



50GE QSFP28 ER Transceiver

APQP2315CDL40B

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Product Features

- ✓ QSFP28 MSA compliant
- ✓ Hot pluggable 38 pin electrical interface
- ✓ 1x50G PAM4 LAN-WDM transmitter
- ✓ 26.5625 Gbit/s Channel Electrical Serial Interface (50GAUI-2)
- ✓ Maximum power consumption 4.5W
- ✓ LC duplex connector
- ✓ Supports 53.125Gb/s aggregate bit rate
- ✓ Up to 40km transmission on single mode fiber
- ✓ Operating case temperature: 0°C to 70°C
- ✓ Single 3.3V power supply
- ✓ RoHS 2.0 compliant

Applications

- ✓ 50GBASE-ER
- ✓ Telecom networking

Product Selection

Part Number	Operating Case temperature	DDMI
APQP2315CDL40B	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
- RoHS compliant with RoHS 2.0(2015/863/EU)

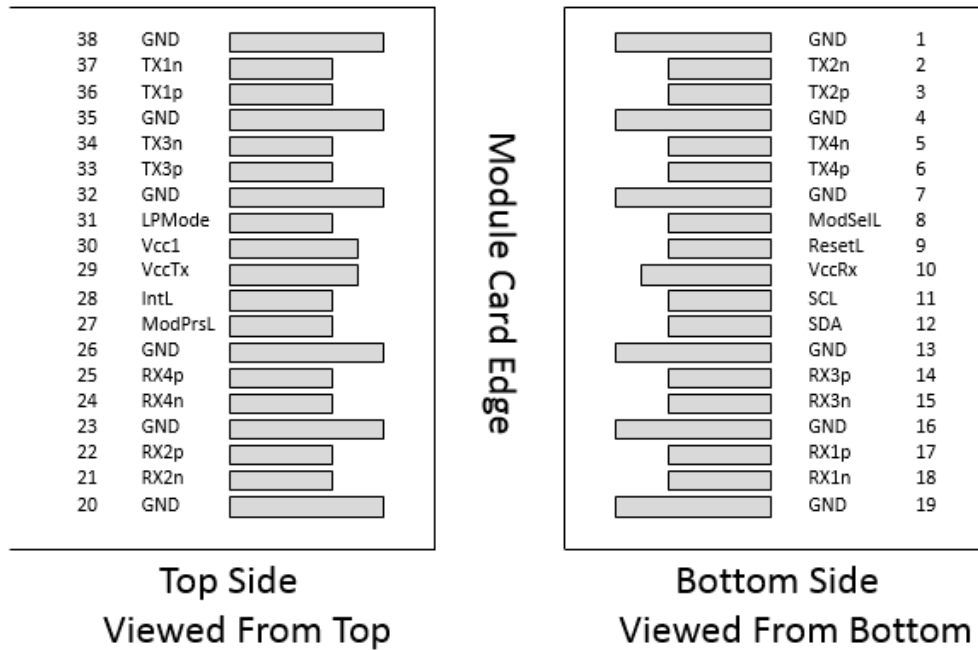
Pin Descriptions

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	GND	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	+ 3.3V Power Supply Receiver	
11	SCL	2-Wire Serial Interface Clock	
12	SDA	2-Wire Serial Interface Data	
13	GND	GND	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	GND	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 Non-Inverted Data Output	
25	Rx4p	Receiver Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	VccTx	+3.3 V Power Supply transmitter	
30	Vcc1	+3.3 V Power Supply	
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	

Pin	Symbol	Name	Ref.
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Ground	1

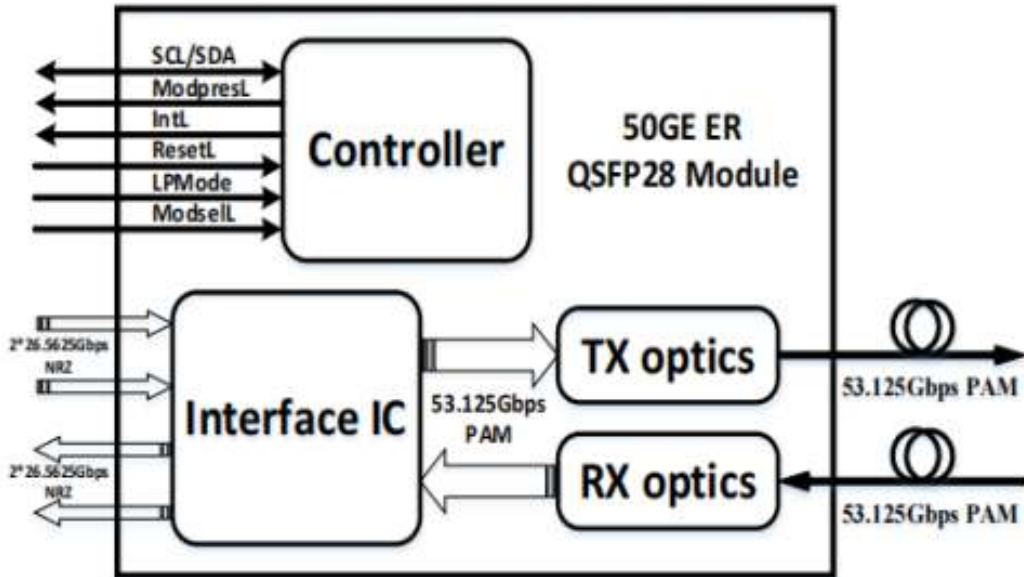
Notes:

1. Circuit ground is internally isolated from chassis ground.



Pin-out of Connector Block on Host Board

Transceiver Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	0		+3.6	V	
Storage Temperature	TS	-40		+85	°C	
Operating Humidity	RH	10		85	%	
Damage Threshold, each lane	THd	-2.4			dBm	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Power Supply Voltage	Vcc	3.135	3.30	3.465	V	
Power Supply Current	Icc	-	-	1.36	A	Steady state
Case Operating Temperature	Tc	0	-	+70	°C	Commercial
Power dissipation	P			4.5	W	
Link Distance with G.652	Lmax	-	-	40	km	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Data Rate, each lane			26.5625		Gbps	
Differential Voltage pk-pk	Vpp			900	mV	1
Common Mode Noise, RMS	Vrms			17.5	mV	
Transition time	Trise/Tfall	10			ps	2
Differential Termination Resistance Mismatch				10	%	
Eye width	EW15	0.46			UI	
Eye height	EH15	95			mV	
Receiver						
Data Rate, each lane			26.5625		Gbps	
Differential Termination Resistance Mismatch				10	%	1
Differential output voltage swing	Vput,pp			900	mV	
Common Mode Voltage	Vcm	-350		2850	mV	
Common Mode Noise, RMS	Vrms			17.5	mV	
Transition time	Trise/Tfall	9.5			ps	2
Vertical Eye Closure (VEC)				5.5	dB	
Eye width	EW15	0.57			UI	
Eye height	EH15	228			mV	

Notes:

1. At 1 MHz.
2. 20%~80%.

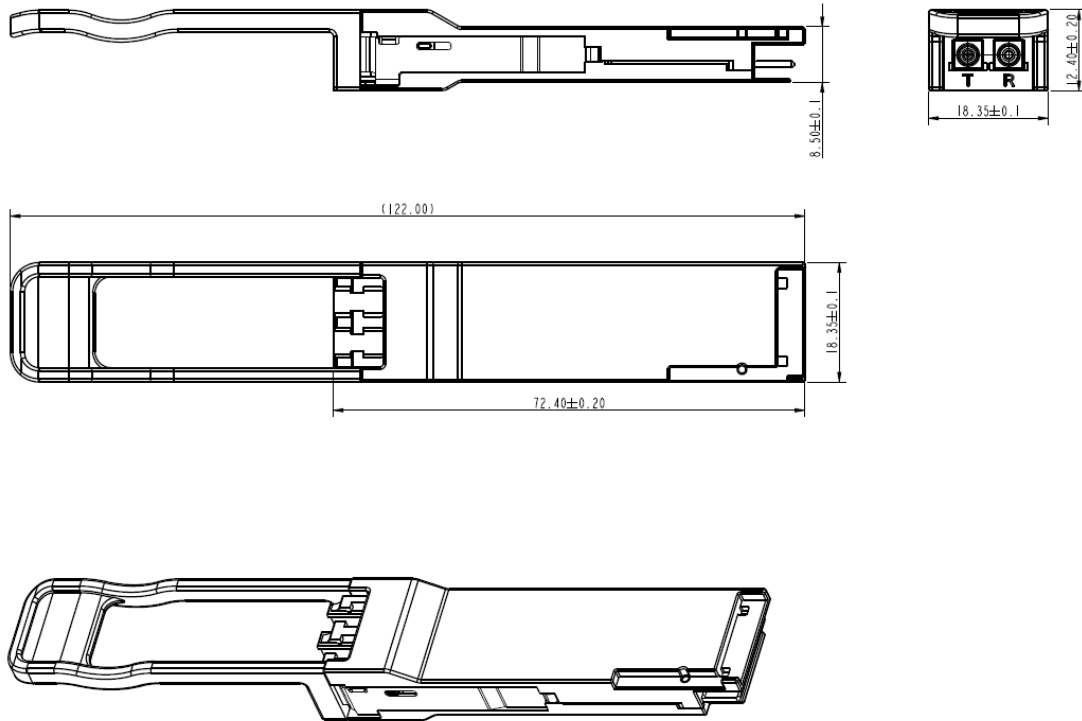
Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Signaling Speed per Lane			26.5625 ± 100 ppm		Gb/s	
Transmit wavelengths		1304.5		1317.5	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Average Launch Power		1.5		8.0	dBm	
Outer Optical Modulation Amplitude,(OMA _{outer})		4.5		9.0	dBm	
Launch power in OMA _{outer} minus TDECQ		2			dBm	
Transmitter and dispersion eye closure for PAM4 (TDECQ)				3.2	dB	
TDECQ-10log ₁₀ (C _{eq})				3.2	dB	
Extinction Ratio	ER	6			dB	
Average launch power of OFF transmitter				-15	dB	
Transmitter transition time				34	ps	
Transmitter reflectance				-26	dB	
Receiver						
Signaling Speed per Lane			26.5625 ± 100 ppm		Gb/s	
Receive wavelengths		1304.5		1317.5	nm	
Average receiver power, each lane	SENS	-15.0		-3.0	dBm	
Receiver power, each lane (OMA)				-2.6	dBm	
Receiver reflectance				-26	dB	
Receiver sensitivity (OMA)				-13.5	dBm	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-20	dBm	
LOS Hysteresis		0.5			dB	

Notes:

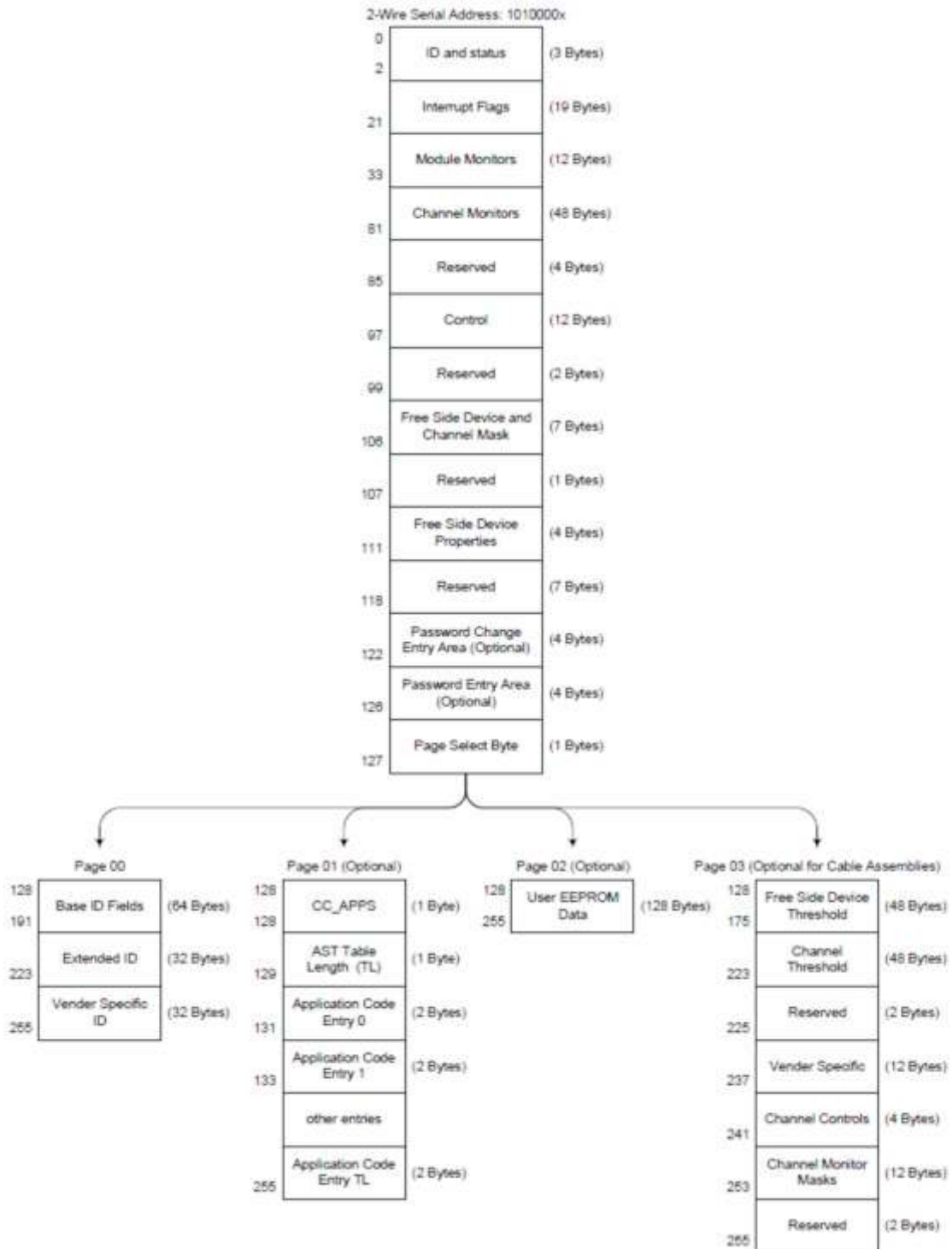
1. Hit ratio 5×10^{-5} .
2. Sensitivity is specified at BER@1E-12 without FEC.

Mechanical Specifications



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 monitoring parameter's accuracy.

Parameter	Related Bytes(A0[00] memory)	Accuracy	Ref.
Temperature	22 to 23	±3°C	1,2
Voltage	26 to 27	±3%	2
Bias Current	42 to 43	±10%	2
TX Power	50 to 51	±3dB	2
RX Power	34 to 35	±3dB	2

Notes:

1. Actual temperature test point is fixed on module case around Laser.
2. Full operating temperature range.

Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
Version1.0	Yawen Zhu	Tang zhiqiang	Dingzheng	Update the new template	Nov 4, 2022



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