

SM10GMA-03H

10Gb/s 850nm SFP+ Transceiver

1. Feature:

- SFP+ package with LC connector
- 850nm VCSEL Laser and PIN photo detector
- Up to 300m transmission on 2000MHz-km MMF
- Up to 11.3Gbps Data Links
- Power dissipation < 1W
- LVPECL compatible data input/output interface
- Low EMI and excellent ESD protection
- laser safety standard IEC-60825 compliant
- Compatible with RoHS
- Compatible with SFF8472

2. Application

- 10GBASE-SR/SW 10G Ethernet
- 1200-Mx-SN-I 10G Fibre Channel

3. Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Storage Temperature	Tst	-40	+85	°C
Supply Voltage	Vcc	0	+3.6	V
Operating Relative Humidity	RH	0	85	%

4. Operation Environment

(Ambient Operating Temperature 0°C to +70°C, V_{cc} =3.3 V)

Parameter	Symbol	Min	Typical	Max	Units
Supply Voltage	V _{cc}	3.1 5		3.45	V
Operating Temperature Case	T _c	0		+70	°C
Power Dissipation				1	W
Data Rate			10.312 5		Gbps

5. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Transmitter Section					
Center Wavelength	λ_o	840	850	860	nm
RMS Spectral Width	$\Delta\lambda$	-	-	0.4 5	dB
Average Output Power	Po	-5	-	0	dBm
Extinction Ratio	Er	3.0	-	-	dB
Dispersion Penalty				3.9	dB
Relative Intensity Noise	RIN ₁₂ OMA			-12 8	dB/Hz
Total jitter	Tj	IEEE 802.3ae			
Receiver Section					
Center Wavelength	λ_o		850		nm
Receiver Sensitivity	Rsen			-11.5	dBm
Stressed Sensitivity	Rsen			-10.5	dBm
Receiver Overload	Rov	0			dBm
Return Loss		12			dB
LOS Assert	LOS _A	-25			dBm
LOS Dessert	LOS _D			-13	dBm
LOS Hysteresis		0.5		4	

6. Electrical Characteristics

(Ambient Operating Temperature 0°C to +70°C, V_{cc} =3.3 V)

Parameter		Symbol	Min.	Typ.	Max.	unit
Transmitter Section						
Input Differential Impendence		Z _{in}	90	10 0	11 0	Ohm
Data Input Swing Differential		V _{in}	18 0		70 0	mV
TX Disable	Disable		2.0		V _{cc}	V
	Enable		0		0.8	V
TX Fault	Assert		2.0		V _{cc}	V
	Deassert		0		0.8	V
Receiver Section						
Output differential impendence		Z _{out}		10 0		Ohm
Data output Swing Differential		V _{out}	30 0		80 0	mV
Rx_LOS	Assert		2.0		V _{cc}	V
	Deassert		0		0.8	V

7. Maximum Supported Distances

Parameter		Symbol	Min.	Typ.	Max.	unit
Fiber Type	850nm OFL BandWidth					
	62.5 um					
50 um	160MHz-km				26	m
	200MHz-km				33	m
	400MHz-km				66	m
	500MHz-km				82	m
	2000MHz-km				300	m

56-59	4	Vendor rev	31 2E 30 20	V1.0
60-61	2	Wavelength	03 52	850nm
62	1	Reserved	00	
63	1	CC BASE	XX	Check sum of byte 0~62
64-65	2	Options	00 1A	LOS, TX_DISABLE, TX_FAULT
66	1	BR, max	00	
67	1	BR, min	00	
68-83	16	Vendor SN	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Unspecified
84-91	8	Vendor date code	XX XX XX 20	Year, Month, Day
92-94	3	Reserved	00	
95	1	CC_EXT	XX	Check sum of byte 64~94
96-255	160	Vendor specific		

10. Pin Description:

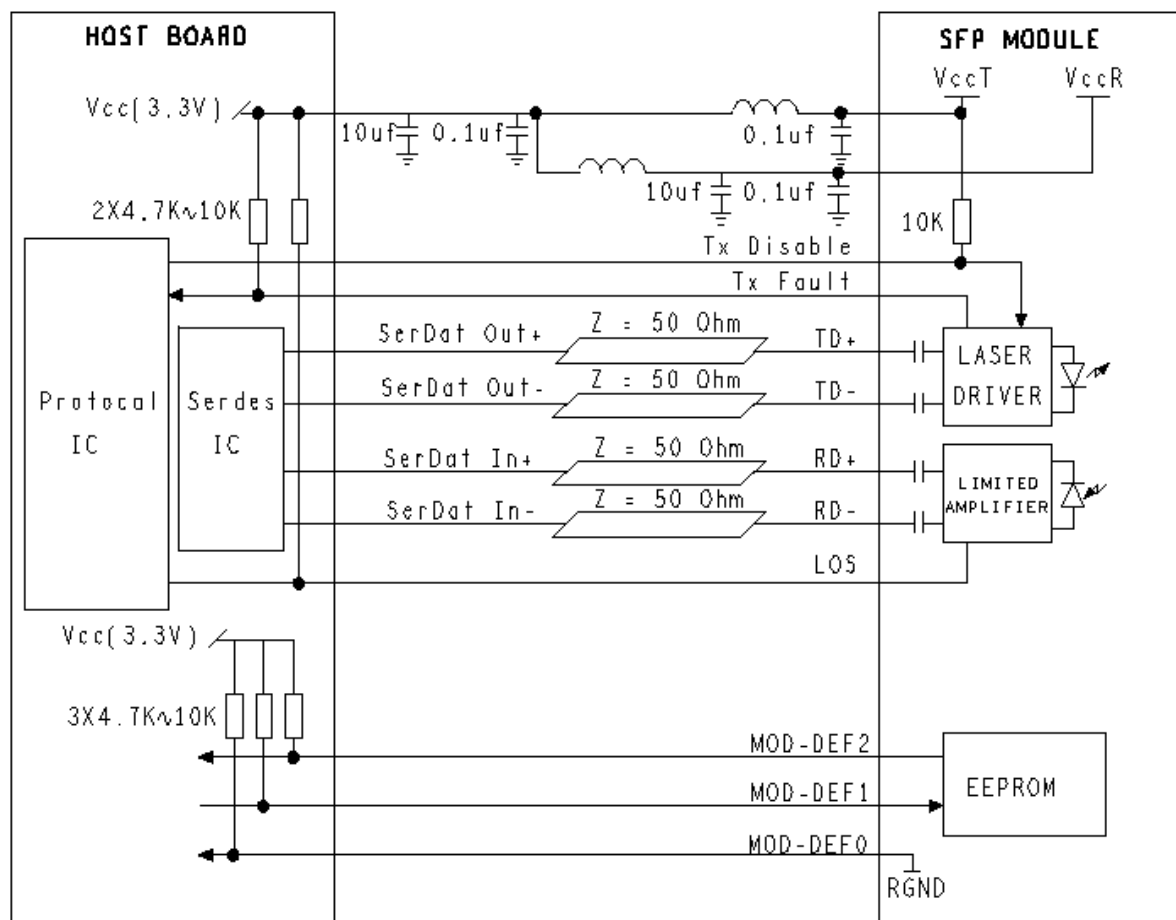
Pin s	Name	Discription	NOTE
1	VeeT	Transmitter Ground	
2	Tx Fault	Transmitter Fault Indication	1
3	Tx Disable	Transmitter Disable	2
4	MOD DEF2	Module Definition 2	3
5	MOD DEF1	Module Definition 1	3
6	MOD DEF0	Module Definition 0	3
7	RS0	Not Connected	
8	LOS	Loss of Signal	4
9	RS1	Not Connected	
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	Inv. Received Data Output	5
13	RD+	IReceived Data Output	5
14	VeeR	Receiver Ground	
15	VccR	Receiver Power	

16	VccT	Transmitter Power	
17	VeeT	Transmitter Ground	
18	TD+	Transmit Data Input	6
19	TD-	Inv. Transmit Data Input	6
20	VeeT	Transmitter Ground	

Notes:

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10k Ω 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. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10k Ω resistor. Its states are:
 Low (0~0.8V): Transmitter on
 (>0.8V, <2.0V): Undefined
 High (2.0~3.465V): Transmitter Disabled
 Open: Transmitter Disabled
3. MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7k~10k Ω resistor on the host board. The pull-up voltage shall be VccT or VccR.
 MOD-DEF 0 is grounded by the module to indicate that the module is present
 MOD-DEF 1 is the clock line of two wire serial interface for serial ID
 MOD-DEF 2 is the data line of two wire serial interface for serial ID
4. LOS is an open collector output, which should be pulled up with a 4.7k~10k Ω resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.
5. These are the differential receiver output. They are internally AC-coupled 100 Ω differential lines which should be terminated with 100 Ω (differential) at the user SERDES.
6. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 Ω differential termination inside the module.

11. Recommended Application Circuit



12. Outline Dimensions (mm)

