

Features

- Hot Pluggable SFP28 form factor
- Operating data rate 25Gbps
- Single +3.3V power supply
- LC Single Connector
- Max power dissipation <1.2W
- Up to 20 km Transmission Distance.
- PIN receivers
- 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
- IEEE 802.3ae
- RoHS

Applications

- Switches with SFP28 ports
- Router with SFP28 Ports
- Server or Network Adapter Card
- Optical Transmission System
- Other devices with SFP28 Ports



Description

The 25G-SFP-D32-20 is a 25Gb/s SFP28 BIDI transceiver designed for long-distance optical communication over single-mode fiber (SMF) up to 20km. It features a TX1330nm / RX1270nm DFB laser, ensuring high-speed and stable data transmission.

This transceiver is fully compliant with SFF-8472, SFF-8402, SFF-8432, and relevant portions of SFF-8431 standards, ensuring seamless integration with industry-standard networking equipment. Additionally, it supports digital diagnostics monitoring (DDM) via a 2-wire serial interface, allowing real-time monitoring of operating parameters for enhanced performance and reliability.

The 25G-SFP-D32-20 is an excellent choice for 5G front-haul, data center interconnects, and enterprise networking, offering high efficiency, low power consumption, and superior signal integrity for next-generation network deployments.

Product performance Specifications

1. Basic Product Characteristics

Parameter	Symbol	Min	Тур.	Max	Unit
Storage Temperature	Ts	-40	-	+85	°C
Supply Voltage	Vcc	-0.3	-	3.6	V
Relative Humidity	RH	0	-	85	%
Operating Case Temperature	T _C	0	-	70	°C
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Power Supply Current	Icc			360	mA
Power Dissipation	PD	-	-	1000	mW
Data Rate	DR	-	25	-	Gbps
Max Supported Link Length	-	10	-	20	m



2. Product Optical and Electrical Characteristics

Parameter	Symbol	Min	Тур.	Max	Unit	
Transmitter						
Center Wavelength	$\lambda_{ extsf{C}}$	1260 1320		1280 1340	nm	
RMS Spectral Width	σ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Output average power	P_{AVG}	0		6	dBm	
OMA Launch Power	OMA		-2		dBm	
Extinction Ratio	ER	3.5			dB	
RIN20OMA	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	ORL			20	dB	
Mask Margin₁		5			%	
Average Launch Power of OFF Transmitter	P _{OFF}			-30	dBm	
Transmitter and Dispersion Penalty 25G BER=5E-5	TDP			4	dB	
Input Differential Impedance	R _{IN}		100		Ω	
Single Ended Data Input Swing	V_{IN}	90		450	mVp-p	
Transmit Disable Voltage	V_{DIS}	2		V _{CCHOST}		
Transmit Enable Voltage	V_{EN}				V	
Transmit Fault Assert Voltage	V_{FA}	2.2		V _{CCHOST}		
Transmit Fault De-Assert Voltage	V_{FDA}	V_{EE}		V _{EE} +0.4	V	
		Receiver				
Center Wavelength	$\lambda_{\rm r}$	1320	1330	1340	nm	
oomer marelength	Ar	1260	1270	1280	11111	
Overload		2.5			dBm	
Los Assert	LosA	-30			dBm	
Los Dessert	LosD			-17	dBm	
Los Hysteresis	LosH	0.5			dB	
OMA Receiver Sensitivity Up to 25G 5E-5	POMA			-14	dBm	
Single Ended Data Output Swing	VOD	200		450	mVp-p	
LOS Fault	VLOSFT	2.2		VLOSFT	V	
LOS Normal	VLOSNR	VEE		VEE+0.4	V	

Note1: Template: {0.31, 0.40, 0.45, 0.34, 0.38, 0.40}, Hit Ratio: 5E-5



Recommended Host Board Power Supply Circuit

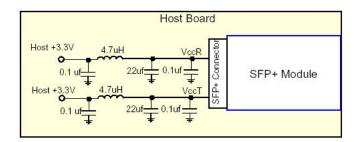


Figure 1:Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

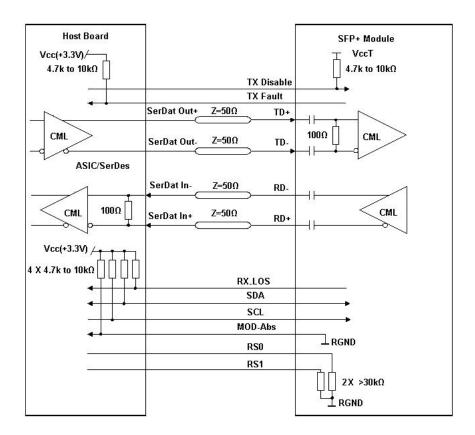


Figure2:Recommended Interface Circuit



Pin-out Definition

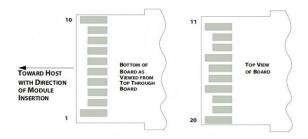


Figure3:Pin view

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 $4.7k\Omega-10k\Omega$ 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 $4.7k\Omega-10k\Omega$ to VccT in the module.

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

Note5: This pin shall be pulled up with $4.7k\Omega-10k\Omega$ to Host_Vcc on the host board.

Note6: Connect with $30k\Omega$ load pulled down to GND in the module.

Monitoring Specification

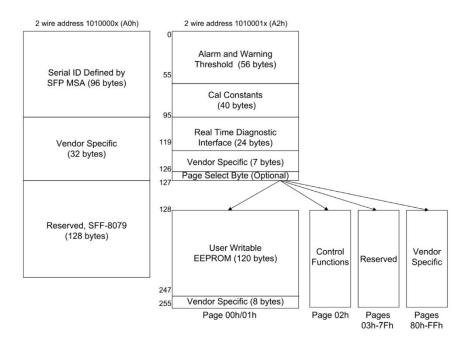


Figure4:Memory map

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	Link length supported for single-mode fiber, units of km, or copper		



		Attenuation	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)
		A	2h 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

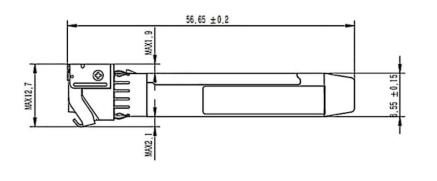


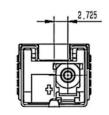
18-19 2 Bias Low Alarm	16-17	2	Bias High Alarm	MSB at low address	
20-21 2 Blas High Warning MSB at low address 22-23 2 Blas Low Warning MSB at low address 24-25 2 TX Power High Alarm MSB at low address 26-27 2 TX Power High Warning MSB at low address 30-31 2 TX Power High Warning MSB at low address 30-31 2 TX Power Low Warning MSB at low address 30-31 2 TX Power Low Warning MSB at low address 32-33 2 RX Power Low Warning MSB at low address 33-33 2 RX Power Low Warning MSB at low address 36-37 2 RX Power Low Warning MSB at low address 36-39 2 RX Power Low Warning MSB at low address 36-39 2 RX Power Low Warning MSB at low address 40-41 2 Optional Laser Temp High Marning MSB at low address 42-43 2 Optional Laser Temp Low Alarm MSB at low address 44-45 2 Optional Laser Temp Low 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 48-49 2 Optional TEC Current High Alarm MSB at low address 48-50-51 2 Optional TEC Current High Warning MSB at low address 48-52-53 2 Optional TEC Current High Warning MSB at low address 48-54 2 Optional TEC Current High Warning MSB at low address 48-55 3 2 Optional TEC Current High Warning MSB at low address 48-56 1 2 Optional TEC Current High Warning MSB at low address 48-89 1 Additional TEC Current High Warning MSB at low address 48-80 1 Additional TEC Current High Warning MSB at low address 48-80 1 Additional TEC Current High Warning MSB at low address 48-80 1 Additional TEC Current High Warning MSB at low address 48-80 1 Additional TEC Current High Warning MSB at low address 48-80 1 Additional TEC Current High Warning MSB at low address 48-81 1 Additional TEC Current High Warning MSB at low address 48-81 1 Additional TEC Current High Warning MSB at low address 48-82 1 Address MSB at low address 48-83 1 Additional TEC Current Pill MSB at low address 48-84 1 Additional TEC Current Pill MSB at low address 48-85 1 Additional TEC Current Pill MSB at low address 48-86 1 Additional TEC Current Pill MSB at low address 48-87 1 Additional TEC Current Pill MSB at low ad					
22-23 2 Blas Low Warning MSB at Iow address 24-25 2 TX Power High Alarm MSB at Iow address 26-27 2 TX Power Low Alarm MSB at Iow address 28-29 2 TX Power Low Warning MSB at Iow address 30-31 2 TX Power High Warning MSB at Iow address 32-33 2 RX Power Low Warning MSB at Iow address 34-35 2 RX Power Low Warning MSB at Iow address 38-37 2 RX Power Low Warning MSB at Iow address 38-39 2 RX Power Low Warning MSB at Iow address 38-39 2 RX Power Low Warning MSB at Iow address 40-41 2 Optional Laser Temp High Alarm MSB at Iow address 40-42 2 Optional Laser Temp Low Warning MSB at Iow address 44-45 2 Optional Laser Temp Low Warning MSB at Iow address 46-47 2 Optional Laser Temp Low Warning MSB at Iow address 48-49 2 Optional EC Current High Alarm MSB at Iow address 48-49 2 Optional EC Current Low Warning MSB at Iow address 48-49 2 Optional TEC Current Low Warning MSB at Iow address 48-50-51 2 Optional TEC Current Low Warning MSB at Iow address 48-51 2 Optional TEC Current Low Warning MSB at Iow address 48-52-53 2 Optional TEC Current High Warning MSB at Iow address 48-54-55 2 Optional TEC Current High Warning MSB at Iow address 48-69 1 AC Company MSB at Iow address 48-75 2 Optional TEC Current High Warning MSB at Iow address 48-75 2 Optional TEC Current High Warning MSB at Iow address 48-89 2 Optional TEC Current Low Warning MSB at Iow address 48-89 3 Part Iow Address 48-89 4 Optional Tex Current High Warning MSB at Iow address 48-89 5 1 Optional Tex Current High Warning MSB at Iow address 48-89 6-91 8-94 8-94 8-94 8-94 8-94 8-94 8-94 8-94					
24-25 2 TX Power High Alarm MSB at low address 26-27 2 TX Power Low Alarm MSB at low address 30-31 2 TX Power Low 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 34-36 2 RX Power High Warning 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 38-39 2 RX Power Low Warning MSB at low address 40-41 2 Optional Laser Temp High Alarm MSB at low address 40-41 2 Optional Laser Temp Low Alarm MSB at low address 40-42 2 Optional Laser Temp Low Warning MSB at low address 40-43 2 Optional Laser Temp Low Warning MSB at low address 40-44 2 Optional Laser Temp Low Warning MSB at low address 40-45 2 Optional Laser Temp Low Warning MSB at low address 40-46 2 Optional Laser Temp Low Warning MSB at low address 40-47 2 Optional Laser Temp High Warning MSB at low address 40-49 2 Optional TEC Current High Alarm MSB at low address 40-50-51 2 Optional TEC Current Low Alarm MSB at low address 40-50-51 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional TEC Current Low Warning MSB at low address 40-50-50 2 Optional External Calibration bit, A0h, byte 92, bit 4 is 1 40-40 40-40-40 40-40-40-40-40-40-40-40-40-40-40-40-40-4					
26-27 2 TX Power Low Alarm MSB at low address 30-31 2 TX Power High Warning MSB at low address 30-31 2 TX Power High 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 Low Alarm 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 40-41 2 Optional Laser Temp Low Alarm MSB at low address 44-45 2 Optional Laser Temp Low 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 48-49 2 Optional TEC Current High Warning MSB at low address 48-49 2 Optional TEC Current High Warning MSB at low address 48-50-51 2 Optional TEC Current Low Alarm MSB at low address 48-55-52 2 Optional TEC Current Low Warning MSB at low address 48-49 3 Optional TEC Current Low Warning MSB at low address 48-55-53 2 Optional TEC Current Low Warning MSB at low address 48-56-91 36 Ext Cal Constants or Additional Enhanced Features Diagnostic calibration bit, A0h, byte 92, bit 4 is 1 48-69-105 10 Diagnostics 49-94 3 Reserved 495 1 CC_DMI Check code for Base Diagnostic Fields (addresses 0 to 94) 496-105 10 Diagnostics 496-105 10 Diagnostics 497-105 10 Diagnostics 498-105 10 Diagnostics 498-105 10 Diagnostics 499-105 10 Diagnostic			•		
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 Low Warning MSB at low address 36-37 2 RX Power Low Warning MSB at low address 36-39 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 Low Warning MSB at low address 46-47 2 Optional TEC Current High Alarm MSB at low address 48-49 2 Optional TEC Current High Alarm MSB at low address 48-49 2 Optional TEC Current High Alarm MSB at low address 48-49 2 Optional TEC Current High Warning MSB at low address 48-50-51 2 Optional TEC Current High Warning MSB at low address 49-55 2 Optional TEC Current High Warning MSB at low address 49-56 3 EXT Cal Constants or Additional Enhanced Features External Calibration bit, A0h, byte 92, bit 4 is 1 Additional Enhanced Features advertisers adver					
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 High Warning MSB at low address 36-37 2 RX Power Low 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 40-42 2 Optional Laser Temp High Warning MSB at low address 44-45 2 Optional Laser Temp High Warning MSB at low address 46-47 2 Optional Laser Temp High Warning MSB at low address 48-49 2 Optional Laser Temp High Warning MSB at low address 48-49 2 Optional TEC Current High Alarm MSB at low address 48-49 2 Optional TEC Current High Warning MSB at low address 50-51 2 Optional TEC Current Low Alarm MSB at low address 52-53 2 Optional TEC Current Low 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 57-59 1 CC_DMI External Calibration bit, A0h, byte 92, bit 4 is 1 58-91 Additional Enhanced Features advertisement, control and status if External Calibration bit, A0h, byte 92, bit 4 is 0 92-94 3 Reserved 92-94 1 CC_DMI Check code for Base Diagnostic Fields (addresses 0 to 94) 96-105 10 Diagnostics Diagnostics 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					
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 Low 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 40-42 2 Optional Laser Temp High Warning MSB at low address 40-43 2 Optional Laser Temp High Warning MSB at low address 40-47 2 Optional Laser Temp Low Alarm MSB at low address 40-47 2 Optional Laser Temp Low Warning MSB at low address 40-49 2 Optional Laser Temp Low Warning MSB at low address 50-51 2 Optional TEC Current High Alarm MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-50 2 Optional TEC Current Low Warning MSB at low address 50-50 3 Diagnostic calibration constants for optional External Calibration if External Calibration bit, A0h, byte 92, bit 4 is 1 60-91 36 Ext Cal Constants or 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 Diagnostics 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 115 1 Rx Out Emphasis 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					
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 High Warning 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 50-51 2 Optional TEC Current Low Warning MSB at low address 52-53 2 Optional TEC Current Low Warning MSB at low address 52-55 2 Optional TEC Current Low Warning MSB at low address 52-55 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 3 2 Optional TEC Current Low Warning MSB at low address 52-50 1 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning MSB at low address 52-50 2 Optional TEC Current Low Warning Flag Status Bits 54-55 2 Optional TEC Current Low Warning Flag Status Bits 55-50 1			•		
38-37 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 Low 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 High Warning MSB at low address 52-53 2 Optional TEC Current High Warning MSB at low address 52-53 2 Optional TEC Current Low 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 57-59 1 CC_DMI 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 58-91 3 Reserved 59-91 1 CC_DMI Check code for Base Diagnostic Fields (addresses 0 to 94) 59-94 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 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					
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 Low 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 Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 2 Optional TEC Current Low Warning MSB at low address 50-51 3 Optional TEC Current Low Warning MSB at low address 50-51 3 Optional TEC Current Low Warning MSB at low address 50-51 4 Optional TEC Current Low Warning MSB at low address 50-51 5 Optional TEC Current Low Warning MSB at low address 50-51 6 Ext Cal Constants or Additional Enhanced Features advertisement, control and status if External Calibration bit, A0h, byte 92, bit 4 is 1 60-91 Additional Enhanced Features advertisement, control and status if External Calibration bit, A0h, byte 92, bit 4 is 0 60-105 10 Diagnostics 60-105 10 Diagnostic Plata (Internally or externally calibrated) 60-105 10 Diagnostics 60-105 10 Diagnostic Plata (Internally or externally calibrated) 60-105 10 Diagnostics 60-105 10 Diagnostic Plata (Internally or externally calibrated) 60-105 10 Diagnostic				MSB at low address	
40-41 2 Optional Laser Temp High Alarm 42-43 2 Optional Laser Temp Low Alarm 44-45 2 Optional Laser Temp High Warning 46-47 2 Optional Laser Temp High Warning 48-49 2 Optional TEC Current High Alarm 48-49 2 Optional TEC Current High Alarm 48-49 2 Optional TEC Current High Alarm 48-49 2 Optional TEC Current Low Alarm 48-49 2 Optional TEC Current High Alarm 48-49 3 Optional TEC Current Low Alarm 48-49 4 Optional TEC Current High Warning 48-49 5 Optional TEC Current Low Alarm 48-49 5 Optional TEC Current Low Alarm 48-49 6 Optional TEC Current Low Warning 48-49 7 Optional TEC Current Low Warning 48-49 8 Optional TEC Current Low Warning 48-40 8 Optional TEC Current Low Warning 48-40 8 Optional TEC Current Low Warning 48-40 9 Optional Check code for Base Diagnostic Fields (addresses 0 to 94) 49-96-105 10 Diagnostics 49-94 9 Optional Diagnostics 49-95 10 CC_DMI 40 Optional Diagnostics 50-105 0 Diagnostics 50-106-109 10 Diagnostics 50-	36-37		RX Power High Warning	MSB at low address	
42-43 2 Optional Laser Temp Low Alarm 44-45 2 Optional Laser Temp High Warning 46-47 2 Optional Laser Temp High Warning 48-49 2 Optional TEC Current High Alarm 48-49 2 Optional TEC Current High Alarm 50-51 2 Optional TEC Current Low Alarm 50-51 2 Optional TEC Current Low Alarm 52-53 2 Optional TEC Current Low Warning 52-53 2 Optional TEC Current Low Warning 56-91 36 Ext Cal Constants or Additional Enhanced Features 52-59 1 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 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	38-39	2	RX Power Low Warning	MSB at low address	
44-45 2 Optional Laser Temp High Warning 46-47 2 Optional Laser Temp Low Warning 48-49 2 Optional TEC Current High Alarm 50-51 2 Optional TEC Current High Alarm 55-53 2 Optional TEC Current High Warning 56-91 36 Ext Cal Constants or Additional Enhanced Features 592-94 3 Reserved 95 1 CC_DMI Check code for Base Diagnostic Fields (addresses 0 to 94) 96-105 10 Diagnostics 10 Diagnostics 110 1 Status/Control 111 1 Reserved 112-113 2 Alarm Flags 114 1 Tx Input EQ control 116-117 2 Warning Flags 120 Optional Flags 120 Optional Flags 120 Optional Flags 120 Optional Flags 121 Optional Flags 120 Optional Flags 120 Optional Flags 120 Optional Flags 120 Optional Flags 121 Optional Status Bits 112-113 2 Ext Status/Control 116-117 2 Warning Flags 122 Optional Page Select 127 1 Table Select MSB at low address Diagnostic calibration bit, A0h, byte 92, bit 4 is 1 MSB at low address Diagnostic Alarm Calibration bit, A0h, byte 92, bit 4 is 1 MSB at low address Diagnostic Maring Flag Status Bits Tx Input equalization Low care address Rx Output emphasis level control Rx Output emphasis	40-41	2	Optional Laser Temp High Alarm	MSB at low address	
46-47 2 Optional Laser Temp Low Warning 48-49 2 Optional TEC Current High Alarm 50-51 2 Optional TEC Current Low Alarm 55-53 2 Optional TEC Current Low Warning 54-55 2 Optional TEC Current Low Warning 56-91 36 Ext Cal Constants or Additional Enhanced Features 57-59 1 CC_DMI 58-10 Diagnostic Calibration bit, A0h, byte 92, bit 4 is 1 58-10 Additional Enhanced Features advertisement, control and status if 58-10 Ext Cal Constants or Additional Enhanced Features 59-94 CC_DMI 59-95 1 CC_DMI 59-105 10 Diagnostics 59-105 10 Diagnostic Palare temperature and TEC current 100 1 Status/Control 100 1 Status/Control 100 1 Tx Input equalization level control 100 1 Tx Input equalization level control 100 1 Tx Input equalization level control 100 1 Rx Out Emphasis control 100 1 Rx Out Emphasis level control 100 1 Rx Out Emphasis 100 10 Rx Out Emphasis level control 100 10 Rx Out Emphasis level contro	42-43	2	Optional Laser Temp Low Alarm	MSB at low address	
48-49 2 Optional TEC Current High Alarm 50-51 2 Optional TEC Current Low Alarm 50-51 2 Optional TEC Current Low Alarm MSB at low address 52-53 2 Optional TEC Current High Warning MSB at low address 52-53 2 Optional TEC Current Low Warning MSB at low address 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 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	44-45	2	Optional Laser Temp High Warning	MSB at low address	
50-51 2 Optional TEC Current Low Alarm 52-53 2 Optional TEC Current High Warning 54-55 2 Optional TEC Current High Warning 56-91 36 Ext Cal Constants or Additional Enhanced Features 56-91 37 Reserved 95 1 CC_DMI 56-105 10 Diagnostics 106-109 4 Optional Diagnostics 110 1 Status/Control 111 1 Reserved 112-113 2 Alarm Flags 114 1 Tx Input EQ control 115 1 116-117 2 Warning Flags 127 Vendor Specific 127 Vendor Specific 128 MSB at low address 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 1 Additional Enhanced Features advertisement, control and status 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 1 Additional Enhanced Features advertisement, control and status byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External Calibration bit, A0h, byte 92, bit 4 is 1 External C	46-47	2	Optional Laser Temp Low Warning	MSB at low address	
S2-53 2 Optional TEC Current High Warning MSB at low address	48-49	2	Optional TEC Current High Alarm	MSB at low address	
54-55 2 Optional TEC Current Low Warning Biagnostic calibration constants for optional External Calibration if External Calibration bit, A0h, byte 92, bit 4 is 1 Enhanced Features 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	50-51	2	Optional TEC Current Low Alarm	MSB at low address	
Diagnostic calibration constants for optional External Calibration if External Calibration if External Calibration bit, A0h, byte 92, bit 4 is 1 Additional Enhanced Features Additional 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	52-53	2	Optional TEC Current High Warning	MSB at low address	
Ext Cal Constants or Additional Enhanced Features Enhanced Features Enhanced Features 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	54-55	2	Optional TEC Current Low Warning	MSB at low address	
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	56-91	36		External Calibration bit, A0h, byte 92, bit 4 is 1 Additional Enhanced Features advertisement, control and status if	
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	92-94	3	Reserved		
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	95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)	
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	96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)	
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	106-109	4	Optional Diagnostics	Monitor Data for Optional Laser temperature and TEC current	
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	110	1	Status/Control	Optional Status and Control 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	111	1	Reserved	Reserved (was assigned to SFF-8079)	
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	112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits	
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	114	1	_	Tx Input equalization level control	
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	115	1	·	Rx Output emphasis level control	
120-126 7 Vendor Specific Vendor specific memory addresses 127 1 Table Select Optional Page Select	116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits	
127 1 Table Select Optional Page Select	118-119	2	Ext Status/Control	Extended module control and status bytes	
	120-126	7	Vendor Specific	Vendor specific memory addresses	
A2h Page 00-01h	127	1	Table Select	Optional Page Select	
		A2h Page 00-01h			

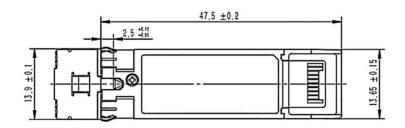


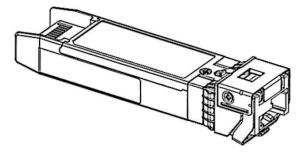
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses
		A	2h Page 02h
128-129	2	Reserved	Reserved for SFF-8690 (Tunable Transmitter)
130	1	Reserved	Reserved for future receiver controls
131	1	Rx Decision Threshold	RDT value setting
132-172	41	Reserved	Reserved for SFF-8690
173-255	83	Reserved	Reserved

Mechanical Dimension









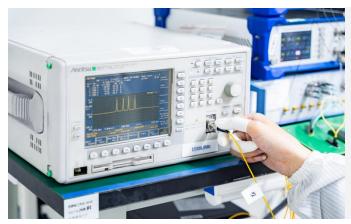
Unit: mm Unspecified Tolerance: ± 0.1 mm



Test Center

1. Performance Testing

Every fiber optic transceiver is thoroughly tested by the LSOLINK Assurance Program, which is equipped with the world's most advanced analytical equipment to ensure that our transceivers meet the industry's international public protocol standards while still functioning flawlessly in your facility.



Optical Spectrum Inspection

Using the industry's leading optical spectrum analyser to check in real time that the parameters of the optical transceiver's laser comply with industry standards.

- Peak: Peak wavelength and peak level
- > 2nd Peak: Side-mode wavelength and level
- > Mean WI: Center wavelength
- Total Power: Total power of spectrum
- SMSR: Side-Mode Suppression Ratio



Optical Signal Quality Inspection

Using highly efficient sampling oscilloscopes and BERT testers, equipped with an automated test platform to accurately test the signal quality of the transceiver, test records are kept for up to 5 years to ensure the traceability of each transceiver.

- Eye Mask Margin(NRZ)
- > TDECQ(PAM4):transmitter dispersion eye closure
- > OMA: Optical modulation amplitude
- **BER:** Bit error rate
- ER: Extinction Ratio



Flow Pressure Test

Using multi-protocol network traffic analyser with various brands of switches to test the transceiver's ability to transmit at full speed.

- **Bandwidth:** Actual transceiver bandwidth on the port
- Packet Loss
- Packet Errors:CRC Errors/PCS Errors/Symbol Errors
- LinkDown Counts
- > latency

Aboveis part of our test bed network equipment. For more information, Please click <u>download</u> for optical transceiver performance test report.



2. Quality Control

We adopt advanced quality management solutions. Each transceiver is self-inspected, including:20x microscope inspection, 200x microscope inspection, and QC process inspection.



visual inspection



Microscopic inspection: 20X



Microscopic inspection: 200X



Reliability Verification



Optical endface inspection



OQC Inspection



Order Information

Part Number	Description
25G-SFP-U23-20	25GBASE-BX SFP28 BIDI TX-1270nm/RX-1330nm 20km DOM LC SMF Transceiver Module
25G-SFP-D32-20	25GBASE-BX SFP28 BIDI TX-1330nm/RX-1270nm 20km DOM LC SMF Transceiver Module
25G-SFP-U23-40	25GBASE-BX SFP28 BIDI TX-1270nm/RX-1310nm 40km DOM LC SMF Transceiver Module
25G-SFP-D32-40	25GBASE-BX SFP28 BIDI TX-1310nm/RX-1270nm 40km DOM LC SMF Transceiver Module



Further Information

Lighting the Path to Global Links

- Web | www.lsolink.com
- ☑ Email | For Sales@lsolink.com

Disclaimer

- We are committed to continuous product improvement and feature upgrades, and the contents cont ained in this manual are subject to change without notice.
- 2. Nothing herein should be construed as constituting an additional warranty.
- LSOLINK assumes no responsibility for the use or reliability of equipment or software not provided by LSOLINK. Copyright LSOLINK.COM All Rights