
MQBG110-D0C-T1

Features

- ◆ Compliant with 100GBASE-LR4
- ◆ Support from 103.125 Gbps~111.81 Gbps
- ◆ Integrated LAN WDM TOSA/ROSA for up to 10 km reach over SMF
- ◆ LC receptacle optical interface compliant
- ◆ No external reference clock
- ◆ Hot-pluggable
- ◆ Power dissipation < 3.5W
- ◆ Operating case temperature range:
Commercial:0°C~+70°C
- ◆ RoHS Compliant
- ◆ DDMI function available with internally calibrated mode

Application

- ◆ Data Center
- ◆ 100GBASE-LR4 100G Ethernet
- ◆ OTN OTU4 411-9D1F

Standard

- ◆ Compliant with IEEE 802.3ba,IEEE802.3bm&100G LR4
- ◆ Compliant with SFF-8636
- ◆ RoHS Compliant

General Description

Mentech 100G QSFP28 LR4 integrates four transmitter and receivers into one module. In the transmitter side, the four lanes of optical data channels are optically multiplexed by the integrated optical multiplexer. In the receive side, the four lanes of optical data channels are optically de-multiplexed by the integrated optical de-multiplexer. Each data channels are recovered by a PIN photo-detector and trans-impedance amplifier, retimed.

The product is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP28 Multi-Source Agreement (MSA) and compliant to IEEE 802.3bm.

Specification

Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Unit	
Storage temperature	TS	-40	85	°C	
Power Supply Voltage	Vcc	-0.5	+4	V	
Relative Humidity	RH	5	95	%	
Recommended Operating Conditions					
Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature 1	Tc	0		70	°C
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Supply Current	Icc			1.12	A
Module total power	P			3.5	w
Each Channel Data Rate	BR	25.78		27.91	Gbps
SMF per G.652	Lmax	-	-	10	km

Note1. We guarantee that the shell temperature meet the 0~70°C, environment temperature may be lower than 70°C when module operating.

Electrical transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Differential data input swing per lane		180		1000	mV	
Differential termination mismatch				10	%	
Eye width			0.46		UI	
Eye height			95		mV	
DC common mode voltage		-350		2850	mV	
Electrical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Differential data output swing	Vout,pp	100		400	mV	1
		300		600		
		400		800		
		600		1200		
Differential termination mismatch				10	%	
Eye width		0.57			UI	
Transition time, 20% to 80%	Tris/Tfall	12			ps	

Note1. The default differential data output swing is 600~1200mV.

100GBASE-LR4 Operation

Optical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Signaling rate per lane		25.78125 ± 100 ppm			GBd	1
Lane center wavelengths(range)	CH0	1294.53		1296.59	nm	
	CH1	1299.02		1301.09		
	CH2	1303.54		1305.63		
	CH3	1308.09		1310.19		
Total Average Launch Power	Pout			10.5	dBm	
Transmit OMA per Lane	TxOMA	-1.3		4.5	dBm	
Average Launch Power per Lane	TXPx	-4.3		4.5	dBm	
Extinction Ratio	ER	4			dB	
Sidemode Suppression ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-130	dB/Hz	
Transmitter Reflectance Reflectance				-12	dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				2
Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Signaling rate per lane		25.78125 ± 100 ppm			GBd	3
Lane center wavelengths(range)	CH0	1294.53		1296.59	nm	
	CH1	1299.02		1301.09		
	CH2	1303.54		1305.63		
	CH3	1308.09		1310.19		
Average Receive Power per Lane	RXPx	-10.6		4.5	dBm	4
Receiver Sensitivity (OMA) per Lane	Rxsens			-8.6	dBm	
Receiver Reflectance				-26	dB	
LOS	Optical De-assert	Pd		-11.6	dBm	
	Optical Assert	Pa	-24			
LOS hysteresis		0.5			dB	

Note1. Transmitter operating at 25.78125Gbps each channel.

Note 2. Hit ratio 5×10^{-5} .

Note 3. Receiver operating at 25.78125Gbps each channel.

Note 4. Power value and power accuracy are with all channels on.

OTU4 4I1-9D1F Operation

Optical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Signaling rate per lane		27.9525± 20 ppm			GBd	1
Lane center wavelengths(range)	CH0	1294.53		1296.59	nm	
	CH1	1299.02		1301.09		
	CH2	1303.54		1305.63		
	CH3	1308.09		1310.19		
Total Average Launch Power	Pout			10.5	dBm	
Average Launch Power per Lane	TXPx	-0.6		4.5	dBm	2
Extinction Ratio	ER	4			dB	
Sidemode Suppression ratio	SMSR	30			dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				3
Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Signaling rate per lane		27.9525± 20 ppm			GBd	4
Lane center wavelengths(range)	CH0	1294.53		1296.59	nm	
	CH1	1299.02		1301.09		
	CH2	1303.54		1305.63		
	CH3	1308.09		1310.19		
Average Receive Power per Lane	RXPx	-6.9		4.5	dBm	2,5
Receiver Sensitivity per Lane	Rxsens			-8.4	dBm	5
LOS	Optical De-assert	Pd		-11.6	dBm	
	Optical Assert	Pa	-24			
LOS hysteresis		0.5			dB	

1. Transmitter operating at 27.95Gbps each channel.

2. Power value and power accuracy are with all channels on.

3. Hit ratio 5×10^{-5} .

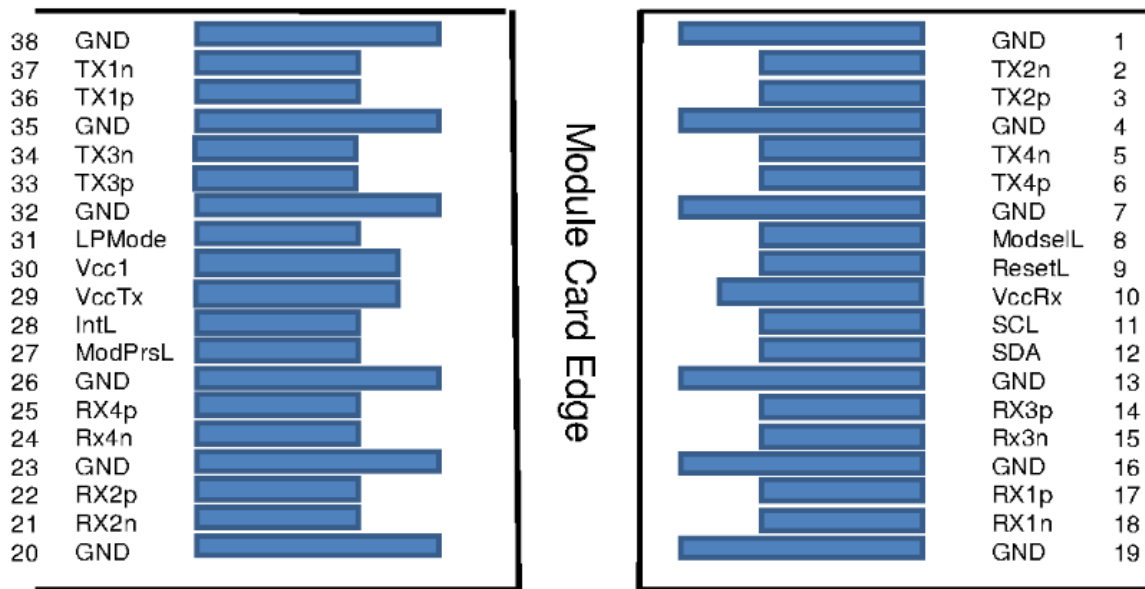
4. Receiver operating at 27.95Gbps each channel.
5. Specified at a BER of 10^{-6} (pre-FEC), per ITU-T G.sup39.

Digital Diagnostic Monitoring Information

Parameter	Accuracy	Calibration	Note
Temperature	±3°C	internal	0~70°C
Voltage	±3%	internal	Vcc=3.3V±5%
Bias Current	±10%	internal	Specified by normal value
TX Power*	±2dB	internal	-4.3~4.5dBm
RX Power*	±2dB	internal	-10.6~4.5dBm

*Transceiver operating at 25.78Gbps each.

Pin Description



Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

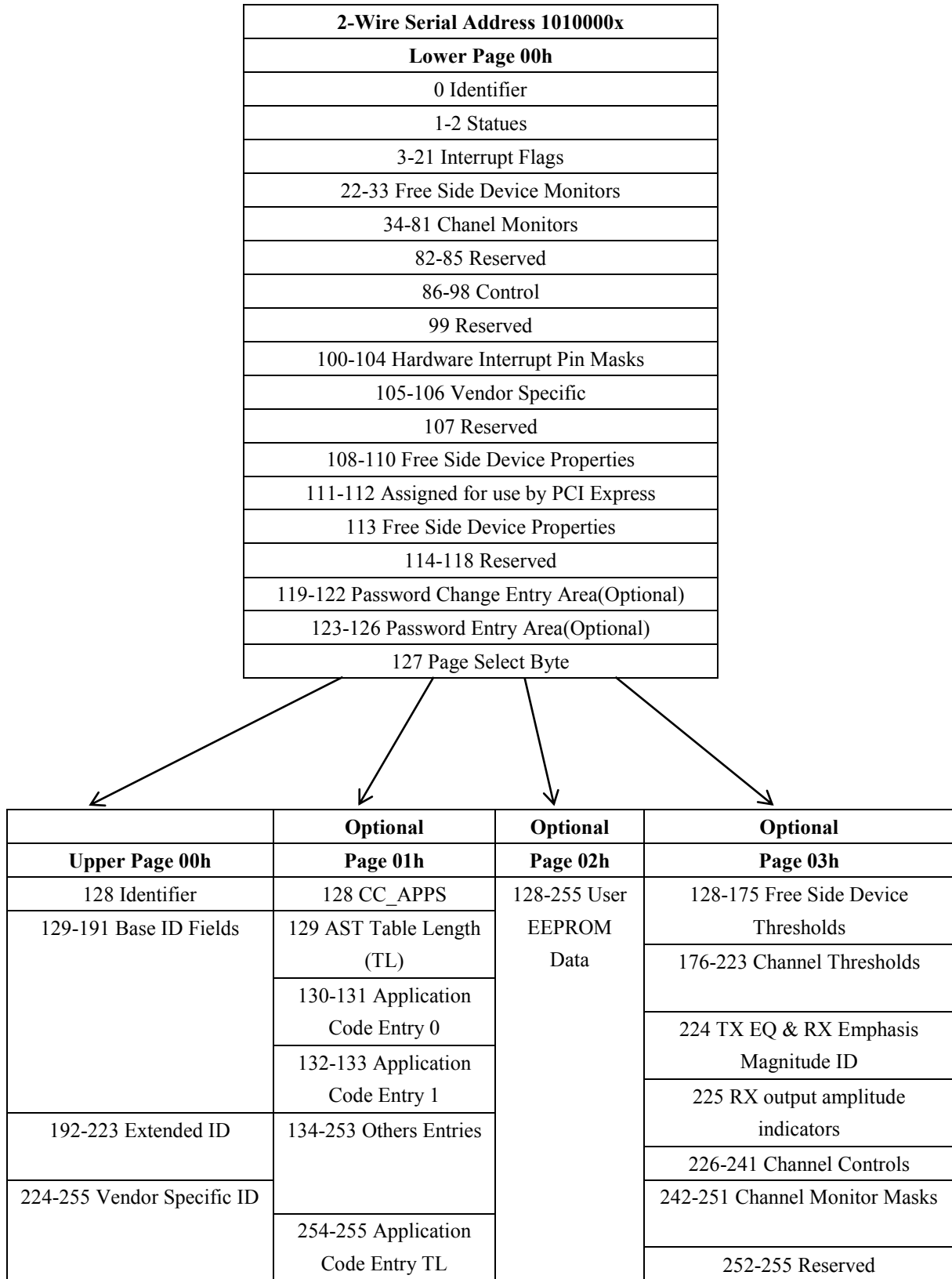
As Viewed Through Top of Board

Pin	Name	Function/Description	Note
1	GND	Ground.	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground.	

5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground.	
8	ModSelL	Module Select.	
9	ResetL	Module Reset.	
10	VccRx	3.3V Power Supply Receiver.	1
11	SCL	2-Wire serial Interface Clock.	
12	SDA	2-Wire serial Interface Data.	
13	GND	Ground.	
14	Rx3p	Receiver Non-Inverted Data Output.	
15	Rx3n	Receiver Inverted Data Output.	
16	GND	Ground.	
17	Rx1p	Receiver Non-Inverted Data Output.	
18	Rx1n	Receiver Inverted Data Output.	
19	GND	Ground.	
20	GND	Ground.	
21	Rx2n	Receiver Inverted Data Output.	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground.	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground.	
27	ModPrsl	Module Present	
28	IntL	Interrupt	
29	VccTx	3.3V power supply.	1
30	Vcc1	3.3V power supply.	1
31	LPMODE	Low Power Mode	
32	GND	Ground.	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground.	
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground.	

Note1. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown 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 500mA.

Memory Map



QSFP28 Memory Map

Ordering information

Part. No	Specifications								
	Pack	Typical Rate* (Gbps)	Average Power * (dBm)	RX	Sen* (dBm)	Temp (°C)	Reach (km)	Pull tap Color	DDM
MQBG110-D0C-T1	QSFP28	25.78125	-4.3~4.5	PIN	<-10.6	0~70	10	Blue	Y

*:For each channel, Transceiver operating at 25.78125Gbps each channel.