



40GBase LR4 QSFP+ Optical Transceivers

Features :

- Supports 41.2 Gb/s Aggregate Bit Rates
- Link Distance up to 10Km over SMF
- Compliant with IEEE 802.3ba 40GBASE LR4
- Compliant with Hot Pluggable QSFP+ MSA (SFF-8436) with Duplex LC connectors
- Uncooled 4x10Gb/s CWDM DFB Laser
- Supports Infiniband SDR, DDR and QDR
- Operating Case Temperature: 0 ~ 70°C
- Low Power Consumption : 2.5 W max
- Digital Diagnostic Monitoring Interface through I2C Management, SFF-8472 Compliant
- EEPROM lock function available
- RoHS 6 Compliant

Applications:

- Data Center Backbone
- 40G Ethernet Switches
- High-speed Servers
- High-performance Computing Clusters
- SAN, Routers, Hubs, Load Balancer

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min.	Max.	Unit
Storage Temperature	T _{Storage}		0	+85	°C
Relative Humidity	RH		0	+85	%

Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Case Temperature	T _C		0	40	70	°C
Power Supply Voltage	V _{CC}		3.15	3.3	3.45	V
Signaling Rate each Channel				10.3125		Gbps
Two Wire Serial (TWS) Interface Clock Rate			---	---	400	kHz
Power Supply Noise			---	---	50	mVpp
Supply Noise Rejection			---	---	100	mV
Receiver Differential Data Output			---	100		Ohm
Operating Distance	D		---	10	---	km

Electrical Characteristics (tested under recommended operating conditions, unless otherwise noted)

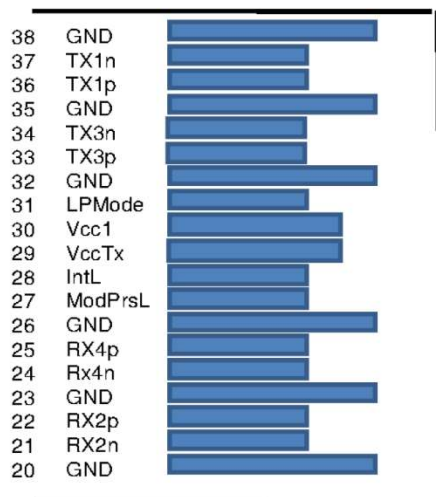
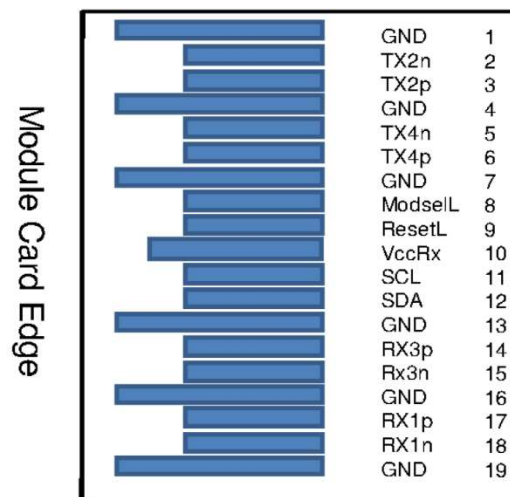
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Consumption			1.4		2.5	W
Supply Current	I _{cc}				800	mA
Gold Finger Length				2.6		mm

Transmitter Characteristics (tested under recommended operating conditions, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Signaling rate, each lane (range)	GBb			10.3125		GBb
Center Wavelength	λ ₀		1264.5		1277.5	nm
	λ ₁		1284.5		1297.5	nm
	λ ₂		1304.5		1317.5	nm
	λ ₃		1324.5		1337.5	nm
Side-mode suppression ratio	SMSR		30			dB
Total average launch power					8.3	dBm
Average launch power, each lane	P _f		-7		2.3	dBm
Optical Modulation Amplitude (OMA), each lane	TxOMA		-4		3.5	dBm
Difference in launch power between any two lanes (OMA)					6.5	dB
Transmitter and Dispersion Penalty	TDP				2.6	dB
Launch power in OMA minus TDP, each lane	Tx-TDP		-4.8			dBm
Average launch power of OFF transmitter, each lane					-30	dBm
Extinction ratio	ER		3.5			dB
Relative Intensity Noise					-128	dB/Hz
Optical return loss tolerance					20	dB
Transmitter reflectance					-12	dB

Receiver Characteristics (tested under recommended operating conditions, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Signaling rate, each lane (range)	GBb			10.3125		GBb
Center Wavelength	λ_0		1264.5		1277.5	nm
	λ_1		1284.5		1297.5	nm
	λ_2		1304.5		1317.5	nm
	λ_3		1324.5		1337.5	nm
Damage threshold			3.3			dBm
Average power at receiver input, each lane			-13.7		2.3	dBm
Receive power, each lane (OMA)					3.5	dBm
Difference in receive power between any two lanes (OMA)					7.5	dBm
Receiver reflectance					-26	dB
Receiver sensitivity (OMA)	S_{OMA}				-11.5	dBm
LOS Assert	LOS_A		-28			dBm
LOS De-Assert	LOS_D				-15	dBm
LOS Hysteresis			0.5		6	dB

Pin Assignment

 Top Side
Viewed From Top

 Bottom Side
Viewed From Bottom

Pin Description

PIN	Logic	Symbol	Name/Description	Note
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-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	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	
20		GND	Ground	
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	
30		Vcc1	+3.3 V Power Supply	
31	LVTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	

33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	

EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0H). Memory Contents of Serial ID are shown in Table as below.

Serial ID Memory Contents

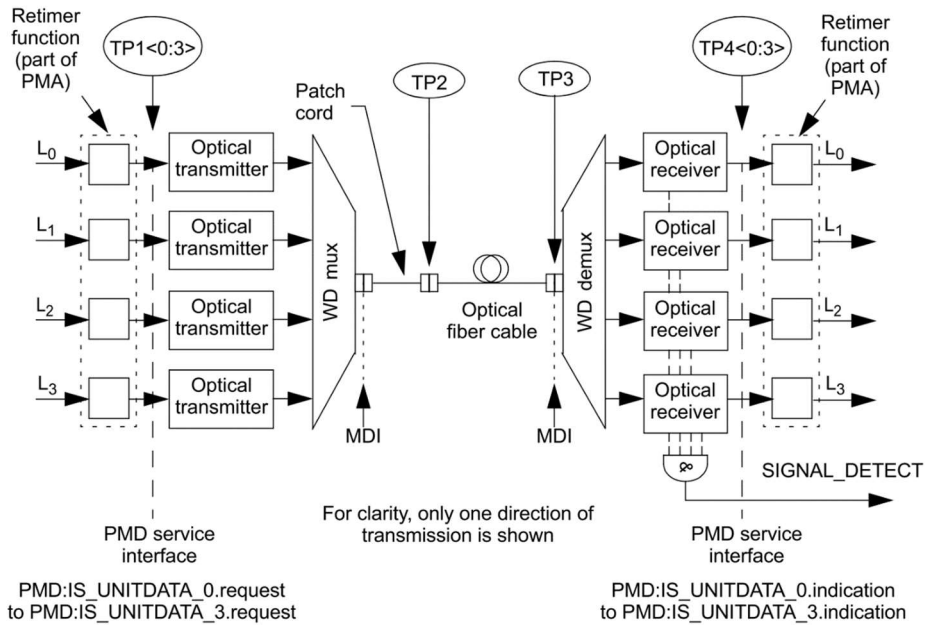
Data Address	Size (Bytes)	Name of Field	Contents (Hex)	Description
BASE ID FIELDS				
0	1	Identifier	0D	QSFP
1-2	2	Status Indicator	00 00	
3-21	19	Interrupt Flags	All 00	
22-33	12	Module Monitors	All 00	
34-81	48	Channel Monitors	All 00	
82-85	4	Reserved	00 00 00 00	
86-97	12	Control	All 00	
98-99	2	Reserved	00 00	
100-106	7	Module & Channel Masks	00 00 00 00 00 00 00	
107-118	12	Reserved	All 00	
119-122	4	Password Change Entry	00 00 00 00	
123-126	4	Password Entry	00 00 00 00	
127	1	Page Select	00	
128	1	Identifier	0D	QSFP+
129	1	Ext. Identifier	40	
130	1	Connector	07	Duplex LC
131-138	8	Specification Compliance	02 00 00 00 00 00 00 00	

139	1	Encoding	05	64B/66B
140	1	BR-Normal	67	10.3Gbps per lane
141	1	Extended Rate Select	00	unspecified
142	1	Length SM-km	0A	10km
143	1	Length, OM3-2m	00	
144	1	Length, OM2-1m	00	
145	1	Length, OM1-1m	00	
146	1	Length, Cu-1m	00	not support copper
147	1	Device technology	40	
148-163	16	Vendor name	57 41 56 45 53 50 4C 49 54 54 45 52 20 20 20 20	Egismos
164	1	Extended Module Codes	00	
165-167	3	Vendor OUI	00 0F 0E	
168-183	16	Vendor Part Number	57 53 54 2D 51 53 46 50 2B 4C 52 34 63 2D 43 20	EGS-QSFP+LR4c-C
184-185	2	Vendor rev	30 33	03
186-187	2	Wavelength	66 58	
188-189	2	Wavelength Tolerance	05 14	
190	1	Max case temp	46	70C
191	1	Check code for [128-190]	Xx	
192-195	4	Options	00 01 00 00	
196-211	16	Vendor SN	CC CM YY MM ID ID SN SN SN SN 20 20 20 20 20 20	CC: Country code CM: CM code MM: Month DD: Date ID: Product ID SN: Sequence
212-219	8	Date code	YY YY MM MM DD DD LL LL	YY: Year MM: Month DD: Day of month LL: Lot number

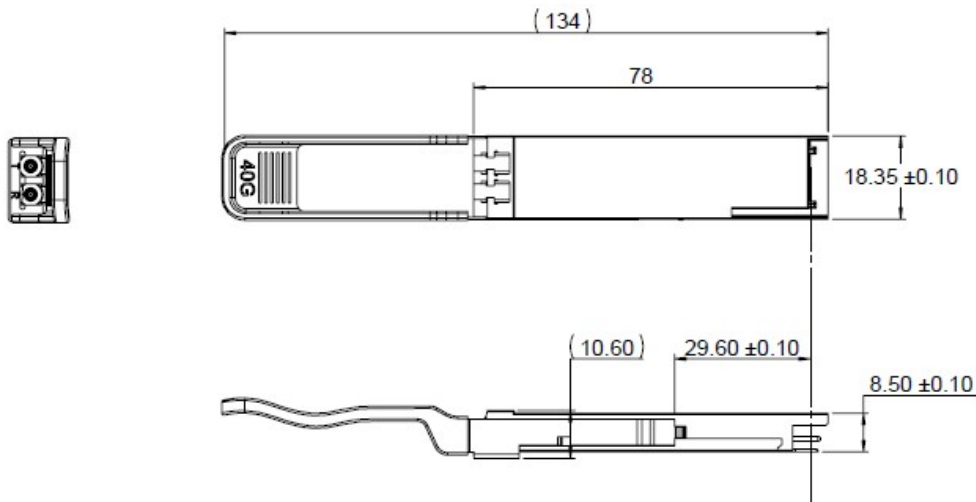
220	1	DOM type	08	For average power
221	1	Enhanced Options	00	
222	1	Reserved	00	
223-255	33	Vendor specified	xx	

Note: EEPROM lock function is available for customer demand. Default setting is no lock.

Block diagram for 40GBASE-LR4 transmit/ receive paths



Outline Dimensions



unit: mm

Sum Up

Part No	Specification									
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Other	Application code
EGS-QSFP+LR4c-C	QSFP+	10.3125 Gbps for each Channel	CWDM DFB	-7~ 2.3 dBm for each Channel	PIN	-11.5dBm For EACH Channel	0~70°C	10KM	DDM RoHS	40G Ethernet