

SP-SMxxDW080D-GP
10G Ethernet 80km DWDM SFP+ Transceiver
10GBASE-ZR

Product Features

- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8431 and SFF-8472
- SFP+ MSA package with duplex LC connector
- DWDM-rated EML Transmitter
- Up to 10.3Gb/s bi-directional data links
- 100GHz ITU Grid, C-Band
- Single +3.3V power supply
- Class 1 laser safety certified
- Commercial operating temperature: 0°C to +70°C
- Up to 80km on 9/125µm SMF
- RoHS Compliant

Applications

- 10G Ethernet 10GBASE-ZR/ZW
- 80km 10G DWDM Network

Ordering information

Part No.	Description
SP-SMxxDW080D-GP	SFP+ DWDM 10Gbs xch xnm LC DDM SMF 80km EML laser

Notes: See Table 1 – Wavelength Guide for “xx” value.

Table 1. Wavelength Guide for “xx” value (100GHz ITU-T channel)

Channel #	Product Part Number	Frequency (THz)	Center Wavelength (nm)
17	SP-SM17DW080D-GP	191.7	1563.86
18	SP-SM18DW080D-GP	191.8	1563.05
19	SP-SM19DW080D-GP	191.9	1562.23
20	SP-SM20DW080D-GP	192.0	1561.42
21	SP-SM21DW080D-GP	192.1	1560.61
22	SP-SM22DW080D-GP	192.2	1559.79
23	SP-SM23DW080D-GP	192.3	1558.98
24	SP-SM24DW080D-GP	192.4	1558.17
25	SP-SM25DW080D-GP	192.5	1557.36
26	SP-SM26DW080D-GP	192.6	1556.55
27	SP-SM27DW080D-GP	192.7	1555.75
28	SP-SM28DW080D-GP	192.8	1554.94
29	SP-SM29DW080D-GP	192.9	1554.13
30	SP-SM30DW080D-GP	193.0	1553.33
31	SP-SM31DW080D-GP	193.1	1552.52
32	SP-SM32DW080D-GP	193.2	1551.72
33	SP-SM33DW080D-GP	193.3	1550.92
34	SP-SM34DW080D-GP	193.4	1550.12
35	SP-SM35DW080D-GP	193.5	1549.32
36	SP-SM36DW080D-GP	193.6	1548.51
37	SP-SM37DW080D-GP	193.7	1547.72
38	SP-SM38DW080D-GP	193.8	1546.92
39	SP-SM39DW080D-GP	193.9	1546.12
40	SP-SM40DW080D-GP	194.0	1545.32
41	SP-SM41DW080D-GP	194.1	1544.53
42	SP-SM42DW080D-GP	194.2	1543.73
43	SP-SM43DW080D-GP	194.3	1542.94
44	SP-SM44DW080D-GP	194.4	1542.14
45	SP-SM45DW080D-GP	194.5	1541.35
46	SP-SM46DW080D-GP	194.6	1540.56
47	SP-SM47DW080D-GP	194.7	1539.77
48	SP-SM48DW080D-GP	194.8	1538.98
49	SP-SM49DW080D-GP	194.9	1538.19
50	SP-SM50DW080D-GP	195.0	1537.40
51	SP-SM51DW080D-GP	195.1	1536.61
52	SP-SM52DW080D-GP	195.2	1535.82

53	SP-SM53DW080D-GP	195.3	1535.04
54	SP-SM54DW080D-GP	195.4	1534.25
55	SP-SM55DW080D-GP	195.5	1533.47
56	SP-SM56DW080D-GP	195.6	1532.68
57	SP-SM57DW080D-GP	195.7	1531.90
58	SP-SM58DW080D-GP	195.8	1531.12
59	SP-SM59DW080D-GP	195.9	1530.33
60	SP-SM60DW080D-GP	196.0	1529.55
61	SP-SM61DW080D-GP	196.1	1528.77

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T _s	-40	85	°C
Relative Humidity	RH	5	95	%
Supply Voltage	V _{cc}	-0.5	4.0	V

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _c	0	25	70	°C
Supply Voltage	V _{cc}	3.135	3.3	3.465	V
Data Rate	-	-	10.3125	-	Gb/s

Transceiver Electrical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes	
Module Supply Current	I _{cc}	-	300	450	mA	-	
Power Dissipation	P _D	-	1.0	1.5	W	-	
Transmitter							
Input Differential Impedance	Z _{IN}	-	100	-	Ω	-	
Differential Data Input Swing	V _{IN, P-P}	180	-	700	mV _{P-P}	-	
TX_FAULT	Transmitter Fault	V _{OH}	2.0	-	V _{CCHOST}	V	-
	Normal Operation	V _{OL}	0	-	0.8	V	-
TX_DISABLE	Transmitter Disable	V _{IH}	2.0	-	V _{CCHOST}	V	-
	Transmitter Enable	V _{IL}	0	-	0.8	V	-
Receiver							
Output Differential Impedance	Z _O	-	100	-	Ω	-	
Differential Data Output Swing	V _{OUT, P-P}	300	-	850	mV _{P-P}	1	

Data Output Rise Time, Fall Time	t_r, t_f	28	-	-	ps	2	
RX_LOS	Loss of signal (LOS)	V_{OH}	2.0	-	V_{CCHOST}	V	3
	Normal Operation	V_{OL}	0	-	0.8	V	3

Notes:

1. Internally AC coupled, but requires a external 100Ω differential load termination.
2. 20–80%.
3. LOS is an open collector output. Should be pulled up with 4.7KΩ on the host board.

Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	P_o	0	-	+4.0	dBm	1
Center Wavelength Range	λ_c	1528.77	-	1563.86	nm	-
Center Wavelength Spacing	-	-	100	-	GHz	
Center Wavelength Tolerance	$\Delta\lambda_c$	-100	-	100	pm	
Extinction Ratio	EX	9.0	-	-	dB	2
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Spectral Width (-20dB)	-	-	-	1	nm	
Transmitter and Dispersion Penalty	TDP	-	-	3.0	dB	-
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Optical Return Loss Tolerance	ORLT	-	-	21	dB	-
Pout @TX-Disable Asserted	P_{off}	-	-	-30	dBm	1
Tx Power Monitor Accuracy				±3	dB	
Eye Diagram	IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ZR compatible					

Notes:

1. The optical power is launched into 9/125μm SMF.
2. Measured with a PRBS $2^{31}-1$ test pattern @10.3125Gbps.

Receiver Optical Characteristics

Table 8. Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λ_c	1528	-	1565	nm	-
Receiver Sensitivity (P_{avg})	S	-	-	-23	dBm	1
Receiver Overload (P_{avg})	P_{OL}	-7.0	-	-	dBm	1
Optical Return Loss	ORL	-	-	-27	dB	-
Chromatic Dispersion	CD	-	-	1600	ps/nm	-
OSNR	-	27	-	-	dB	2
Max OSNR Path Penalty	-	-	-	4	dB	2
Optical Power Path Penalty	-	-	-	3	dB	-
Rx Power Monitor Accuracy	-	-	-	± 3	dB	-
Dispersion Limited Distance	-	-	-	80	Km	-
Attenuation Limited Distance	-	-	-	80	Km	-
LOS De-Assert	LOS_D	-	-	-25	dBm	-
LOS Assert	LOS_A	-35	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Notes:

1. Measured with PRBS $2^{31}-1$ test pattern, 10.3125Gb/s, BER $<10^{-12}$.
2. Receiver power@ -7~-18dBm, 10.3125Gb/s, BER $<10^{-12}$.

Mechanical specifications

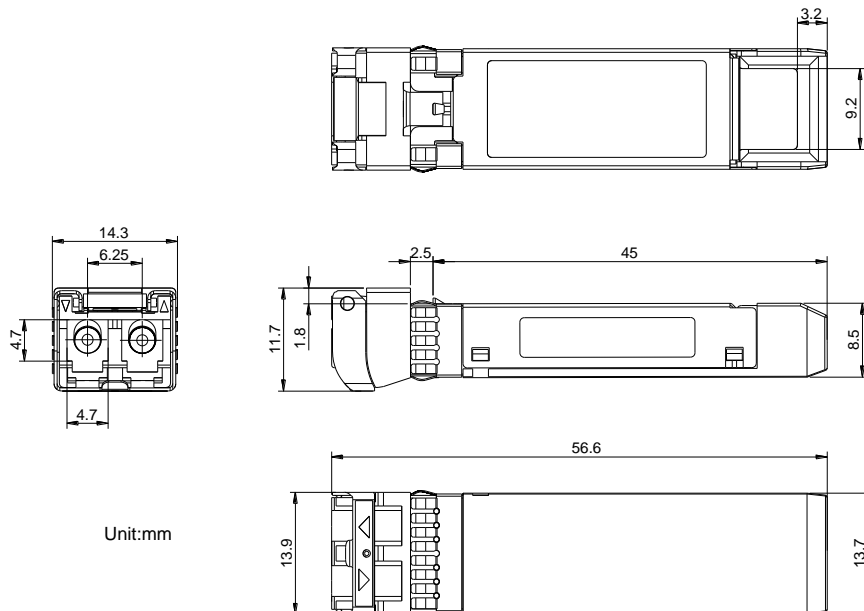


Figure 5. Outline Drawing