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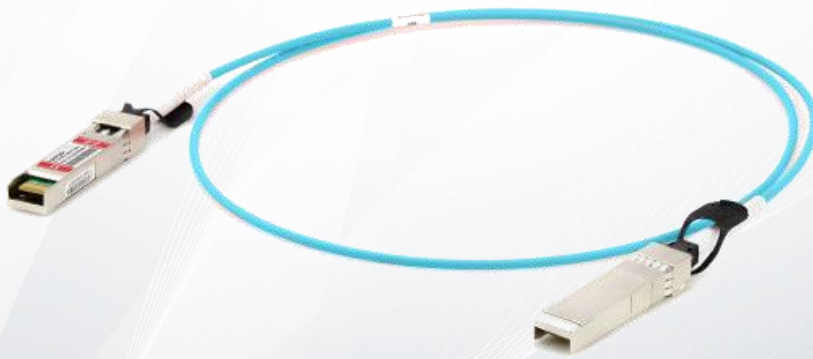# 25G SFP28 Active Optical Cable (AOC)

Application

- 25G Ethernet
- High capacity IO with SFP28 interface
- Data center and in-rack connection

Features

- SFF-8432 Mechanical MSA
- 25G 850nm VCSEL transmitter
- 25G PIN photo-detector
- Pre-terminated fiber cable
- Up to 70m/100m by active optical cable with OM3/OM4 fiber
- Single 3.3V power supply

- 2-wire interface for management specifications compliant with SFF 8472 digital diagnostic monitoring interface for optical transceivers
- Operating environment temperature: 0 to 70℃
- RoHS compliant

- SFP28 housing with enhanced EMI shielding
- 25G electrical interface (OIF CEI-28G-VSR)
- Maximum power consumption 1.0W each terminal

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Power Supply Voltage	V_{CC}	0		3.6	V	
Storage Temperature	Ts	40		85	℃	
Operating Case Temperature	T_C	0		70	℃	
Relative Humidity	RH	5		95	%	

II. Recommended Operating Environment

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Operating Case Temperature	T_C	0	25	70	℃	
Data Rate, each Lane			25.78125		Gb/s	
Data Rate Accuracy		-100		100	ppm	
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Fiber Bend Radius	Rbend	3			cm	

III. Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Transmitter						
Power Consumption				1.0	W	1

Supply Current	Icc			300	mA	1
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (Vcm)	TP1	-350		2850	mV	2
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
Differential Return Loss (SDD11)	TP1			See CEI- 28G VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1			See CEI-28G VSR Equation 13-20	dB	
Stressed Input Test	TP1a			See CEI-28G-VSR Section 13.3.11.2.1		

Receiver

Differential Voltage, pk-pk	TP4			900	mV	
Common Mode Voltage (Vcm)	TP4	-350		2850	mV	2
Common Mode Noise, RMS	TP4			17.5	mV	At 1MHz
Differential Termination Resistance	TP4			10	%	
Differential Return Loss (SDD22)	TP4			See CEI-28G VSR Equation 13-	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC22, SCD22)	TP4			See CEI-28G VSR Equation 13-19	dB	
Common Mode Return Loss (SCC22)	TP4			-2	dB	3
Transition Time, 20 to 80%	TP4	9.5			Ps	
Vertical Eye Closure (VEC)	TP4			5.5	dB	
Eye Width at 10^{-15} probability (EW15)	TP4	0.57			UI	
Eye Height at 10^{-15} probability (EH15)	TP4	228			mV	

Notes:

1. Per terminal.

2. Vcm is generated by the host. Specification includes effects of ground offset voltage.
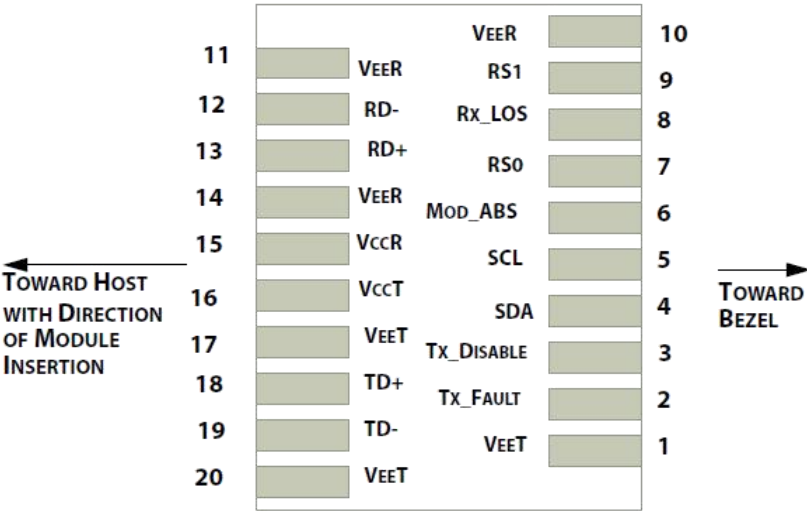
3. From 250MHz to 30GHz .
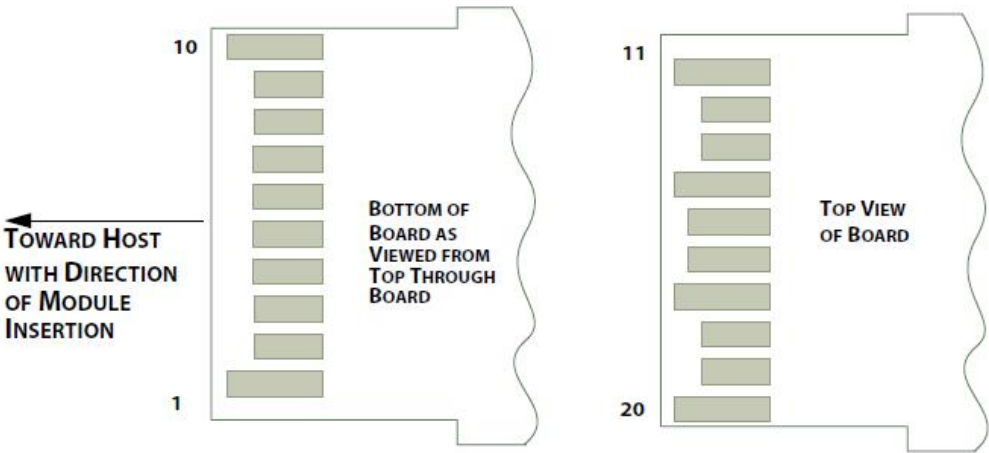
IV. Pin Assignment

Figure 1 –Interface to Host

Figure 2 – Contact Assignment

Pin	Logic	Symbol	Description	Notes
1		VeeT	Module Transmitter Ground	1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	
3	LVTTL-I	TX_Dis	Transmitter Disable; Turns off transmitter laser output	
4	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
5	LVTTL-I	SCL	2-Wire Serial Interface Clock	2
6		MOD-DEF0	Module Definition, Grounded in the module	
7	LVTTL-I	RS0	No connection required	
8	LVTTL-O	RX-LOS	Receiver Loss of Signal Indication. Logic 0 indicates normal operation	
9	LVTTL-I	RS1	No connection required	
10		VeeR	Module Receiver Ground	1
11		VeeR	Module Receiver Ground	1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Data Output	
14		VeeR	Module Receiver Ground	1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Receiver 3.3 V Supply	
17		VeeT	Module Transmitter Ground	1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	1

Notes:

1. Module ground pins GND are isolated from the module case.

2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

V. Diagram Mechanical Drawing

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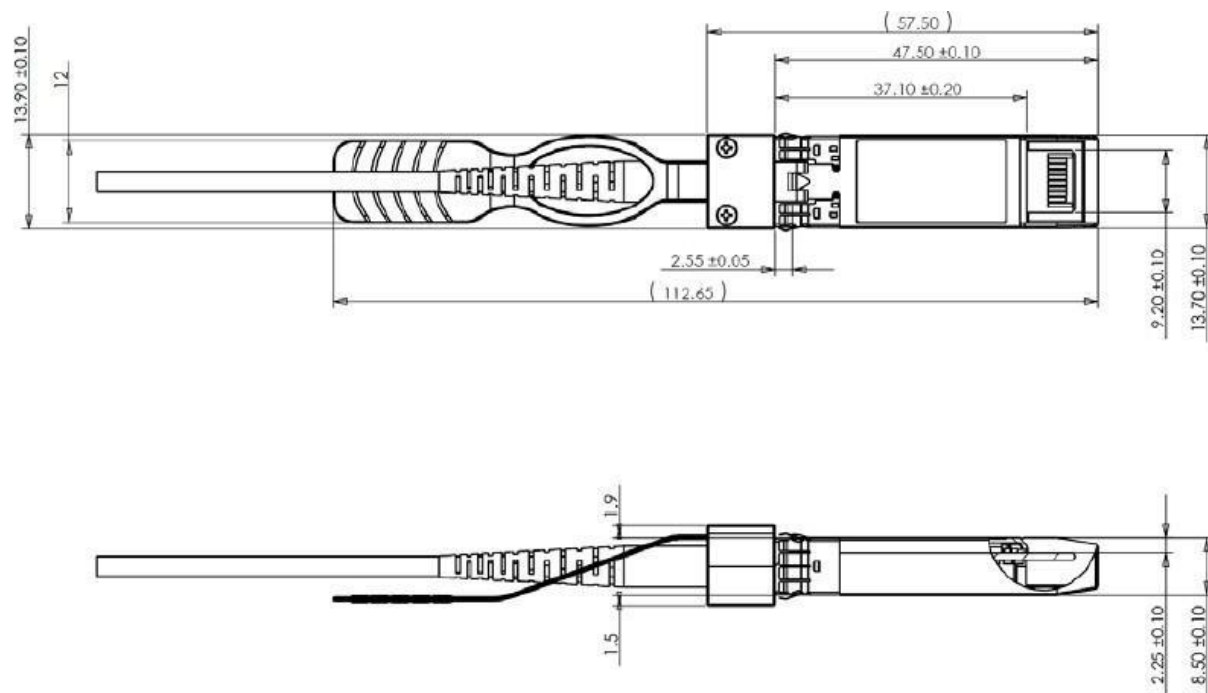
Test Center

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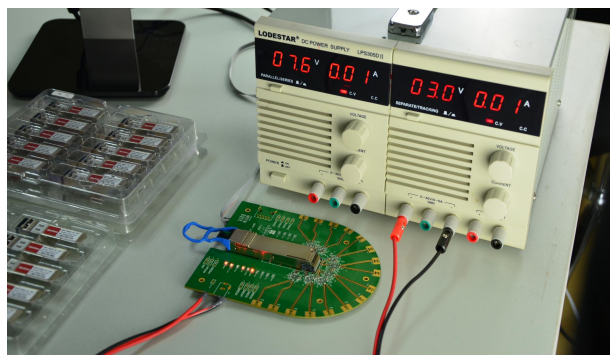
Our in-house coding facility programs all of our parts to standard OEM specs for compatibility on all major vendors and systems such as Cisco, Juniper, Brocade, HP, Dell, Arista and so on.

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.

Order Information

Part Number	Data Rate	Length	Wire Gauge	Connector Type	Temp.Range	Cable Jacket
S28-AO01	Up to 25G	1m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO03	Up to 25G	3m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO05	Up to 25G	5m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO07	Up to 25G	7m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO10	Up to 25G	10m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO15	Up to 25G	15m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO20	Up to 25G	20m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO25	Up to 25G	25m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP
S28-AO30	Up to 25G	30m	SFP28 to SFP28	AOC Cable	0-70℃	OFNP

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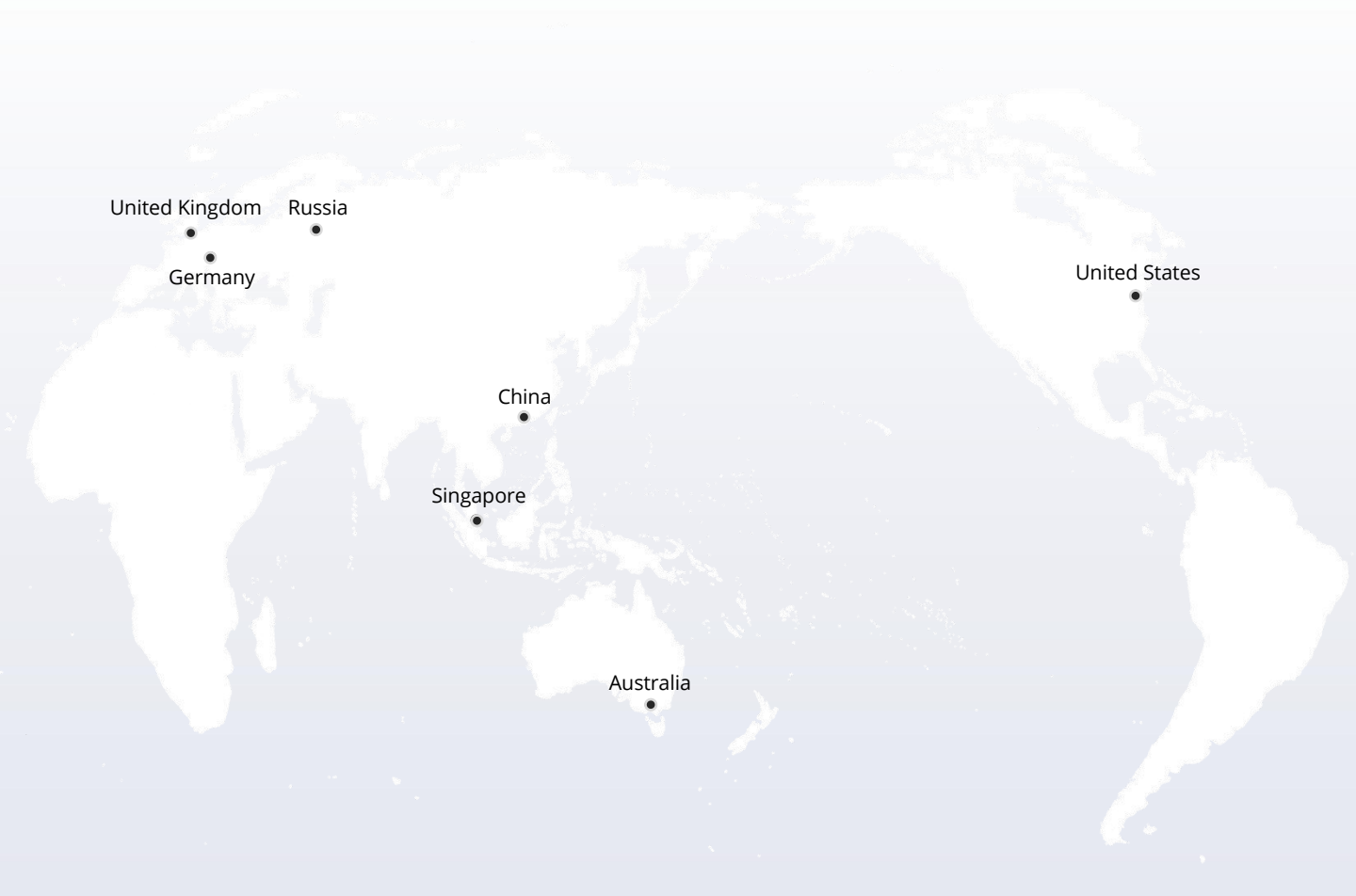
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