LWO-SFP28-SW-HPE

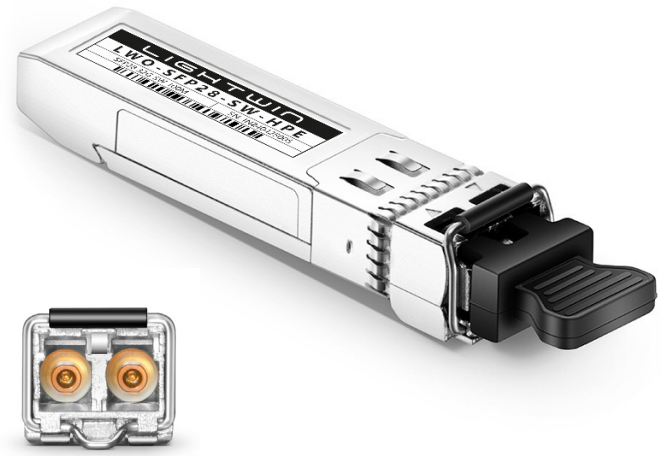
32 Gbit SFP28 FC, 850nm, 100m, LC-Duplex, Multimode, Enterprise Version, HP Aruba

Features

- 100m over OM4 MMF
- 70m over OM3 MMF
- VCSEL Laser and PIN receiver
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- HP Aruba Coding
- Hot-pluggable SFP28 footprint
- Build-in dual CDR
- Single 3.3V power supply
- Power dissipation < 1.2 W
- Case operating temperature:
  - Commercial: 0 ~ +70°C
  - Industrial: -40 ~ +85°C

Application

- 25GBASE-SR
- eCPRI and CPRI
- 32G FC



Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Typical	Max.	Units
Storage Temperature	T_S	-40	-	85	°C
Relative Humidity	R_H	5	-	95	%
Power Supply Voltage	V_{CC}	-0.3	-	4	V
Signal Input Voltage	V_{SI}	V_{CC}-0.3	-	V_{CC}+0.3	V
Rx Damage Threshold	PR_{dmg}	3			dBm

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max.	Units	Notes
Operating Case Temperature	T_{OP}	0		70	°C	
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Data Rate			25.78	28.05	Gb/s	TX Rate/RX Rate
Power Supply Current	I_{CC}			300	mA	
Link Distance (MMF)	D		100		m	OM4 MMF
			70			OM3 MMF

Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF-8472 Rev10.2 with internal calibration mode. For external calibration mode please contact our sales staff.

Parameter	Symbol	Min	Max.	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	°C	Over operating temp
Supply voltage monitor absolute error	DMI_VCC	-3	3	%	Full operating range
RX power monitor absolute error	DMI_RX	-3	3	dB	
Bias current monitor	DMI_bias	-10	10	%	
TX power monitor absolute error	DMI_TX	-3	3	dB	

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Diagram of Host Board Connector Block Pin Numbers and Names

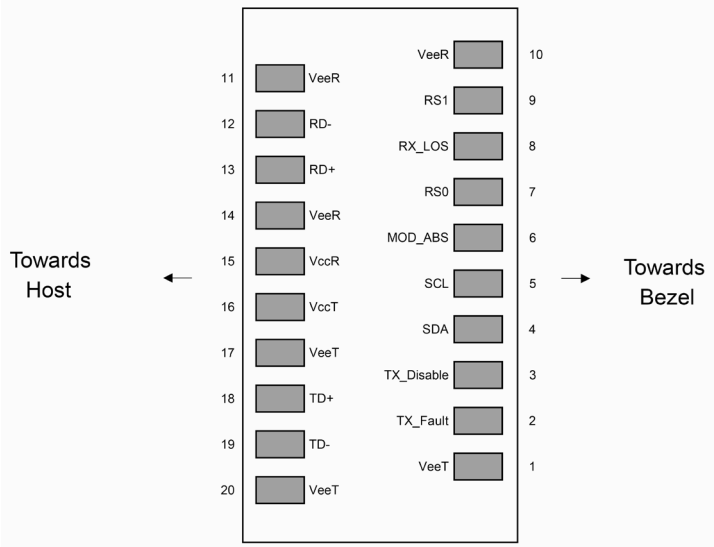

Figure 1: SFP28 module pad layout

Pad Function Definition

Pin	Logic	Symbol	Name/Description	Note
1		VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	LVTTL-O	TX_Fault	Transmitter Fault	2
3	LVTTL-I	TX_Disable	Transmitter Disable. Laser output disabled on high or open.	3
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line	4
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock Line	4
6		MOD_ABS	Module Absent. Grounded within the module	4
7	LVTTL-I	RS0	Rate Select 0, internal pull down	5
8	LVTTL-O	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	LVTTL-I	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	CML-O	RD-	Receiver Inverted DATA out. AC Coupled	
13	CML-O	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	CML-I	TD+	Transmitter Non-Inverted DATA in. AC Coupled	
19	CML-I	TD-	Transmitter Inverted DATA in. AC Coupled	
20		VeeT	Transmitter Ground (Common with Receiver Ground)	1

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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 4.7kΩ ~ 10kΩ 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 pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
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.

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Input differential impedance	Rin		100		Ω	1
Single ended data input swing	Vin, pp	200		900	mV	
Transmitter Fault Output-High	V_{FaultH}	2	-	Vcc+0.3	V	
Transmitter Fault Output-Low	V_{FaultL}	0	-	0.8	V	
Transmitter Disable Voltage- High	V_{DISH}	2	-	Vcc+0.3	V	
Transmitter Disable Voltage- low	V_{DISL}	0	-	0.8	V	-
Receiver						
Differential data output swing	Vout, pp	300		900	mV	2
LOS Output Voltage-High	V_{LOSH}	2	-	Vcc+0.3	V	
LOS Output Voltage-Low	V_{LOSL}	0	-	0.8	V	-

Notes

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Into 100 ohms differential termination.

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Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Transmitter						
Signaling rate	DR	Gb/s		25.78125 ±100 ppm		
Center Wavelength	λ	nm	840	850	860	
RMS Spectral Width	RSW	nm			0.6	
Average launch power	P_{avg}	dBm	-8.4		2.4	
Extinction ratio	ER	dB	2			
Average Launch Power of OFF Transmitter	Poff	dBm			-30	
Optical return loss tolerance		dB			12	
Transmitter eye mask {X1, X2, X3, Y1, Y2, Y3}				{0.3,0.38,0.45,0.35,0.41,0.5}		1
Receiver						
Receive Rate	DR	Gb/s		25.78125 ±100 ppm		
Wavelength Range	λ	nm	840		860	
Overload Input Optical Power	P_{max}	dBm	2.4			
Average Receive Power	P_{in}	dBm	-10.3		2.4	
Rx Sensitivity@25.78 Gb/s	RSENS	dBm			-10	2
Recevier Reflectance	REFLr	db			-12	
Los De-Assert	P_d	dBm			-11	
Los Assert	P_a	dBm	-30			
Loss Hysteresis	P_d-P_a	dBm	0.5			

Notes

1. Hit Ratio 1.5 x 10^{-3} hits/sample.
2. Measured with BER =<5x10^{-5} @PRBS=2^{31}-1 NRZ.

Mechanical Dimensions

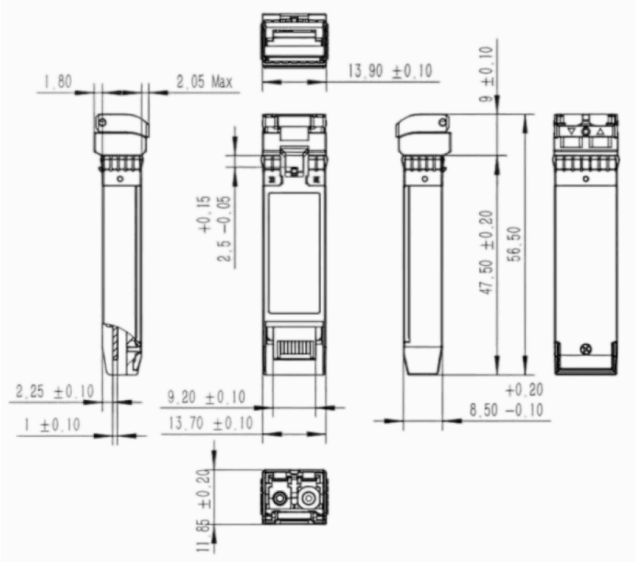

Figure 2. Mechanical Outline

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ESD

This transceiver is specified as ESD threshold 1kV for high speed data pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 / JESD22- A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser Safety

This is a Class 1 Laser Product according to EN 60825-1:2014. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.