Свойства

4x25Gb/s канала, 103.1Gb/s aggregate bit rate

WDM DML лазеры

до 10км на одномодовом G.652 оптическом кабеле

цифровая диагностика (DDMI)

Duplex LC коннектор

Применение

100GBASE-LR4 Ethernet

● Максимальные параметры

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_S	-40		+85	°C
Supply Voltage	V_{CC}	-0.5		3.6	V
Relative Humidity	RH	0		85	%

● Рекомендованные параметры

Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Units**
Operating Case Temperature	T_{OP}	0		70	degC
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Data Rate, each Lane			25.78		Gb/s
Data Rate Accuracy		-100		100	ppm
Control Input Voltage High		2		Vcc	V
Control Input Voltage Low		0		0.8	V
Link Distance with G.652	D	0.002		10	km

● Электрические характеристики

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Consumption				3.5	W	
Supply Current	Icc			1.12	A	
Transmitter (each Lane)						
Differential Input Voltage Swing	$V_{in,pp}$			900	mVpp	
Differential Input Impedance	Z_{in}	90	100	110	Ohm	
Receiver (each Lane)						
Differential Output Voltage Swing	Vout,pp	100		400	mVpp	1
		300		600		
		400		800		
		600		1200		
Differential Output Impedance	Zout	90	100	110	Ohm	

Notes:

1、Output voltage is settable in 4 discrete ranges via I2C. Default range is 400 – 800 mV.

● Оптические параметры

QSFP28 100GBASE-LR4						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Signaling Speed per Channel			25.78125		Gbps	
Lane Wavelength	L0	1294.53	/	1296.59	nm	
	L1	1299.02	/	1301.09	nm	
	L2	1303.54	/	1305.63	nm	
	L3	1308.09	/	1310.19	nm	
Transmitter						
Side Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	P_T			10.5	dBm	
Average Launch Power, each Lane	P_{AVG}	-4.3		4.5	dBm	
OMA, each Lane	P_{OMA}	-1.3		4.5	dBm	
Difference in Launch Power between any Two Lanes (OMA)	Ptx,diff			5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-2.3			dBm	
TDP, each Lane	TDP			2.2	dB	

Extinction Ratio	ER	4			dB	
$RIN_{20}OMA$	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Reflectance	R_T			-12	dB	
Eye Mask{X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28,				1
		0.4}				
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Receiver						
Signaling Speed per Channel			25.78125		Gbps	
Lane Wavelength	L0	1294.53	/	1296.59	nm	
	L1	1299.02	/	1301.09	nm	
	L2	1303.54	/	1305.63	nm	
	L3	1308.09	/	1310.19	nm	
Total Average Receive Power				10.5	dBm	
Average Receive Power, each Lane				4.5	dBm	
Receive Power (OMA), each Lane				4.5	dBm	
Receiver Sensitivity (OMA), each Lane	SEN			-8.6	dBm	2
Stressed Receiver Sensitivity (OMA), each Lane				-6.8	dBm	
Difference in Receive Power between any Two Lanes (OMA)	Prx,diff			5.5	dB	
LOS Assert	LOSA	-25			dBm	
LOS De-assert	LOSD			-13	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	

Notes:

1. Compliant to IEEE 802.3ba.
2. Measured with conformance test signal at receiver input for BER = $1x10^{-12}$.

● Цифровая диагностика (DDMI)

Parameter	Symbol	Min	Max	Units	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temperature range
Supply voltage monitor absolute error	DMI _VCC	-0.1	0.1	V	Over full operating range
Channel RX power monitor absolute error	DMI_RX_Ch	-2	2	dB	1
Channel Bias current monitor	DMI_Ibias_Ch	-10%	10%	mA	
Channel TX power monitor absolute error	DMI_TX_Ch	-2	2	dB	1

Notes:

1. Due to measurement accuracy of different single mode fibers, there could be an additional +/-1dB fluctuation, or a +/- 3 dB total accuracy.

- **Блок-схема**

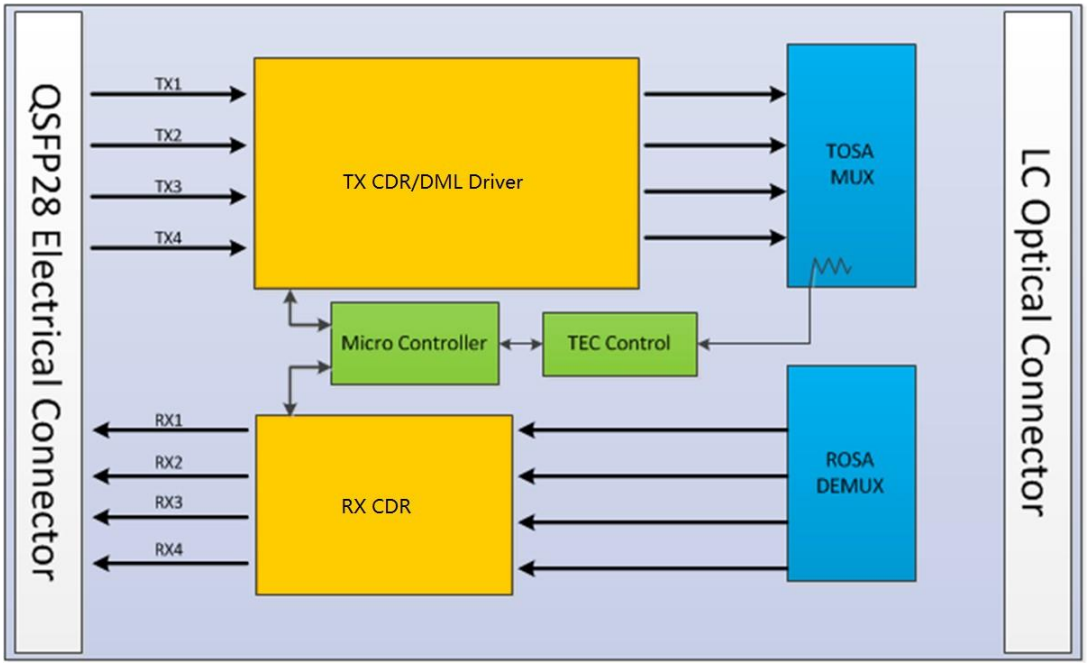


Figure1: Block Diagram

- **Назначение контактов**

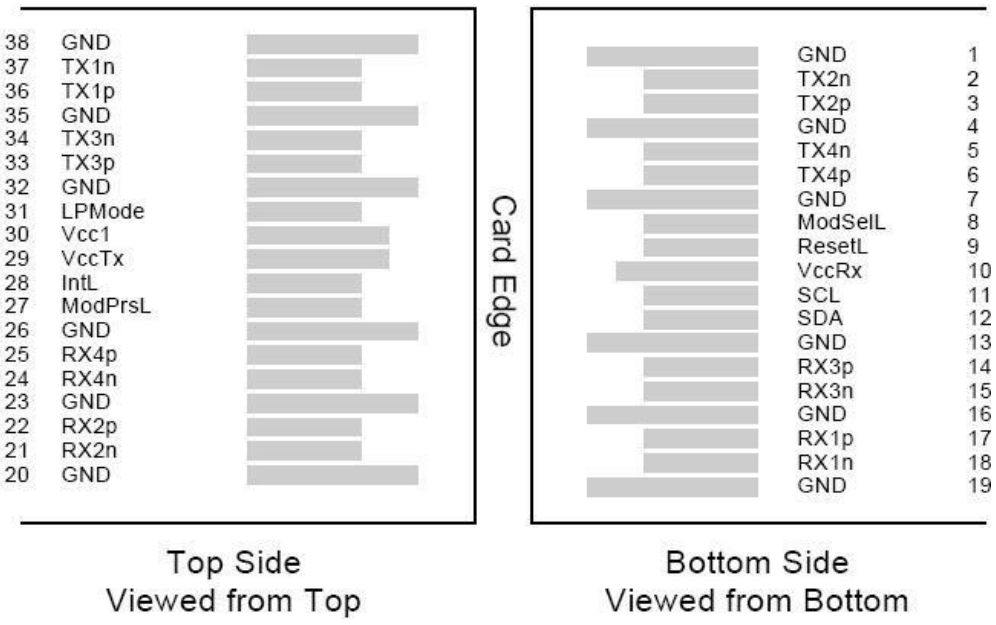


Diagram of Host Board Connector Block Pin Numbers and Name

- **Описание контактов**

PIN	Logic	Symbol	Name/Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	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 receiver and transmitter power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure 3 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.

Рекомендованная схема включения

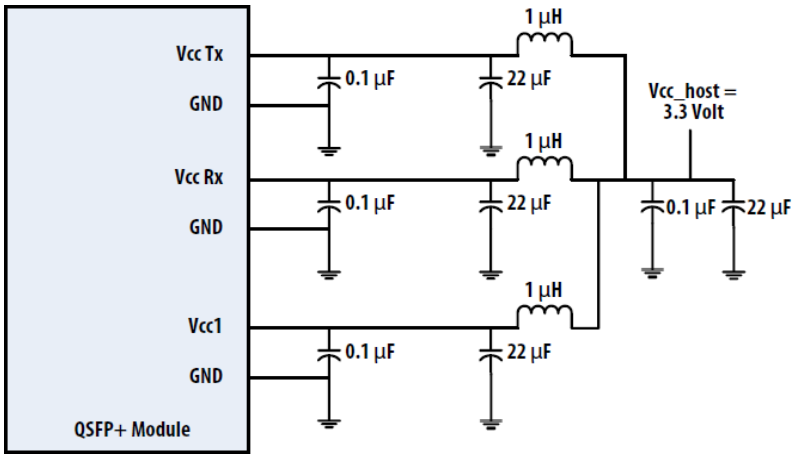
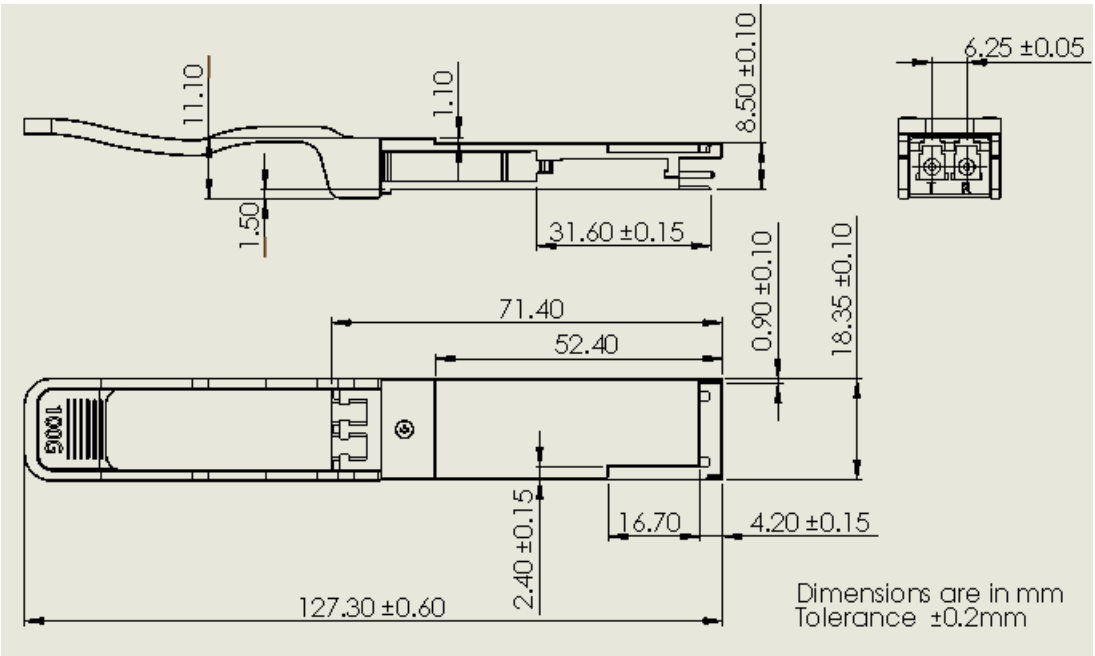


Figure 3. Recommended Power Supply Filter

● Размеры


11.10
1.10
8.50 ±0.10
6.25 ±0.05
1.50
31.60 ±0.15
0.90 ±0.10
18.35 ±0.10
71.40
52.40
2.40 ±0.15
16.70
4.20 ±0.15
127.30 ±0.60
Dimensions are in mm
Tolerance ±0.2mm