QFP1301040PD – QSFP+ Parallel Fibre

1310nm / 10km / 40 Gigabit Ethernet / LR-4

For your product safety, please read the following information carefully before any manipulation of the transceiver:

ESD
This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.

LASER SAFETY
This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

1. Overview

QFP1301040PD is a high performance QSFP+ transceiver module for 40 Gigabit Ethernet (aggregated) data links over single mode ribbon fibre. The maximum reach[1] is 10km, with 6.2dB end of life (EOL) power budget. The transmitters (4×) are 1310nm DFB lasers, the receivers (4×) are PIN photodiodes.

This transceiver module is compliant with the Small Form-factor Pluggable (QSFP+) Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics commercial agents for compatibility with different equipment platforms.

2. Features

- QSFP+ Multi-Source Agreement compliant [SFF-8436]
- Hot pluggable QSFP+ footprint
- Serial ID functionality supported according to [SFF-8438]
- MPO/MTP™ Optical Receptacle (8-degree angled)
- 4x parallel DFB transmitters (1310nm)
- Up to 11.2Gbps per Lane
- 10km point-to-point transmission on single mode ribbon fibre
- Operating temperature range 0°C to 70°C
- Low power dissipation (<3.5W)

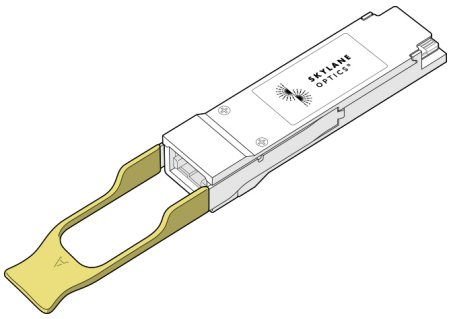

Figure 1. QSFP+
(non-binding illustration)

3. Applications

- 40GBASE-LR4
- Infiniband QDR and DDR Interconnects
- Client-side 40G Telecom Connections

4. Optical Interface

P/N	Nominal Wavelength [nm]	Optical Output Power, per Lane[2] [dBm]	Optical Receiver Sensitivity[3], per Lane [dBm]	Optical Path Penalt[3], per Lane [dB]	Optical Receiver Overload[4], per Lane [dBm]	Power Budget[2], per Lane [dB]
QFP1301040PD	1310	-8.2 to 0.5	≤ -14.4	≤ 3.2	-0.5	≥ 6.2

1. Distance is estimated assuming typical optical losses after decent quality fibre deployment; only optical budget value is guaranteed.
2. EOL, over operating temperature range
3. Measured with 10.3125Gbps, PRBS $2^{\wedge 31}$-1, ER=9dB
4. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers (optical loop back) before ensuring that proper optical attenuation is used

5. Technical Parameters

5.1. Recommended Operating Conditions					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Storage temperature	-40		85	°C	
Operating Case Temperature	0		70	°C	
Relative Humidity	0		85	%	Non-Condensing
Power Supply Voltage	3.135	3.3	3.465	V	
Power Dissipation			3.5	W	

5.2. Transmitter Optical Specifications					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Optical Output Power, each lane	-8.2		0.5	dBm	5
Difference in Output Power between any two lanes			6.5	dB	
Centre Wavelength	1260		1355	nm	
Spectral Width (-20dB)			1	nm	
Optical Extinction Ratio	3.5			dB	
Dispersion Penalty, each lane			3.2	dB	6

5. Output power coupled into a 9/125 µm single-mode fibre

5.3. Receiver Optical Specifications					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Operating Wavelength	1260		1355	nm	
Receiver Sensitivity, each Lane			-14.4	dBm	6
Receiver Overload, each Lane	-0.5			dBm	6
Difference in Received Power between any two lanes			7.5	dB	

6. Measured with 10.3125Gbps, PRBS $2^{\wedge 31}$-1, ER=9dB

6. Electrical Connector

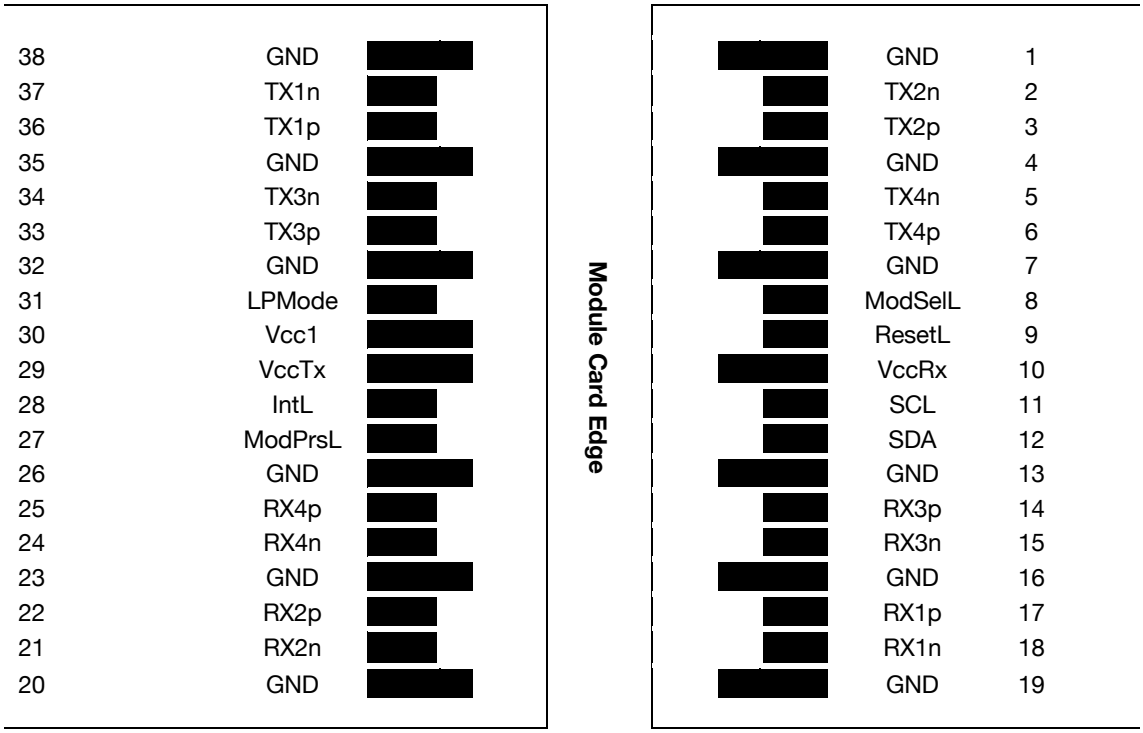

Figure 2. QSFP+ Module Pad Layout

7. Pin Function Definition

Pin	Symbol	Description	Pin	Symbol	Description
1	GND	Ground	20	GND	Ground
2	TX2n	Transmitter Inverted Data Input	21	RX2n	Receiver Inverted Data Output
3	TX2p	Transmitter Non-Inverted Data Input	22	RX2p	Receiver Non-Inverted Data Output
4	GND	Ground	23	GND	Ground
5	TX4n	Transmitter Inverted Data Input	24	RX4n	Receiver Inverted Data Output
6	TX4p	Transmitter Non-Inverted Data Input	25	RX4p	Receiver Non-Inverted Data Output
7	GND	Ground	26	GND	Ground
8	ModSelL	Module Select	27	ModPrsL	Module Present
9	ResetL	Module Reset	28	IntL	Interrupt
10	VccRx	+3.3V Power Supply Receiver	29	VccTx	+3.3V Power supply transmitter
11	SCL	2-wire serial interface clock	30	Vcc1	+3.3V Power supply
12	SDA	2-wire serial interface data	31	LPMode	Low Power Mode
13	GND	Ground	32	GND	Ground
14	RX3p	Receiver Non-Inverted Data Output	33	TX3p	Transmitter Non-Inverted Data Input
15	RX3n	Receiver Inverted Data Output	34	TX3n	Transmitter Inverted Data Input
16	GND	Ground	35	GND	Ground
17	RX1p	Receiver Non-Inverted Data Output	36	TX1p	Transmitter Non-Inverted Data Input
18	RX1n	Receiver Inverted Data Output	37	TX1n	Transmitter Inverted Data Input
19	GND	Ground	38	GND	Ground

8. EEPROM

QSFP+ MSA (SFF-8436)

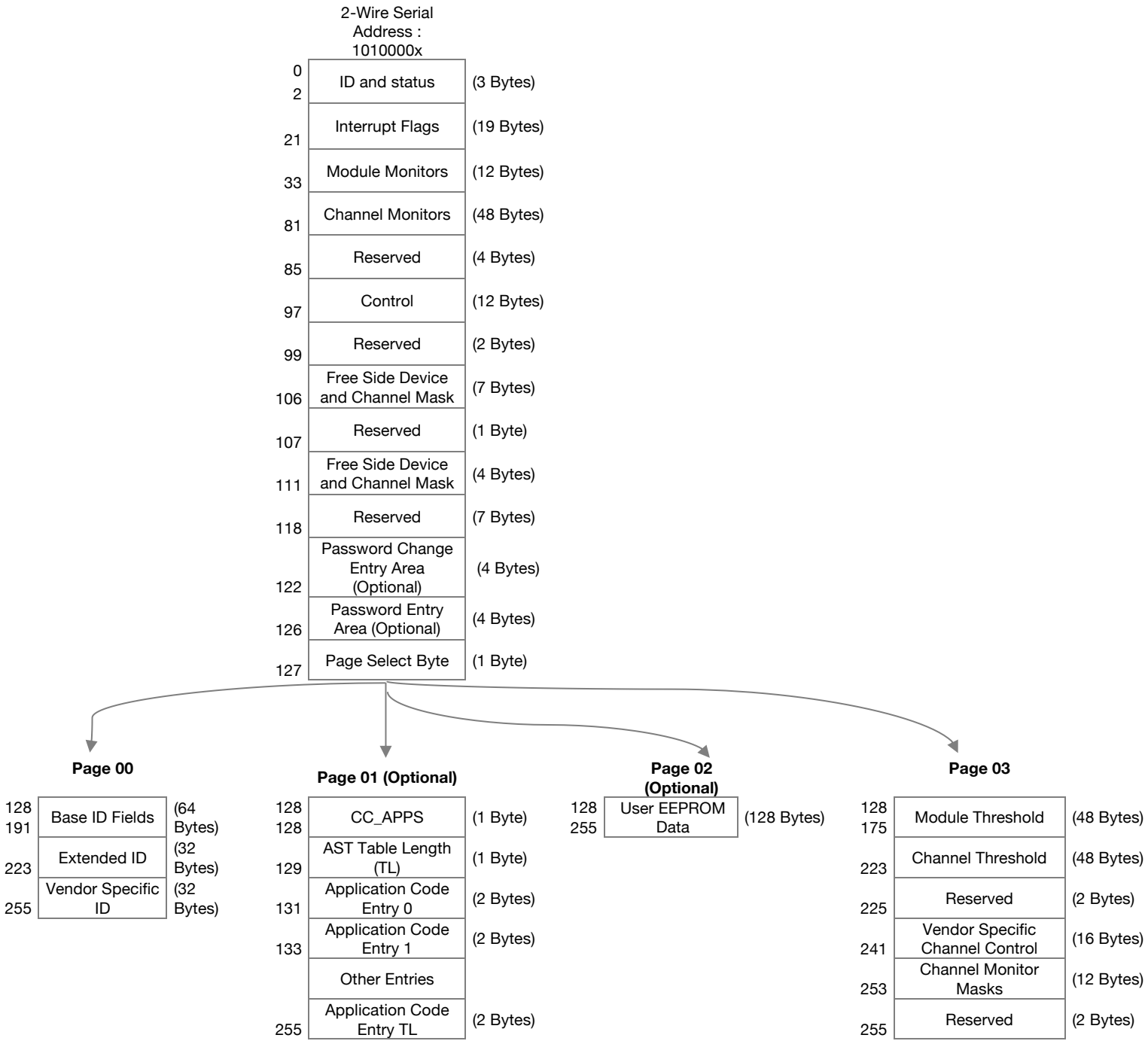

Figure 3. EEPROM of a Compact QSFP+

9. Ordering Information

Part Number	Description
QFP1301040PD	QSFP+ LR-4 40G 1310nm, Tx (DFB), Rx (PIN), maximum distance 10km, power budget 6.2dB, 40x Gigabit Ethernet & Infiniband QDR, MTP/MPO connector, 0°C to 70°C, DDM

10. Document Revision Information

Revision	Description
RevA	Initial release
RevB	Optical interface information updated in section 2

Skylane Optics supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

For questions on this product please contact:
support@skylaneoptics.com