

EQP854X-03D-SR4

QSFP+ 40Gb/s SR4 300m Optical Transceiver

PRODUCT FEATURES

- **Multi rate of up to 10.3125Gb/s per channel**
- **Transmission distance up to 300m OM3**
- **Hot-pluggable QSFP+ footprint**
- **Single 1x12 MPO receptacle**
- **Low power consumption**
- **Four-channel full-duplex transceiver module**
- **RoHS-6 compliant and lead-free**
- **+3.3V single power supply**
- **Support Digital Diagnostic Monitor interface**
- **Case operating temperature**
- **Commercial: 0°C to +70°C**

APPLICATIONS

- **40GBASE-SR4 40G Ethernet**
- **InfiniBand QDR**
- **Other optical links**

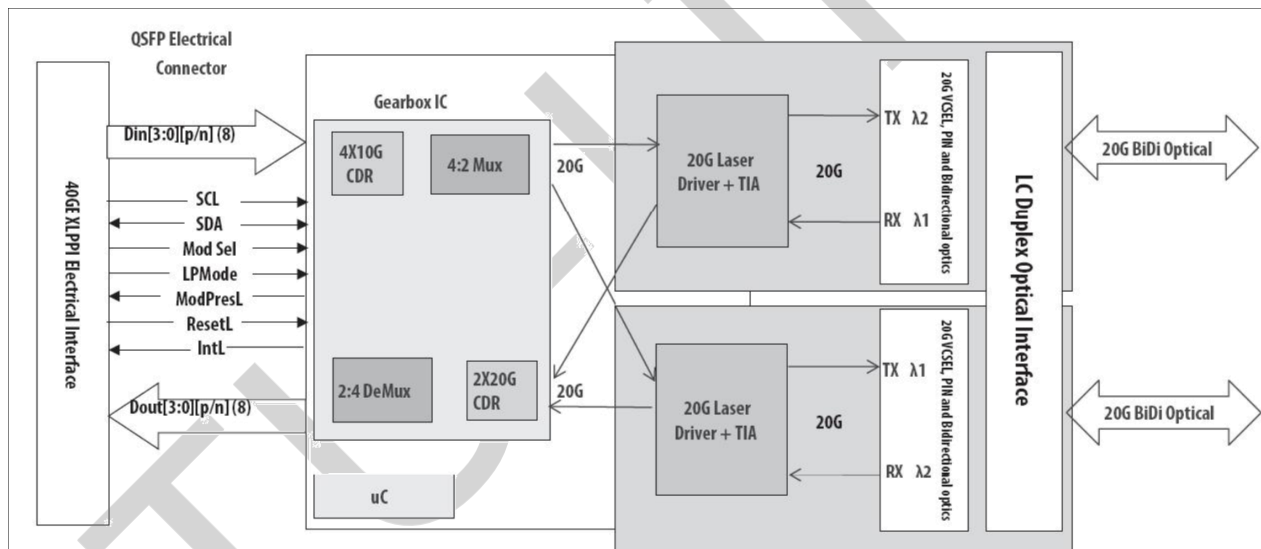
COMPLIANCE

- QSFP+ MSA.
- IEEE802.3ba
- SFF-8436
- RoHS

DESCRIPTIONS

It is a Four-Channel, Pluggable, LC Duplex, Fiber-Optic QSFP+ Transceiver for 40 Gigabit Ethernet Applications. This transceiver is a high performance module for short-range duplex data communication and interconnection applications. It integrates four electrical data lanes in each direction into transmission over a single LC duplex fiber optic cable. Each electrical lane operates at 10.3125 Gbps and conforms to the 40GE XLPPi interface.

Module Block Diagram



Ordering Information

Part No.	Data Rate(optical)	Laser(nm)	Fiber Type	Distance	Optical Interface	Temp	DDMI
EQP854X-03D-SR	40Gbps	850	MMF	300M	MPO 1X12	0~70℃	Y

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	TS	-40		85	°C	
Relative Humidity	HA	5		85	%	

Maximum Supply Voltage	V _{CC1} , V _{CCTX} , V _{CCR X}	-0.5		3.6	V	
Receiver Damage Threshold		+3.4			dBm	
Lead Soldering Temperature/ Time	TSOLD			260/ 10	°C/sec	1
Lead Soldering Temperature/ Time	TSOLD			360/ 10	°C/sec	2

Note:

- 1.Suitable for wave soldering.
2. Only for soldering by iron.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	T _{case}	0	-	70	°C	Without air flow
Power Supply Voltage	V _{CC}	3.13	3.3	3.46	V	
Power Supply Current	I _{CC}	-		1000	mA	
Power Dissipation	PD			3.5	W	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	V _{CC1} , V _{CCTX} , V _{CCR X}	3.15		3.45	V	
Supply Current	I _{CC}			350	mA	
Transmitter(per Lane)						
Input different impedance	R _{in}	90	100	110	Ω	1
Single ended input voltage tolerance	V _{inT}	-0.3		4.0	V	
Single ended data input swing	V _{in, pp}	200		1000	mV	2
Receiver (per Lane)						
Output different impedance	R _{out}	90	100	110	Ω	1
Single ended data output swing	V _{out, pp}	200		1000	mV	3
Single-ended output voltage	V _{outR}	-0.3		4.0	V	

Note :

- 1.Connected directly to TX data input pins. AC coupled thereafter.
2. After internal AC coupling. Self-biasing 100Ω differential input

3. Into 100Ω differential termination.

Optical and Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter(per Lane)						
Average Output Power	P _{OUT}	-6		2.4	dBm	
Extinction Ratio	ER	3.0			dB	
Center Wavelength	λ _C	840		860	nm	
RMS Spectral Width	σ			0.6	nm	
Transmitter OFF Output Power	POff			-30	dBm	
Relative Intensity Noise	RIN			-128	dB/ Hz	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}		0.23,0.34,0.43,0.27,0.35,0.4				
Receiver(per Lane)						
Input Optical Wavelength	λ _{IN}	840		860	nm	
Rx Sensitivity per lane	RSENS			-10.3	dBm	@BER=1E-12
Input Saturation Power (Overload)	PSAT	+2.4			dBm	1
Loss of Signal Assert	PA	-30			dBm	
Loss of Signal De- assert	PD			-12	dBm	
LOS Hysteresis	PD - PA	0.5		6	dB	

Note:

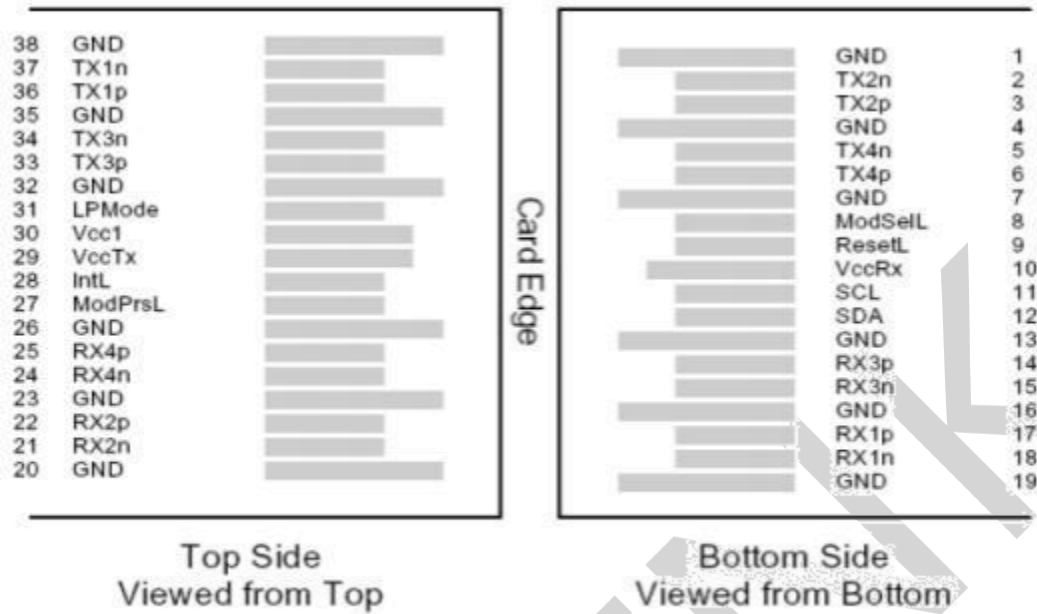
1. Measured with PRBS 2³¹- 1 test pattern @10.3125Gbps.BER=1E- 12.

Digital Diagnostic

The following characteristics are defined over recommended operating conditions.

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	°C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

Pin Diagram



QSFP+ MSA-compliant 38-pin connector

Pin Definitions

Pin	Symbol	Name/ Description	Ref.
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSe1L	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	

15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	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 Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrSL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power Supply	
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Note:

1. Circuit ground is internally isolated from chassis ground.

Recommended Interface Circuit

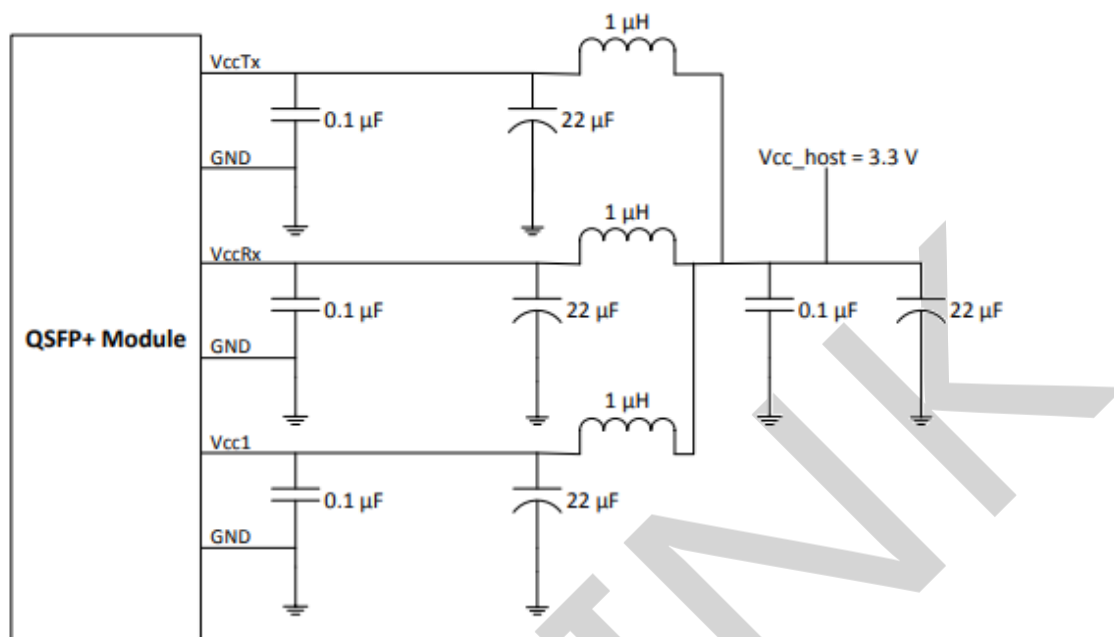
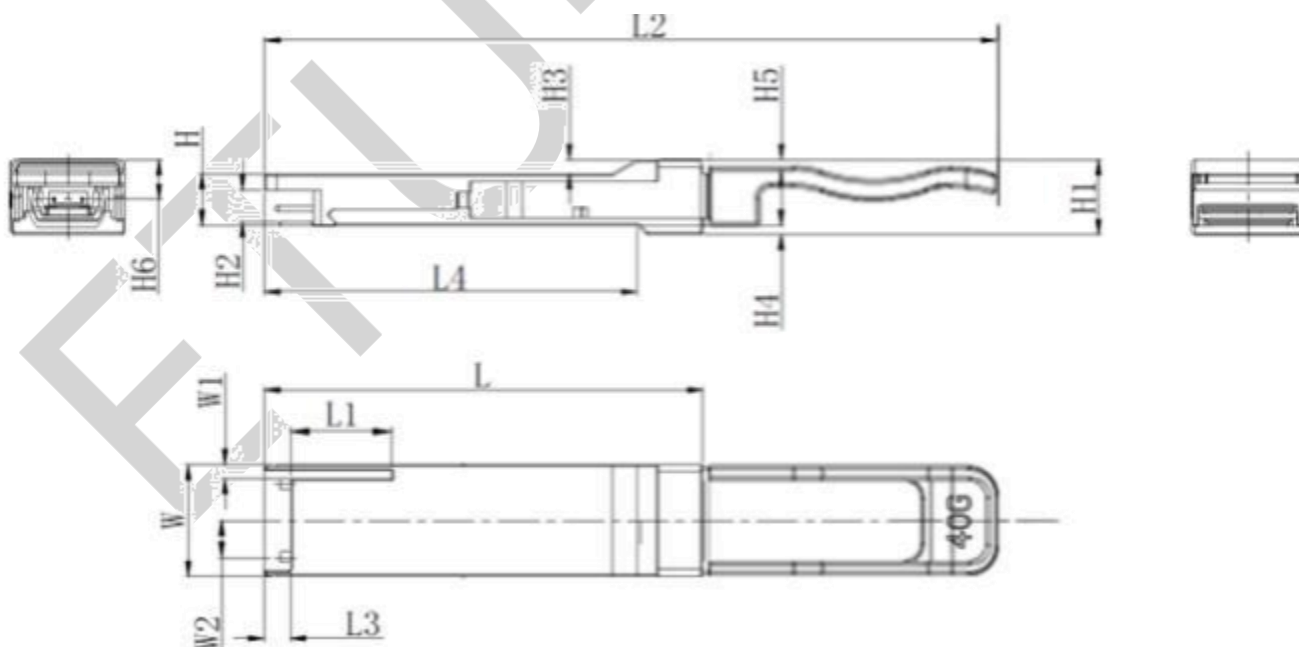


FIGURE 5-4 RECOMMENDED HOST BOARD POWER SUPPLY FILTERING

Mechanical Diagram



Unit mm

	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
Max	72.2	-	-	4.35	61.4	18.45	-	6.2	8.6	12.4	5.35	2.5	1.6	2	-
TYPE	72	-	121	4.2	61.2	18.35	-	-	8.5	12.2	5.2	2.3	1.5	1.8	6.55
Min	68.8	16.5	-	4.05	61	18.25	2.2	5.8	8.4	12	5.05	2.1	1.3	1.6	-

Revision History

Version No.	Date	Description
1.0	February 18, 2019	Preliminary datasheet
2.0	July 15, 2024	Format change

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