

SP-SMxxCW040D-GP

10G Ethernet 40km
CWDM SFP+ Transceiver
10GBASE-ER

Product Features

- Compliant with IEEE Std 802.3-2005
10G Ethernet 10GBase-ER/EW
- Electrical interface specifications per SFF-8431
- Management interface specifications per
SFF-8431 and SFF-8472
- SFP+ MSA package with duplex LC connector
- Cooled EML Laser
- Up to 10.3Gb/s bi-directional data links
- Single +3.3V power supply
- Class 1 laser safety certified
- Commercial operating temperature: 0°C to +70°C
- Up to 40km on 9/125µm SMF
- RoHS Compliant

Applications

- 10G Ethernet 10GBASE-ER
- 40km 10G CWDM Network

Ordering information

Part No.	Description
SP-SMxxCW040D-GP	SFP+ CWDM 10G (1470-1610nm) LC DDM SMF EML Laser

Part Number	Transmitter	Receiver	Reach	Temp	DDM	RoHS
SP-SM47CW040D-GP	1470nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM49CW040D-GP	1490nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM51CW040D-GP	1510nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM53CW040D-GP	1530nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM55CW040D-GP	1550nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM57CW040D-GP	1570nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM59CW040D-GP	1590nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant
SP-SM61CW040D-GP	1610nm EML	PIN	40km	0 ~ 70 °C	Available	Compliant

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}	-	-	450	mA	-	
Power Dissipation	P _D	-	-	1500	mW	-	
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 100 Ω differential load termination.
2. 20–80%.
3. LOS is an open collector output. Should be pulled up with 4.7K Ω on the host board.

Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	P_o	-1	-	+3.0	dBm	1
Center Wavelength Range	λ_c	1464.5	-	1617.5	nm	-
Center Wavelength Tolerance	$\Delta\lambda_c$	-6.5	-	6.5	nm	-
Extinction Ratio	EX	8.2	-	-	dB	2
Optical Modulation Amplitude	OMA	-2.1	-	-	dBm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Transmitter and Dispersion Penalty @800ps/nm	TDP	-	-	2.0	dB	-
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	-
Optical Return Loss Tolerance	ORLT	-	-	21	dB	-
Pout @TX-Disable Asserted	P_{off}	-	-	-30	dBm	1
Eye Diagram	IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ER compatible					

Notes:

1. The optical power is launched into 9/125 μ m SMF.
2. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps.

Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λ_c	1464.5	-	1617.5	nm	-
Receiver Sensitivity (P_{avg})	S	-	-	-15.8	dBm	1
Receiver Sensitivity (OMA)	S_{OMA}	-	-	-14.1	dBm	1
Receiver Overload (P_{avg})	P_{OL}	-1.0	-	-	dBm	1
Stressed Sensitivity (OMA)	-	-	-	-11.3	dBm	2
Optical Return Loss	ORL	26	-	-	dB	-
LOS De-Assert	LOS_D	-	-	-17	dBm	-
LOS Assert	LOS_A	-30	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Notes:

1. Measured with PRBS 2³¹-1 test pattern, 10.3125Gb/s, BER<10⁻¹².
2. Comply with IEEE 802.3-2005.

Mechanical specifications

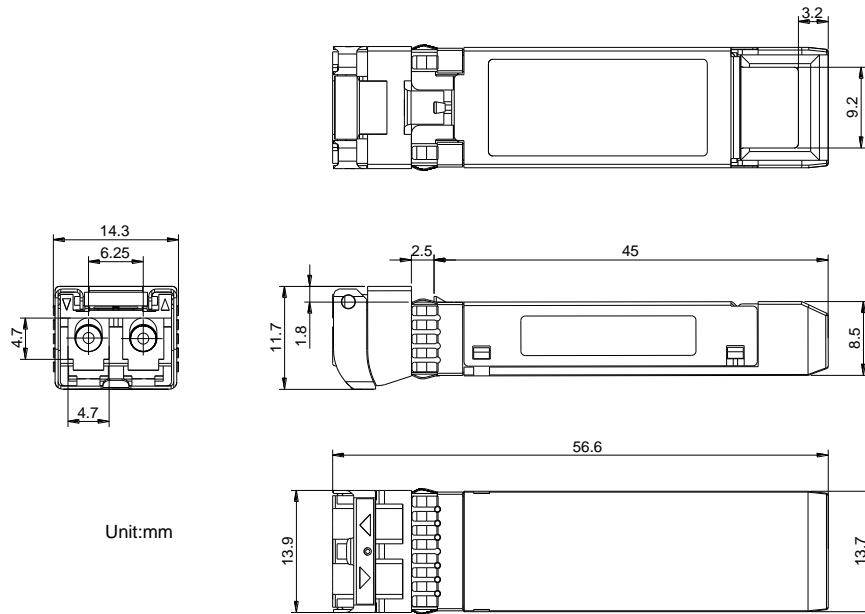


Figure 5. Outline Drawing