SFP28-25G-LR

SFP28, 25 GbE-LR, DDM, 10km 1310nm, 7dB, SM

1. Product overview

SFP28 optical transceiver supporting up to 25.78 Gbps and 10 km transmission over single-mode fiber. The optical assembly uses a DFB transmitter and PIN 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-LR.

4. Technical data

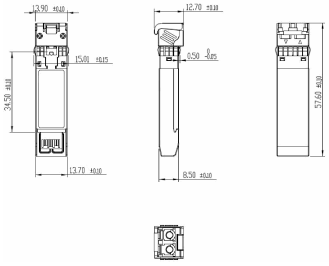
Absolute maximum rating	Specification	Absolute maximum rating	Specification
Storage temperature	-40 to +85°C	Supply voltage	-0.5 to 4.5 V
Humidity	5-85% (source operating/relative humidity)	Optical connector	Duplex LC

Electrical interface

Parameter	Specification	Parameter	Specification
Differential input swing	180-850 mV	Differential output swing	300-900 mV
Input differential impedance	90 / 100 / 110 Ω (min/typ/max)	TX-disable / TX-fault high	2.0 to Vcc V
TX-enable / TX-fault normal	0-0.8 V	LOS high / low	2.0 to Vcc V / 0.8 V max

PECL input, internally AC-coupled and terminated. Receiver output is internally AC-coupled.

Mechanical dimensions - original drawing



Simplified functional illustration



Optical RX → PIN + 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	3.135 / 3.3 / 3.465 V
Supply current / data rate	400 mA max / 25.78 Gbps typ (TX and RX)
Transmission distance / fiber	10 km / SMF

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6. Optical characteristics

Transmitter	Specification
Centre wavelength, min / typ / max	1270 / 1310 / 1350 nm
Spectral width (-20 dB)	1 nm max
SMSR	30 dB min
Average output power	-7 to +2 dBm
Extinction ratio	3.5 dB min

Receiver	Specification
Centre wavelength	1260-1600 nm
Sensitivity	-13.3 dBm max
Overload	2 dBm min
LOS deassert	-15 dBm max
LOS assert	-30 dBm min
LOS hysteresis	0.5 dB min

Power launched into SMF. Sensitivity and overload measured with PRBS 2^{31}-1 at 25.78 Gbps, BER ≤$5x10^{-5}$.

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	-7 to +2 dBm	±3 dB	Internal
RX power	-14 to +2 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	2 ms / 100 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
S25G-LR	SFP28, 25 GbE-LR, DDM, 10km 1310nm, 7dB, SM