Свойства

- до 2км на одномодовом оптическом кабеле G.652 или до 100м на многомодовом оптическом кабеле OM3

- дуплексный LC коннектор

- до 11.2Gbps на канал с агрегацией в 40Gbps канал

- цифровая диагностика (DDMI)

- соответствие MSA для QSFP+

Применение

40G Ethernet

● Максимальные параметры

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_S	-40		+85	°C
Supply Voltage	$V_{CC}T$, R	-0.5		4	V
Relative Humidity	RH	0		85	%

● Рекомендованные параметры

Parameter	Symbol	Min.	Typical	Max.	Unit
Case operating Temperature	T_C	0		+70	°C
Supply Voltage	$V_{CCT, R}$	+3.13	3.3	+3.47	V
Supply Current	I_{CC}			500	mA
Power Dissipation	PD			3.5	W

● Электрические характеристики

Parameter	Symbol	Min	Typ	Max	Unit	Note
Data Rate per Channel		-	10.3125	11.2	Gbps	
Power Consumption		-	2.5	3.5	W	
Supply Current	Icc		0.75	1.1	A	
Control I/O Voltage-High	VIH	2.0		Vcc	V	
Control I/O Voltage-Low	VIL	0		0.7	V	
Inter-Channel Skew	TSK			150	Ps	
RESETL Duration			10		Us	
RESETL De-assert time				100	ms	
Power On Time				100	ms	
Transmitter						
Single Ended Output Voltage Tolerance		0.3		4	V	1
Common mode Voltage Tolerance		15			mV	
Transmit Input Diff Voltage	VI	150		1200	mV	
Transmit Input Diff Impedance	ZIN	85	100	115		
Data Dependent Input Jitter	DDJ		0.3		UI	
Receiver						
Single Ended Output Voltage Tolerance		0.3		4	V	
Rx Output Diff Voltage	Vo	370	600	950	mV	
Rx Output Rise and Fall Voltage	Tr/Tf			35	ps	1
Total Jitter	TJ		0.2		UI	

Note: 20～80%

● Оптические параметры

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Wavelength Assignment	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	P_T			+8.3	dBm	
Transmitter Dispersion Penalty, MMF	TDP			+4.7	dB	
Transmitter Dispersion Penalty, SMF	TDP			+2.6		
Optical Modulation Amplitude, each Lane,MMF	OMA			+4.7		
Optical Modulation Amplitude, each Lane,SMF	OMA	-7.5		+3.5	dBm	
Laser Off Power Per Channel	Poff			-30	dBm	
Optical Extinction Ratio	ER	3.5			dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				
Relative Intensity Noise	Rin			-128	dB/HZ	1
Optical Return Loss Tolerance				12	dB	
Receiver						
Damage Threshold	THd	3.3			dBm	1
Receiver Sensitivity(OMA), each Lane,MMF	R			-10		
Receiver Sensitivity(OMA), each Lane,SMF	R			-10	dBm	
Receiver Power(OMA), each Lane,MMF	RXP_X			4.8	dB	
Receiver Power(OMA), each Lane,SMF	RXP_X			3.3		
Receive Electrical 3 dB upper Cut off Frequency, each Lane				12.3	GHz	
RSSI Accuracy		-2		2	dB	
Receiver Reflectance	Rrx			-12	dB	
LOS De-Assert	LOS_D			-13	dBm	
LOS Assert	LOS_A	-30			dBm	
LOS Hysteresis	LOS_H	0.5			dB	

✧ **Note :**

✧ 1. 12dB Reflection

● Цифровая диагностика (DDMI)

2. Lower Memory Map (A0h)

3.

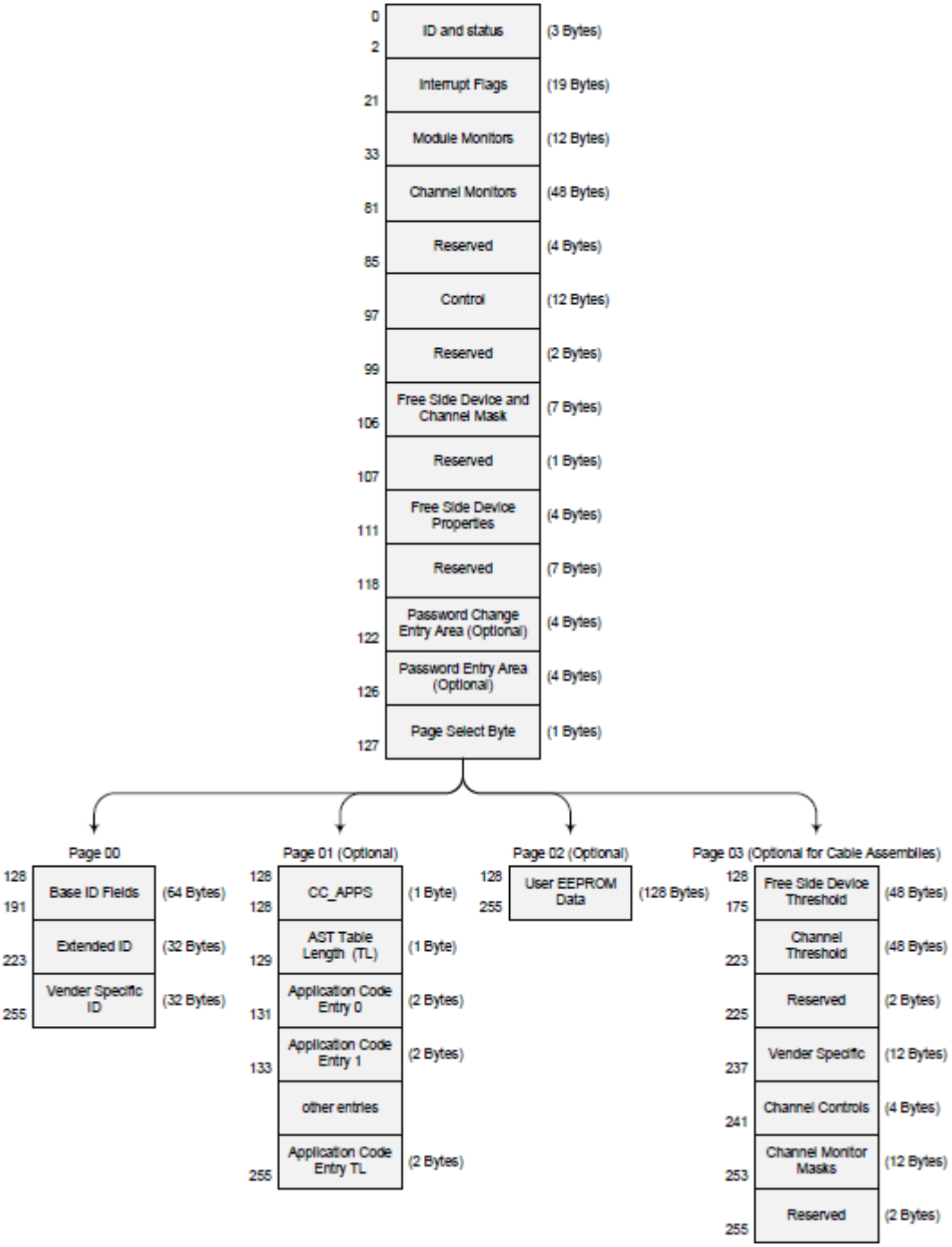
Address	Size (Bytes)	Description	Type
0	1	Identifier	Read-Only
1-2	2	Status	Read-Only
3-21	19	Interrupt Flags	Read-Only
22-33	12	Module Monitors	Read-Only
34-81	48	Channel Monitors	Read-Only
82-85	4	Reserved	Read-Only
86-97	12	Control	Read/Write
98-99	2	Reserved	Read/Write
100-106	7	Module and Channel Masks	Read/Write
107-118	12	Reserved	Read/Write
119-122	4	Reserved	Read/Write
123-126	4	Reserved	Read/Write
127	1	Page Select Byte	Read/Write

4.

5. Upper Memory Map Page 03h

6.

Address	Size (Bytes)	Description	Type
128-175	48	Module Thresholds	Read-Only
176-223	48	Reserved	Read-Only
224-225	2	Reserved	Read-Only
226-239	14	Reserved	Read/Write
240-241	2	Channel Controls	Read/Write
242-253	12	Reserved	Read/Write
254-255	2	Reserved	Read/Write


0
ID and status
(3 Bytes)
2
Interrupt Flags
(19 Bytes)
21
Module Monitors
(12 Bytes)
33
Channel Monitors
(48 Bytes)
81
Reserved
(4 Bytes)
85
Control
(12 Bytes)
97
Reserved
(2 Bytes)
99
Free Side Device and Channel Mask
(7 Bytes)
106
Reserved
(1 Bytes)
107
Free Side Device Properties
(4 Bytes)
111
Reserved
(7 Bytes)
118
Password Change Entry Area (Optional)
(4 Bytes)
122
Password Entry Area (Optional)
(4 Bytes)
126
Page Select Byte
(1 Bytes)
127
Page 00
128
Base ID Fields
(64 Bytes)
191
Extended ID
(32 Bytes)
223
Vender Specific ID
(32 Bytes)
255
Page 01 (Optional)
128
CC_APPS
(1 Byte)
128
AST Table Length (TL)
(1 Byte)
129
Application Code Entry 0
(2 Bytes)
131
Application Code Entry 1
(2 Bytes)
133
other entries
Application Code Entry TL
(2 Bytes)
255
Page 02 (Optional)
128
User EEPROM Data
(128 Bytes)
255
Page 03 (Optional for Cable Assemblies)
128
Free Side Device Threshold
(48 Bytes)
175
Channel Threshold
(48 Bytes)
223
Reserved
(2 Bytes)
225
Vender Specific
(12 Bytes)
237
Channel Controls
(4 Bytes)
241
Channel Monitor Masks
(12 Bytes)
253
Reserved
(2 Bytes)
255

Serial ID: Data Fields

Address	Size (Bytes)	Name	Description of Base ID Field
Base ID fields			
128	1	Identifier	Identifier Type of serial Module
129	1	Ext. Identifier	Extended Identifier of Serial Module
130	1	Connector	Code for connector type
131-138	8	Specification compliance	Code for electronic compatibility or optical compatibility
139	1	Encoding	Code for serial encoding algorithm
140	1	BR, nominal	Nominal bit rate, units of 100 MBits/s
141	1	Extended Rate select Compliance	Tags for extended rate select compliance
142	1	Length(SMF)	Link length supported for SMF fiber in km
143	1	Length(OM3 50um)	Link length supported for EBW 50/125um fiber (OM3), units of 2m
144	1	Length(OM2 50um)	Link length supported for 50/125um fiber (OM2), units of 1m
145	1	Length(OM1 62.5 um)	Link length supported for 62.5/125um fiber (OM1), units of 1m
146	1	Length (Copper)	Link length of copper or active cable, units of 1m
147	1	Device tech	Device technology
148-163	16	Vendor name	QSFP+ vendor name(ASCII)
164	1	Extended Module	Extended Module codes for InfiniBand
165-167	3	Vendor OUI	QSFP+ vendor IEEE company ID
168-183	16	Vendor PN	Part number provided by QSFP+ vendor(ASCII)
184-185	2	Vendor rev	Revision level for part number provided by vendor (ASCII)
186-187	2	Wave length or Copper Cable Attenuation	Nominal laser wavelength (wavelength=value/20 in nm)
188-189	2	Wavelength tolerance	Guaranteed range of laser wavelength(+/- value) from nominal wavelength. (wavelength Tol.=value/200 in nm)
190	1	Max case temp.	Maximum case temperature in degrees C
191	1	CC_BASE	Check code for base ID fields (addresses 128-190)
Extended ID fields			
192-195	4	Options	Rate Select, TX Disable, TX Fault, LOS
196-211	16	Vendor SN	Serial number provided by vendor (ASCII)
212-219	8	Date Code	Vendor’s manufacturing date code
220	1	Diagnostic Monitoring Type	Indicates which types of diagnostic monitoring are implemented (if any) in the Module. Bit 1,0 Reserved
221	1	Enhanced Options	Indicates which optional enhanced features are implemented in the transceiver.
222	1	Reserved	
223	1	CC_EXT	Check code for the Extended ID Fields (addresses 192-222)
Vendor Specific ID Fields			
224-255	32	Vendor Specific EEPROM	

Page02 is User EEPROM and its format decided by user.

The detail description of low memory and page00.page03 upper memory please see SFF-8436 document.

Назначение контактов

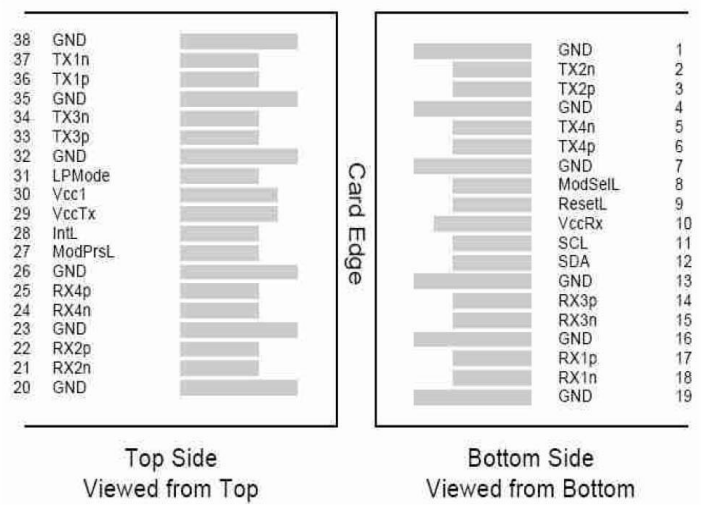


Diagram of Host Board Connector Block Pin Numbers and Name

Описание контактов

Pin	Logic	Symbol	Name/Description	Ref.
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 Output	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Output	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2

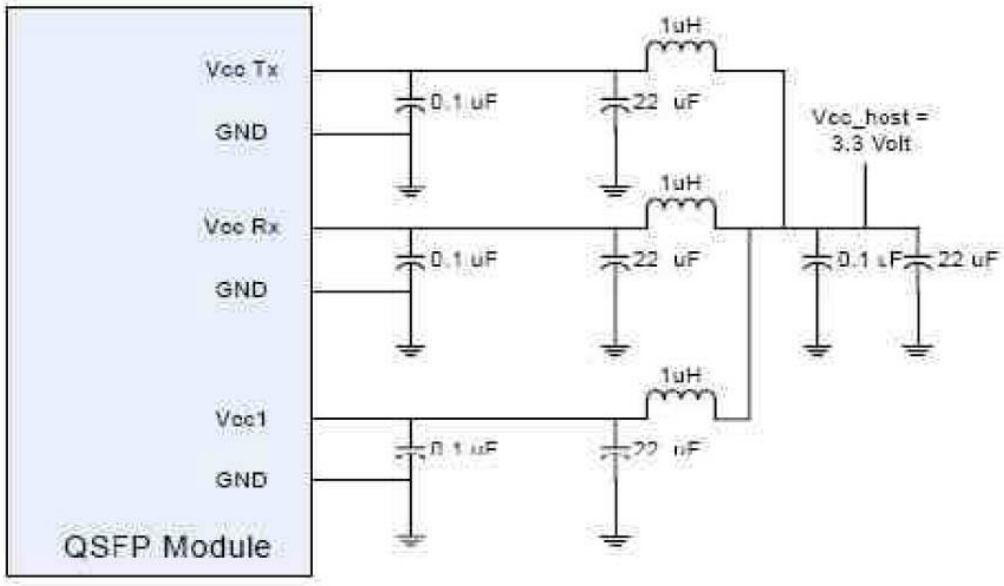
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Inverted Data Output	
15	CML-O	Rx3n	Receiver Non-Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Inverted Data Output	
18	CML-O	Rx1n	Receiver Non-Inverted 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	
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	+3.3V Power Supply Transmitter	2
30		Vcc1	+3.3V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Inverted Data Output	

34	CML-I	Tx3n	Transmitter Non-Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Inverted Data Output	
37	CML-I	Tx1n	Transmitter Non-Inverted Data Output	
38		GND	Ground	1

Notes:

1. GND is the symbol for single and supply(power) common for QSFP modules, All are common within the QSFP module and all module voltages are referenced to this potential otherwise noted. Connect these directly to the host board signal common ground plane. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
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 below. VccRx, Vcc1 and VccTx may be internally connected within the QSFP transceiver module in any combination. The connector pins are each rated for maximum current of 500mA.

- **Рекомендованная схема включения**



- **Размеры**