

## 100G QSFP28 break to 4x25G SFP28 Optical Cable

### Features

- Compliant to QSFP28 MSA SFF-8636
- Compliant to SFP28 MSA SFF-8431 and SF-8472
- 850nm VCSEL Transmitter
- PIN photo-detector receiver
- +3.3V single power supply
- Low power consumption
- Length up to 70m using OM3 MMF and 100m using OM4 MMF
- Operating case temperature range 0°C to +70 °C
- RoHS compliant



### Applications

- IEEE 802.3bm 100GBASE-SR4
- IEEE 802.3by 25GBASE-SR
- Servers, switches, storage and host card adapters

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	Vcc <sub>3</sub>	-0.5	-	+3.6	V	
Storage Temperature	T <sub>s</sub>	-10	-	+85	°C	
Operating Humidity	RH	+5	-	+85	%	1

- **Note: 1** No condensation

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T <sub>c</sub>	0	-	+70	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
QSFP28 Power Dissipation	Pd	-	-	2.5	W	1
SFP28 Power Dissipation	Pd	-	-	1	W	1
Bit Rate per lane	BR	10.3215	25.78125	-	Gbps	

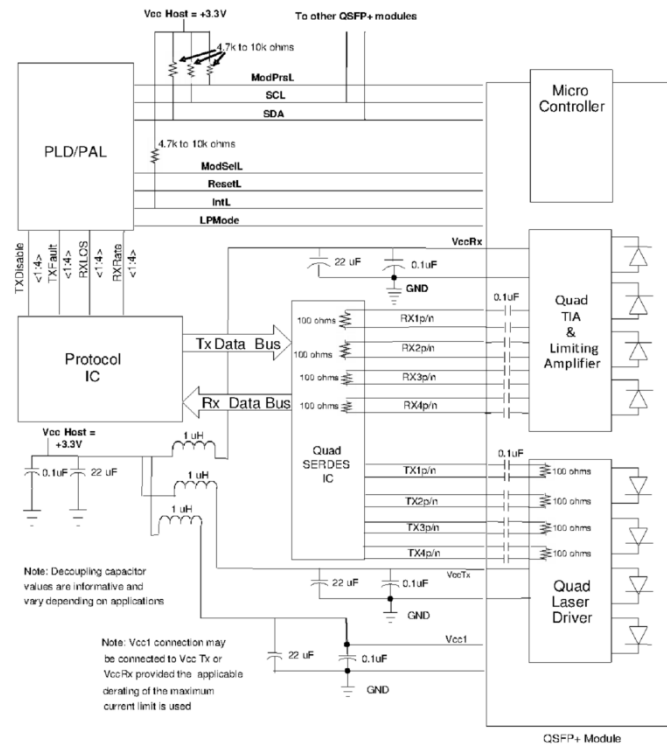
- **Note: 1** Per terminal

**Electrical Characteristics**

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
ModSelL	Module Select	V <sub>OL</sub>	0	-	0.8	V	
	Module Unselect	V <sub>OH</sub>	2.5	-	V <sub>CC</sub>	V	
LPMode	Low Power Mode	V <sub>IL</sub>	0	-	0.8	V	
	Normal Operation	V <sub>IH</sub>	2.5	-	V <sub>CC</sub> +0.3	V	
ResetL	Reset	V <sub>IL</sub>	0	-	0.8	V	
	Normal Operation	V <sub>IH</sub>	2.5	-	V <sub>CC</sub> +0.3	V	
ModPrsL	Normal Operation	V <sub>OL</sub>	0	-	0.4	V	
IntL	Interrupt	V <sub>OL</sub>	0	-	0.4	V	
	Normal Operation	V <sub>OH</sub>	2.4	-	V <sub>CC</sub>	V	
<b>Electrical transmitter Characteristics</b>							
Differential Date Input Swing		V <sub>out</sub>	200	-	1600	mV	
Output Differential Impedance		Z <sub>D</sub>	90	100	110	Ω	
<b>Electrical Receiver Characteristics</b>							
Differential Data Output Swing		V <sub>in,P-P</sub>	200	-	800	mV <sub>PP</sub>	
Bit Error Rate		BER1			1x10 <sup>-12</sup>		1
Input Differential Impedance		Z <sub>IN</sub>	90	100	110	Ω	

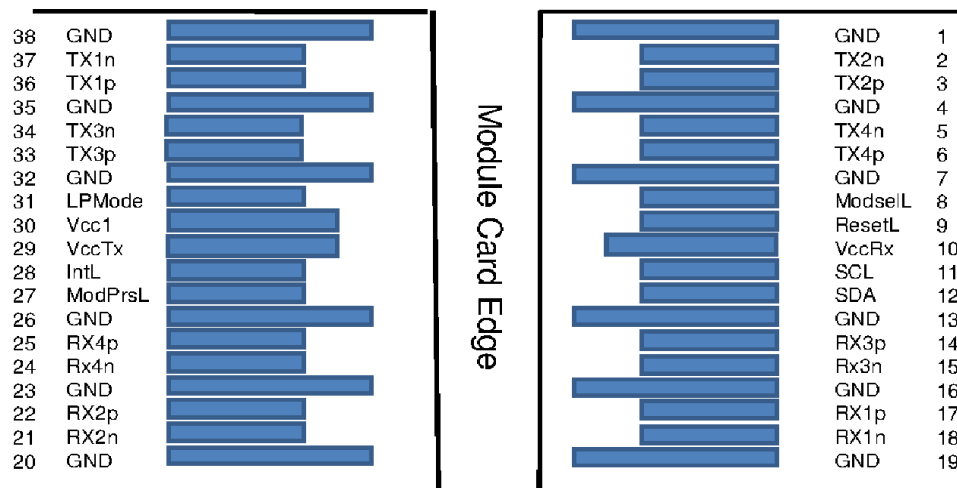
- Note: 1 PRBS2^31-1

**Recommended Interface Circuit**



**Figure 1, Recommended Interface Circuit**

**Pin arrangement**



**Top Side Viewed From Top**

**Bottom Side Viewed From Bottom**

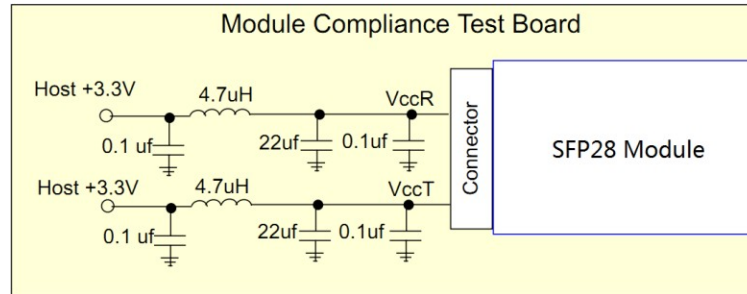
**Figure 2, Pin View**

**Pin Function Definitions**

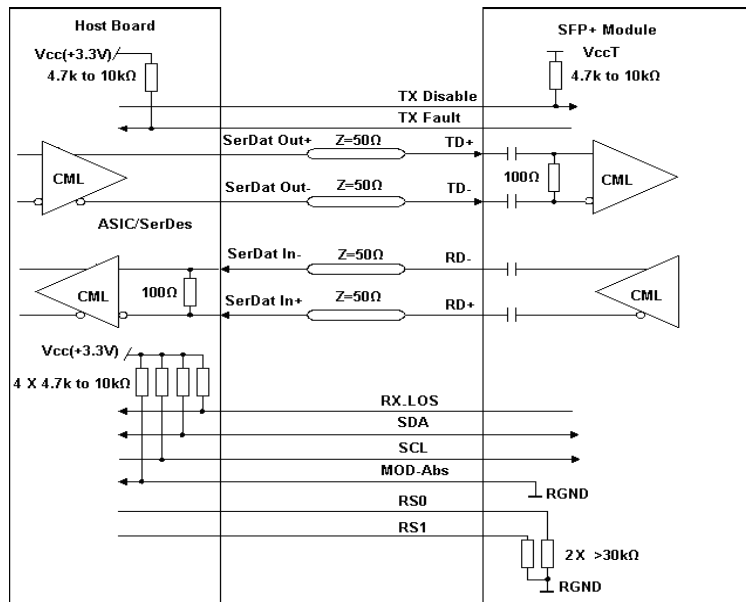
Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

- Note: 1. Circuit ground is internally isolated from chassis ground.

**Recommended Interface Circuit**



**Figure 3, Recommended Host Board Power Supply Circuit for SFP28**



**Figure 4, Recommended Interface Circuit for SFP28**

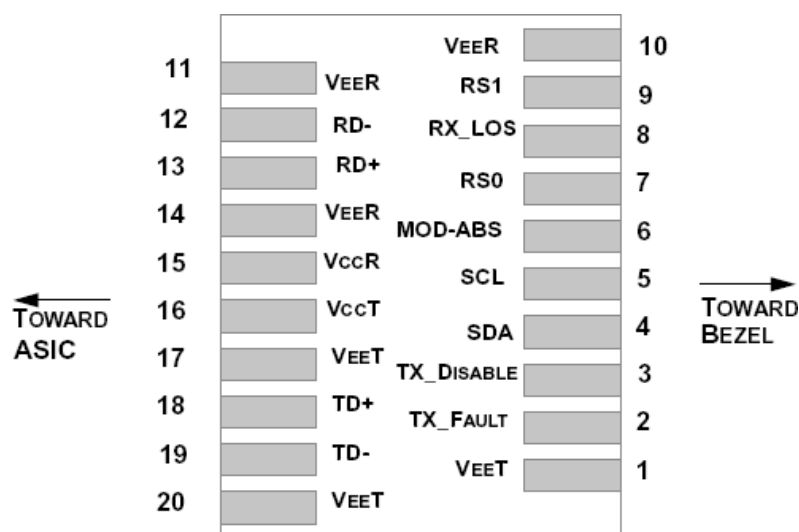
**Pin arrangement**


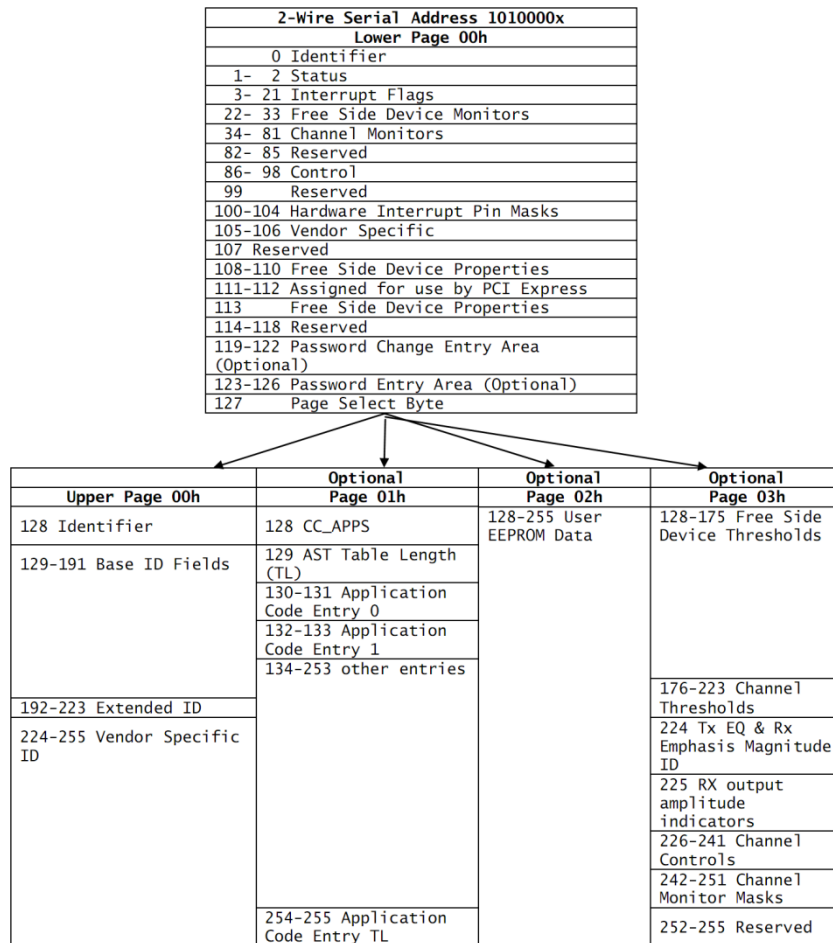
Figure 5, Pin View

Pin	Symbol	Name/Description	Notes
1	VEET	Module Transmitter Ground	1
2	TX_FAULT	Module Transmitter Fault	2
3	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	2-Wire Serial Interface Data Line (MOD-DEF2)	
5	SCL	2-Wire Serial Interface Clock (MOD-DEF1)	
6	MOD_ABS	Module Absent, connected to V <sub>EE</sub> T or V <sub>EE</sub> R in the module	2
7	RS0	Rate Select 0, optionally controls SFP+ module receiver	4
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as NOT Signal Detect)	2
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter	4
10	V <sub>EE</sub> R	Module Receiver Ground	1
11	V <sub>EE</sub> R	Module Receiver Ground	1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted Data Output	
14	V <sub>EE</sub> R	Module Receiver Ground	1
15	V <sub>CC</sub> R	Module Receiver 3.3 V Supply	
16	V <sub>CC</sub> T	Module Transmitter 3.3 V Supply	
17	V <sub>EE</sub> T	Module Transmitter Ground	1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	V <sub>EE</sub> T	Module Transmitter Ground	1

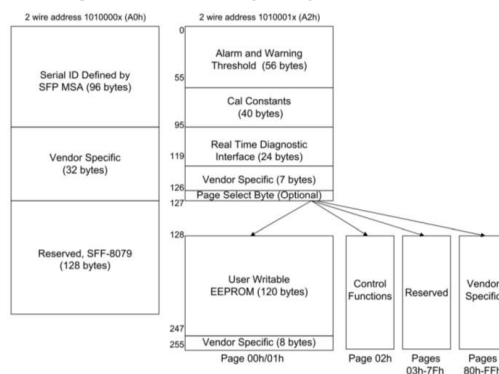
**Notes:**

1. The module ground pins are isolated from the module case.
2. The pins shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.46V on host board.
3. The pin is pulled up to VCCT with a 4.7K-10KΩ resistor in the module.
4. See SFF-8472 Rev12.2 Table 10-2.

**Monitoring Specification**



**Figure 6, Memory Map for QSFP28**



**Figure 7, Memory Map for SFP28**

**Mechanical**

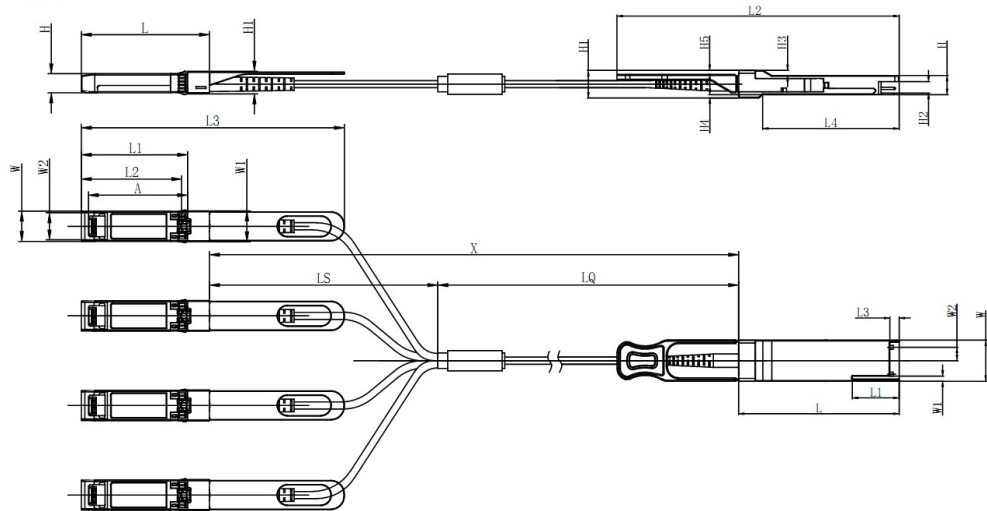


Figure 8, Mechanical Diagram

**ESD**

This transceiver is specified as ESD threshold 1kV for high speed data pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

**Laser Safety**

This is a Class 1 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).

**Ordering Information**

Ordering P/Ns	Description
DH88hh-QCCC-XXX	100G QSFP28 break to 4*25G SFP28 AOC, 850nm, MMF, Commercial temperature.

XXX	Cable (MMF) Length
001	001=1m
050	050=50m
100	100=100m



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