ETU-LINK®

Optical Communication System

SFP28 Series

SFP28

ES285(2)X-3LCD01

10/25Gb/s 850nm Multi-mode SFP28 Transceiver

- Supports 10G ~ 25.78Gb/s bit Dual rate
- 850nm VCSEL laser and PIN photo-detector
- Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF
- Digital diagnostics functions are available via the I2C interface
- Operating case temperature: 0°C to +70 °C
- +3.3V single power supply
- Power consumption less than 1W
- RoHS compliant

Applications

- 25GBASE-SR Ethernet
- 32G Fiber Channel
- Other optical links

Order Information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance	Fiber Type	DDMI	Connector	Temp[note1]
ES285(2)X-3 LCD01	25.78125	850	1~100m	MMF	YES	LC	0℃~+70℃

Note:

1. OM4 fiber,70m for OM3 fiber
2. Case Temperature after assembling

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	Vcc_3	-0.5	-	+3.6	V	
Storage Temperature	T_s	-40	-	+85	°C	
Operating Humidity	RH	+5	-	+85	%	1

Note:

1. No condensation

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	0	-	+70	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Supply Current	Icc	-	-	300	mA	
Power Dissipation	Pd	-	-	1.0	W	
Bit Rate	BR	8.5	25.78125	-	Gbps	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
Transmitter							
Differential Data Input Swing		$V_{in,P-P}$	200	-	1600	mV_{PP}	
Input Differential Impedance		Z_{IN}	90	100	110	Ω	
Tx_Fault	Normal Operation	V_{OL}	0	-	0.8	V	
	Transmitter Fault	V_{OH}	2.0	-	V_{CC}	V	
Tx_Disable	Normal Operation	V_{IL}	0	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver							
Differential Date Output		V_{out}	400	-	800	mV	
Output Differential Impedance		Z_D	90	100	110	Ω	
Rx_LOS	Normal Operation	V_{OL}	0	-	0.8	V	
	Lose Signal	V_{oH}	2.0	-	V_{CC}	V	

Optical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Optical transmitter Characteristics						
Bit Rate	BR	Gbps	8.5	25.78125	-	1
Center Wavelength Range	λc	nm	820	850	880	
Average Launch power Tx_off	Poff	dBm	-	-	-45	
Average Optical Power	P_0	dBm	-5.0		2.4	2
Extinction Ratio	ER	Db	2.0	-	-	
Optical Eye Mask	-	%	5	-	-	
Optical Receiver Characteristics						
Bit Rate	BR	Gbps	8.5	25.78125	-	1
Sensitivity@BER=5E-5	BER	dBm	-	-	-10.3	3
Sensitivity@BER=1E-12	BER	dBm	-	-	-5.2	3
Overload Input Optical Power	P_{IN}	dBm	2.4	-	-	3
Center Wavelength Range	λc	nm	820	-	880	

Note:

1. Set low of RS0/RS1 pin and 0 of RS0/RS1 bit. Engine CDR lock at low bit rate. Set high of RS0/RS1 pin and 0 of RS0/RS1 bit. Engine CDR lock at high bit rate.
2. Coupled into 50/125 MMF.
3. Measured with PRBS 2^{31}-1 test pattern @25.78125Gbps.
4. Measured with a PRBS 2^{31}-1 test pattern, @10.325Gb/s, BER<10^{-12}

Recommended Host Board Power Supply Circuit

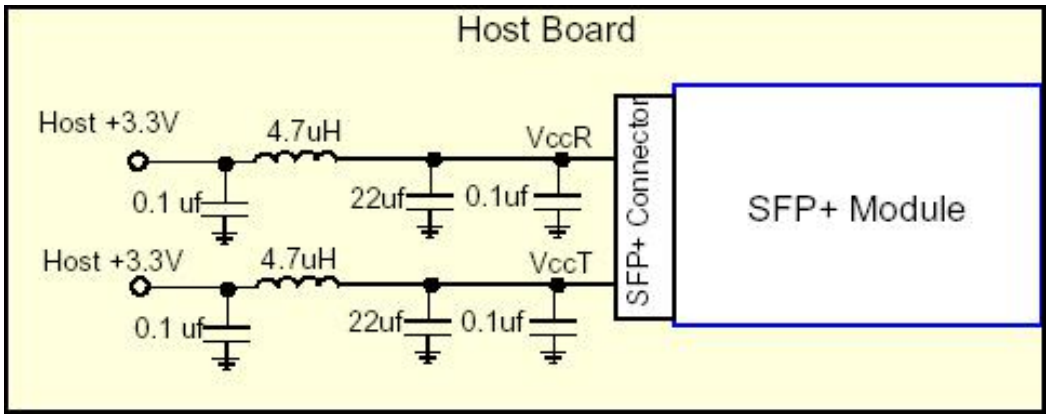


Figure 1, Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

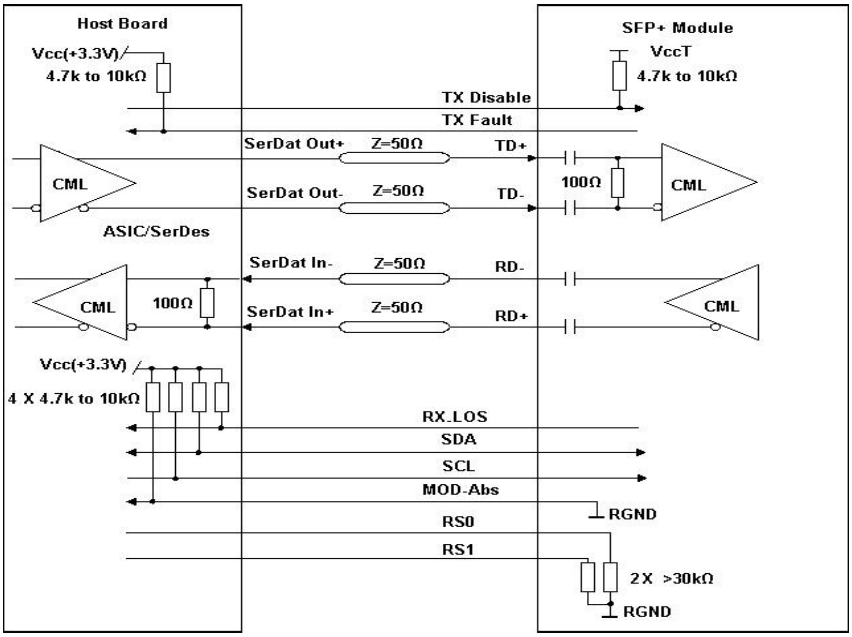


Figure 2, Recommended Interface Circuit

Pin arrangement

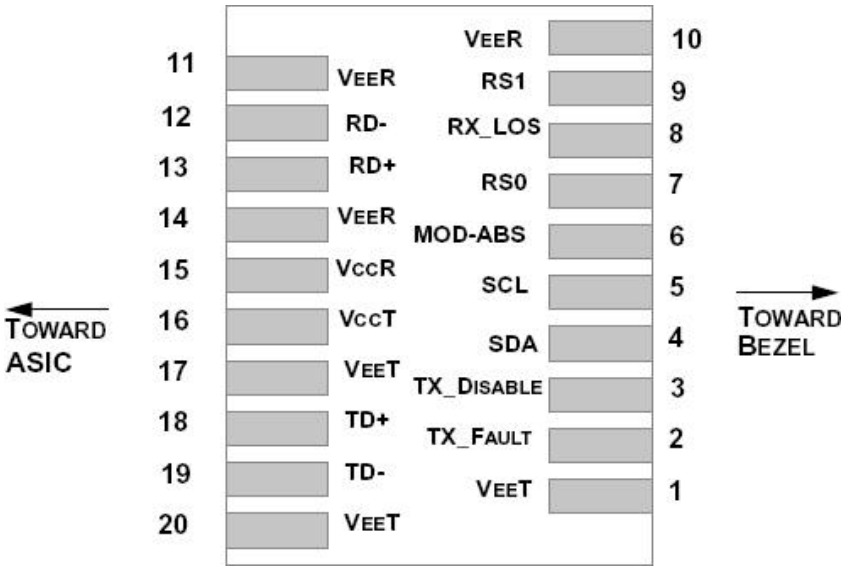


Figure 3, Pin View

Pin Function Definitions

Pin	Symbol	Name/Description	Notes
1	VEET	Module Transmitter Ground	1
2	TX_FAULT	Module Transmitter Fault	2
3	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	2-Wire Serial Interface Data Line (MOD-DEF2)	
5	SCL	2-Wire Serial Interface Clock (MOD-DEF1)	
6	MOD_ABS	Module Absent, connected to $V_{EE}T$ or $V_{EE}R$ in the module	2
7	RS0	Rate Select 0, optionally controls SFP+ module receiver	4
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)	2
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter	4
10	$V_{EE}R$	Module Receiver Ground	1

11	$V_{EE}R$	Module Receiver Ground	1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted Data Output	
14	$V_{EE}R$	Module Receiver Ground	1
15	$V_{CC}R$	Module Receiver 3.3 V Supply	
16	$V_{CC}T$	Module Transmitter 3.3 V Supply	
17	$V_{EE}T$	Module Transmitter Ground	1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	$V_{EE}T$	Module Transmitter Ground	1

Note:

1. The module ground pins are isolated from the module case.
2. The pins shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.46V on host board.
3. The pin is pulled up to VCCT with a 4.7K-10KΩ resistor in the module.
4. See SFF-8472 Rev12.2 Table 10-2.

Monitoring Specification

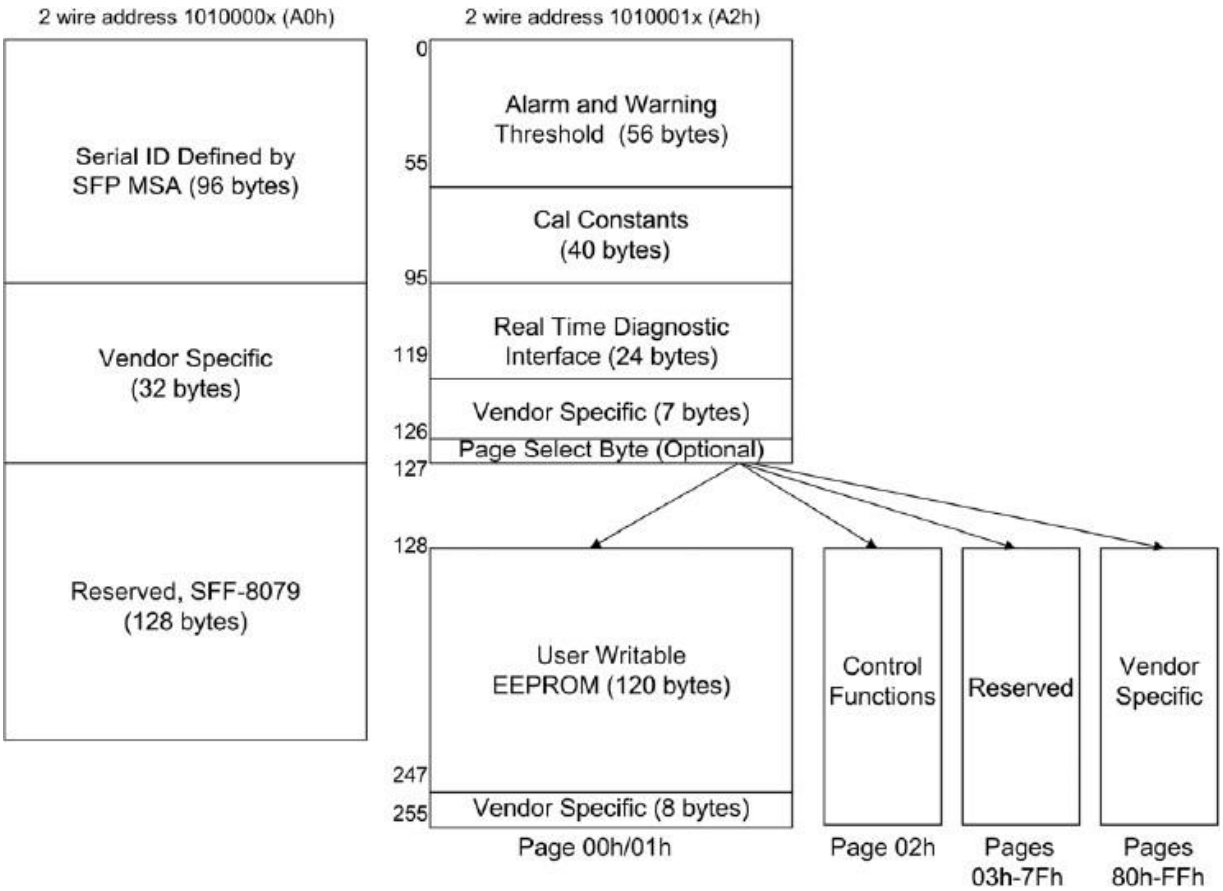
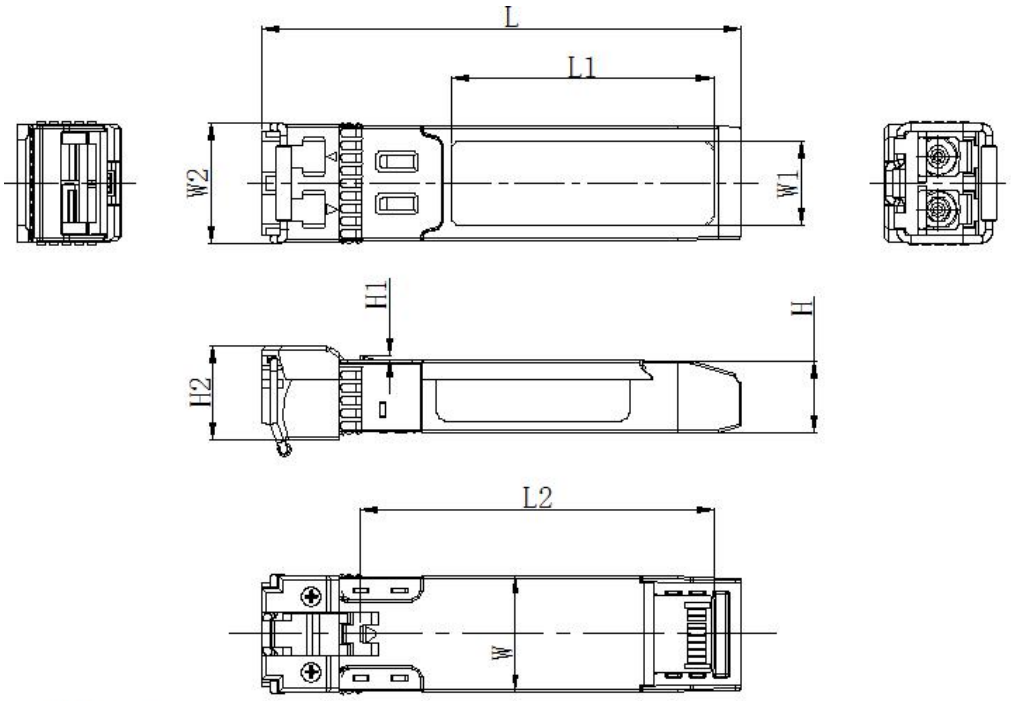


Figure 4, Memory

Mechanical



Unit: mm

	L	L1	L2	W	W1	W2	H	H1	H2
MAX	56.9	31.2	41.95	13.8	10.2	14.5	8.7	0.55	11.5
Typical	56.7	31.0	41.80	13.7	10.0	14.3	8.6	0.5	11.3
MIN	56.5	30.8	41.65	13.6	9.8	14.1	8.5	0.45	11.1

Figure 5, Mechanical Diagram

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Compatibility Test

In order to ensure the product compatibility, our products will be tested on the switch before shipment. Our modules can compatible with many mainstream brand switches, such as Cisco, Juniper, Extreme, Brocade, IBM, H3C, HP, Huawei, D-Link, Mikrotik, ZTE, TP-Link...

Our test equipment: VOLKTEK MEN-4110, HP 2530-8G, CRS226-24G-25+RM, Catalyst 2960G Series, Catalyst 3850 XS 10G SFP+, Catalyst 3750-E Series, HUAWEI S5700Series, H3C S3100V2 Series, Juniper-EX4200, etc.

Cisco Catalyst 3850

HUAWEI S5700

H3C S3100V2

HP J9264AR

Juniper EX 4200

Alcatal 6850E-U24X

Mikrotik CR5226-24G-25+RM

Cisco Catalyst 2960G

Volktek MEN-4110

Product Production Process

Quality Assurance

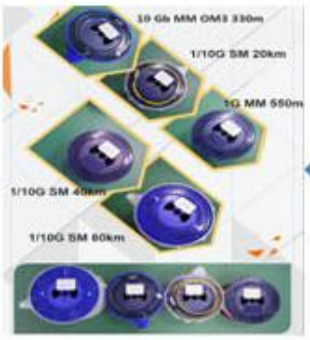
Continuous introduction of new equipment, produced by strict standards, strict quality inspection, to guarantee the high quality standard of each product.

Standardized Production Line

Professional Welding

Assembling

Cleaning end face



Distance Testing

Aging Testing

Product Initial Test

Switch Testing

Product Final Test

Packaging

ETU-Link provides two kinds of packaging, 10pcs/Tray and individual package.

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Tel: +86-755 2328 4603

Addresses and phone number also have been listed at www.etulinktechnology.com.
Please e-mail us at sales@etulinktechnology.com or call us for assistance.