

# 25G CWDM SFP28 1270-1370nm 10km DOM Transceiver Module

CWDM-SFP25G-10SP



## Application

- 25G GE LR
- eCPRI , CPRI
- Ethernet Switches
- High-speed Servers
- High-performance Computing Clusters

## Features

- 25.78 Gbps serial optical interface
- 1310nm DFB transmitter and PIN PD receiver
- Superior eye performances
- Up to 10km on 9/125 um SMF
- Operating temperature range : 0 ° C to 70 ° C

## Description

FS's CWDM-SFP25G-10SP SFP28 transceivers are designed for use in Ethernet links up to 25.78 Gb/s data rate and up to 10 km link length. They are compliant SFF-8472 , and compatible with SFF-8432 and applicable portions of SFF-8431. The product is RoHS compliant and lead-free per Directive 2011/96/EU.

## Product Specifications

### I. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit
<b>Storage Temperature</b>	$T_S$	-40		85	°C
<b>Case Operating Temperature</b>	$T_A$	0		70	°C
<b>Maximum Supply Voltage</b>	VCC	0		3.6	V
<b>Relative Humidity(Non-condensing)</b>	RH	0		85	%

### II. Electrical Characteristics (TOP= 0 to 70 ° C, VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Note
<b>Supply Voltage</b>	Vcc	3.15		3.46	V	
<b>Supply Current</b>	Icc			400	mA	
<b>Power Consumption</b>	P			1.3	W	
<b>Data Rate</b>	R	-	25.8		Gb/s	
<b>Fiber Length</b>	L			10	KM	

Parameter	Symbol	Min	Typ.	Max	Unit	Note
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**Transmitter Section:**

<b>Input differential impedance</b>	Rin		100		$\Omega$	1
<b>Single-ended data input swing</b>	Vin,pp	125		450	mV	
<b>Transmit Disable Voltage</b>	VD	2		Vcc	V	
<b>Transmit Enable Voltage</b>	VEN	Vee		Vee+0.8	V	

**Receiver Section:**

<b>Single-ended data output swing</b>	Vo	185		425	mV	
<b>LOS Fault</b>	VLOS fault	2		VccHOST	V	
<b>LOS Normal</b>	VLOS norm	Vee		Vee+0.8	V	

**Notes:**

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.

**III. Optical Characteristics (TOP = 0 to 70° C, VCC = 3.135 to 3.465 Volts)**

Parameter	Symbol	Min	Typ.	Max	Unit	Note
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**Transmitter Section:**

<b>Center Wavelength</b>	$\lambda_t$	( $\lambda - 6.5$ )	( $\lambda$ )	( $\lambda + 6.5$ )	nm	1
<b>Spectral Width</b>	$\Delta\lambda$			1	nm	
<b>Average Optical Power</b>	Pavg	0		+6.0	dBm	
<b>Laser Off Power</b>	Poff			-40	dBm	
<b>Side Mode Suppression Ratio</b>		30				
<b>Extinction Ratio</b>	ER	3.5			dBm	3.5
<b>Optical Modulation Amplitude</b>	TxOMA	-4		2.5	dBm	

<b>Transmitter and Dispersion Penalty</b>	TDP				3	dB	
<b>Average Launch Power of OFF Transmitter</b>	Poff				-20	dBm	
<b>Extinction Ratio</b>	ER	3.5				dB	
<b>Optical Return Loss Tolerance</b>					20	dB	
<b>Receiver Section:</b>							
<b>Center Wavelength</b>	$\lambda_r$	1260			1370	nm	
<b>Receiver Sensitivity</b>	Sen				-14	dBm	
<b>Los Assert</b>	LOSA	-30				dBm	
<b>Los Dessert</b>	LOSD				-16	dBm	
<b>Los Hysteresis</b>	LOSH	0.5				dB	
<b>Receiver Reflectance</b>					-12	dB	

**Notes:**

1. The available transmitter center wavelengths ( $\lambda$ ) are: 1271nm, 1291nm, 1311nm, 1331nm, 1351nm and 1371nm.
2. Receiver sensitivity is informative. Shall be measured with conformance test signal for . BER =5E-5 .

**IV. Digital Diagnostic Specifications**

Parameter	Symbol	Accuracy	Units	Min	Max	Accuracy
<b>Transceiver Temperature</b>	DDDTemp	°C	0	+70	±5°C	Transceiver Temperature
<b>Transceiver Supply Voltage</b>	DDDVoltage	V	3.15	3.45	±3%	Transceiver Supply Voltage
<b>Transmitter Bias Current</b>	DDDBias	mA	0	35	±10%	Transmitter Bias Current
<b>Transmitter Output Power</b>	DDDTx-Power	dBm	-5	+5	±3dB	Transmitter Output Power
<b>Receiver Average Optical Input Power</b>	DDDRx-Power	dBm	-16	-3	±3dB	Receiver Average Optical Input Power

## V. SFP Module EEPROM Information and Management

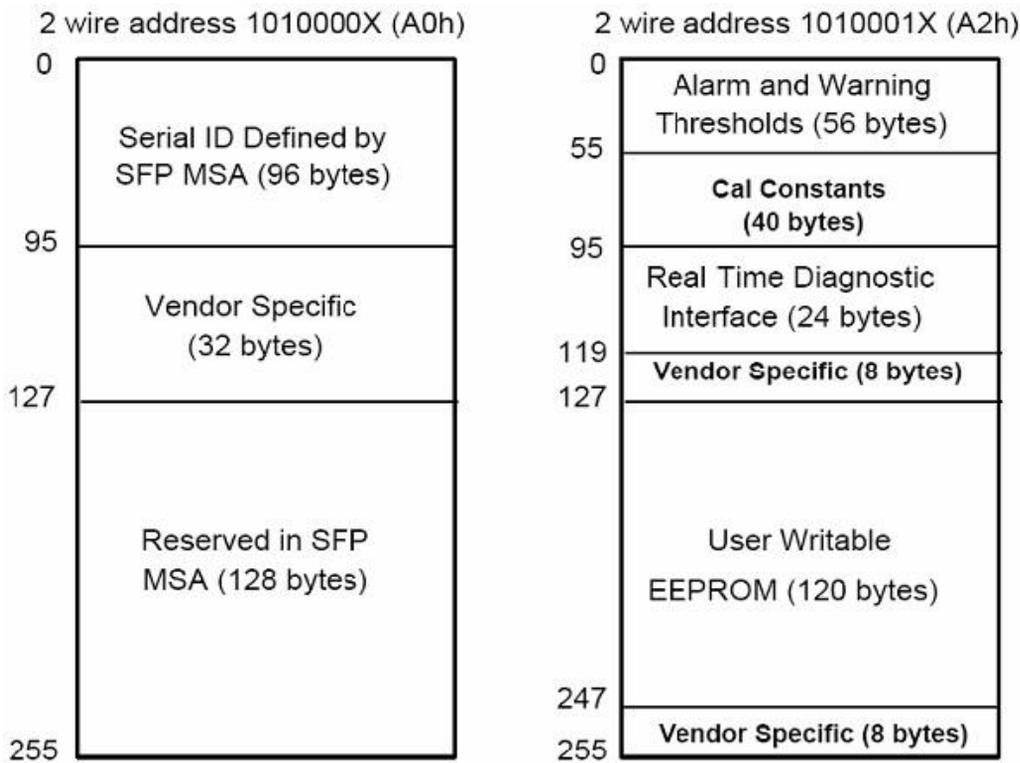
The SFP modules implement the 2-wire serial communication protocol as defined in the SFP -8472. The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h. The memory is mapped in Table 1.

Detailed ID information (A0h) is listed in Table 2.

And the DDM specification at address A2h.

For more details of the memory map and byte definitions, please refer to the SFF-8472, "Digital Diagnostic Monitoring Interface for Optical Transceivers". The DDM parameters have been internally calibrated.

Table 1 - Digital Diagnostic Memory Map (Specific Data Field Descriptions)



## VI. Regulatory Compliance

The CWDM-SFP25G-10SP complies with international Electromagnetic Compatibility (EMC) and international safety requirements and standards (see details in Table following).

<b>Electrostatic Discharge(ESD) to the Electrical Pins</b>	MIL-STD-883E Method 3015.7	Class 1(>1000 V)
<b>Electrostatic Discharge (ESD) to the Duplex LC Receptacle</b>	IEC 61000-4-2GR-1089-CORE	Compatible with standards
<b>Electromagnetic Interference (EMI)</b>	FCC Part 15 Class B EN55022 Class B (CISPR 22B)VCCI Class B	Compatible with standards
<b>Laser Eye Safety</b>	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class 1 laser product.

## VII. Pin Description

Pin	Logic	Symbol	Name/Description
1		VeeT	Module transmitter ground
2	LVTTTL-O	Tx Fault	Module transmitter fault
3	LVTTTL-I	Tx Disable	Transmitter Disable; Turns off transmitter laser output
4	LVTTTL-I/O	SDA	2 wire serial interface data line
5	LVTTTL-I	SCL	2 wire serial interface clock
6		MOD_DEF0	Module definition, grounded in the module
7	LVTTTL-I	RS0	Receiver rate select
8	LVTTTL-O	RX_LOS	Receiver loss of signal Indication active low
9	LVTTTL-I	RS1	Transmitter rate select(not used)
10		VeeR	Module receiver ground

Pin	Logic	Symbol	Name/Description
11		VeeR	Module receiver ground
12	CML-O	RD-	Receiver inverted data output
13	CML-O	RD+	Receiver data output
14		VeeR	Module receiver ground
15		VccR	Module receiver 3.3V supply
16		VccT	Module transmitter 3.3V supply
17		VeeT	Module transmitter ground
18	CML-I	TD+	Transmitter non-inverted data input
19	CML-I	TD-	Transmitter inverted data input
20		VeeT	Module transmitter ground

**Notes:**

1. The module ground pins shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host\_Vcc on the host board.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host\_Vcc on the host board.

### VIII .Pin Assignment and Description

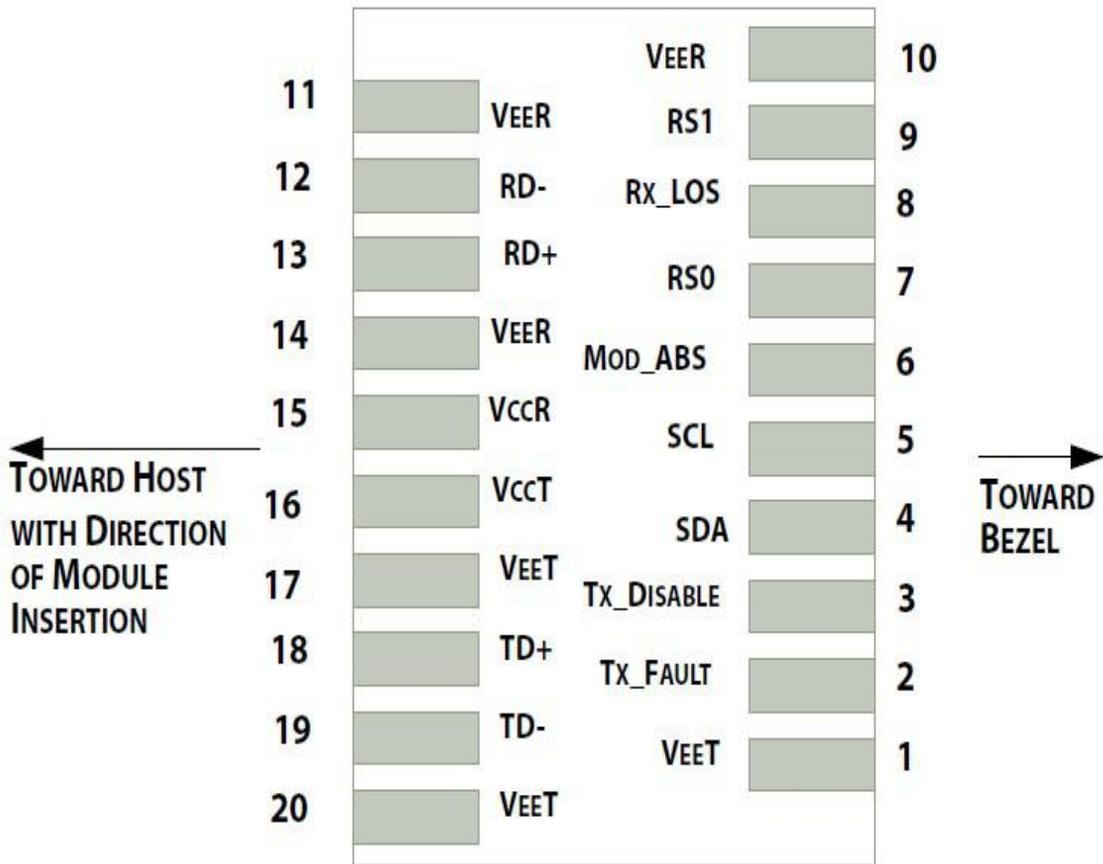
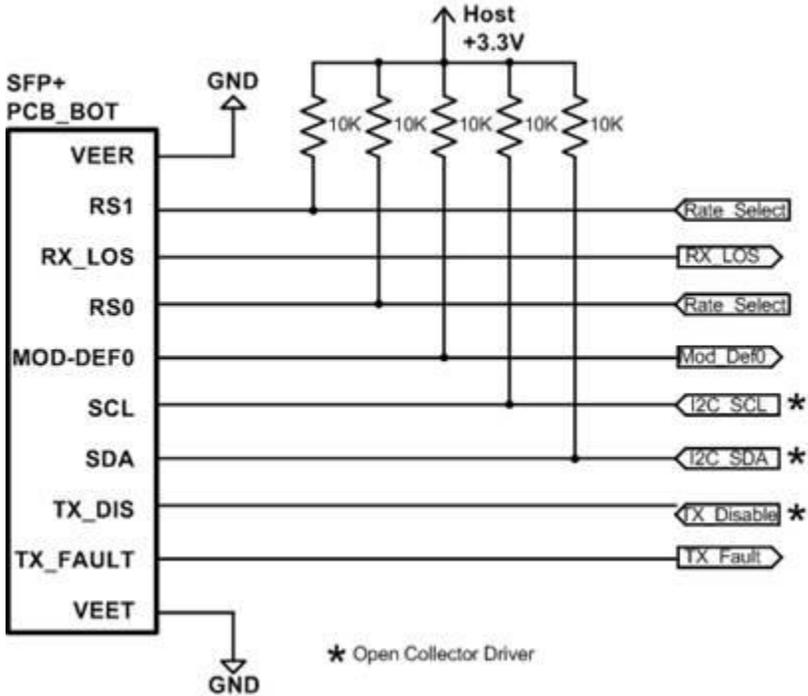
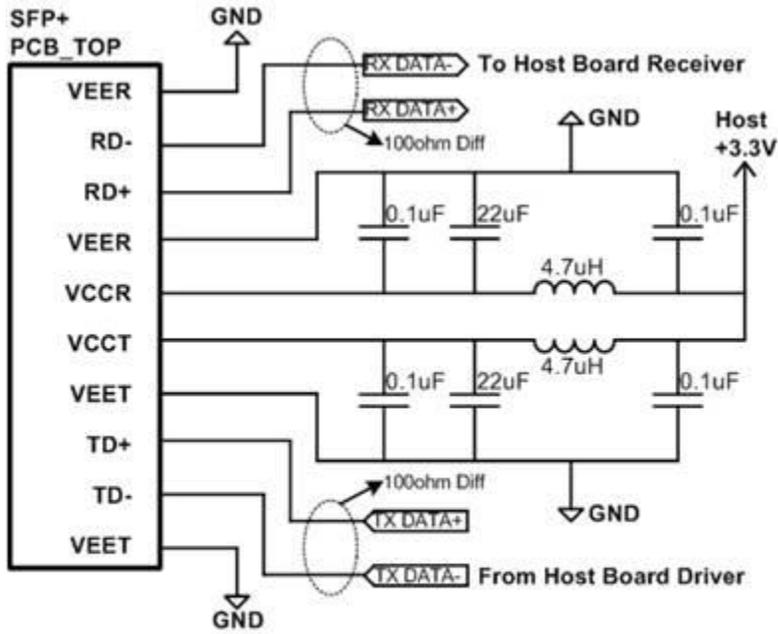


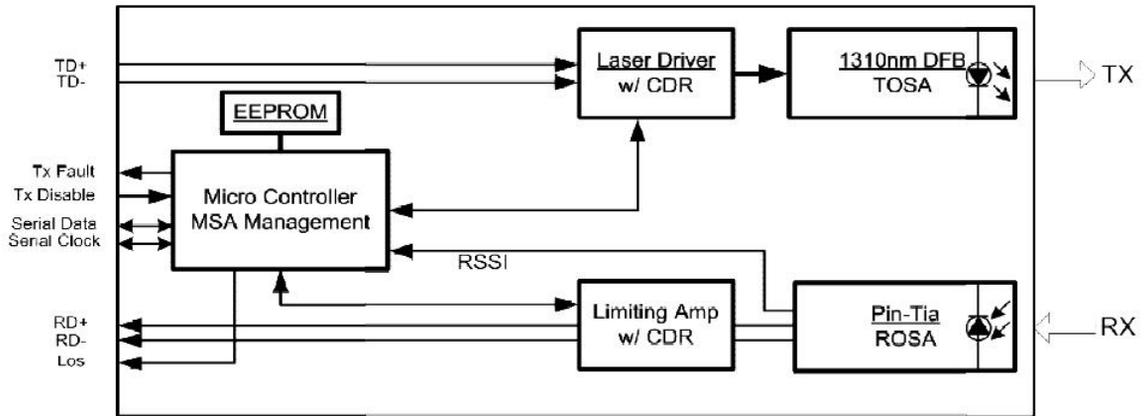
Diagram of Host Board Connector Block Pin Numbers and Names

**IX .Recommended Circuit:**

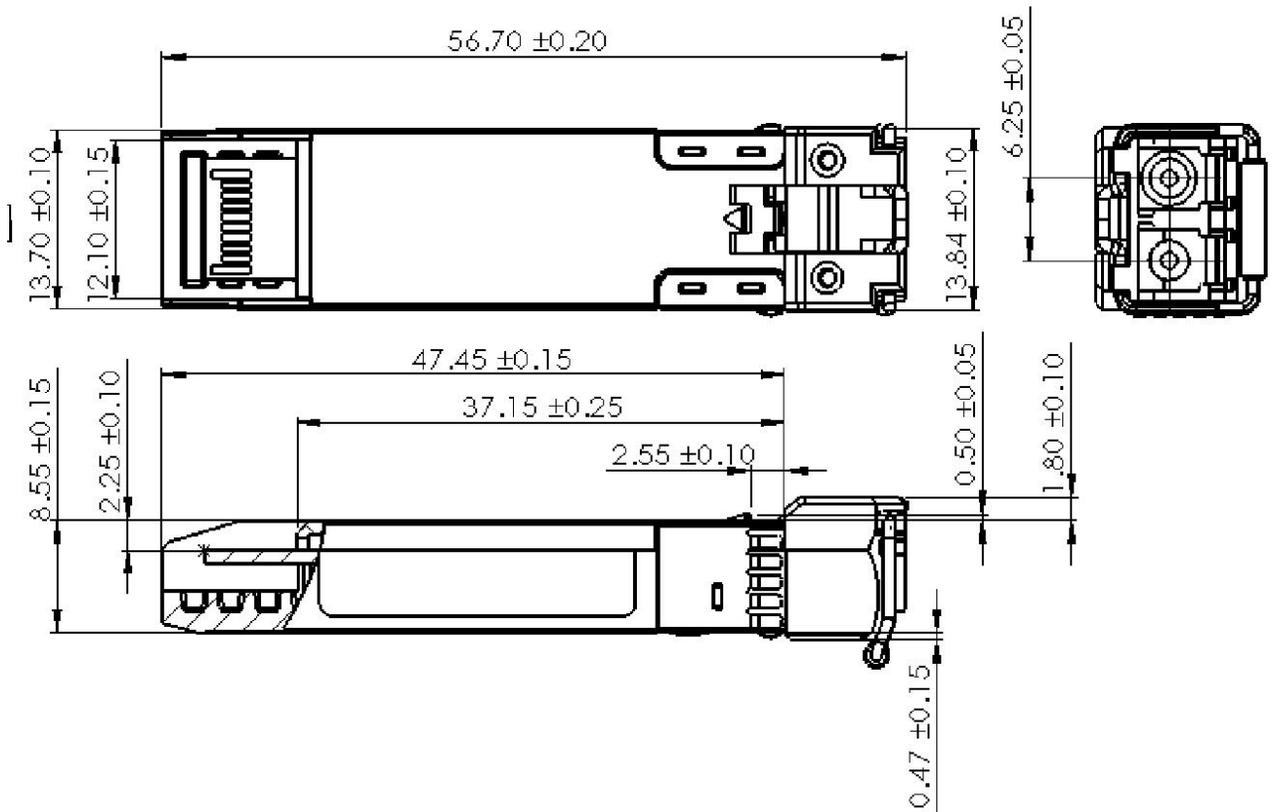


**Recommended High-speed Interface Circuit**

### X. Transceiver Block Diagram



### XI. Mechanical Dimensions



## Test Center

FS.COM transceivers are tested to ensure connectivity and compatibility in our test center before shipped out. FS.COM test center is supported by a variety of mainstream original brand switches and groups of professional staff, helping our customers make the most efficient use of our products in their systems, network designs and deployments.

The original switches could be found nowhere but at FS.COM test center, eg: Juniper MX960 & EX 4300 series, Cisco Nexus 9396PX & Cisco ASR 9000 Series, HP 5900 Series & HP 5406R ZL2 V3(J9996A), Arista 7050S-64, Brocade ICX7750-26Q & ICX6610-48, Avaya VSP 7000 MDA 2, etc.



Cisco ASR 9000 Series(A9K-MPA-1X40GE)



ARISTA 7050S-64(DCS-7050S-64)



Juniper MX960



Brocade ICX 7750-26Q



Extreme Networks X670V VIM-40G4X



Mellanox M3601Q



Dell N4032F



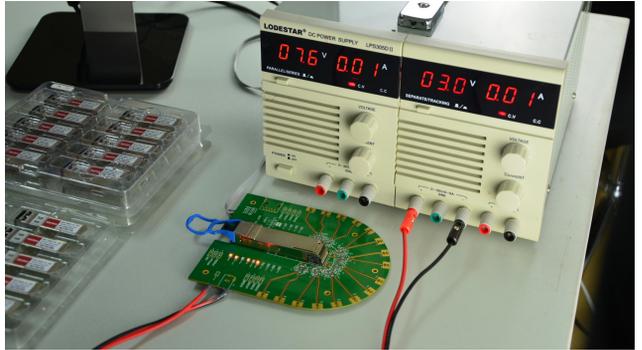
HP 5406R ZL2 V3(J9996A)



AVAYA 7024XLS(7002QQ-MDA)

## Test Assured Program

FS.COM truly understands the value of compatibility and interoperability to each optics. Every module FS.COM provides must run through programming and an extensive series of platform diagnostic tests to prove its performance and compatibility. In our test center, we care of every detail from staff to facilities—professionally trained staff, advanced test facilities and comprehensive original-brand switches, to ensure our customers to receive the optics with superior quality.



Our smart data system allows effective product management and quality control according to the unique serial number, properly tracking the order, shipment and every part.

Our in-house coding facility programs all of our parts to standard OEM specs for compatibility on all major vendors and systems such as Cisco, Juniper, Brocade, HP, Dell, Arista and so on.



With a comprehensive line of original-brand switches, we can recreate an environment and test each optics in practical application to ensure quality and distance.

The last test assured step to ensure our products to be shipped with perfect package.



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