**AP28-MM85xxM**

**SFP28 25Gb/s Active Optical Cable**

**Features**

* Up to 70m over OM3 and 100m over OM4
* Interface compliant to SFF-8431 and SFF-8472
* Operating case temperature 0°C to 70°C
* Power supply 3.3 V
* RoHS 6 compliant

**Applications**

* 25 Gigabit Ethernet
* InfiniBand QDR. DDR, SDR
* Servers, switches, storage host card adapters and datacenter

**Description**

Photonics Valley’s AP28-MM85xxM is active optical cable assemblies with SFP28 hot pluggable connectors. Enjoys low power consumption. It is suitable for short distance and offer a cost-effective way to connect within racks and across adjacent racks. Its length

is up to 70m over OM3 100m and over OM4.

**Ordering information**

|  |  |
| --- | --- |
| AP28-MM8501M | 25GBase SFP28 Active Optical Cable 1 meter |
| AP28-MM8502M | 25GBase SFP28 Active Optical Cable 2 meter |
| AP28-MM8503M | 25GBase SFP28 Active Optical Cable 3 meter |
| AP28-MM8505M | 25GBase SFP28 Active Optical Cable 5 meter |
| AP28-MM8510M | 25GBase SFP28 Active Optical Cable 10 meter |
| AP28-MM8520M | 25GBase SFP28 Active Optical Cable 20 meter |
| AP28-MM8530M | 25GBase SFP28 Active Optical Cable 30 meter |

**Absolute Maximum Ratings**

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Symbol** | **Min** | **Max** | **Unit** | **Note** |
| Storage Temperature | Ts | -20 | 85 | ℃ |  |
| Relative Humidity(non-condensing) | RH | 0 | 85 | % |  |
| Operating Case Temperature | Tc | 0 | 70 | ℃ |  |
| Supply Voltage | Vcc | -0.3 | 3.6 | V |  |

**Recommended Operating Conditions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Symbol** | **Min** | **Typical** | **Max** | **Unit** |
| Operating Case Temperature | Tc | 0 |  | 70 | ℃ |
| Power Supply Voltage | Vcc | 3.13 | 3.3 | 3.47 | V |
| Supply current | Icc |  | 300 |  | mA |
| Bit Rate | BR |  | 25.78 |  | Gbps |

**Optical Characteristics**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Symbol** | **Min** | **Typical** | **Max** | **Unit** | **Notes** |
| **Transmitter** |
| Center Wavelength | λC | 840 | 850 | 860 | nm |  |
| Extinction Ratio | ER | 2.0 |  |  | dB |  |
| Transmit Enable Voltage | VEN |  |  | 0.8 | V |  |
| Transmit Disable Voltage | VD | 2.0 |  |  | V |  |
| Average Launch Power | PAVG | -7.5 | -1 | +2.5 | dBm |  |
| Input Differential Impedance | Zin | 90 | 100 | 110 | ohm |   |
| Differential Data Input Swing | Vin PP | 300 |  | 1100 |  mV |  |
| **Receiver** |
| Center Wavelength | λC | 840 | 850 | 860 | nm |  |
| Receiver Overload |  PinMax | 2.5 |  |  | dBm |  |
| Bit Error Rate |  BER |  |  | 5E-5 | dBm |  |
| Differential Data Output Swing |  Vout pp | 500 |  | 800 | mV |  |
| Output Differential Impedance | Zout | 90 | 100 | 110 | ohm |  |
| LOS Fault | VOH | 2.4 |  |  | V |  |
| LOS Normal | VOL |  |  | 0.4 | V |  |

**Notes:** All parameters are specified under the recommended operating conditions with PRBS31 data pattern unless otherwise specified.

**IN Description**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pin** | **Symbol** | **Name/Description** | **NOTE** |
| 1 | VEET | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TFAULT | Transmitter Fault. | 2 |
| 3 | TDIS | Transmitter Disable. Laser output disabled on high or open. | 3 |
| 4 | SDA | 2-wire Serial Interface Data Line | 4 |
| 5 | SCL | 2-wire Serial Interface Clock Line | 4 |
| 6 | MOD\_ABS | Module Absent. Grounded within the module | 4 |
| 7 | RS0 | Rate Select 0, internal pull down | 5 |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. | 6 |
| 9 | RS1 | Rate Select 1, internal pull down | 5 |
| 10 | VEER | Receiver Ground (Common with Transmitter Ground) | 1 |
| 11 | VEER | Receiver Ground (Common with Transmitter Ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled |  |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled |  |
| 14 | VEER | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | VCCR | Receiver Power Supply |  |
| 16 | VCCT | Transmitter Power Supply |  |
| 17 | VEET | Transmitter Ground (Common with Receiver Ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. |  |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. |  |
| 20 | VEET | Transmitter Ground (Common with Receiver Ground) | 1 |

**Notes:**

* 1. Circuit ground is internally isolated from chassis ground.
	2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
	3. Laser output disabled on TDIS>2.0V or open, enabled on TDIS<0.8V.
	4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD\_ABS pull line low to indicate module is plugged in.
	5. Rate select can also be set through the 2-wire bus in accordance with SFF-8472. Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.
	6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

**Mechanical Dimensions**



**Regulatory Compliance**

|  |  |  |
| --- | --- | --- |
| **Feature**  | **Reference**  | **Performance**  |
| Electrostatic discharge（ESD）  | IEC/EN 61000-4-2  | Compatible with standards  |
| Electromagnetic Interference (EMI)  | FCC Part 15 Class B EN 55022 Class B (CISPR 22A)  | Compatible with standards  |
| Laser Eye Safety  | FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2  | Class 1 laser product  |
| Component Recognition  | IEC/EN 60950, UL  | Compatible with standards  |
| ROHS  | 2002/95/EC  | Compatible with standards  |
| EMC  | EN61000-3  | Compatible with standards  |

**Appendix A. Document Revision**

|  |  |  |
| --- | --- | --- |
| **Version No.**  | **Date**  | **Description**  |
| 1.0  | 2018-3-1  | Preliminary datasheet  |