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Data Sheet
Rev 01.1220

10GBASE-SW/SR 10G Ethernet 850nm MMF Mini SFF Optical Transceiver

CM85-10GM-3S-TI

Description

The CM85-10GM-3S-TI transceivers provide products for maximum bandwidth of 10Gbps and transmission up to 400m. The transceiver is provided in mini SFF with duplex LC connector interface.

Features

- Single power supply 3.3V
- Duplex LC optical connection
- Class 1 laser product compliant with EN 60825-1
- Input/Output: AC/AC
- Industrial temperature range -40°C to 85°C
- Transmit distance: 33m (OM1 Fiber), 82m (OM2 Fiber), 300m (OM3 Fiber), 400m (OM4 Fiber)

Applications

- Multimode core fiber backbone links up to 400m
- 10GBASE-SW/SR Ethernet

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Internal Transceiver Temperature	-40 to 95	±3	°C	Internal
Internal Transceiver Voltage	3.0 to 3.6	±0.1	V	
Bias Current	0 to 15	±10%	mA	
TX Power	-8 to 0	±3	dB	
RX Average Power	-14 to 0	±3	dB	

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	T_S	-40	85	°C	
Supply Voltage	V_{CC}	-0.5	4.0	V	
Input Voltage	V_{IN}	-0.5	V_{CC}	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit	Notes
Case Operating Temperature	T_C	-40	85	°C	
Supply Voltage	V_{CC}	3.14	3.46	V	
Supply Current	$I_{TX} + I_{RX}$		300	mA	
Power Consumption	P	-	1.0	W	

Transmitter Electro-Optical Characteristics (V_{CC} = 3.14V to 3.46V, T_C = -40°C to 85°C)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	B		10.3125		Gbps	
Output Optical Power (50/125um fiber, NA=0.20) (62.5/125um fiber, NA=0.275)	P_{out}	-7.1	-	-1	dBm	
Optical Modulation Amplitude	OMA	-4.3			dBm	
Extinction Ratio	ER	3.5			dB	
Center Wavelength	λ_C	840	850	860	nm	
Spectral Width (RMS)	$\Delta\lambda$	-	-	0.45	nm	
Transmitter and Dispersion Penalty	TDP			3.9	dB	
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Output Eye	Compliant with IEEE802.3ae					
Max. P_{out} TX-DISABLE Asserted	P_{OFF}	-	-	-35	dBm	
Differential Input Impedance	Z_d	80	100	120	Ω	
Differential Input Voltage Swing	V_{DIFF}	200		800	mV	
TX_DISABLE Assert Time	t_off	-	-	100	µs	
TX_DISABLE Negate Time	t_on	-	-	2	ms	
Time to Initialize	t_init	-	-	300	ms	
TX_DISABLE Time to start reset	t_reset	10	-	-	µs	

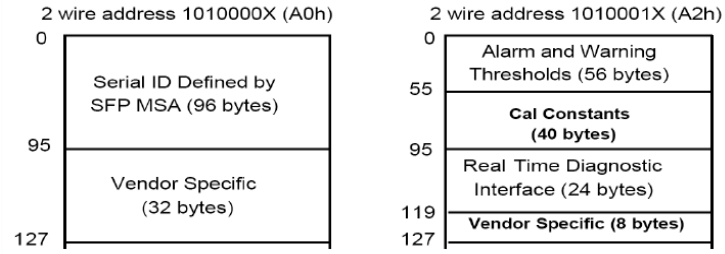
Receiver Electro-Optical Characteristics (V_{CC} = 3.14V to 3.46V, T_C = -40°C to 85°C)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	B		10.3125		Gbps	
Optical Input Power-Maximum	P_{IN}	-1	-	-	dBm	BER<10^{-12}
Receiver Sensitivity (OMA)	P_{IN}	-	-	-11.1	dBm	BER<10^{-12}
Operating Center Wavelength	λ_C	840	-	860	nm	
Optical Return Loss	ORL	12	-	-	dB	
Loss of Signal-Asserted	P_A	-30	-	-	dBm	Note 1
Loss of Signal-Deasserted	P_D	-	-	-12	dBm	Note 1
Differential Output Impedance	Z_d	80	100	120	Ω	
Differential Output Voltage	V_{DIFF}	300	-	800	mV	

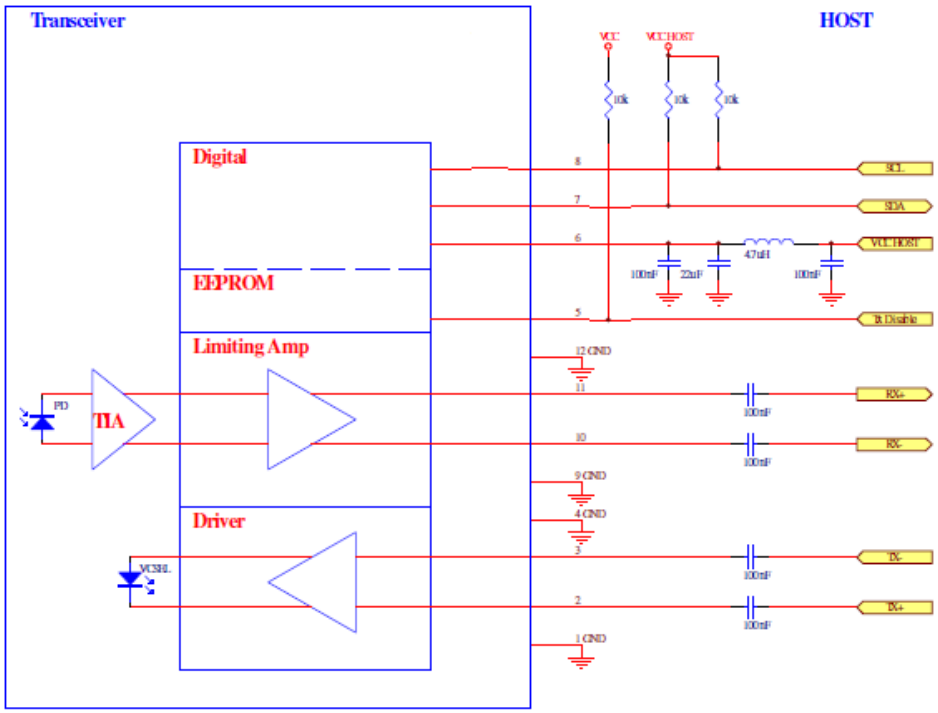
Note:

1. The LOS state is monitored and defined at SFF-8472 byte 110 bit 1.

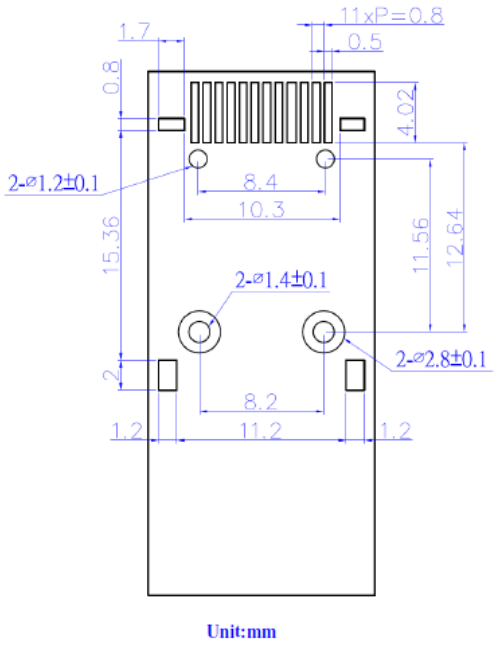
Digital Diagnostic Memory Map



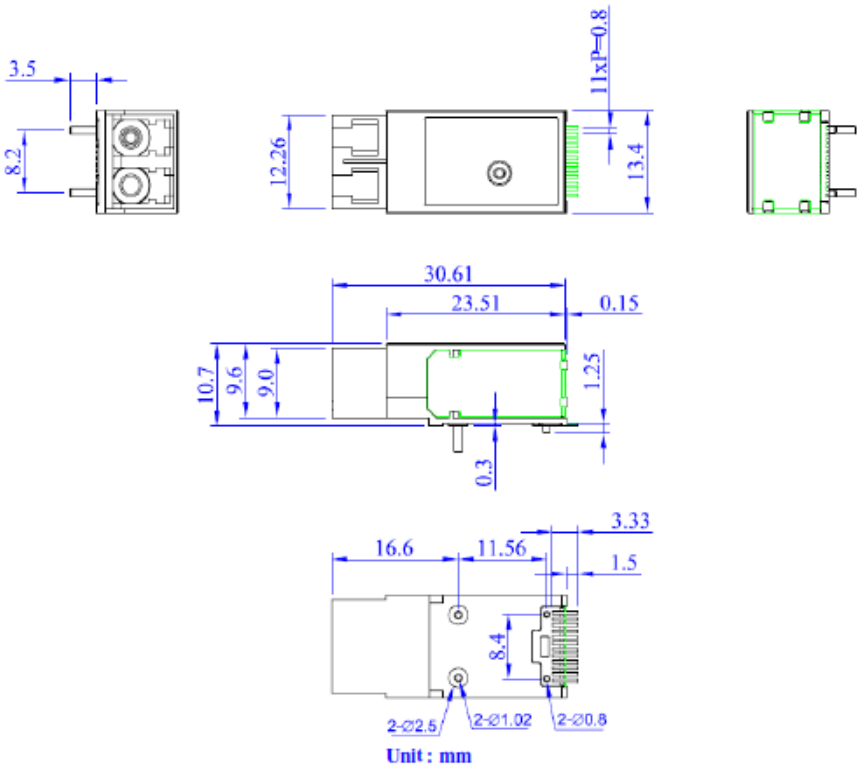
Recommended Interface Circuit



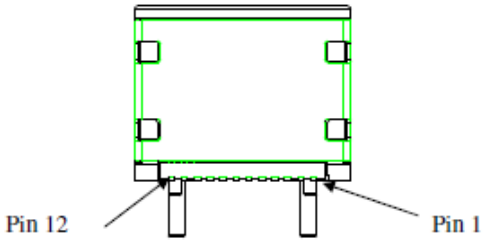
Recommended Host Board Mechanical Layout



Dimensions



Pin Assignment



PIN	SIGNAL NAME	DESCRIPTION
1	GND	Ground
2	TX+	Transmit Data in, ac coupled
3	TX-	Transmit Data in Bar, ac coupled
4	GND	Ground
5	TX_DISABLE	Transmit Disable
6	V_{CC}	3.3V Power Supply
7	MOD_DEF (2)	SDA Serial Data Signal
8	MOD_DEF (1)	SCL Serial Clock Signal
9	GND	Ground
10	RX-	Receive Data out Bar, ac coupled
11	RX+	Receive Data out, ac coupled
12	GND	Ground

Additional Notes

- Avoid eye or skin exposure to laser radiations.
- The device is sensitive to electro-static discharge (ESD). The device should be handled with ESD proof tools. To assemble the device on PCB, proper grounding is required to prevent ESD.
- Specifications are subject to change without notice.

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