



1000BASE-SX 1.25 Gigabit Ethernet 850nm MMF Mini SFF Optical Transceiver

CM85-1GM-3S-TI



Description

The CM85-1GM-3S-TI transceivers provide products for maximum bandwidth of 1Gbps and transmission up to 550m. The transceiver is provided in mini SFF with duplex LC connector interface.

Features

- Compliant with IEEE802.3z Gigabit Ethernet Standard
- 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: 275m (62.5/125), 550m (50/125)

Applications

- Multimode 50um or 62.5um core fiber backbone links up to 550m

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 | -10 to -3 | ±3 | dB | |
| RX Average Power | -20 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 | |
| Hand Soldering Temperature | T _{SOLD} | - | 360 | °C | <5 seconds, for 1x12 pins |
| Hand Soldering Temperature | T _{SOLD} | - | 360 | °C | <15 seconds, for housing fix pins |

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 $3.46V$, $T_C = -40^\circ C$ to $85^\circ C$)

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|------------------------------------|---------------------------|------|-----|------|----------|-------|
| Data Rate | B | 1.25 | | | Gbps | |
| Output Optical Power | P_{out} | -9.5 | - | -4 | dBm | |
| Extinction Ratio | ER | 9 | | | dB | |
| Center Wavelength | λ_C | 830 | 850 | 860 | nm | |
| Spectral Width (RMS) | $\Delta\lambda$ | - | - | 0.85 | nm | |
| Relative Intensity Noise | RIN | - | - | -116 | dB/Hz | |
| Output Eye | Compliant with IEEE802.3z | | | | | |
| Max. P_{out} TX-DISABLE Asserted | P_{OFF} | - | - | -45 | 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 | |

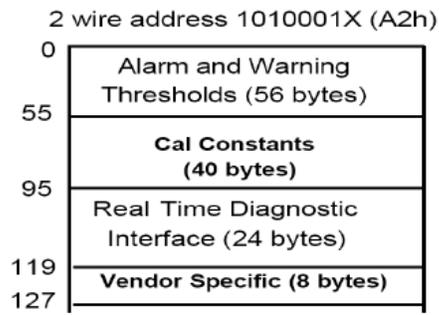
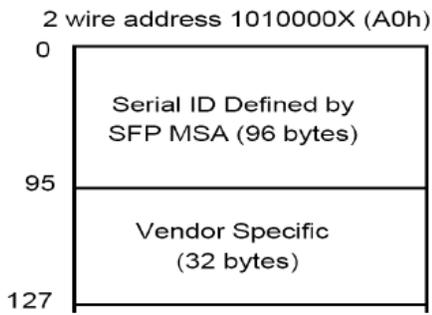
Receiver Electro-Optical Characteristics ($V_{CC} = 3.14V$ to $3.46V$, $T_C = -40^\circ C$ to $85^\circ C$)

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|-------------------------------|-------------|------|-----|-----|----------|-----------------------|
| Data Rate | B | 1.25 | | | Gbps | |
| Optical Input Power-Maximum | P_{IN} | 0 | - | - | dBm | BER<10 ⁻¹² |
| Receiver Sensitivity (OMA) | P_{IN} | - | - | -18 | dBm | BER<10 ⁻¹² |
| Operating Center Wavelength | λ_C | 770 | - | 860 | nm | |
| Optical Return Loss | ORL | 12 | - | - | dB | |
| Loss of Signal-Asserted | P_A | -30 | - | - | dBm | Note 1 |
| Loss of Signal-Deasserted | P_D | - | - | -18 | dBm | Note 1 |
| Differential Output Impedance | Z_d | 80 | 100 | 120 | Ω | |
| Differential Output Voltage | V_{DIFF} | 300 | - | 800 | mV | |

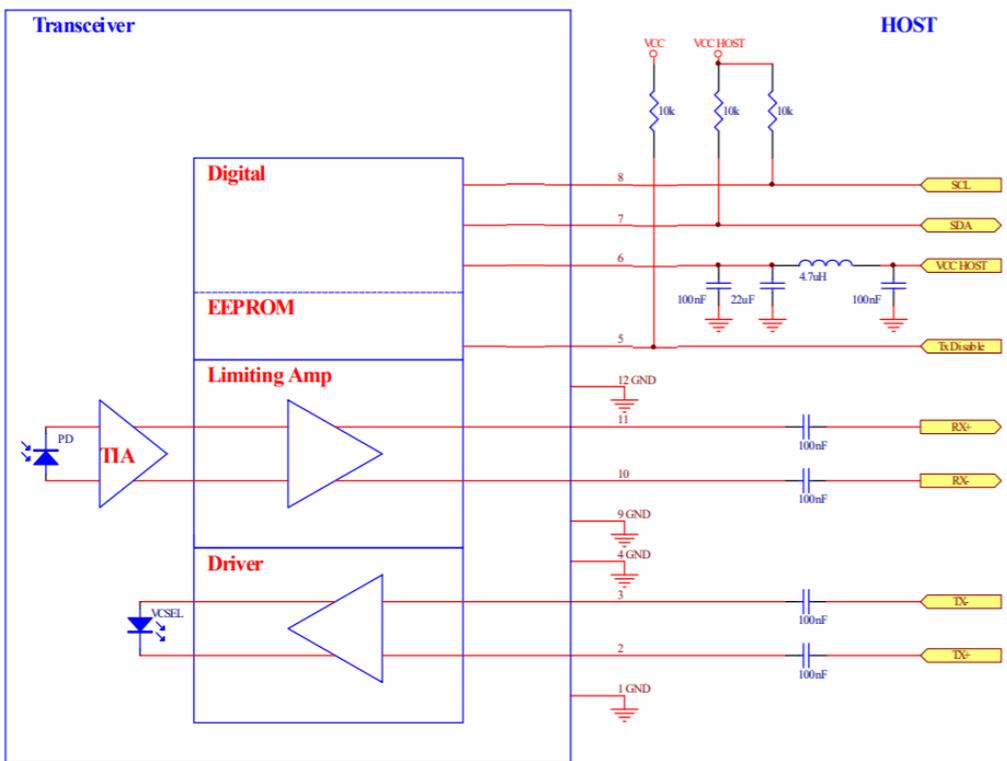
Note:

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

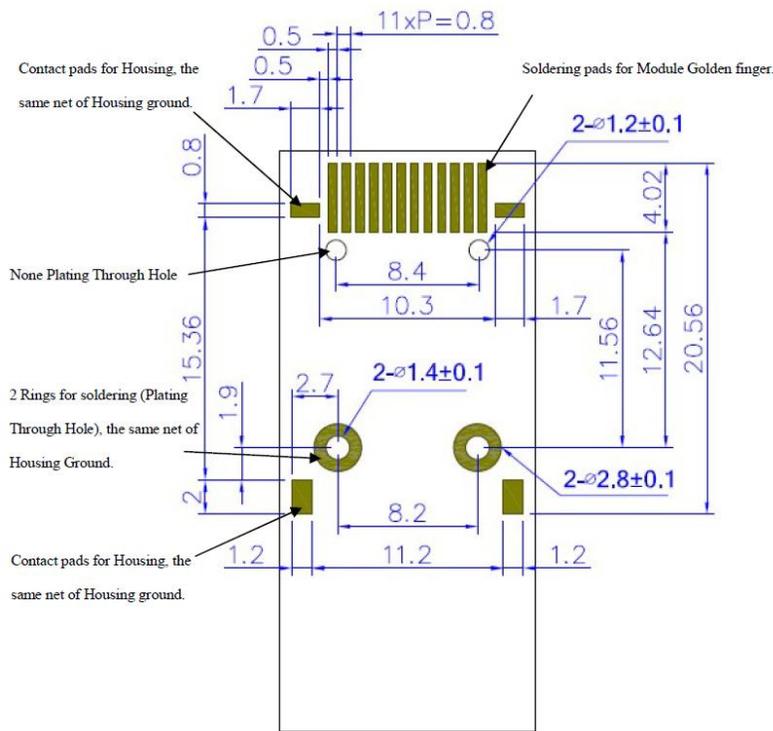
Digital Diagnostic Memory Map



Recommended Interface Circuit



Recommended Host Board Mechanical Layout (unit: mm)

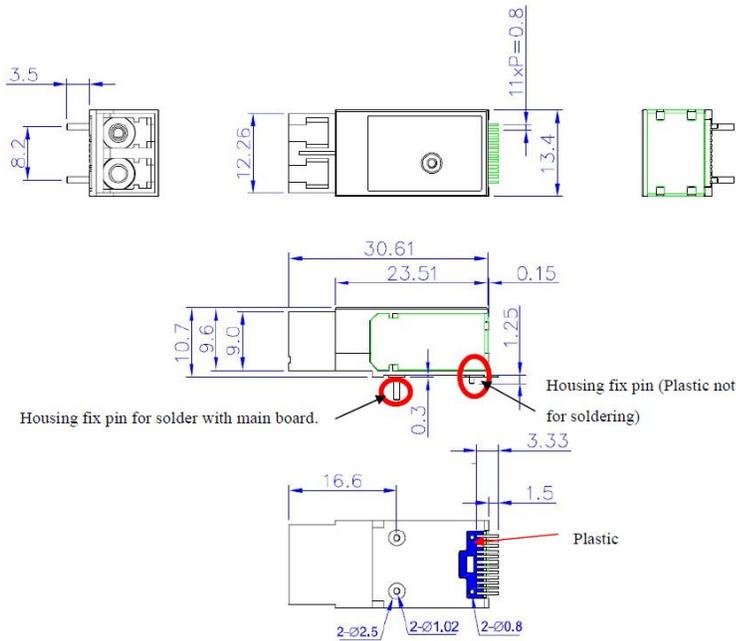


Soldering and Handling

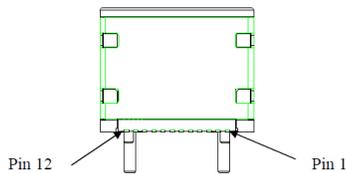
The transceivers are delivered with protective process plugs inserted into the duplex LC connector receptacle. This process plug protects the optical subassemblies during hand soldering and acts as a dust cover during shipping.

| Soldering Method | Temperature(°C) | Time(sec) | Note |
|------------------|-----------------|-----------|---|
| Hand Soldering | 350 ±10 | < 5 | For each Golden pin should below 5 secs |
| Hand Soldering | 350 ±10 | < 15 | For each Fix pin should below 15 secs |

Dimensions (unit: mm)



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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