

Q2B85M70C00D – QSFP28 Bidirectional

850nm / 900nm / 70m / 100 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

Q2B85M70C00D is a high performance QSFP28 transceiver module for 100 Gigabit Ethernet data links over a multi-mode fibre pair. The maximum reach is 100m (OM4) or 70m (OM3). Four 25Gbps data streams are internally encoded into two 25GBd PAM4 signals, which are transmitted optically in two 850/900nm bidirectional links. At the receive side, the two 25GBd PAM4 signals are decoded and the four original 25Gbps data streams are recovered.

The two transmitters are 850 and 900nm Vertical Cavity Surface Emitting Lasers (VCSEL), each generating a 25GBd optical output signal. The two receivers are PIN photodiodes, each detecting a 25GBd optical input signal.

This transceiver module is compliant with the QSFP28 Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics® commercial agents for compatibility with different equipment platforms.

2. Features

- QSFP28 Multi-Source Agreement compliant (SFF-8661)
- Hot pluggable QSFP+ footprint
- Serial ID functionality supported according to (SFF-8636)
- Supports 103.125Gbps aggregated Data Rate
- 4x 25.78125Gbps Serial Electrical Interface (IEEE 100GE CAUI-4)
- Dual LC Optical Receptacle
- Two 850/900nm VCSEL Transmitters
- Two 850/900nm PIN Receivers
- Integrated PAM4 and FEC Encoder/Decoder
- Up to 100m/70m 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

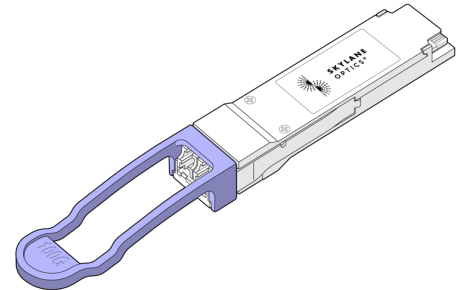


Figure 1. QSFP28 LC (non-binding illustration)

3. Applications

- 100 Gigabit Ethernet

4. Optical Interface

P/N	Nominal Wavelengths [nm]	Protocol	Optical Output Power ¹ , each Channel [dBm]	Stressed Receiver Sensitivity (OMA), each Ch. [dBm]	Optical Receiver Overload ² [dBm]	Link Length ^{1,3} [m]
Q2B85M70C00D	850 900	100GBASE	-6 to 4	≤ -3	4	≤ 100

1. EOL over operating temperature range

2. 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

3. 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	3.135	3.3	3.465	V	
Power Supply Current			1.13	A	
Power Dissipation			3.5	W	

5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Signalling Rate, each Channel		26.5625		GBd	4
Aggregated Data Rate		103.125		Gbps	5
Centre Wavelength 1	847	855	863	nm	
Centre Wavelength 2	900	908	916	nm	
Spectral Width (RMS), each Channel			0.59	nm	
Average Output Power, each Channel	-6.0		4.0	dBm	6
Launched OMA, each Channel	-4.0		4.0	dBm	6
Launched OMA minus TDECQ, each Channel	-5.9			dBm	
Transmitter and Dispersion Eye Closure (TDECQ), each Channel			4.9	dB	
Extinction Ratio, each Channel	3.0			dB	

4. PAM4

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	847		863	nm	
Operating Wavelength 2	900		916	nm	
Damage Threshold, each Channel	7.5			dBm	7
Average Receive Power, each Channel	-7.9		4.0	dBm	8
Receive Power (OMA), each Channel	-5.9		3.5	dBm	
Stressed Receiver Sensitivity (OMA), each Channel			-3.0	dBm	

7. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power

8. Average receive power, each channel (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance

6. Transceiver Electrical Pad Layout

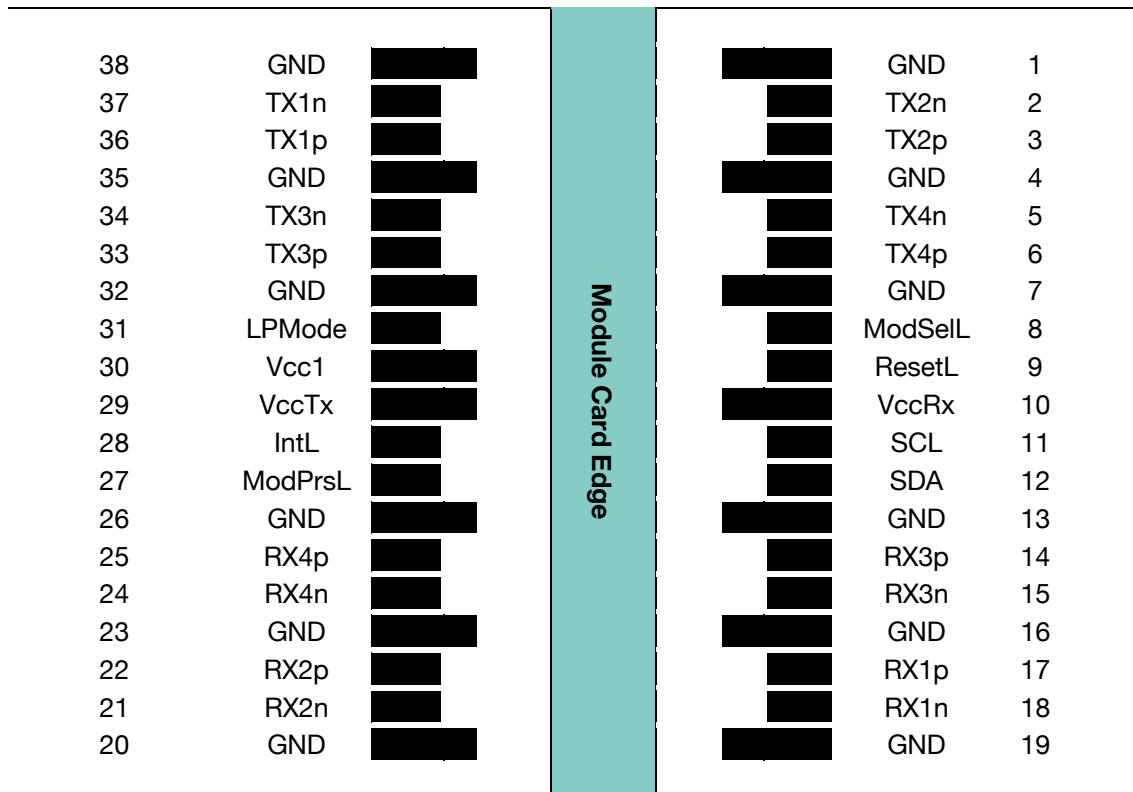


Figure 2. Transceiver Electrical Pad Layout

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	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

QSFP28 MSA (SFF-8636)

2-Wire Serial
Address :
1010000x

0	ID and status	(3 Bytes)
2		
21	Interrupt Flags	(19 Bytes)
33	Module Monitors	(12 Bytes)
81	Channel Monitors	(48 Bytes)
85	Reserved	(4 Bytes)
97	Control	(12 Bytes)
99	Reserved	(2 Bytes)
106	Free Side Device and Channel Mask	(7 Bytes)
107	Reserved	(1 Byte)
111	Free Side Device and Channel Mask	(4 Bytes)
118	Reserved	(7 Bytes)
122	Password Change Entry Area (Optional)	(4 Bytes)
126	Password Entry Area (Optional)	(4 Bytes)
127	Page Select Byte	(1 Byte)

Page 00

Page 01 (Optional)

Page 02 (Optional)

Page 03

128	Base ID Fields	(64 Bytes)
191		
223	Extended ID	(32 Bytes)
255	Vendor Specific ID	(32 Bytes)

128	CC_APPS	(1 Byte)
128	AST Table Length (TL)	(1 Byte)
129	Application Code Entry 0	(2 Bytes)
131	Application Code Entry 1	(2 Bytes)
133	Other Entries	
255	Application Code Entry TL	(2 Bytes)

128	User EEPROM Data	(128 Bytes)
255		

128	Module Threshold	(48 Bytes)
175	Channel Threshold	(48 Bytes)
223	Reserved	(2 Bytes)
225	Vendor Specific Channel Control	(16 Bytes)
241	Channel Monitor Masks	(12 Bytes)
253	Reserved	(2 Bytes)
255	Reserved	(2 Bytes)

Figure 3. QSFP28 Memory Map

Datasheet

Q2B85M70C00D_RevA.docx



9. Ordering Information

Part Number	Description
Q2B85M70C00D	QSFP28 bidi, 850/900nm, Tx (VCSEL), Rx (PIN), maximum distance 70m on OM3 MMF, 100 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

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