



100G QSFP28 CWDM4 2km Transceiver

APQP2LRA3CDL2

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Product Features

- ✓ Compliant with 100G CWDM4 MSA Specification
- ✓ Uncooled 4x25Gb/s CWDM transmitter
- ✓ Wide Operating Temperature(0°C~70°C)
- ✓ Maximum link length of 2km via Single Mode Fiber (SMF)

Applications

- ✓ Data Center Backbone
- ✓ Ethernet Switches
- ✓ High-speed Servers
- ✓ High-performance Computing Clusters
- ✓ SAN,Routers,Hubs,Load Balancer

Product Selection

Part Number	Operating Case temperature	DDMI
APQP2LRA3CDL2	Commercial(0~70°C)	Yes

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Duplex LC Receptacle: compatible with EN 61000-4-2
- Immunity compatible with EN 61000-4-3
- EMI compatible with FCC Part 15 Class B
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 IEC 60950, IEC60825-1,2

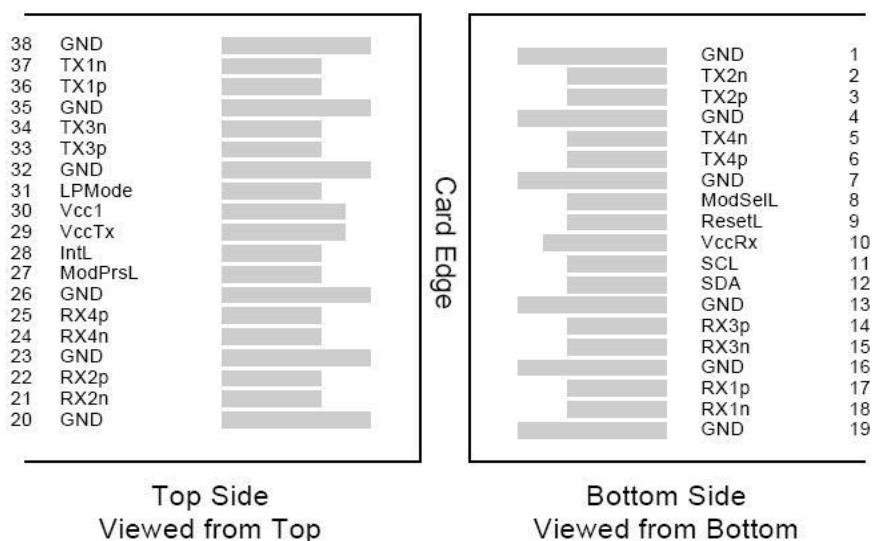
Pin Descriptions

Pin	Symbol	Name	Ref.
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Output	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Output	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	+ 3.3V Power Supply Receiver	2
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	VccTx	+3.3 V Power Supply transmitter	2
30	Vcc1	+3.3 V Power Supply	2
31	LPMode	Low Power Mode.	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Ground	1

Pin	Symbol	Name	Ref.
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Ground	1

Notes:

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.
2. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 1000mA.



Pin-out of Connector Block on Host Board

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		+3.6	V	
Storage Temperature	TS	-40		+85	°C	
Operating Humidity	RH	0		85	%	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Power Supply Voltage	Vcc	3.135	3.30	3.465	V	
Supply Current	Icc			1050	mA	
Operating Case Temperature	Tc	0		+70	°C	
Data Rate, each lane			25.78125		Gb/s	
9/125um G.652 SMF		-	-	2	km	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Input differential impedance	Rin	90	100	110	Ω	1
Differential data input swing	Vin, pp	95	-	900	mV	
TX Disable-High	-	Vcc-0.8	-	Vcc	V	
TX Disable-Low	-	Vee	-	Vee+0.8	V	
TX Fault-High	-	Vcc-0.8	-	Vcc	V	
TX Fault-Low	-	Vee	-	Vee+0.8	V	
Receiver						
Output Differential Impedance	Rin	90	100	110	Ω	1
Differential Data Output Swing	Vout, pp	-	-	900	mV	2
LOS-High	-	Vcc-0.8		Vcc	V	
LOS-Low	-	Vee		Vee+0.8	V	

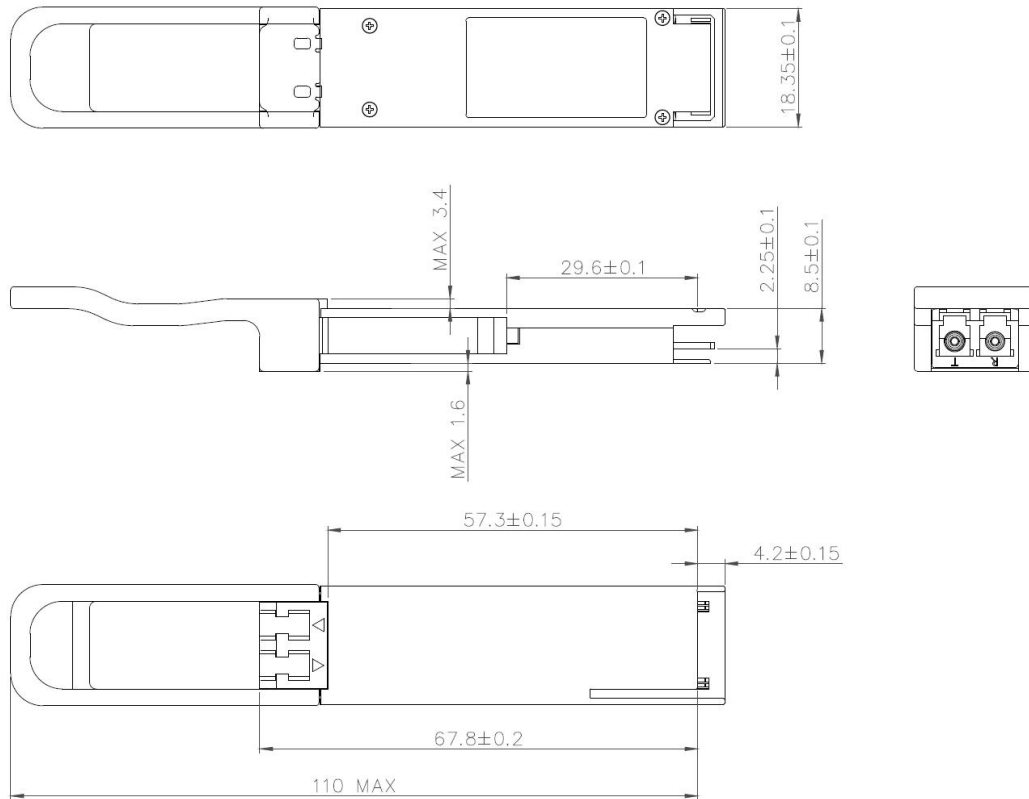
Notes:

1. AC coupled.
2. Into 100 ohm differential termination.

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Center Wavelength	L0	1264.5		1277.5	nm	
	L1	1284.5		1297.5	nm	
	L2	1304.5		1317.5	nm	
	L3	1324.5		1337.5	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	PT			8.5	dBm	
Average Launch Power, each Lane	P _{AVG}	-6.5		2.5	dBm	
Optical Modulation Amplitude (OMA), each Lane		-4		2.5	dBm	
Transmitter and Dispersion Penalty	TDP			3.0	dB	
Extinction Ratio	ER	3.5			dB	
Receiver						
Center Wavelength	L0	1264.5		1277.5	nm	
	L1	1284.5		1297.5	nm	
	L2	1304.5		1317.5	nm	
	L3	1324.5		1337.5	nm	
Average Receive Power, each Lane		-10		2.5	dBm	
Damage Threshold, each Lane	THd	3.5			dBm	
Receive Power, each Lane(OMA)				2.5	dBm	
Receiver Sensitivity (OMA)	SEN(OMA)			-8.1	dBm	BER@1E-12
LOS Assert	LOSA	-24			dBm	
LOS Deassert	LOSD			-11.6	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	

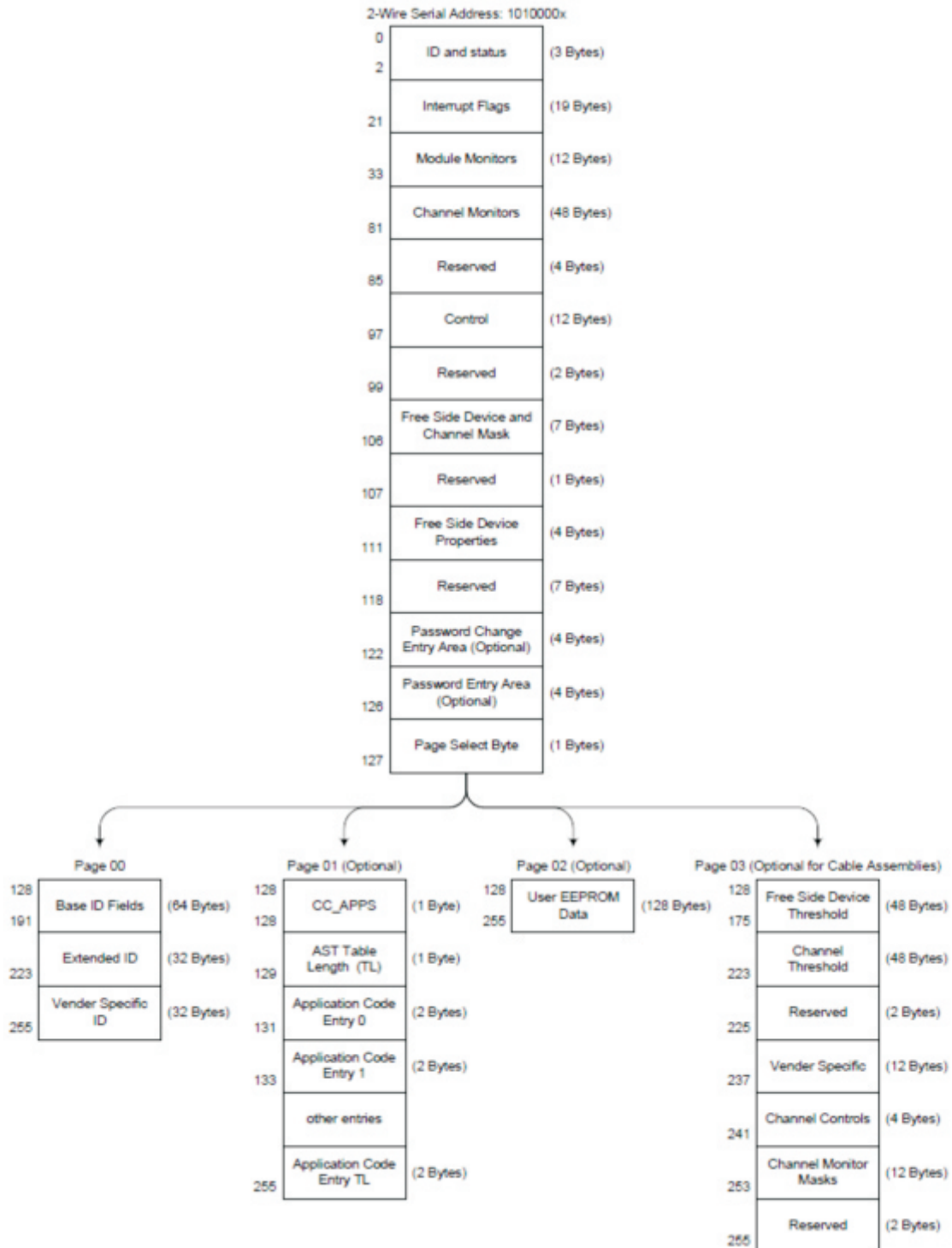
Mechanical Specifications



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EEPROM Information

- EEPROM memory map specific data field description is as below:



Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitor parameter's accuracy.

Parameter	Range	Accuracy	Calibration
Temperature	0 to +70°C	±3°C	Internal
Voltage	2.97 to 3.63V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
TX Power	-6.5 to 2.5dBm	±3dB	Internal
RX Power	-10 to 2.5dBm	±3dB	Internal



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