Features

- Supports up to 14.025Gbps bit rates
- Hot-pluggable SFP+ footprint
- 850nm VCSEL laser and PIN photodiode, Up to 100m for OM3-MMF transmission
- Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle
- Built-in digital diagnostic functions
- Single +3.3V power supply
- Metal enclosure,for lower EMI
- ROHS compliant and lead-free
- Operating Temperature: Standard 0~70ºC, Extended -10~85ºC, Industrial -40~85ºC

Applications

- 4G/8G/16G Fibre channel

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5	4.5	V	
Storage Temperature	T_S	-40	85	°C	
Operating Humidity	RH	5	85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Supply Current	Icc			300	mA	
Case Operating Temperature	Tc	0		70	°C	Standard
		-10		85	°C	Extended
		-40		85	°C	Industrial
Data Rate		4.25		14.025	Gbps	

Maximum Supported Distances

Fiber Type	Data rate	Maximum Distance	Notes
OM1 62.5μm (200-500MHz*km)	4G FC	70 m	
	8G FC	21 m	
	16G FC	15 m	
	4G FC	150 m	

OM2 50μm (500MHz*km)	8G FC	50 m	
	16G FC	35 m	
OM3 50μm (1500MHz*km)	4G FC	380 m	
	8G FC	150 m	
	16G FC	100 m	
OM4 50μm (3500MHz*km)	4G FC	400 m	
	8G FC	190 m	
	16G FC	125 m	

Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λc	840	850	860	nm	
Spectral Width（RMS）	Δλ			0.59	nm	
Side-Mode Suppression Ratio	SMSR	-	-	-	dB	
Average Output Power	P_{out}	-7.8		-0.5	dBm	1
Extinction Ratio	ER	3.0			dB	
Data Input Swing Differential	V_{IN}	180		950	mV	2
Input Differential Impedance	Z_{IN}	90	100	110	Ω	

TX Disable	Disable		2.0		Vcc	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.0		Vcc	V	
	Normal		0		0.8	V	
Receiver							
Centre Wavelength		λc	840	850	860	nm	
Receiver Sensitivity					-10.5	dBm	3
Receiver Overload			0			dBm	3
LOS De-Assert		LOS_D			-12	dBm	
LOS Assert		LOS_A	-22			dBm	
LOS Hysteresis			0.5		4	dB	
Data Output Swing Differential		V_{out}	500	700	900	mV	4
LOS		High	2.0		Vcc	V	
		Low			0.8	V	

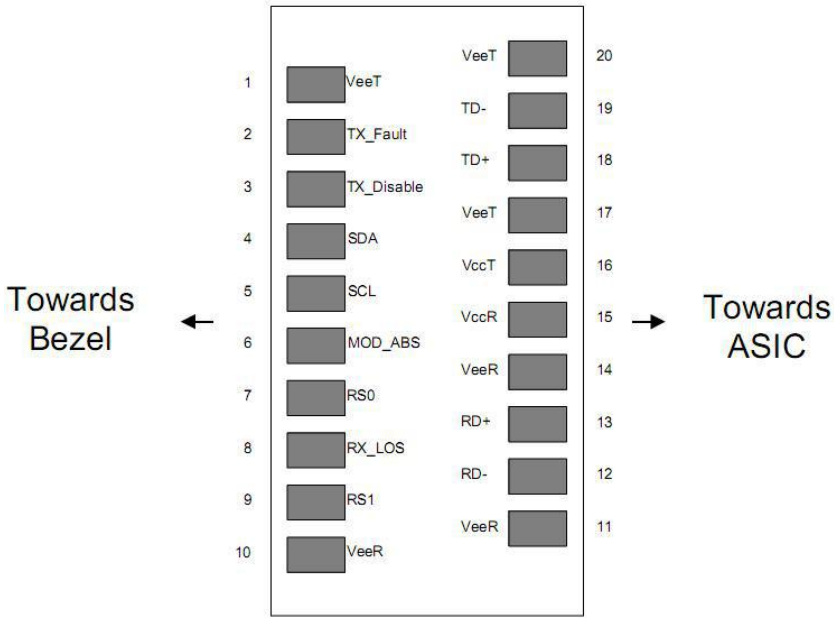
Note :

1. The optical power is launched into MMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2^{31}-1 test pattern @10312Mbps, BER ≤1×10^{-12}.
4. Internally AC-coupled.

Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate Time	t_on			1	ms
Tx Disable Assert Time	t_off			10	μs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	μs
Tx Disable To Reset	t_reset	10			μs
LOS Assert Time	t_loss_on			100	μs
LOS De-assert Time	t_loss_off			100	μs
Serial ID Clock Rate	f_serial_clock		100	400	KHz
MOD_DEF (0:2)-High	V_H	2		Vcc	V
MOD_DEF (0:2)-Low	V_L			0.8	V

Pin Definitions



Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5

19	TD-	Inv. Transmit Data In	3	Note 5
20	V_{EET}	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

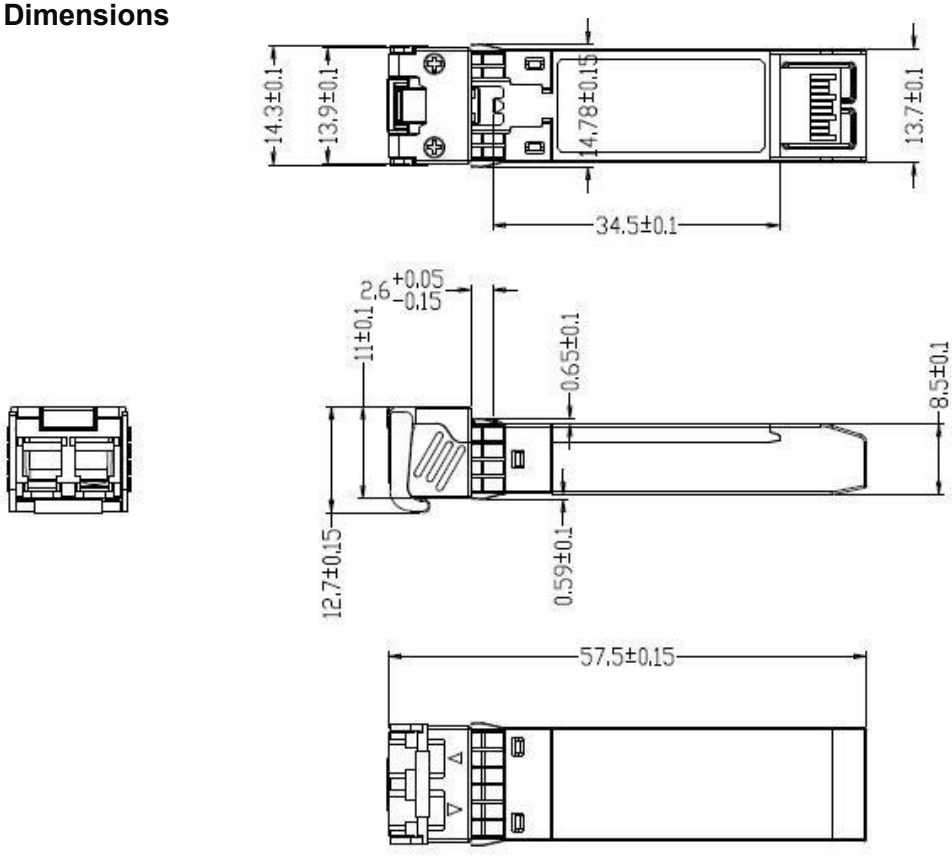
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

3. LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

4. RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.

5. TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Mechanical Dimensions



Ordering information

Part number	Description
QT-SFP+-16G-02	16G Fibre Channel SFP+ SR transceiver, MMF, 850nm, 100m, LC, DOM, 0~70ºC