

GPON OLT SFP 1490nm-TX/1310nm-RX 2.5G-TX/1.25G-RX Class C++ 20km SC SMF Transceiver (Industrial)

GSFP-43-20C++L-I



Features

- Compliant with CCSA YD/T 1688.3-2017 GPON Class C++
- SFP Package with SC Receptacle Optical Interface
- 1490nm Continuous-mode Transmitter with DFB Laser
- 1310nm Burst-mode Receiver with APD-TIA
- 2488 Mbps Downstream-Tx/1244 Mbps Upstream-Rx
- Digital diagnostic SFF-8472 compliant
- +3.3V Power Supplies
- RoHS With Exemption 7C(I)
- Operation case temperature : 0~70 °C for Commercial temperature, and -40~85 °C for Industrial temperature

Products Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T _S	-40	-	+85	°C	
Operation Case Temperature	T _C	0		70	°C	C temp
		-40		85		I temp
Supply Voltage	V _{CC3}	-0.3	-	3.6	V	
Operating Relative Humidity	RH	5	-	85	%	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V _{CC3}	3.14	3.3	3.46	V	
Operation Case Temperature	T _C	0		70	°C	C temp
		-40		85		I temp
Supply Current	I _{CC3}			318	mA	C temp
				477	mA	I temp
Power Consumption	P _w			1	W	C temp
				1.5	W	I temp
Back Reflection at 1490nm				-20	dB	
Back Reflection at 1310nm				-20	dB	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
1490nm to 1310nm Crosstalk				-46	dB	
Transmission Distance				20	km	
Data Rate	Tx	2.488(+/-100ppm)			Gbit/s	
	Rx	1.244 (+/-100ppm)				

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Transmitter Signal Rate			2.488		Gbps	
Centre Wavelength	λ_{C}	1480		1500	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Average Launch Power	P _{OUT}	4.5		8	dBm	1
Average Launch Power-OFF Transmitter	P _{OFF}			-40	dBm	
Extinction Ratio	ER	8.2			dB	
-20dB Width				1	nm	
Tolerance to the Transmitter Incident Light Power		-15			dB	
Optical Eye Mask	Compliant With ITU-T G.984.2					2
Receiver						
Operating Wavelength	λ_{C}	1290		1330	nm	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Sensitivity	P_{SEN}			-33	dBm	3
Saturation	P_{SAT}	-12			dBm	3
Loss of Signal Assert	P_{LOSA}	-45	-	-	dBm	
Loss of Signal Deassert	P_{LOSD}			-34	dBm	
Receiver Burst-Mode Dynamic Range		15	20		dB	
Rx Reflectance				-20	dB	
CID		72			bits	
Tolerance to the Reflected Optical Power				10	dB	

Notes:

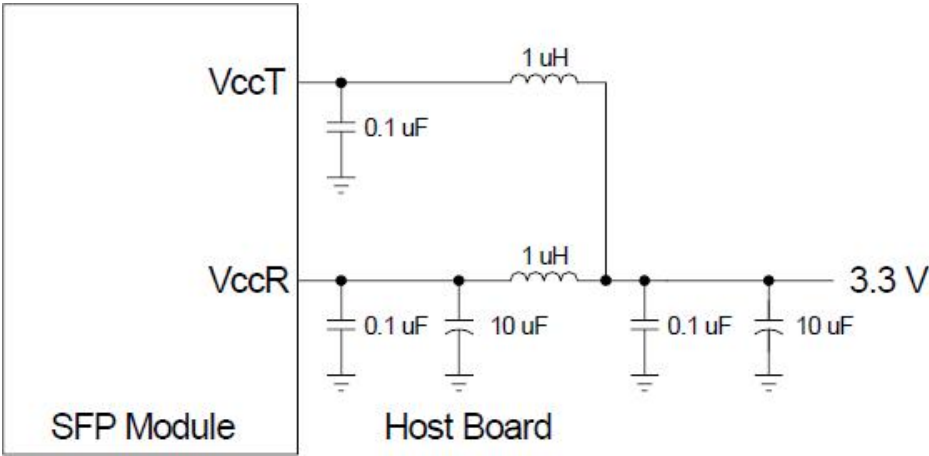
- 1. The optical power is launched into 9/125um SMF.
- 2. Measured with PRBS 2²³-1 test pattern @2.488Gbps.
- 3. Measured with PRBS 2²³-1 test pattern @1.244Gbps and ER=8.2 dB, BER=10⁻⁴

IV. Electrical Specifications and Timing

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Data Input Differential Swing	V_{IN}	200		1600	mV _{p,p}	
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
Transmitter Fault Indication Voltage –Low	VTFI, L	0		0.4	V	
Transmitter Fault Indication Voltage -High	VTFI, H	2.4		V_{CC}	V	
Transmitter Disable Voltage-Low	VTDIS, L	0		0.8	V	
Transmitter Disable Voltage -High	VTDIS, H	2.0		V_{CC}	V	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Receiver						
Data Output Differential Swing	V_{OUT}	600		1600	mV _{p,p}	
Loss of Signal Detected Voltage-Low	$V_{LOS, L}$	0		0.4	V	
Loss of Signal Detected Voltage-High	$V_{LOS, H}$	2.4		V_{CC3}	V	
Loss of Signal Assert Time	T_{LOSA}			512	ns	
Loss of Signal Deassert Time	T_{LOSD}			512	ns	
Output Differential Impedance	R_{OUT}	80	100	120	Ω	
Time to Initialize	t_{start_up}	-	-	300	ms	

Notes: Recommended Host Board Power Supply Circuit:



V. PIN Definition

Pin No.	Symbol	Description	Notes
1	V _{ee} T	Transmitter Ground	
2	TX Fault	Transmitter Fault Indication	1
3	TX Disable	Transmitter Disable	2
4	MOD-DEF2	Module Definition 2	3
5	MOD-DEF1	Module Definition 1	
6	MOD-DEF0	Module Definition 0	
7	Reset	CMOS input. Assert "Reset" high at the end of previous burst, 2 bytes in duration	
8	BRST_Det	LVTTTL output. BRST_Det assert low when module receives "reset" signal, assert high when incoming burst is present	4
9	RSSI Trigger	LVTTTL Active high	
10	V _{ee} R	Receiver Ground	
11	V _{ee} R	Receiver Ground	
12	RD-	Inv. Receiver Data Out	5
13	RD+	Receiver Data Out	
14	V _{ee} R	Received Ground	
15	V _{CC} R	Receiver V _{CC}	6
16	V _{CC} T	Transmitter V _{CC}	
17	V _{ee} T	Transmitter Ground	
18	TD+	Transmit Data In	7
19	TD-	Inv. Transmit Data In	
20	V _{ee} T	Transmitter Ground	

VI. RSSI Parameter

Item	Symbol	Min	Typical	Max	unit
Optical Signal Length	T_{OPT}	1000			ns
RSSI Trigger Delay	T_d	100			ns
RSSI Trigger Signal Width	T_w	600			ns
I ² C Read Time	T_{I^2C}	500			us

Notes: RSSI Timing:

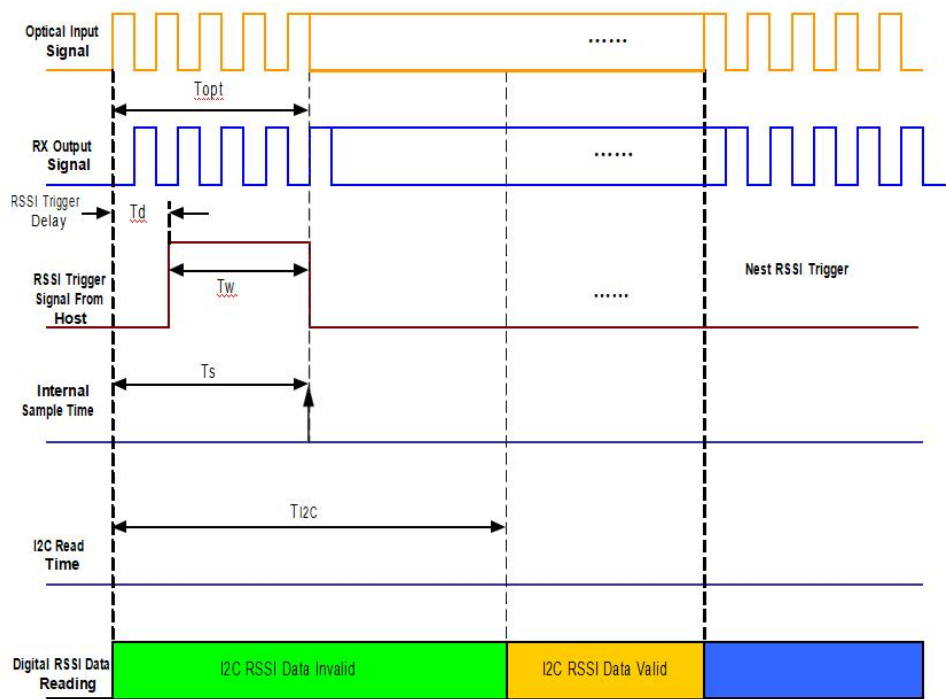
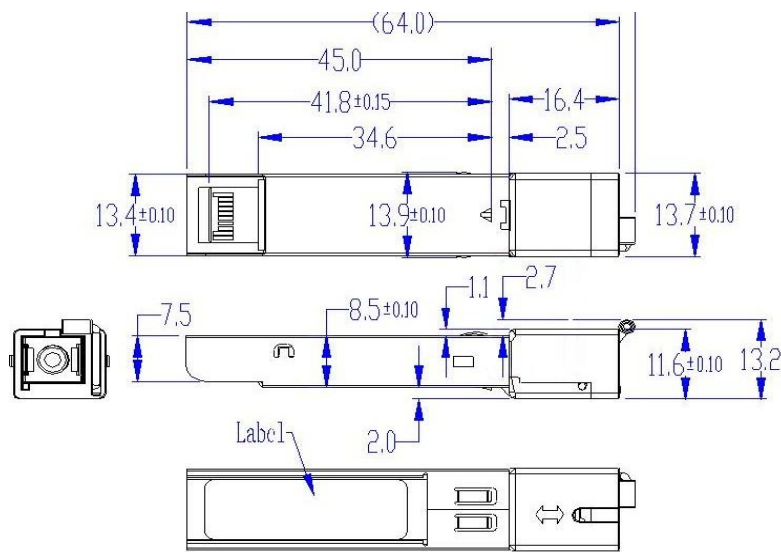


Figure 1 RSSI Timing

VII. Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Notes
Temperature	0 to 70 -40 to 85	±5	°C	Internal	LSB equal to 1/256C
Voltage	3 to V _{CC}	±3%	V	Internal	LSB equal to 100uV
Bias Current	0 to 80	10%	mA	Internal	LSB equal to 4uA
Tx Power	4.5 to 8	±2	dBm	Internal	LSB equal to 0.2uW
Rx Power	-33 to -12	±2	dBm	Internal	LSB equal to 0.1uW

VIII. Diagram Mechanical Drawing



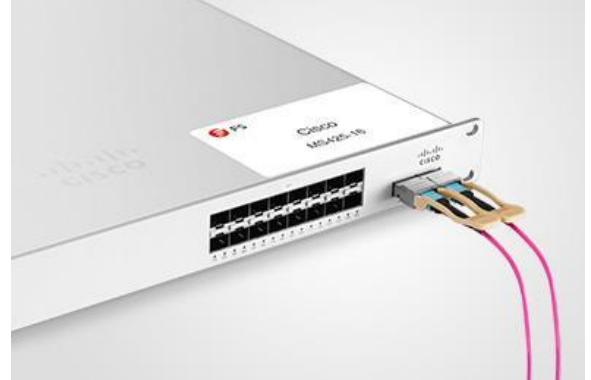
Test Center

I. Compatibility Testing

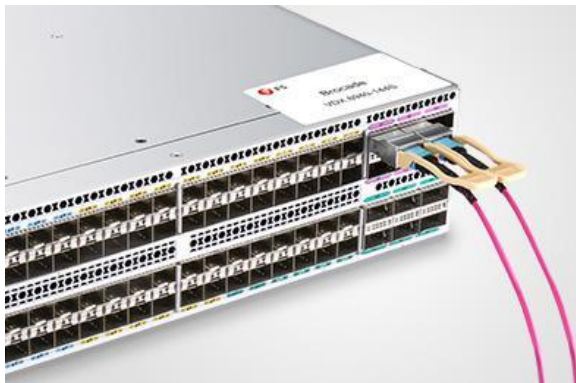
Each fiber optical transceiver has been tested in host device on site in FS Assured Program to ensure full compatibility with over 200 vendors.



Cisco Catalyst C9500-24Y4C



Cisco MS425-16



Brocade VDX 6940-144S



Dell EMC Networking Z9100-ON



Force@tm S60-44T

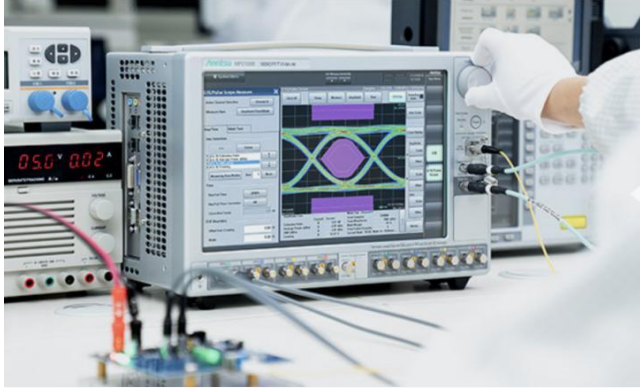


HUAWEI S6720-30L-HI-24S

Above is part of our test bed network equipment. For more information, please click the [Test Bed](#) PDF. It will be updated in real time as we expand our portfolio.

II. Performance Testing

Each fiber optical transceiver has been fully tested in FS Assured Program equipped with world's most advanced analytical equipment to ensure that our transceivers work perfectly on your device.



1. TX/RX Signal Quality Testing

Equipped with the all-in-one tester integrated 4ch BERT & sampling oscilloscope, and variable optical attenuator to ensure the input and output signal quality.

- Eye Pattern Measurements: jitter, Mask Margin, etc
- Average Output Power
- OMA
- Extinction Ratio
- Receiver Sensitivity
- BER Curve

2. Reliability and Stability Testing

Subject the transceivers to dramatic changes in temperature on the thermal shock chamber to ensure reliability and stability of the transceivers.

- Commercial: 0 °C to 70 °C
- Extended: -5 °C to 85 °C
- Industrial: -40 °C to 85 °C



3. Transfer Rate and Protocol Testing

Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

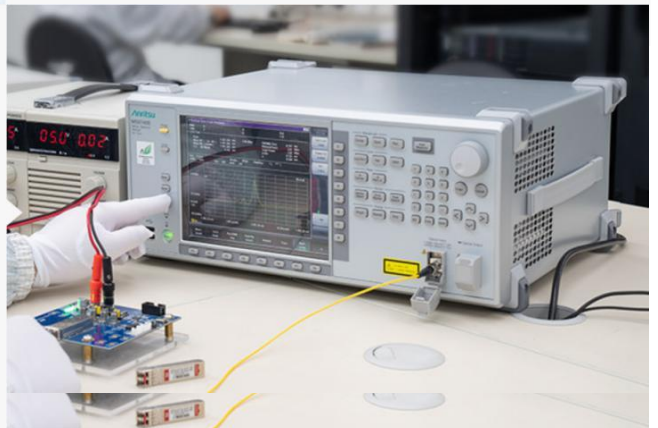
- Ethernet
- Fibre Channel
- SDH/SONET
- CPRI



4. Optical Spectrum Evaluation

Evaluate various important parameters with the Optical Spectrum Analyzer to meet the industry standards.

- Center Wavelength, Level
- OSNR
- SMSR
- Spectrum Width



Order Information

Part Number	Description
GSFP-43-20C++L-I	2.5G-TX/1.25G-RX GPON Transceiver Module (SMF, 1490nm-TX/1310nm-RX, Class C++, 20km, SC) (Industrial)
GSFP-43-20B+L-I	2.5G-TX/1.25G-RX GPON Transceiver Module (SMF, 1490nm-TX/1310nm-RX, Class B+, 20km, SC) (Industrial)
ESFP-34-20N-I	1.25G-TX/1.25G-RX EPON Transceiver Module (SMF, 1310nm-TX/1490nm-RX, 20km, SC, DDM) (Industrial)
ESFP-43-20	1.25G EPON Transceiver Transceiver Module (SMF, 1490nm-TX/1310nm-RX, 20km, SC)
GPON-ONU-34-20BI	1.25GTx/2.5GRx GPON Stick with MAC (SMF, 1310nmTx/1490nmRx, 20km, SC/APC, Industrial, DDM)
GSFP-43-20B	2.5G-TX/1.25G-RX GPON Transceiver Module (SMF, 1490nm-TX/1310nm-RX, Class B+, 20km, SC)
GSFP-43-20C	2.5G-TX/1.25G-RX GPON Transceiver Module (SMF, 1490nm-TX/1310nm-RX, Class C+, 20km, SC)