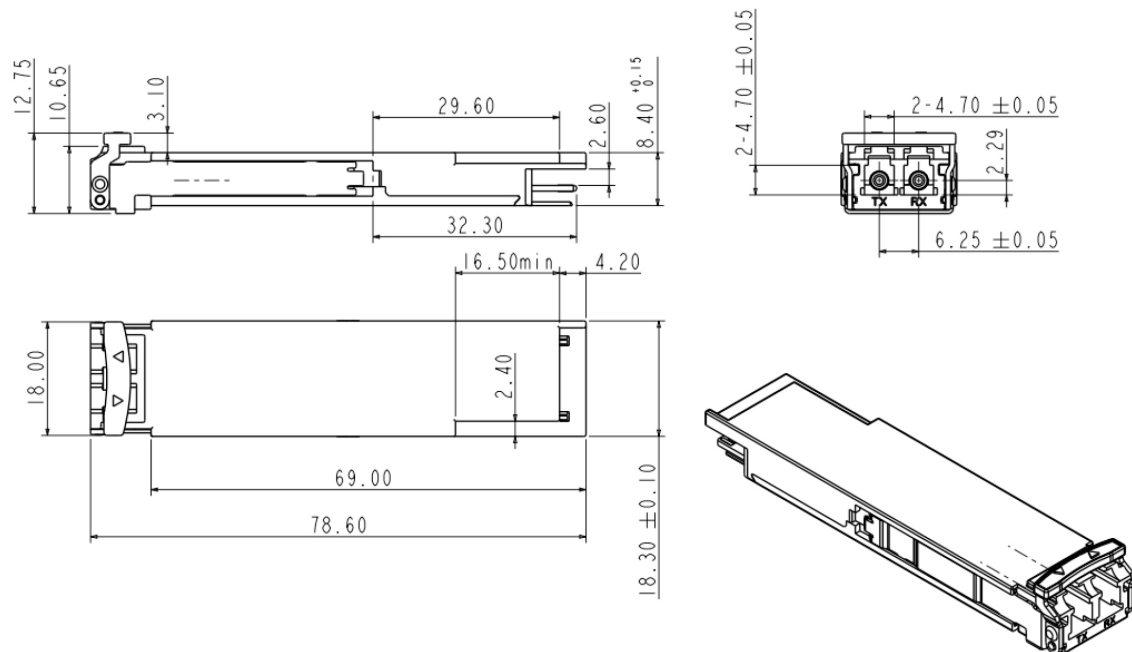
Note:

1. The single ended input voltage tolerance is the allowable range of the instantaneous input signals

EEPROM Information



Mechanical Specifications



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