

25Gb/s SFP+ Passive Cable



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SFP28 based on SFP+ the same shape, compliant with InfiniBand Architecture and 25G Ethernet standards, can provide the 25Gb/s transmission no error, SFP28 applied to high density of 25G Ethernet switches and network interface, data center server connection. It uses the popular SFP + packaging format, upgrade the 10G Ethernet connection for the enterprise, provides a more cost-effective solution.

Product Features

- ✓ Support hot-pluggable
- ✓ Available in lengths from 0.5m to 5m
- ✓ Low insertion loss and low crosstalk
- ✓ Single 3.3V power supply
- ✓ RoHS Compliant and Lead-Free
- ✓ Compliant with SFF-8402& IEEE802.3.bj
- ✓ Wire/Cable Type Twinax

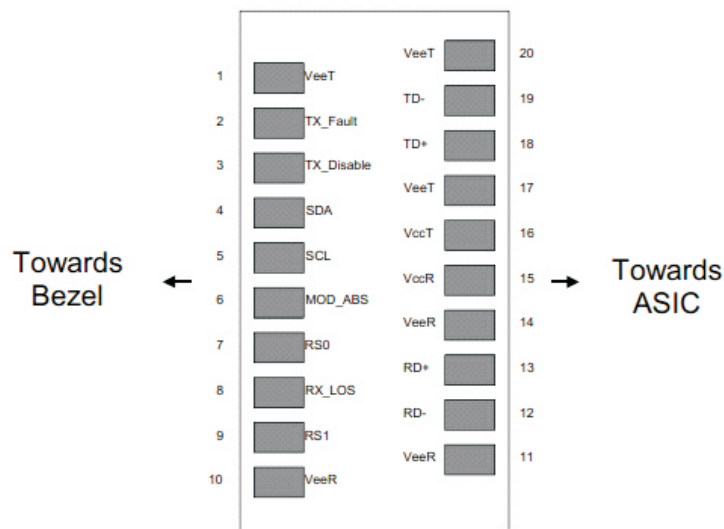
Applications

- ✓ Data/Servers/ Routers
- ✓ Networked storage systems
- ✓ External storage systems
- ✓ Data Center networking
- ✓ Communications Switches
- ✓ InfiniBand



Pin Descriptions

| Pin | Symbol | Name | Ref. |
|-----|------------|---|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground) | |
| 2 | TX Fault | Transmitter Fault. LVTTTL-O | |
| 3 | TX Disable | Transmitter Disable. Laser output disabled on high or open. LVTTTL-I | |
| 4 | SDA | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O | |
| 5 | SCL | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I | |
| 6 | Mod_ABS | Module Absent, Connect to VeeT or VeeR in Module. | |
| 7 | RS0 | Rate Select 0, optionally controls SFP+ module receiver LVTTTL-I | |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. LVTTTL-O | |
| 9 | RS1 | Rate Select 1, optionally controls SFP+ module transmitter. LVTTTL-I | |
| 10 | VeeR | Receiver Ground (Common with Transmitter Ground) | |
| 11 | VeeR | Receiver Ground (Common with Transmitter Ground) | |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled. CML-O | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled. CML-O | |
| 14 | VeeR | Receiver Ground (Common with Transmitter Ground) | |
| 15 | VccR | Receiver Power Supply | |
| 16 | VccT | Transmitter Power Supply | |
| 17 | VeeT | Transmitter Ground (Common with Receiver Ground) | |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. CML-I | |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. CML-I | |
| 20 | VeeT | Transmitter Ground (Common with Receiver Ground) | |



Pin-out of Connector Block on Host Board

Signal Integrity

| ITEM | | REQUIREMENT | TEST CONDITION | | | | |
|--|-----------------------------|--|-------------------------------------|--------|--------|--------|----------|
| | Cable Impedance | 105+5/-10Ω | | | | | |
| Differential Impedance | Paddle Card Impedance | 100±10Ω | Rise time of 25ps (20 % - 80 %). | | | | |
| | Cable Termination Impedance | 100±15Ω | | | | | |
| [Differential (Input/Output) Return loss SDD11/SDD22] | | $\text{Return_loss}(f) \geq \begin{cases} 16.5-2\sqrt{f} & 0.05 \leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{cases}$ <p>Where f is the frequency in GHz Return_loss(f) is the return loss at frequency f</p> | 10MHz≤f≤19GHz | | | | |
| [Differential to common-mode (Input/Output)Return loss SCD11/SCD22] | | $\text{Return_loss}(f) \geq \begin{cases} 22-(20/25.78)f & 0.01 \leq f < 12.89 \\ 15-(6/25.78)f & 12.89 \leq f \leq 19 \end{cases}$ <p>Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f</p> | 10MHz≤f≤19GHz | | | | |
| Common-mode to Common-mode(Input/Output)Return loss SCC11/SCC22 | | $\text{Return_loss}(f) \geq 2\text{dB} \quad 0.2 \leq f \leq 19$ <p>Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f</p> | 10MHz≤f≤19GHz | | | | |
| (Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture) | | | | | | | |
| Differential Insertion Loss (SDD21 Max.) | AWG \ F | 1.25GHz | 2.5GHz | 5.0GHz | 7.0GHz | 10Ghz | 12.89Ghz |
| | 30(1m)Max. | 4.5dB | 5.4dB | 6.3dB | 7.5dB | 8.5dB | 10.5dB |
| | 30/28(3m)Max. | 7.5dB | 9.5dB | 12.2dB | 14.8dB | 18.0dB | 21.5dB |
| | 26(3m)Max. | 5.7dB | 7.2dB | 9.9 dB | 11.9dB | 14.1dB | 16.5dB |
| | 26/25(5m)Max. | 7.8dB | 10.0dB | 13.5dB | 16.0dB | 19.0dB | 22.0dB |
| Differential to common-mode Conversion Loss-Differential Insertion Loss(SCD21-SDD21) | | $\text{Conversion_loss}(f) - \text{IL}(f) \geq \begin{cases} 10 & 0.01 \leq f < 12.89 \\ 27-(29/22)f & 12.89 \leq f < 15.7 \\ 6.3 & 15.7 \leq f \leq 19 \end{cases}$ <p>Where f is the frequency in GHz Conversion_loss(f) is the cable assembly differential to common-mode conversion loss IL(f) is the cable assembly insertion loss</p> | 10MHz≤f≤19GHz | | | | |
| MDNEXT(multiple disturber near-end crosstalk) | | ≥26dB @12.89GHz | 10MHz≤f≤19GHz | | | | |
| Intra Skew | | 15ps/m | 10MHz≤f≤19GHz | | | | |

Other Electrical Performance

| ITEM | REQUIREMENT | TEST CONDITION |
|---------------------------------|--------------------------------|---|
| Low Level Contact Resistance | 70milliohms Max. From initial. | EIA-364-23:Apply a maximum voltage of 20mV And a current of 100 mA. |
| Insulation Resistance | 10Mohm(Min.) | EIA364-21:AC 300V 1 minute |
| Dielectric Withstanding Voltage | NO disruptive discharge. | EIA-364-20:Apply a voltageof 300 VDC for 1 minute between adjacent terminals And between adjacent terminals and ground. |

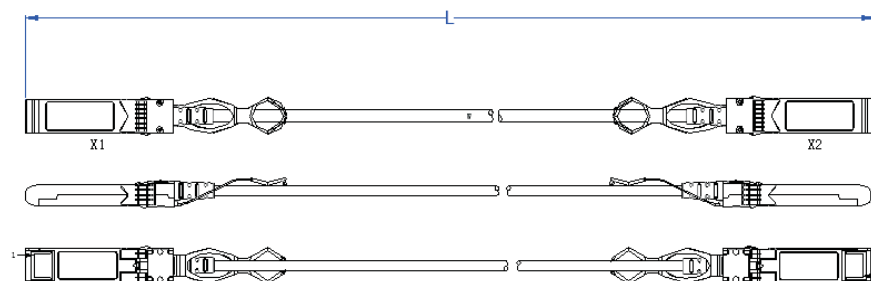
Environment Performance

| ITEM | REQUIREMENT | TEST CONDITION |
|--|--|---|
| Operating Temp. Range | 0°C to +70°C | Cable operating temperature range. |
| Storage Temp. Range (in packed condition) | -40°C to +80°C | Cable storage temperature range in packed condition. |
| Thermal Cycling Non-Powered | No evidence of physical damage | EIA-364-32D, Method A, -25 to 90C, 100 cycles, 15 min. dwells |
| Salt Spraying | 48 hours salt spraying after shell corrosive area less than 5%. | EIA-364-26 |
| Mixed Flowing Gas | Pass electrical tests per 3.1 after stressing. (For connector only) | EIA-364-35 Class II, 14 days. |
| Temp. Life | No evidence of physical damage | EIA-364-17C w/ RH, Damp heat 90°C at 85% RH for 500 hours then return to ambient |
| Cable Cold Bend | 4H, No evidence of physical damage | Condition: -20°C ±2°C , mandrel diameter is 6 times the cable diameter. |

Mechanical and Physical Characteristics

| ITEM | REQUIREMENT | TEST CONDITION |
|------------------------------|--|---|
| Vibration | Pass electrical tests per 3.1 after stressing. | Clamp & vibrate per EIA-364-28E, TC-VII, test condition letter – D, 15 minutes in X, Y & Z axis. |
| Cable Flex | No evidence of physical damage | Flex cable 180° for 20 cycles ($\pm 90^\circ$ from nominal position) at 12 cycles per minute with a 1.0kg load applied to the cable jacket. Flex in the boot area 90° in each direction from vertical. Per EIA-364-41C |
| Cable Plug Retention in Cage | 90N Min. No evidence of physical damage | Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per SFF-8432 Rev 5.0 |
| Cable Retention in Plug | 90N Min. No evidence of physical damage | Cable plug is fixtured with the bulk cable hanging vertically. A 90N axial load is applied (gradually) to the cable jacket and held for 1 minute. Per EIA-364-38B |
| Mechanical Shock | Pass electrical tests Per 3.1 after stressing. | Clamp and shock per EIA-364-27B, TC-G, 3 times in 6 directions, 100g, 6ms. |
| Cable Plug Insertion | 18N Max. (SFP+) | Per SFF-8432 Rev 5.0 |
| Cable plug Extraction | 12.5N Max. (SFP28) | Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per SFF-8432 Rev 5.0 |
| Durability | 50 cycles, No evidence of physical damage | EIA-364-09, perform plug & unplug cycles: Plug and receptacle mate rate: 250times/hour. 50times for module (CONNECTOR TO PCB) |

Mechanical Specifications



Wiring Diagram

| Starting | End | Remark |
|--|--|------------------------------|
| X1. 12 | X2. 19 | Pair |
| X1. 13 | X2. 18 | |
| X1. 18 | X2. 13 | Pair |
| X1. 19 | X2. 12 | |
| X1:1, 2, 6 8, 10, 11, 14, 17, 20 | X2:1, 2, 6 8, 10, 11, 14, 17, 20 | Drain wire |
| X1:1, 4, 5 15, 16 | X2:1, 4, 5 15, 16 | EEPROM point at both ends |

Package diagram

The connectors at both ends are protected by protective sleeves, and each high-speed cable is separately put into an anti-static bag.

<=3m: 200mm*300mm

>3m: 300mm*350mm

