TITLE **100G QSFP28 PSM4 500m Transceiver**	**DOC No.**	**DTRX-000002**
	REVISION：01	**AUTHORIZED BY：Mike Sun**
	DATE：12/05/2018	**CLASSIFICATION：Optical Transceiver**

100G QSFP28 PSM4 500m Transceiver

1. SCOPE

The scope of this specification is the definition of a high performance, cost effective modules, which is optimized for 100G QSFP28 PSM4, and transmission distance up to 500m. The transceiver consists of two sections: The transmitter section incorporates a 1310nm driver. The receiver section consists of a PIN photodiode integrated with a transimpedance preamplifier (TIA).

2. PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

100G QSFP28 PSM4 Transceiver

Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
P59000ECCB02-1	100G	1310nm	500m	SMF	-9.4 ~ +2	-11.35	MPO	C

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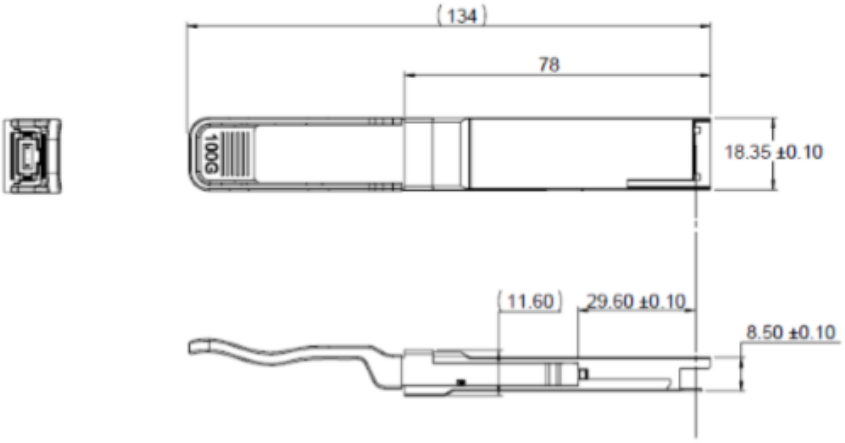
2.2 DIMENSIONS,MATERIALS,PLATINGS AND MARKING



Unit is millimeter. All dimensions are ±0.1mm unless otherwise specified.

To minimize MPO connection induced reflections, an MPO receptacle with8-degree angled end-face is utilized for this product. A female MPO connector with 8-degree end-face should be used with this product as illustrated in below.

3. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- Compliant with 100G PSM4 Specification 2.04
- Compliant with 100G Ethernet IEEE 802.3bm
- Compliant to SFF-8665 (QSFP28 Solution) Revision 1.8
- MPO optical connector (IEC61754-7-1)

4. QUALIFICATION

- Electrostatic Discharge (ESD) to the Electrical Pins
- Electrostatic Discharge (ESD) to the MPO Connector
- RoHS compliance

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5. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-40	+85	℃
Supply Voltage	V_{CC3}	-0.5	4	V
Relative Humidity(Non-condensing)	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	25	70	℃
Operating Case Temperature	TI	-40	25	85	℃
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
Data Rate PER Channel	-	-	25.78125	-	Gbps

Transmitter Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Launch Optical Power	P0	-9.4	-	+2	dBm	
Center Wavelength	λ	1295	-	1325	nm	
Extinction Ratio	ER	3.5	-	-	dB	
Optical Modulation Amplitude	OMA	OMAmin	-	2.2	dBm	
Transmitter and dispersion penalty	TDP			2.9	dB	Transmitter and dispersion penalty
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Optical Return Loss	ORL	-		20	dB	
Average launch power of OFF transmitter transmitter, each lane	Poff	-	-	-30	dBm	
Eye Mask {X1, X2, X3, Y1, Y2, Y3}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}					

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Receiver Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ	1295	-	1325	nm	
Receiver sensitivity (OMA), each lane	S1			-11.35	dBm	
Stressed receiver sensitivity (OMA), each lane	S2			-8.79	dBm	
Damage Threshold	POL	3			dBm	
Average Power at Receiver Input,Each		-12.66		+2	dBm	
Receiver reflectance				-26	dB	
LOS De-Assert	LOSD			-15	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5		6	dB	

Transceiver Electrical Characteristic

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Module Supply Current	Icc			1200	mA	
Power Dissipation	PD			4000	mW	
Transmitter						
Single-ended Input Voltage Tolerance	-	-0.3	-	4.0	V	
Input differential impedance	Zin	-	100		Ω	
Differential data input swing	Vin, P-P	200	-	900	mVP-P	
AC Common Mode Input Voltage Tolerance	-	15	-	-	mV	
Differential Input Voltage Swing Threshold	-	50	-	-	mVpp	
Receiver						
Single-ended Output Voltage	-	-0.3	-	4.0	V	

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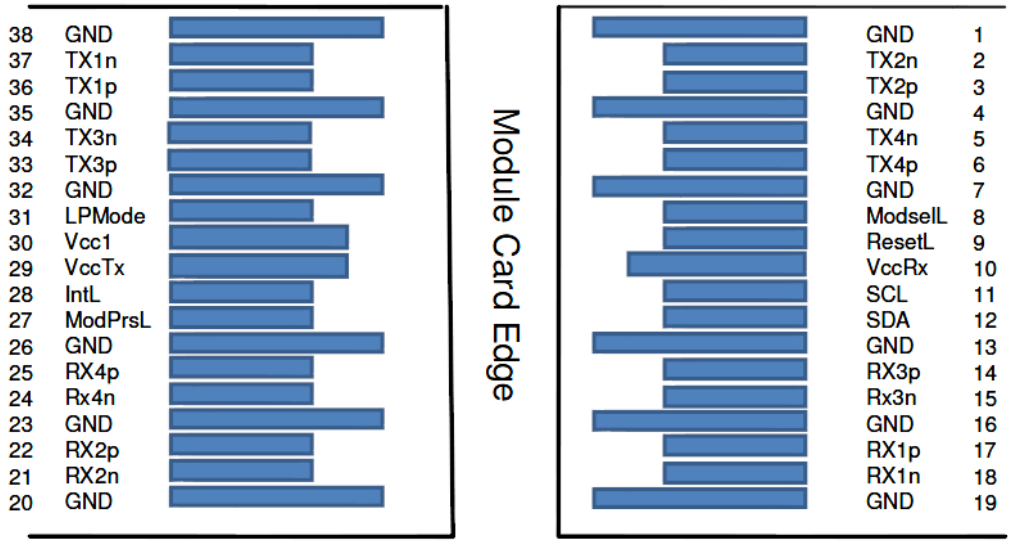
Output Differential Impedance	ZO	90	100	110	Ω	
Differential Data Output Swing	VOUT, P-P	200	-	900	mVP-P	
AC Common Mode Output Voltage	-	-	-	7.5	mV	

6. Applications Note :



Pin Definitions

Pin Assignment

Pin	Logic	Name/Description	Note
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	2

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9	ResetL	Module Reset	2
10	Vcc Rx	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	2
12	SDA	2-wire serial interface data	2
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	1
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	2
29	VccTx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMode	Low Power Mode	2
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

Notes：

[1] GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

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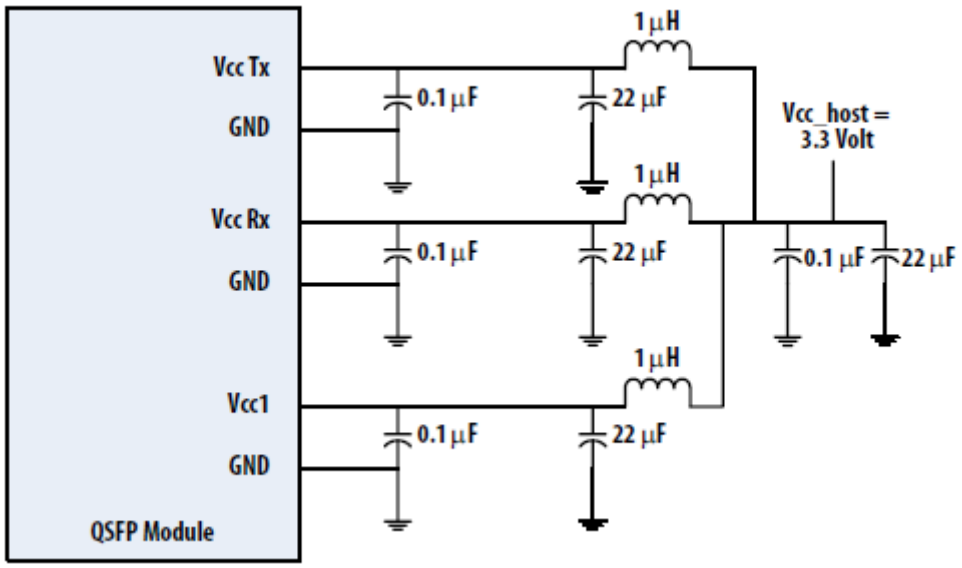
[2] VccRx, Vcc1 and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure 7. VccRx, Vcc1 and VccTx may be internally connected within the QSFP28 Module in any combination. The connector pins are each rated for a maximum current of 500 mA.

Digital Diagnostic Function

Parameters	Unit	Accuracy
Temperature	℃	±3
Voltage	V	±3%
Ibias	mA	±10%
Rx power	dB	±3
Tx power	dB	±3

Recommended Host Board Power Supply Filter Network



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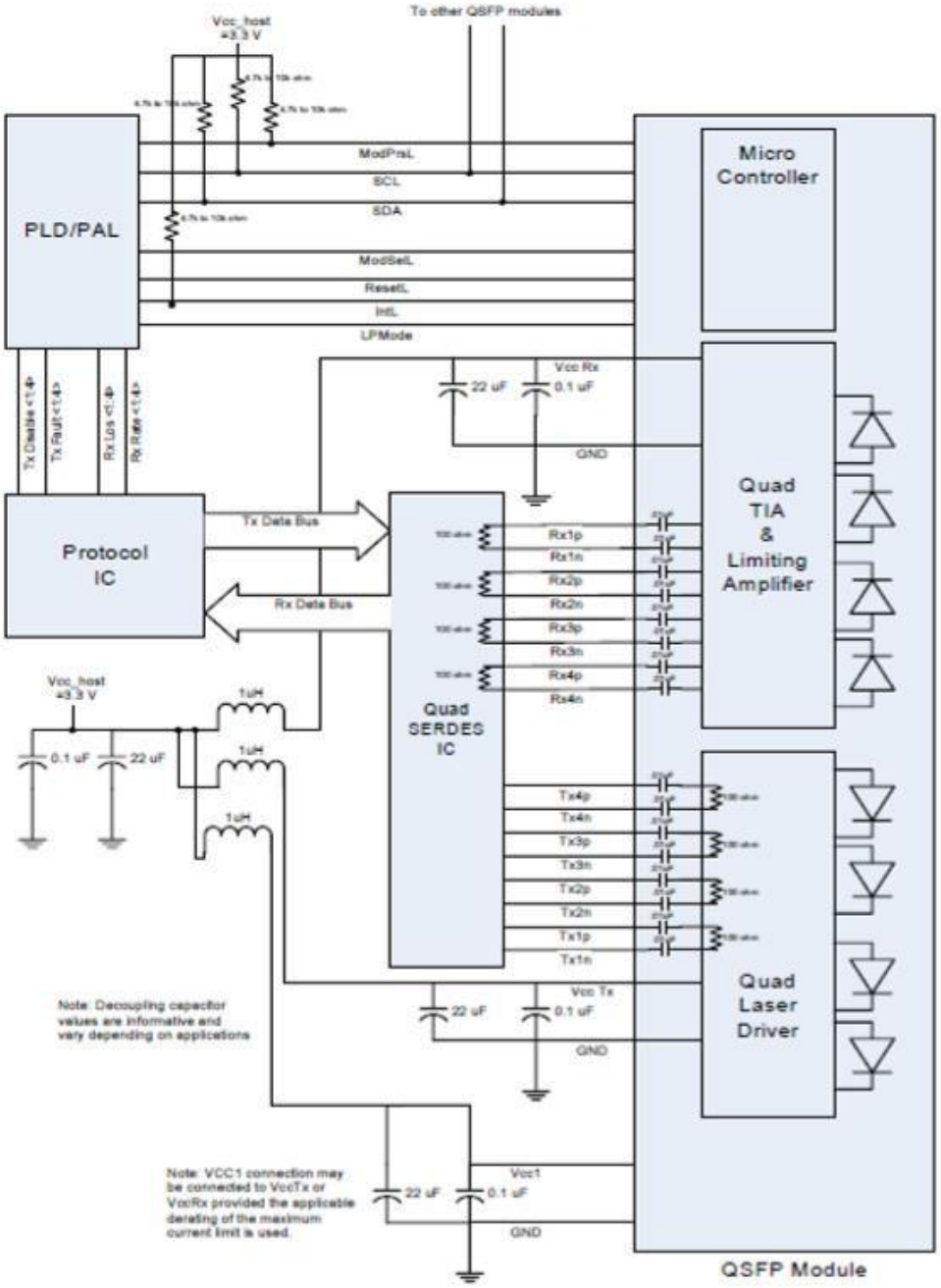
Recommended Application Interface Block Diagram



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7. Modification History

Rev.	Comments	Date	Originator	Approval
01	Preliminary Draft	12/05/2018	Mike Sun	Ray Yang