



## S2D46010250F000

MSA 25GBase-DWDM SFP28 Transceiver C-Band 100GHz (SMF, 1540.56nm, 10km, LC, DOM)

### Product Description

This MSA Compliant SFP28 transceiver provides 25GBase-DWDM throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1540.56nm via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

### Features:

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications:

- 25GBase-LR Ethernet
- Access, Metro and Enterprise

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*For your product safety, please read the following information carefully before any manipulation of the transceiver:*



#### ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



#### LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

*The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.*

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## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

## Wavelength Guide (100GHz ITU Channels)

| Channel | Wavelength (nm) | Frequency (THZ) | Channel | Wavelength (nm) | Frequency (THZ) |
|---------|-----------------|-----------------|---------|-----------------|-----------------|
| 21      | 1560.61         | 192.1           | 41      | 1544.53         | 194.1           |
| 22      | 1559.79         | 192.2           | 42      | 1543.73         | 194.2           |
| 23      | 1558.98         | 192.3           | 43      | 1542.94         | 194.3           |
| 24      | 1558.17         | 192.4           | 44      | 1542.14         | 194.4           |
| 25      | 1557.36         | 192.5           | 45      | 1541.35         | 194.5           |
| 26      | 1556.55         | 192.6           | 46      | 1540.56         | 194.6           |
| 27      | 1555.75         | 192.7           | 47      | 1539.77         | 194.7           |
| 28      | 1554.94         | 192.8           | 48      | 1538.98         | 194.8           |
| 29      | 1554.13         | 192.9           | 49      | 1538.19         | 194.9           |
| 30      | 1553.33         | 193.0           | 50      | 1537.4          | 195.0           |
| 31      | 1552.52         | 193.1           | 51      | 1536.61         | 195.1           |
| 32      | 1551.72         | 193.2           | 52      | 1535.82         | 195.2           |
| 33      | 1550.92         | 193.3           | 53      | 1535.04         | 195.3           |
| 34      | 1550.12         | 193.4           | 54      | 1534.25         | 195.4           |
| 35      | 1549.32         | 193.5           | 55      | 1533.47         | 195.5           |
| 36      | 1548.51         | 193.6           | 56      | 1532.68         | 195.6           |
| 37      | 1547.72         | 193.7           | 57      | 1531.9          | 195.7           |
| 38      | 1546.92         | 193.8           | 58      | 1531.12         | 195.8           |
| 39      | 1546.12         | 193.9           | 59      | 1530.33         | 195.9           |
| 40      | 1545.32         | 194.0           | 60      | 1529.55         | 196.0           |

## Absolute Maximum Ratings

| Parameter                  | Symbol | Min.  | Typ. | Max.  | Unit | Notes |
|----------------------------|--------|-------|------|-------|------|-------|
| Maximum Supply Voltage     | Vcc    | -0.3  |      | 4.0   | V    |       |
| Storage Temperature        | TS     | -40   |      | 85    | °C   |       |
| Operating Case Temperature | Tc     | 0     |      | 70    | °C   |       |
| Relative Humidity          | RH     | 0     |      | 85    | %    |       |
| Data Rate                  | BR     | 24.33 |      | 25.78 | Gbps |       |

## Electrical Characteristics

| Parameter                          | Symbol                    | Min.            | Typ. | Max.                 | Unit  | Notes |
|------------------------------------|---------------------------|-----------------|------|----------------------|-------|-------|
| Supply Voltage                     | V <sub>CC</sub>           | 3.13            |      | 3.47                 |       |       |
| Power Dissipation                  | PD                        |                 |      | 2.0                  | W     |       |
| <b>Transmitter</b>                 |                           |                 |      |                      |       |       |
| Data Input Swing Differential      | V <sub>IN</sub>           | 190             |      | 1000                 | mV    |       |
| Differential line input Impedance  | R <sub>IN</sub>           | 80              | 100  | 120                  | Ohm   |       |
| Transmitter Fault Output-High      | V <sub>FaultH</sub>       | 2               |      | V <sub>CC</sub> +0.3 | V     |       |
| Transmitter Fault Output-Low       | V <sub>FaultL</sub>       | V <sub>EE</sub> |      | V <sub>EE</sub> +0.8 | V     |       |
| Transmitter Disable Voltage-High   | V <sub>DisH</sub>         | 2               |      | V <sub>CC</sub> +0.3 | V     |       |
| Transmitter Disable Voltage- low   | V <sub>DisL</sub>         | V <sub>EE</sub> |      | V <sub>EE</sub> +0.8 | V     |       |
| <b>Receiver</b>                    |                           |                 |      |                      |       |       |
| Differential line Output Impedance | R <sub>OUT</sub>          | 80              | 100  | 120                  | Ohm   |       |
| Differential Data Output Voltage   | V <sub>DR</sub>           | 350             |      | 850                  | mVp-p |       |
| LOS Output Voltage-High            | V <sub>LOSH</sub>         | 2               |      | V <sub>CC</sub> +0.3 | V     |       |
| LOS Output Voltage-Low             | V <sub>LOSL</sub>         | V <sub>EE</sub> |      | V <sub>EE</sub> +0.8 | V     |       |
| <b>Others</b>                      |                           |                 |      |                      |       |       |
| Cold-Start time                    | T <sub>start-cooled</sub> |                 |      | 35                   | s     |       |

## Optical Characteristics

| Parameter                                                    | Symbol                | Min.    | Typ. | Max.    | Unit  | Notes |
|--------------------------------------------------------------|-----------------------|---------|------|---------|-------|-------|
| <b>Transmitter</b>                                           |                       |         |      |         |       |       |
| Wavelength                                                   | $\lambda$             | 1529.55 |      | 1560.61 | nm    |       |
| Center Wavelength Spacing                                    |                       | 100     |      |         | GHz   |       |
| Average Launched Power                                       | P <sub>O</sub>        | -1      |      | 5       | dBm   |       |
| Extinction Ratio                                             | ER                    | 6       |      |         | dB    |       |
| Average Launched Power (Laser Off)                           | P <sub>off</sub>      |         |      | -30     | dBm   |       |
| Side-Mode Suppression Ratio                                  | SMSR                  | 30      |      |         | dB    |       |
| Relative Intensity Noise                                     | RIN <sub>20 OMA</sub> |         |      | -130    | dB/Hz |       |
| <b>Receiver</b>                                              |                       |         |      |         |       |       |
| Center Wavelength                                            | $\lambda_{IN}$        | 1260    |      | 1620    | nm    |       |
| Receiver Overload                                            | P <sub>overload</sub> | 2       |      |         | dBm   |       |
| Receiver Sensitivity @5E-5 BOL                               | P <sub>sen BOL</sub>  |         |      | -15     | dBm   |       |
| Receiver Sensitivity @5E-5 EOL                               | P <sub>sen EOL</sub>  |         |      | -14.5   | dBm   | 1     |
| Receiver Sensitivity @5E-5 EOL after 10km fiber transmission | P <sub>sen1 EOL</sub> |         |      | -9.0    | dBm   | 1     |
| Los Of Signal Assert                                         | PA                    | -30     |      |         | dBm   |       |
| Los Of Signal De-assert                                      | PD                    |         |      | -16     | dBm   |       |
| LOS -Hysteresis                                              | P <sub>Hys</sub>      | 0.5     |      | 6       | dB    |       |

### Notes:

1. Measured at 5E-5, ER>4dB, PRBS 2<sup>31</sup> -1

## Pin Descriptions

| Pin | Symbol  | Name/Descriptions                                              | Ref. |
|-----|---------|----------------------------------------------------------------|------|
| 1   | VEET    | Transmitter 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                              | 2    |
| 5   | SCL     | 2-wire Serial Interface Clock Line                             | 2    |
| 6   | MOD_ABS | Module Absent. Grounded within the module                      | 2    |
| 7   | NA      | Not Used                                                       |      |
| 8   | RX_LOS  | Loss of Signal indication. Logic 0 indicates normal operation. | 4    |
| 9   | NA      | No Used                                                        |      |
| 10  | VEER    | Receiver Ground                                                | 1    |
| 11  | VEER    | Receiver Ground                                                | 1    |
| 12  | RD-     | Receiver Inverted DATA out. AC Coupled.                        |      |
| 13  | RD+     | Receiver Non-inverted DATA out. AC Coupled.                    |      |
| 14  | VEER    | Receiver Ground                                                | 1    |
| 15  | VCCR    | Receiver Power Supply                                          | 5    |
| 16  | VCCT    | Transmitter Power Supply                                       | 5    |
| 17  | VEET    | Transmitter Ground                                             | 1    |
| 18  | TD+     | Transmitter Non-Inverted DATA in. AC Coupled.                  |      |
| 19  | TD-     | Transmitter Inverted DATA in. AC Coupled.                      |      |
| 20  | VEET    | Transmitter Ground                                             | 1    |

## Notes:

1. Circuit ground is internally isolated from chassis ground.
2. T<sub>FAULT</sub> 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 V<sub>cc</sub> + 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 T<sub>DIS</sub> >2.0V or open, enabled on T<sub>DIS</sub> <0.8V.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
5. Internally connected



Pin-out of connector Block on Host board

### Block Diagram of Transceiver



Recommended Interface Circuit



Mechanical Specifications



# About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

