QFB85P10400D – QSFP+ Bidirectional

850nm / 900nm / 100m / 40 Gigabit Ethernet

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

QFB85P10400D is a high performance QSFP+ transceiver module for 40 Gigabit Ethernet data links over a multi-mode fibre pair. The maximum reach is 150m (OM4) or 100m (OM3). Four 10Gbps data streams are internally multiplexed into two 20Gbps signals, which are transmitted optically in two 850/900nm bidirectional links. At the receive side, the two 20Gbps signals are demultiplexed and the four original 10Gbps data streams are recovered.

The two transmitters are 850 and 900nm Vertical Cavity Surface Emitting Lasers (VCSEL), each generating a 20Gbps optical output signal. The two receivers are PIN photodiodes, each detecting a 20Gbps optical input signal.

This transceiver module is compliant with the 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-8436)
- Supports 41.25Gbps aggregated Data Rate
- 4× 10.3125Gbps Serial Electrical Interface (IEEE 40GE XLPPI)
- Dual LC Optical Receptacle
- Two 850/900nm VCSEL Transmitters
- Two PIN Receivers
- Up to 150m/100m Point-to-Point Transmission on OM4/OM3 Multi Mode Fibre
- Operating temperature range 0°C to 70°C
- Power Dissipation < 3.5W
- Single +3.3V Power Supply

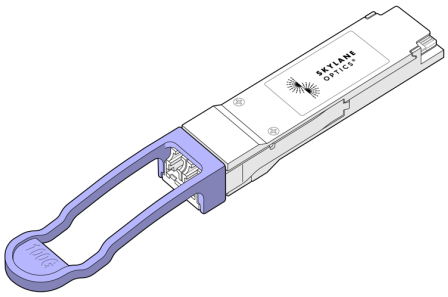

Figure 1. QSFP+ LC
(non-binding illustration)

3. Applications

- 40 Gigabit Ethernet

4. Optical Interface

P/N	Nominal Wavelengths [nm]	Protocol	Optical Output Power[1], each Lane [dBm]	Stressed Receiver Sensitivity[2] (OMA), each Lane [dBm]	Optical Receiver Overload[3] [dBm]	Link Length[1,4] [m]
QFB85P10400D	850 900	40GBASE	-4 to 5	≤ -3.86	5	≤ 150

1. EOL over operating temperature range
2. Measured with 20.625Gbps, BER≤10^{-12}
3. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers before ensuring that proper optical attenuation is used
4. Cabled optical fibre as per IEEE 802.3bm-2015

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	3.1	3.3	3.47	V	
Power Supply Current			1.15	A	
Power Dissipation			3.5	W	

5.2. Transmitter Optical Specifications					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Data Rate, each Channel		20.625		Gbps	
Aggregated Data Rate		41.25		Gbps	5
Centre Wavelength 1	832	850	868	nm	
Centre Wavelength 2	882	900	918	nm	
Spectral Width (RMS), each Lane			0.59	nm	
Average Output Power, each Lane	-4		5	dBm	6
Launched OMA, each Lane	-1		5	dBm	6
Extinction Ratio, each Channel	3			dB	

5. IEEE 802.3-2012
6. Output power coupled into a 50/125 µm multi-mode fibre

5.3. Receiver Optical Specifications					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Operating Wavelength 1		850		nm	
Operating Wavelength 2		900		nm	
Damage Threshold, each Lane	7			dBm	7
Average Receive Power, each Lane			5	dBm	
Receiver Sensitivity (OMA), 850nm			-7.1	dBm	8
Receiver Sensitivity (OMA), 900nm			-7.7	dBm	8
Stressed Receiver Sensitivity (OMA), 850nm			-3.83	dBm	9
Stressed Receiver Sensitivity (OMA), 900nm			-3.86	dBm	9

7. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level
8. Measured with 20.625Gbps, BER≤10^{-12}
9. Measured with 20.625Gbps, BER≤10^{-12}, VECP≤2.4dB (850nm), VECP ≤3.1dB (900nm)

6. Transceiver Electrical Pad Layout

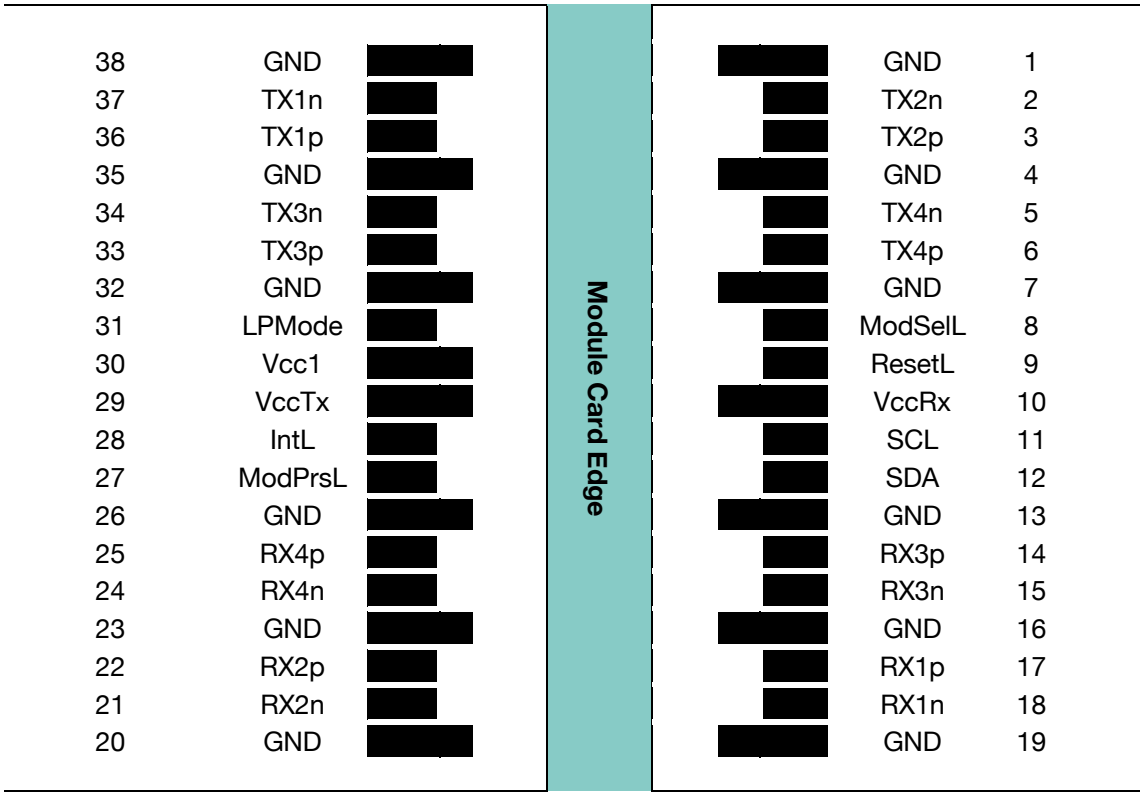

Figure 2. Transceiver Electrical Pad Layout

7. Module Electrical Pin Definition

Pin Number	Name	Function	Pin Number	Name	Function
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	ModSel L	Module Select	27	ModPrs L	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)

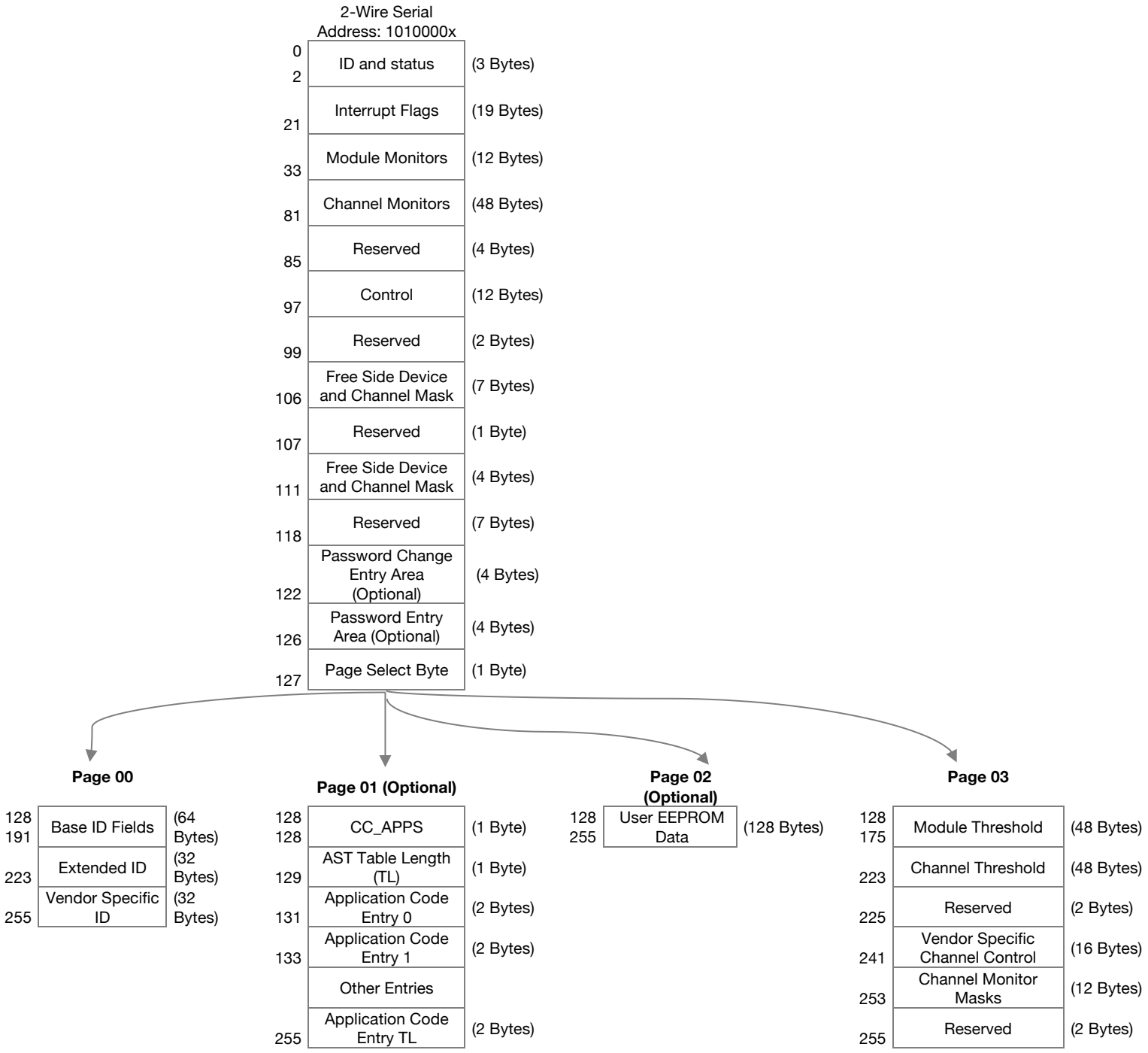

Figure 3. QSFP+ Memory Map

9. Ordering Information

Part Number	Description
QFB85P10400D	QSFP+ bidi, 850/900nm, Tx (VCSEL), Rx (PIN), maximum distance 100m on OM3 MMF, 40 Gigabit Ethernet, LC connector, 0°C to 70°C, DDM

10. Document Revision Information

Revision	Description
A	Initial release

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