25G SFP28 BiDi 1270/1330 nm Optical Transceiver

25.78 Gbps | Simplex LC | Up to 10 km over 9/125 µm SMF | DDM

Complementary 1270 nm and 1330 nm modules provide bidirectional transmission over a single fiber. Each module uses an uncooled DFB transmitter and a PIN photodiode with a transimpedance amplifier.



PRODUCT FEATURES

- Hot-pluggable SFP28 footprint with 20-pin interface
- Simplex LC interface for single-fiber links
- Uncooled DFB laser and PIN/TIA receiver
- Commercial and industrial case temperature options
- Single +3.3 V DC supply, 1.5 W maximum dissipation
- Digital Diagnostic Monitoring via 2-wire interface
- Class 1 laser safety and RoHS compliance
- Compliant with SFP28 MSA, SFF-8431 and SFF-8472

APPLICATIONS

25G high-speed interconnects, switch-to-switch links, storage area networks and other optical links.

ORDERING INFORMATION

Part number	Tx nominal	Rx nominal	Case temperature	Reach	DDM
DPP2-2325-1CY1	1270 nm	1330 nm	0 to +70 °C	10 km	Yes
DPP2-3225-1CY1	1330 nm	1270 nm	0 to +70 °C	10 km	Yes
DPP2-2325-1IY1	1270 nm	1330 nm	-40 to +85 °C	10 km	Yes
DPP2-3225-1IY1	1330 nm	1270 nm	-40 to +85 °C	10 km	Yes

Pair a 1270 nm Tx module with a 1330 nm Tx module at opposite ends of the link. The photos show the commercial pair.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	TS	-40	+85	°C
Supply voltage	VCC3	3.1	3.6	V
Relative humidity, non-condensing	RH	5	95	%

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit
Commercial operating case temperature	TC	0	—	+70	°C
Industrial operating case temperature	TC	-40	—	+85	°C
Power supply voltage	VCC3	3.135	3.3	3.465	V
Supply current	ICC3	—	—	450	mA
Power dissipation	PD	—	—	1.5	W
Data rate	—	—	25.78	—	Gbps
Transmission distance over 9/125 µm SMF	—	—	—	10	km

TRANSMITTER OPTICAL & ELECTRICAL CHARACTERISTICS

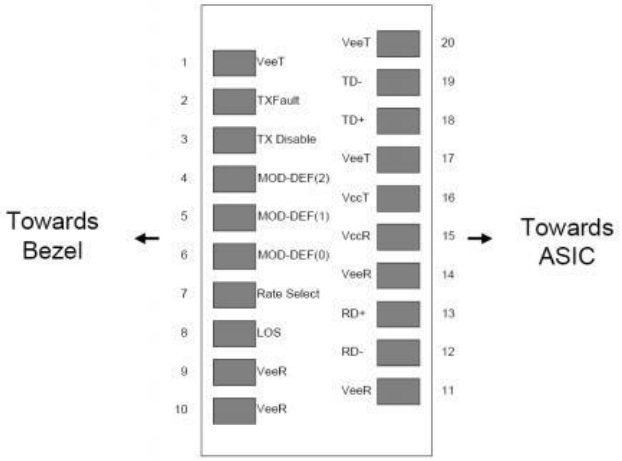
Parameter	Symbol	Min.	Typ.	Max.	Unit
Center wavelength, 1270 nm Tx	λc	1250	1270	1290	nm
Center wavelength, 1330 nm Tx	λc	1310	1330	1350	nm
Laser off power	Poff	—	—	-30	dBm
Average optical output power	Pavg	-4	—	+2	dBm
DFB spectral width at -20 dB	—	—	—	1	nm
Side mode suppression ratio	SMSR	30	—	—	dB
Extinction ratio	ER	3.5	—	—	dB
Tx differential input swing	VI	180	—	700	mVpp
TX_Disable input, laser disabled	VIH	2	—	VCC	V
TX_Disable input, laser enabled	VIL	VEE	—	VEE + 0.8	V

RECEIVER OPTICAL & ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit
Center wavelength, 1270 nm Rx	λc	1250	1270	1290	nm
Center wavelength, 1330 nm Rx	λc	1310	1330	1350	nm
Receiver sensitivity (1)	S	—	—	-12	dBm
LOS assert threshold	LOS A	-35	—	—	dBm
LOS deassert threshold	LOS D	—	—	-13	dBm
LOS hysteresis	LOSH	0.5	—	6	dB
Receiver overload	Pov	+1	—	—	dBm
Rx differential output swing	Vo	300	—	850	mVpp

(1) Minimum average optical power measured at ER = 4 dB, using a PRBS 2^31 - 1 pattern and BER < 5 × 10^-5.

PIN CONFIGURATION & DEFINITIONS



20-pin SFP28 connector pinout. Directions are shown in the original drawing.

Pin	Symbol	Name / description	Ref.
1	VeeT	Module transmitter ground	1
2	TX_Fault	Module transmitter fault	2
3	TX_Disable	Transmitter disable input	3
4	SDA	2-wire serial interface data (MOD-DEF2)	4
5	SCL	2-wire serial interface clock (MOD-DEF1)	4
6	MOD_ABS	Module absent. Connected internally to VeeT or VeeR.	5
7	RS	Optional rate select (RS0)	6
8	RX_LOS	Receiver loss of signal indication	2
9	VeeR	Module receiver ground	1
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data output	
13	RD+	Receiver non-inverted data output	
14	VeeR	Module receiver ground	1
15	VccR	Receiver 3.3 V supply	
16	VccT	Transmitter 3.3 V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter non-inverted data input	
19	TD-	Transmitter inverted data input	
20	VeeT	Module transmitter ground	1

PIN NOTES

1. VeeR and VeeT are isolated from the module case.

2. TX_Fault and RX_LOS are open-collector/drain outputs. Use a 4.7–10 kΩ pull-up to host Vcc. The host must keep each module pin at or below the module VccT/R + 0.5 V.

3. TX_Disable is pulled up internally to VccT through 4.7–10 kΩ.

4. Refer to SFF-8472, section 4.2, for the 2-wire electrical specifications.

5. Pull MOD_ABS up to host Vcc through 4.7–10 kΩ.

6. Pin 7 is designated optional RS0. Its behavior for these 25G variants requires confirmation.

CONTROL & STATUS I/O TIMING

Parameter	Symbol	Min.	Max.	Unit
TX Disable assert time	t_off	—	100	µs
TX Disable negate time	t_on	—	1	ms
Initialization, including TX_Fault reset	t_init	—	300	ms
TX Fault assert time	t_fault	—	100	µs
TX Fault reset	t_reset	10	—	µs
LOS assert time	t_loss_on	—	100	µs
LOS deassert time	t_loss_off	—	100	µs
Serial ID clock rate	f_serial_clock	100	400	kHz

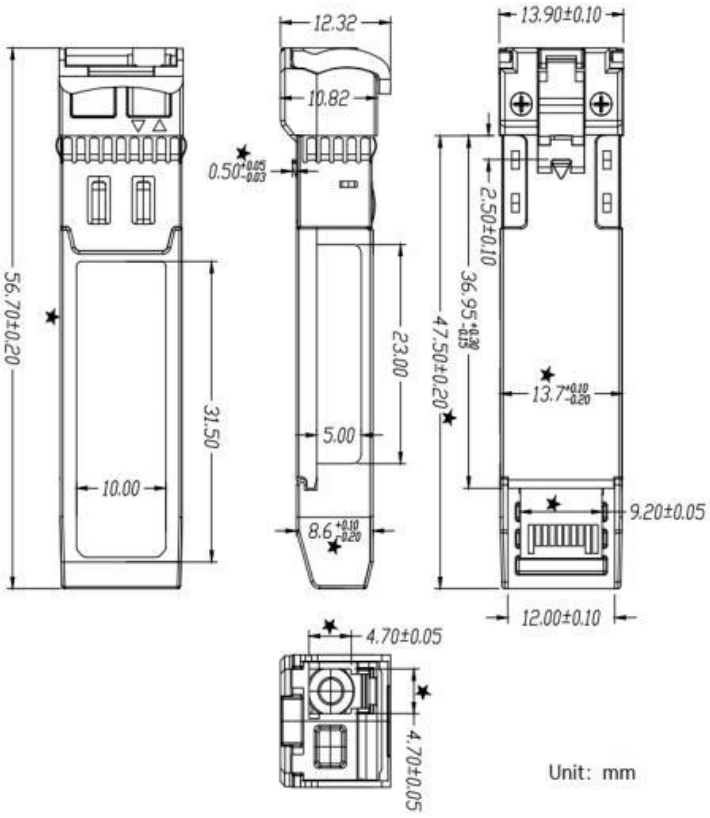
TX Disable assert time is measured from the rising edge to below 10% of nominal optical output. Negate time is measured from the falling edge to above 90% of nominal modulated output. Initialization starts at power-on or TX Fault negation via TX Disable. TX Fault reset is the minimum time TX Disable must be held high.

LOS timing is measured from the receiver entering or leaving the loss-of-signal state to the associated RX_LOS transition.

DIGITAL DIAGNOSTIC MONITORING

The SFF-8472 2-wire serial interface reports module temperature, supply voltage, laser bias current, transmitted optical power and received optical power.

MECHANICAL SPECIFICATIONS



Module outline and connector dimensions. All dimensions are in millimeters.