

## SF-SM31020DI-GP

- Single-Mode SFP Transceiver
- RoHS Compliant

### Features

- Compliant with IEEE Std 802.3-2005, Gigabit Ethernet 1000Base-LX
- Compliant with SFF-8074i and SFF-8472, revision 9.5
- Compliant with SFP MSA Specification
- Digital Diagnostic Monitoring available
- Uncooled 1310nm Fabry-Perot (FP) Laser
- Up to 1.25Gb/s bi-directional data links
- Duplex LC connector compliant
- Single +3.3V DC power supply
- Hot-pluggable SFP footprint
- Class 1 laser safety certified
- Operating temperature: -40°C to +85°C
- Up to 20km on 9/125µm SMF
- RoHS6 Compliant

### Applications

- Gigabit Ethernet 1000Base-LX
- 1.0625Gb/s Fiber Channel
- Enterprise Router
- Switch to Switch Interface
- Other Optical Links

## Ordering information

Part No.	Description
SF-SM31020DI-GP	SFP 1.25Gbps LX 1310nm LC DDM SMF 20km, industrial ver (-40+85)

## Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T <sub>S</sub>	-40	85	°C
Relative Humidity	RH	5	95	%
Supply Voltage	V <sub>CC</sub>	-0.5	4.0	V

## Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Case Temperature	T <sub>C</sub>	-40	25	85	°C
Power Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Data Rate	-	0.1	-	1.25	Gb/s

## Electrical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Module Supply Current	I <sub>CC</sub>	-	-	220	mA	-
Power dissipation	P <sub>D</sub>	-	-	800	mW	-
Transmitter Differential Input Voltage (TD +/-)	-	300	-	2200	mV <sub>p-p</sub>	1
Receiver Differential Output Voltage (RD +/-)	-	600	-	1200	mV <sub>p-p</sub>	2
Low speed output: Transmitter Fault(TX_FAULT) / Loss of Signal (LOS)	V <sub>OH</sub>	2.0	-	V <sub>CC</sub>	V	3
	V <sub>OL</sub>	0	-	0.8	V	-
Low speed iutput: Transmitter Disable (TX_DISABLE), MOD_DEF1, MOD_DEF2	V <sub>IH</sub>	2.0	-	V <sub>CC</sub>	V	4
	V <sub>IL</sub>	0	-	0.8	V	-

**Notes:**

1. Internally AC coupled and terminated to 100Ω differential load.
2. Internally AC coupled, but requires a 100Ω differential termination or internal to Serializer/Deserializer.
3. Pulled up externally with a 4.7KΩ-10KΩ resistor on the host board to VCCT,R.
4. Mod\_Def1 and Mod\_Def2 must be pulled up externally with a 4.7KΩ-10KΩ resistor on the host board to VCCT,R.

## Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
<b>Transmitter</b>						
Launch Optical Power	$P_o$	-9	-6	-3	dBm	-
Center Wavelength Range	$\lambda_c$	1260	1310	1360	nm	-
Extinction Ratio	EX	9	-	-	dB	-
Spectral Width(RMS)	$\Delta\lambda$	-	-	4	nm	-
Total Jitter	TJ	-	-	266	ps	-
Dispersion Penalty	-	-	-	1	dB	-
Optical Rise/Fall Time	$T_{rise}/T_{fall}$	-	-	260	ps	-
Pout @TX-Disable Asserted	$P_{off}$	-	-	-45	dBm	-
Eye Diagram	IEEE Std 802.3-2005 Gigabit Ethernet 1000Base-LX compatible					-
<b>Receiver</b>						
Receiver Sensitivity	S	-	-	-23	dBm	1
Receiver Overload	$P_{OL}$	-3	-	-	dBm	1
Optical Return Loss	ORL	12	-	-	dB	-
LOS De-Assert	$LOS_D$	-	-	-24	dBm	-
LOS Assert	$LOS_A$	-35	-	-	dBm	-
LOS Hysteresis	-	0.5	3	5	dB	-

**Notes:**

1. Measured with PRBS 2<sup>7</sup>-1 test pattern, 1.25Gb/s, EX=9dB, BER<10<sup>-12</sup>.

## Mechanical specifications

