SFP28-L40-DOxxx

SFP28, 25 GbE LWDM4 40km DWDM 200GHz O-Band, 19dB, SM

1. Product overview

SFP28 optical transceiver supporting up to 25.78 Gbps and 40 km transmission over single-mode fiber. The optical assembly uses a EML transmitter and APD receiver with a transimpedance preamplifier and MCU control. Digital diagnostics are available through a two-wire serial interface.

2. Key features

Hot-pluggable SFP+ footprint; single +3.3 V supply; real-time digital diagnostics; duplex LC receptacle; SFF-8472 management.

3. Applications

25GBASE-ER

4. Technical data

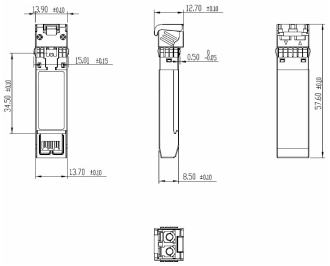
Absolute maximum rating	Specification	Absolute maximum rating	Specification
Storage temperature	-40 to +85°C	Supply voltage	-0.3 to 4 V
Humidity	5-95% (source operating/relative humidity)	Signal input voltage	Vcc-0.3 to Vcc+0.3 V

Electrical interface

Transmitter / input	Specification	Receiver / output	Specification
Differential swing	190-700 mV p-p	Differential swing	300-850 mV p-p
Termination mismatch	10% max	Termination mismatch	10% max
Eye width / height	0.46 UI max / 95 mV typ	Eye width / vertical closure	0.57 UI min / 5.5 dB max
DC common mode	-350 to +2850 mV	Transition, 20-80%	12 ps min
Applied p-p sinusoidal jitter	IEEE 802.3bm	TX-fault / TX-disable / LOS	High 2 to Vcc+0.3 V; low 0-0.8 V

Minimum differential input and output return loss RLd(f): 9.5-0.37f for 0.01 ≤ f <8; 4.75-7.4log10(f/14) for 8 ≤ f <19 (dB). Minimum TX differential-to-common and RX common-to-differential return loss: 22-20(f/25.78) for 0.01 ≤ f <12.89; 15-6(f/25.78) for 12.89 ≤ f <19 (dB). Frequency units are not stated in the table.

Mechanical dimensions - original drawing



Simplified functional illustration



Optical RX → APD + TIA → RX data
MCU / two-wire control: SCL, SDA
Monitor: temperature, voltage, bias, TX/RX power

5. Recommended operating conditions

Parameter	Specification
Case temperature	0 to +70°C
Supply voltage, min / typ / max	3.14 / 3.3 / 3.47 V
Supply current / data rate	600 mA max / 25.78 Gbps typ (TX and RX)
Transmission distance / fiber	40 km / 9/125 µm SMF

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6. Optical characteristics

Transmitter	Specification
Centre wavelength / lane ranges	1272.55-1310.19 nm
Average launch power	0 to +6 dBm
Laser-off launch power	-30 dBm max
Spectral width (-20 dB)	1 nm max
SMSR / extinction ratio	30 dB min / 6 dB min
TX and dispersion penalty	1 dB max
Output eye mask	IEEE 802.3cc

Receiver	Specification
Input wavelength	1272.55-1310.19 nm
Sensitivity, AVG / OMA	-19 / -18.2 dBm max
Overload	-4 dBm min
Receiver reflectance	-26 dB max
LOS assert / deassert	-30 dBm min / -20 dBm max
LOS hysteresis	0.5 dB min

Receiver sensitivity and overload: BER ≤$5x10^{-5}$. The source references an eye-mask note (2) but does not supply its text.

7. Digital diagnostics and management

Monitor	Range	Accuracy	Calibration
Temperature	0 to +70°C	±3°C	Internal
Supply voltage	3.0-3.6 V	±3%	Internal
Bias current	0-100 mA	±10%	Internal
TX power	0 to +6 dBm	±3 dB	Internal
RX power	-19 to -4 dBm	±3 dB	Internal

Two-wire serial interface SCL/SDA provides serial ID and live diagnostics. The memory-map description states both internal and external calibration; the monitor table specifies internal calibration.

Timing / logic	Specification	Timing / logic	Specification
TX-disable negate / assert	1 ms / 10 µs max	Initialize, incl. fault reset	300 ms max
TX-fault assert	100 µs max	TX-disable to reset	10 µs min
LOS assert / deassert	100 / 100 µs max	Serial-ID clock	100 kHz typ; 400 kHz max
MOD_DEF(0:2) high	2 to Vcc V	MOD_DEF(0:2) low	0.8 V max

Memory map: A0h (1010000X): serial ID 0-95 (96 bytes); vendor-specific 96-127 (32); reserved 128-255 (128). A2h (1010001X): alarm/warning thresholds 0-55 (56); calibration constants 56-95 (40); real-time diagnostics 96-119 (24); vendor-specific 120-127 (8); user-writable EEPROM 128-247 (120); vendor-specific 248-255 (8).

Pin map: TX grounds 1/17/20; RX grounds 10/11/14; TX-fault 2; TX-disable 3; SDA 4; SCL 5; module-absent 6 (grounded in module); RS0/RS1 7/9: not connected; LOS 8; RX data -/+ 12/13; RX/TX supply 15/16; TX data +/- 18/19. Hot-plug sequence: grounds 1; supplies 2; remaining contacts 3.

TX-fault and LOS are open-collector: host pull-ups 4.7-10 kΩ to 2.0 V through Vcc+0.3 V (TX-fault), or 2.0-3.6 V (LOS). Low means normal; high means fault/loss. TX disabled above 2.0 V or open; enabled below 0.8 V. RX outputs are AC-coupled 100 Ω differential lines, requiring 100 Ω SERDES termination. TX inputs are AC-coupled and internally terminated at 100 Ω. Source circuit: 50 Ω single-ended data paths; 10 kΩ module TX-disable pull-up; two host TX-control and three management pull-ups of 4.7-10 kΩ.

8. Safety and regulatory

Class I laser; RoHS compatibility; SFP/SFP+ MSA and SFF-8472.

9. Ordering information

GLOBALfiber part number	Original product description
S25-L40-DOxxx	SFP28, 25 GbE LWDM4 40km DWDM 200GHz O-Band, 19dB, SM