Product Specification

25G SFP28 to 25G SFP28 Active Optical Cable

PN: S25-S25-A

Features

- Hot Pluggable SFP28 form factor
- Available length range 1~100m
- Active Optical Cable
- Operating data rate 25.78Gbps
- Single +3.3V power supply
- Max power dissipation <0.8 W
- Small diameter cable design
- Built-in digital diagnostic function
- Commercial temperature range 0°C to 70°C

Compliance

- SFP28 MSA
- Compliant with SFP28 Electrical MSA SFF-8431
- Compliant with SFP28 Mechanical MSA SFF-8432
- SFF-8472
- RoHS

Applications

- 1/2/4/8G Fibre Channel
- 25G Gigabit Ethernet
- 25 GbE high performance computer clusters
- Data center and in-rack connection
- High capacity IO with SFP28 interface

Description

The 25G-SFP-A is an SFP28 Active Optical Cable (AOC) module designed for high-speed 25Gbps connectivity in data centers, enterprise networks, and cloud infrastructure. Featuring integrated multimode fiber and low-power optics, it supports link lengths up to 100m with a power consumption of <0.8W, complying with SFP28 MSA and IEEE 802.3by standards. This hot-swappable solution offers plug-and-play compatibility with 25GBase-SR interfaces, delivering superior EMI resistance and flexibility over copper DACs. Its lightweight, bend-optimized cable simplifies rack cabling and minimizes signal degradation in high-density environments.

Equipped with DDM/DOM diagnostics for real-time monitoring, the module ensures BER <1E-12 and stable performance across 0–70°C operating ranges. Ideal for server-storage interconnects, top-of-rack switching, and 5G fronthaul networks, the 25G-SFP-A bridges cost-effective scalability with backward compatibility for 10G/25G hybrid infrastructures. Ruggedized connectors and error-free transmission make it a robust choice for latency-sensitive applications like AI edge computing and virtualization platforms.

Product performance Specifications

1、Product Basic Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Storage Temperature	T_S	-40	-	85	°C
Supply Voltage	V_{CC}	3.135	3.3	3.47	V
Relative Humidity	RH	0		85	%
Operating Case Temperature	T_C	0	25	70	°C
Power Dissipation	I_{CC}			300	mA
Data Rate Per Lane		1	25.78		Gbp/s
Power Dissipation	PD			0.8	W
Transmission Distance		1		100	m

2、Product Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Transmitter						
Center Wavelength	λC	840	850	860	nm	
Laser Off Power	Poff	840	-	-30	dBm	
Average Optical Power	Pavg	-8.4	-	2.4	dBm	

Extinction Ratio	ER	2	-	-	dB	
Differential input impedance		Ω		10		
				0		
Tx Input Diff Voltage	VI	100		900		
Optical Return Loss Tolerance	VoL	Vee		0.8	V	
	VoH	2		VCC	V	
Average Optical Power	VIL	Vee		0.8	V	
	VIH	2		Vcc	V	
Receiver						
Center Wavelength	λr	840	850	860	nm	
Bit Error Rate	Ber			1E-1		
				2		
Overload	Pin	2.4			dBm	
Differential output impedance				10	Ω	
				0		
Rx Output Diff Voltage	Vo	400		800	mV	
Rx_LOS	VoL	Vee		0.8	V	
	VoH	2		Vcc	uA	
RS0,RS1	VIL	Vee		0.8	V	
	VIH	2		Vcc	V	

Recommended Host Board Power Supply Circuit

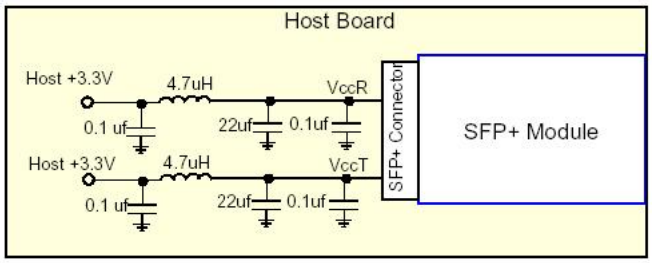


Figure 1: Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

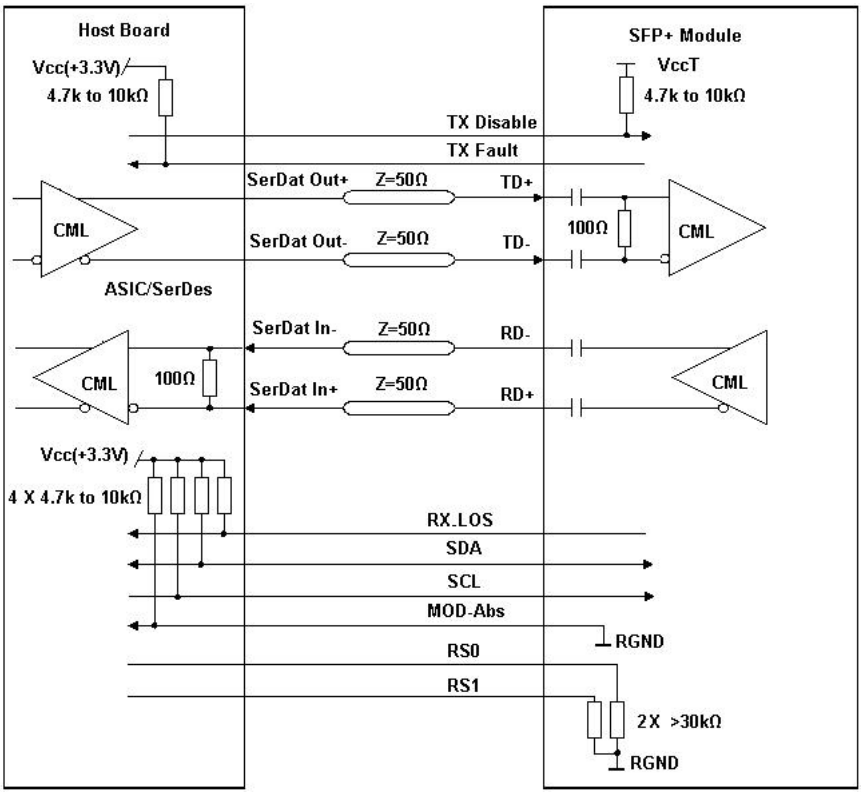


Figure2: Recommended Interface Circuit

Pin-out Definition

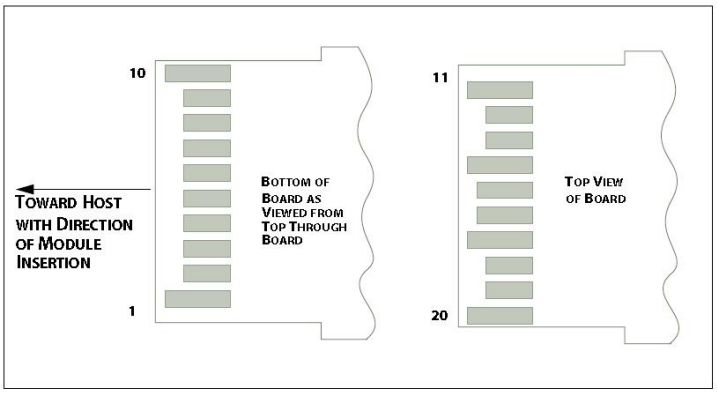


Figure3: Pin view

Pin Function Definitions

Pin	Logic	Symbol	Description
1		$VeeT_1$	Module Transmitter Ground
2	LVTTL-O	TX_Fault_2	Module Transmitter Fault
3	LVTTL-I	$TX\_Disable_3$	Transmitter Disable; Turns off transmitter laser output
4	LVTTL-I/O	SDA4	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)
5	LVTTL-I/O	SCL4	2-wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)
6		MOD_ABS5	Module Absent, connected to VeeT or VeeR in the module
7	LVTTL-I	RS06	Adaptive multi-rate operation
8	LVTTL-O	RX_LOS_2	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)
9	LVTTL-I	RS16	Adaptive multi-rate operation
10		$VeeR_1$	Module Receiver Ground
11		$VeeR_1$	Module Receiver Ground
12	CML-O	RD-	Receiver Inverted Data Output
13	CML-O	RD+	Receiver Non-Inverted Data Output
14		$VeeR_1$	Module Receiver Ground
15		VccR	Module Receiver 3.3 V Supply
16		VccT	Module Transmitter 3.3 V Supply
17		$VeeT_1$	Module Transmitter Ground

18	CML-I	TD+	Transmitter Non-Inverted Data Input
19	CML-I	TD-	Transmitter Inverted Data Input
20		VeeT[1]	Module Transmitter Ground

Note1: The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.

Note2: This pin is an open collector/drain output pin and shall be pulled up with 4.7kΩ-10kΩ to Host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5V.

Note3: This pin is an open collector/drain input pin and shall be pulled up with 4.7kΩ-10kΩ to VccT in the module.

Note4: See SFF-8431 4.2 2-wire Electrical Specifications.

Note5: This pin shall be pulled up with 4.7kΩ-10kΩ to Host_Vcc on the host board.

Note6: Connect with 30kΩ load pulled down to GND in the module.

Monitoring Specification

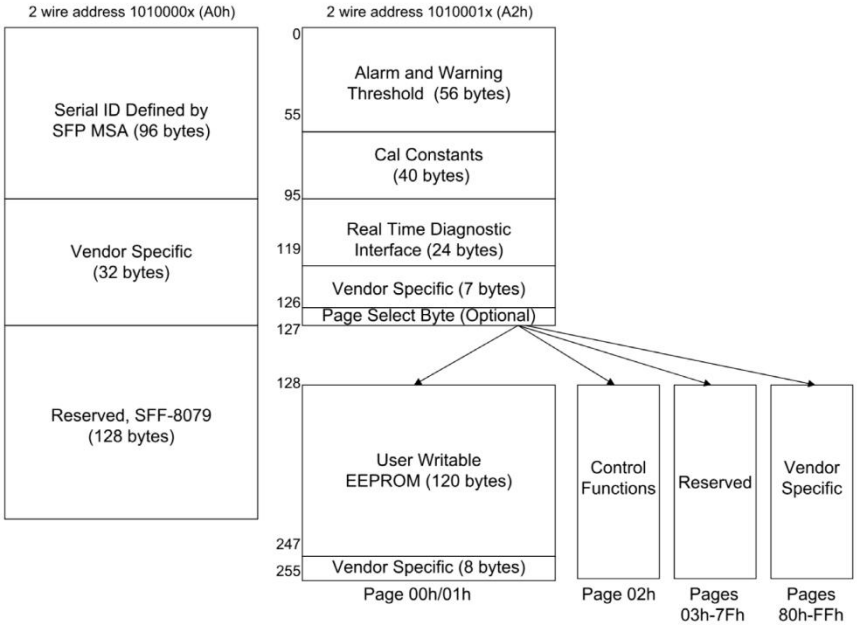


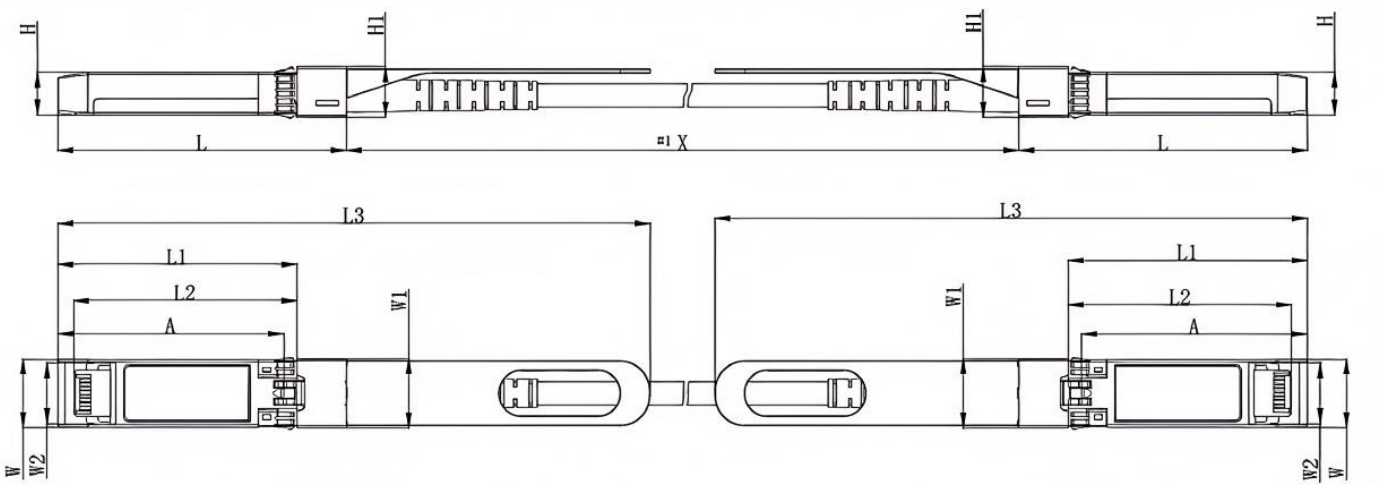
Figure4: Memory map

Memory map table

Byte	Unit	Name	Description
A0h ID Fields			
0	1	Identifier	Type of transceiver
1	1	Ext. Identifier	Extended identifier of type of transceiver
2	1	Connector	Code for connector type

3-10	8	Transceiver	Code for electronic or optical compatibility
11	1	Encoding	Code for high speed serial encoding algorithm
12	1	Signaling Rate, Nominal	Nominal signaling rate, units of 100 MBd.
13	1	Rate Identifier	Type of rate select functionality
14	1	Length (SMF,km) or Copper Cable Attenuation	Link length supported for single-mode fiber, units of km, or copper cable attenuation in dB at 12.9 GHz
15	1	Length (SMF) or Copper Cable Attenuation	Link length supported for single-mode fiber, units of 100 m, or copper cable attenuation in dB at 25.78 GHz
16	1	Length (50 um, OM2)	Link length supported for 50 um OM2 fiber, units of 10 m
17	1	Length (62.5 um, OM1)	Link length supported for 62.5 um OM1 fiber, units of 10 m
18	1	Length (OM4 or copper cable)	Link length supported for 50um OM4 fiber, units of 10 m. Alternatively, copper or direct attach cable, units of m
19	1	Length (OM3) or Cable length, additional	Link length supported for 50 um OM3 fiber, units of 10 m. Alternatively, copper or direct attach cable multiplier and base value
20-35	16	Vendor name	SFP vendor name (ASCII)
36	1	Transceiver	Code for electronic or optical compatibility
37-39	3	Vendor OUI	SFP vendor IEEE company ID
40-55	16	Vendor PN	Part number provided by SFP vendor (ASCII)
56-59	4	Vendor rev	Revision level for part number provided by vendor (ASCII)
60-61	2	Wavelength	Laser wavelength (Passive/Active Cable Specification Compliance)
62	1	Fibre Channel Speed 2	Transceiver's Fibre Channel speed capabilities
63	1	CC_BASE	Check code for Base ID Fields (addresses 0 to 62)
64-65	2	Options	Indicates which optional transceiver signals are implemented
66	1	Signaling Rate, max	Upper signaling rate margin, units of %
67	1	Signaling Rate, min	Lower signaling rate margin, units of %
68-83	16	Vendor SN	Serial number provided by vendor (ASCII)
84-91	8	Date code	Vendor's manufacturing date code
92	1	Diagnostic Monitoring Type	Indicates which type of diagnostic monitoring is implemented (if any) in the transceiver
93	1	Enhanced Options	Indicates which optional enhanced features are implemented (if any) in the transceiver
94	1	SFF-8472 Compliance	Indicates which revision of SFF-8472 the transceiver complies with.
95	1	CC_EXT	Check code for the Extended ID Fields (addresses 64 to 94)
96-127	32	Vendor Specific	Vendor Specific EEPROM
128-255	128	Reserved	Reserved (was assigned to SFF-8079)

Mechanical Dimension



Note:

- Diameter: 3mm
- Minimum bend radius:30mm
- Cable color:Orange(OM2),Aqua(OM3),Magenta(OM4)
- When L≤1m, the tolerance is +5cm
- When 1m≤L≤4.5m, the tolerance is +15cm
- When 5m≤L≤14.5m, the tolerance is +30cm
- When L≥15m, the tolerance is +2%m

Waring:

- The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles.It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.
- 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.