

Product Specification

25GBASE-SR SFP28 850nm 100m DOM Duplex
LC/UPC Optical Transceiver Module

PN: SFP-25G-SR



Features

- Hot Pluggable SFP28 form factor
- Operating data rate 25.78Gbps
- Single +3.3V power supply
- Duplex LC-UPC connector
- Max power dissipation <1.0W
- Up to 70m transmission distance on OM3 MMF
- Up to 100m transmission distance on OM4 MMF
- 850nm VCSEL laser
- PIN receivers
- 25GAUI C2M Electrical Interface
- Built-in CDR
- Built-in digital diagnostic function
- Commercial temperature range 0°C to 70°C

Compliance

- SFP MSA
- Compliant with SFP+ Electrical MSA SFF-8431
- Compliant with SFP+ Mechanical MSA SFF-8432
- SFF-8472
- IEEE 802.3ae
- RoHS

Applications

- Switches with SFP+ ports
- Router with SFP+ Ports
- Server or Network Adapter Card
- Optical Transmission System
- Other devices with SFP+ Ports

Description

The SFP-25G-SR is a high-performance, multi-mode optical transceiver module designed for 25 Gigabit Ethernet applications. It supports data rates of up to 25.78 Gbps and is optimized for short-reach communication, with a maximum transmission distance of up to 100 meters on OM4 multi-mode fiber (MMF) and 70 meters on OM3 MMF. This SFP28 module operates at a wavelength of 850nm, making it ideal for high-speed data center interconnects, enterprise networks, and other short-distance applications. Its duplex LC interface ensures easy integration into existing network setups, providing reliable and efficient data transmission.

The SFP-25G-SR is fully compliant with industry standards, including SFF-8472, SFF-8431, and SFF-8432, ensuring interoperability with a wide range of networking equipment. It features advanced digital diagnostics monitoring (DDM) capabilities, accessible via a 2-wire serial interface, enabling real-time monitoring of key parameters such as temperature, voltage, and optical power. With low power consumption and a compact SFP28 form factor, the SFP-25G-SR is a cost-effective and energy-efficient solution for high-speed networking needs. Its robust design and compliance with environmental standards make it a dependable choice for modern network operators seeking to enhance their infrastructure with reliable, high-performance connectivity.

Product performance Specifications

1、 Basic Product Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Storage Temperature	T _s	-40	-	+85	°C
Supply Voltage	V _{cc}	0	-	3.6	V
Relative Humidity	RH	5	-	85	%
Operating Case Temperature	T _c	0	-	70	°C
Power Supply Voltage	V _{cc}	3.135	3.3	3.47	V
Power Supply Current	I _{cc}			288	mA
Power Dissipation	PD	-	-	1000	mW
Data Rate			25.78125		Gbps
Transmission Distance(OM4)	-		-	100	m

2、Product Optical and Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Transmitter					
Center Wavelength	λ_C	840	850	860	nm
RMS Spectral Width	σ			0.6	nm
Optical Power for TX DISABLE	P_{OFF}			-30	dBm
Output average power	P_{AVG}	-8.4		2.4	dBm
Optical Modulation Amplitude	OMA	-6.4		3	dBm
Extinction Ratio	ER	2			dB
Relative Intensity Noise	RIN			-128	dB/Hz
Optical Return Loss Tolerance	ORL			12	dB
Transmitter Dispersion Penalty	TDP			4.3	dB
Optical Eye Mask		5			%
Tx Input Diff Voltage	V_I	180		700	mV
Tx Fault	V_{oL}	-0.3		0.4	V
	I_{oH}	-50		37.5	uA
Tx_Disable	V_{IL}	-0.3		0.8	V
	V_{IH}	2		$V_{CC}+0.3$	V
Receiver					
Center Wavelength	λ_C	840	850	860	nm
Receiver Sensitivity ₁	R_{sens}			-10	dBm
Los Assert	$LosA$	-30			dBm
Los Dessert	$LosD$			-13	dBm
Los Hysteresis	$LosH$	0.5			dB
Overload	P_{in}	2.4			dBm
Receiver Reflectance				-6	dB
Operating Data Rate			10.3125		Gbps
Rx Output Diff Voltage	V_o	300		900	mV
Rx_LOS ₂	V_{oL}	-0.3		0.4	V
	I_{oH}	-50		37.5	uA
RS0 and RS1	V_{IL}	-0.3		0.8	V
	V_{IH}	2		$V_{CC}+0.3$	V

Note1:Receiver sensitivity is informative. shall be measured with conformance test signal for BER=1x10⁻⁵.

Note2:Measured with a 4.7 kΩ load pulled up to V_{CC} .

Recommended Host Board Power Supply Circuit

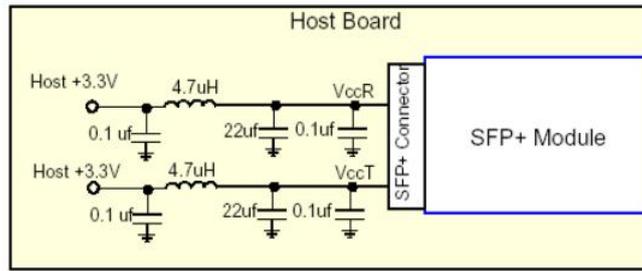


Figure 1: Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

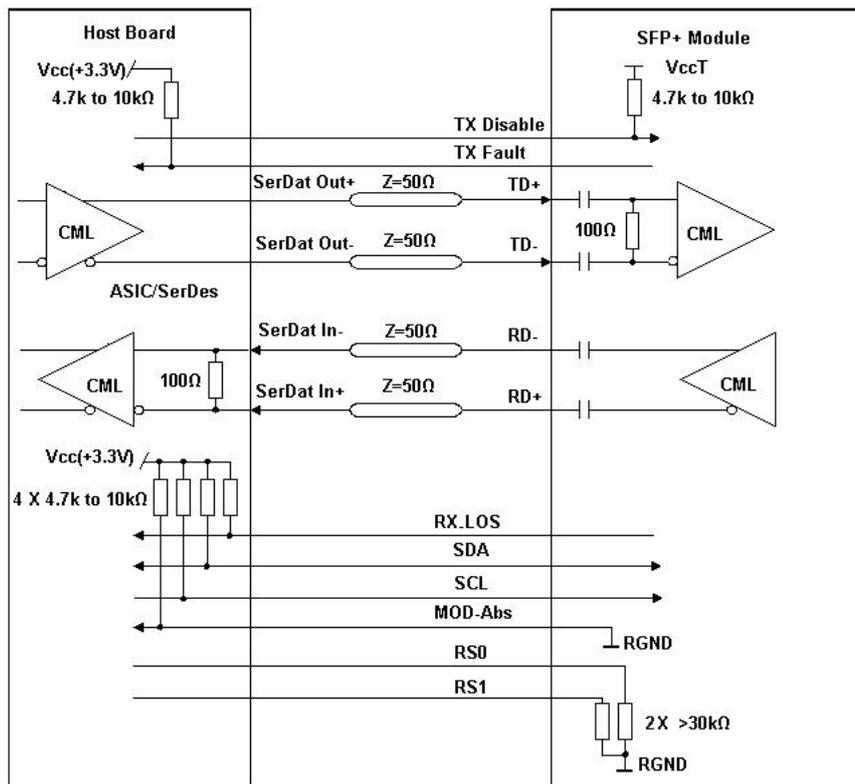


Figure2: Recommended Interface Circuit

Pin-out Definition

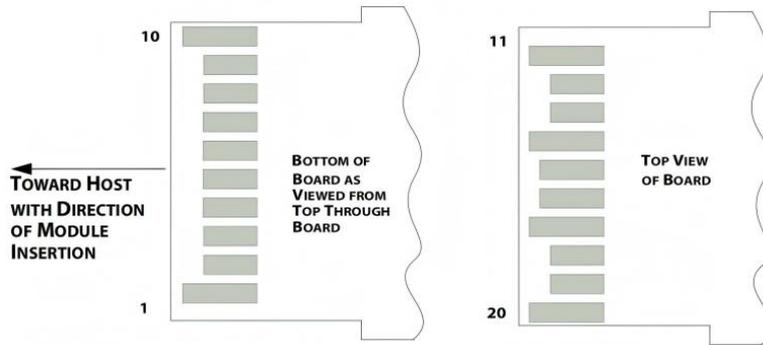


Figure3:Pin view

Pin Function Definitions

Pin	Logic	Symbol	Description	Note
1		VeeT	Module Transmitter Ground	1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	2
3	LVTTL-I	TX_Disable	Transmitter Disable; Turns off transmitter laser output	3
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	4
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)	4
6		MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	5
7	LVTTL-I	RS0	Adaptive multi-rate operation	6
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)	2
9	LVTTL-I	RS1	Adaptive multi-rate operation	6
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 Non-Inverted Data Output	
14		VeeR	Module Receiver Ground	1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Transmitter 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

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.

Monitoring Specification

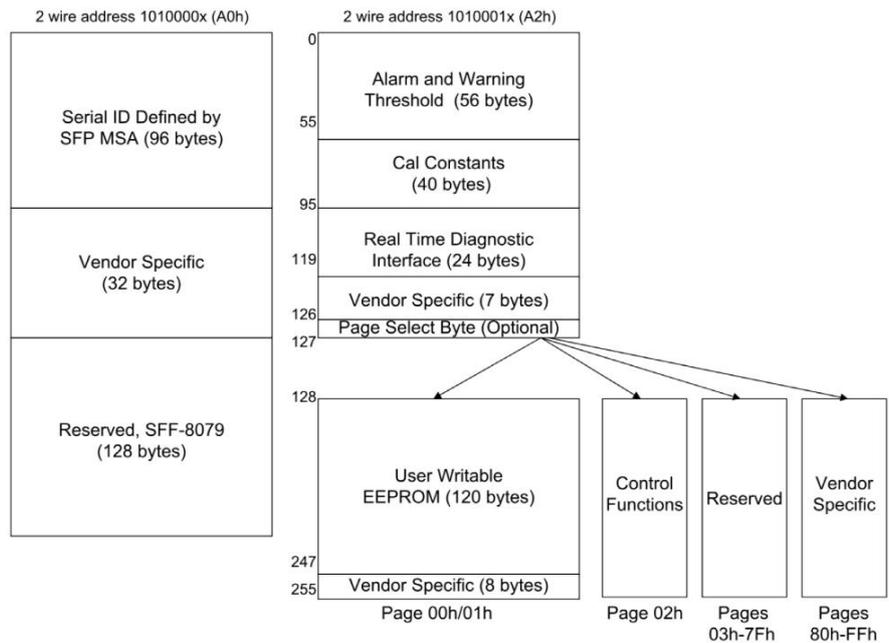


Figure4:Memory map

Memory map Table

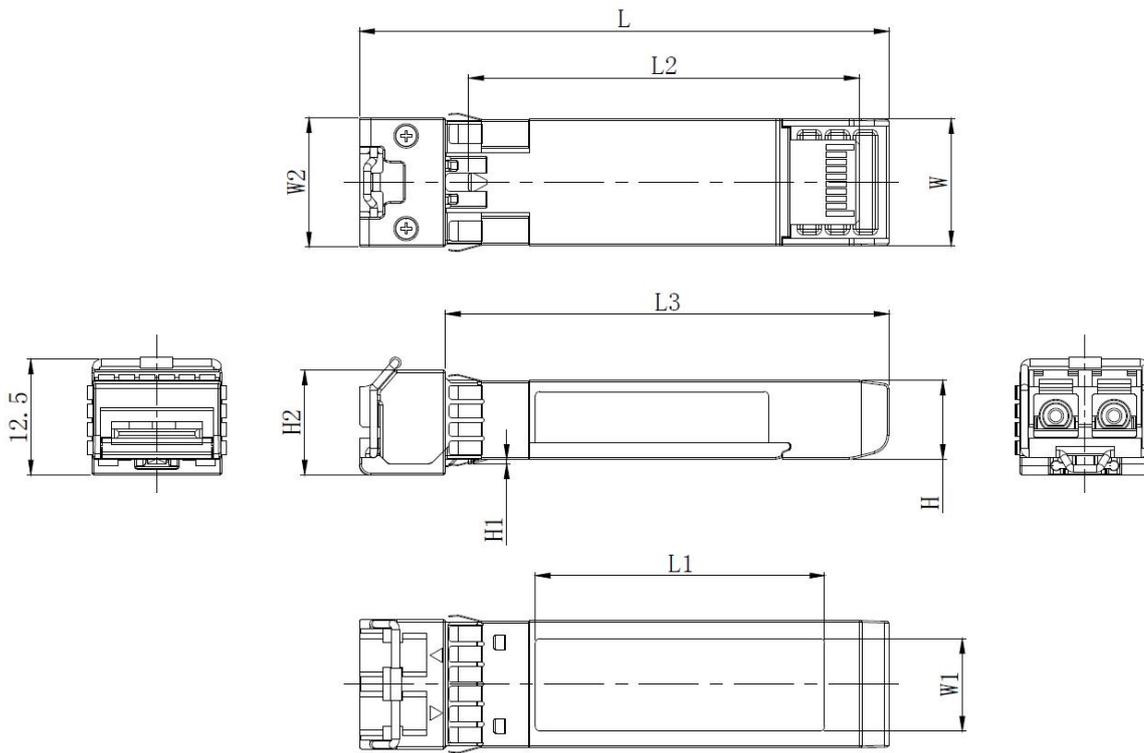
A0h	Bytes	Name	Description
A0h ID Fields			
0	1	Identifier	Type of transceiver
1	1	Ext. Identifier	Extended identifier of type of transceiver
2	1	Connector	Code for connector type
3-10	8	Transceiver	Code for electronic or optical compatibility
11	1	Encoding	Code for high speed serial encoding algorithm
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)
A2h ID Fields			
00-01	2	Temp High Alarm	MSB at low address
02-03	2	Temp Low Alarm	MSB at low address
04-05	2	Temp High Warning	MSB at low address
06-07	2	Temp Low Warning	MSB at low address
08-09	2	Voltage High Alarm	MSB at low address
10-11	2	Voltage Low Alarm	MSB at low address
12-13	2	Voltage High Warning	MSB at low address
14-15	2	Voltage Low Warning	MSB at low address
16-17	2	Bias High Alarm	MSB at low address
18-19	2	Bias Low Alarm	MSB at low address

20-21	2	Bias High Warning	MSB at low address
22-23	2	Bias Low Warning	MSB at low address
24-25	2	TX Power High Alarm	MSB at low address
26-27	2	TX Power Low Alarm	MSB at low address
28-29	2	TX Power High Warning	MSB at low address
30-31	2	TX Power Low Warning	MSB at low address
32-33	2	RX Power High Alarm	MSB at low address
34-35	2	RX Power Low Alarm	MSB at low address
36-37	2	RX Power High Warning	MSB at low address
38-39	2	RX Power Low Warning	MSB at low address
40-41	2	Optional Laser Temp High Alarm	MSB at low address
42-43	2	Optional Laser Temp Low Alarm	MSB at low address
44-45	2	Optional Laser Temp High Warning	MSB at low address
46-47	2	Optional Laser Temp Low Warning	MSB at low address
48-49	2	Optional TEC Current High Alarm	MSB at low address
50-51	2	Optional TEC Current Low Alarm	MSB at low address
52-53	2	Optional TEC Current High Warning	MSB at low address
54-55	2	Optional TEC Current Low Warning	MSB at low address
56-91	36	Ext Cal Constants or Additional Enhanced Features	Diagnostic calibration constants for optional External Calibration if External Calibration bit, A0h, byte 92, bit 4 is 1 Additional Enhanced Features advertisement, control and status if External Calibration bit, A0h, byte 92, bit 4 is 0
92-94	3	Reserved	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)
106-109	4	Optional Diagnostics	Monitor Data for Optional Laser temperature and TEC current
110	1	Status/Control	Optional Status and Control Bits
111	1	Reserved	Reserved (was assigned to SFF-8079)
112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits
114	1	Tx Input EQ control	Tx Input equalization level control
115	1	Rx Out Emphasis control	Rx Output emphasis level control
116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits
118-119	2	Ext Status/Control	Extended module control and status bytes
120-126	7	Vendor Specific	Vendor specific memory addresses
127	1	Table Select	Optional Page Select
A2h Page 00-01h			
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses
A2h Page 02h			

128-129	2	Reserved	Reserved for SFF-8690 (Tunable Transmitter)
130	1	Reserved	Reserved for future receiver controls
131	1	Rx Decision Threshold	RDT value setting
132-172	41	Reserved	Reserved for SFF-8690
173-255	83	Reserved	Reserved

Mechanical Dimension



Unit: mm

	L	L1	L2	L3	W	W1	W2	H	H1	H2
MAX	56.9	31.2	41.95	47.7	13.8	10.2	14.0	8.6	0.6	11.5
Typical	56.7	31.0	41.80	47.5	13.7	10.0	-	8.5	0.5	11.3
MIN	56.5	30.8	41.65	47.3	13.5	9.8	-	8.4	0.4	11.1