

Datasheet

10 Gbps 100 GHz DWDM 80 km Single-Mode SFP+ Transceivers

SFP-10GDWZR-xx



Highlights

- SFP+ transceiver
- C-band (standard 100 GHz DWDM ITU grid)
- Data Rates: 8 Gbps to 11.3 Gbps
- Protocols supported:
 - 10G Ethernet (10GBase-ER/EW [LAN/WAN]) with/without FEC
 - 10G Fibre Channel with/without FEC
 - SONET OC-192/STM-64 with/without FEC
 - 8 Gbps Fibre Channel
- Single-mode fiber
- Dual fiber, bi-directional
- 40 - 80 km
- Duplex LC connector
- Digital Diagnostics (SFF-8472)
- Hot-swap

Overview

Small Form-Factor Pluggable (SFP) interfaces from MRV Communications provide flexible high speed links in a small industry-standard package. They deliver the deployment options and inventory control that network administrators demand for growing networks.

SFPs are designed to Multi-Source Agreement (MSA) standards to ensure network equipment compatibility. They are a perfect addition to MRV’s extensive lines of networking equipment.

Visit the MRV website at www.mrv.com or contact your nearest authorized MRV Communications dealer for more information.

Specifications Overview

Data Rate	8 - 11.3 Gbps
Tx Wavelength	100 GHz ITU Grid, C-Band DWDM (channel 17 – 61)
Tx Power (Minimum)	0 dBm
Tx Dispersion Penalty (@ 10.3125 Gbps)	< 3 dB
Tx Disable	Yes
Rx Wavelength Range	1528 - 1564 nm
Rx Sensitivity	-23 dBm
Rx Saturation	-8 dBm
Operating Temperature Range	-5 to 70 °C
Power Consumption	1 Watt

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Transmitter Specifications (Optical)

Parameter	Symbol	Min	Max	Unit	Notes
Data Rate	B	8	11.3	Gbps	-
Center Wavelength	λ_c	See Ordering Information Table		nm	1
Average Optical Output Power	P_{avg}	0	4	dBm	-
Extinction Ratio	ER	8.2	-	dB	-
Relative Intensity Noise	RIN	-	-128	dB/Hz	-
Side Mode Suppression Ratio	SMSR	30	-	dB	-
Optical Return Loss Tolerance	-	-	-21	dB	-
Dispersion Penalty (@10.3125Gbps)	DP	-	3	dB	-
Optical Output Eye	-	Compliant with IEEE 802.3ae			-

Notes: 1. BOL: +/-0.05nm from ITU grid; EOL: +/-0.1nm from ITU grid.

Receiver Specifications (Optical)

Parameter	Symbol	Min	Max	Unit	Notes
Data Rate	B	8	11.3	Gbps	-
Wavelength of Operation	λ	1528	1565	nm	-
Receiver Sensitivity (@10.3125Gbps)	P_{min}	-	-23	dBm	1
Maximum Input Power (10^{-12} BER)	P_{max}	-8	-	dBm	-
Reflectance Of Receiver	-	-	-27	dB	-
LOS Hysteresis	-	0.5	-	dB	-
LOS Thresholds (Increasing Light Input)	P_{los+}	-	-25	dBm	-
LOS Thresholds (Decreasing Light Input)	P_{los-}	-38	-	dBm	-

Notes: 1. Specified with BER $<1 \times 10^{-12}$ and PRBS $2^{31}-1$

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature Range	T_{ST}	-40	85	°C	-
Operating Case Temperature	T_{OP}	-5	70	°C	1
Operating Relative Humidity	RH	0	85	%	2
Supply Voltage Range	V_{CC}	-0.5	3.6	V	-

Notes: 1. Measured on top side of SFP+ module at the front center vent hole of the cage.
2. Non condensing

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Transmitter Specifications (Electrical)

Parameter	Symbol	Min	Max	Unit	Notes
Differential Input Impedance	Z_d	80	120	Ω	-
Differential Input Voltage Swing	$V_{PP-DIFF}$	180	700	mV	-
Input High Voltage (TX Disable)	V_{IH}	2.0	V_{CC}	V	1
Input LOW Voltage (TX Disable)	V_{IL}	0	0.8	V	1
Output High Voltage (TX Fault)	V_{OH}	2.0	$V_{CC} + 0.3$	V	2
Output LOW Voltage (TX Fault)	V_{OL}	0	0.8	V	2

- Notes:**
1. There is an internal 4.7 to 10 k Ω pull-up resistor to VccT
 2. Open collector compatible, 4.7 to 10 k Ω pull-up resistor to Vcc (Host Supply Voltage)

Receiver Specifications (Electrical)

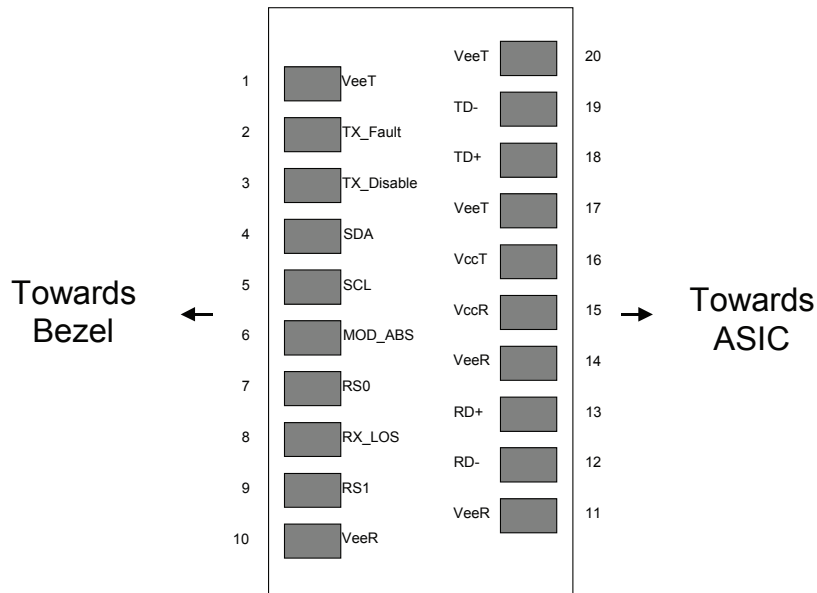
Parameter	Symbol	Min	Max	Unit	Notes
Differential Output Impedance	Z_d	80	120	Ω	-
Differential Output Swing	$V_{PP-DIFF}$	300	850	mV	-
Output Rise and Fall time (20% to 80%)	t_{RH}, t_{FH}	28	-	ps	-
Output HIGH Voltage (LOS)	V_{OH}	$V_{CC} - 1.3$	$V_{CC} - 0.3$	V	1
Output Low Voltage (LOS)	V_{OL}	0	0.8	V	1

- Notes:**
1. Open collector compatible, 4.7 to 10 k Ω pull-up resistor to Vcc (Host Supply Voltage)

Power Supply Specifications (Electrical)

Parameter	Symbol	Min	Max	Unit	Notes
Power Supply Voltage	V_{CC}	3.13	3.47	V	-
DC Common Mode Voltage	V_{CM}	0	3.6	V	-
Supply Current	I_{VCM}	-	340	mA	-
Power Consumption	P_W	-	1.12	W	-

Host Board Connector Pinout

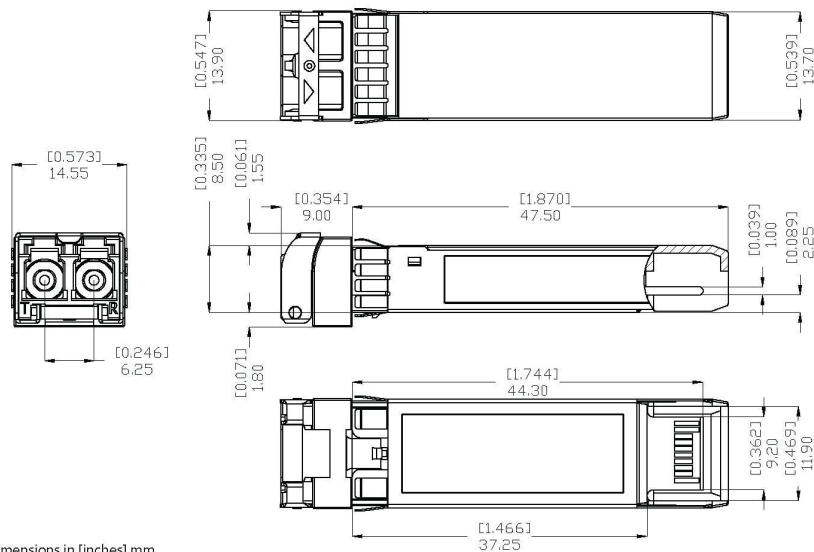


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Pin Descriptions

Pin	Logic	Symbol	Description
1	-	VeeT	Module Transmitter Ground
2	LVTTTL-O	TX_FAULT	Module Transmitter Fault
3	LVTTTL-I	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output
4	LVTTTL-I/O	SDA	2-Wire Serial Interface Data Line
5	LVTTTL-I/O	SCL	2-Wire Serial Interface Clock
6	-	MOD-ABS	Module Definition, Grounded in the module
7	LVTTTL-I	RS0	No function implemented
8	LVTTTL-O	RX_LOS	Receiver Loss of Signal Indication
9	LVTTTL-I	RS1	No function implemented
10	-	VeeR	Module Receiver Ground
11	-	VeeR	Module Receiver Ground
12	CML-O	RD-	Receiver Inverted Data Output
13	CML-O	RD+	Receiver Non-Inverted Data Output
14	-	VeeR	Module Receiver Ground
15	-	VccR	Module Receiver 3.3V Supply
16	-	VccT	Module Transmitter 3.3V Supply
17	-	VeeT	Module Transmitter Ground
18	CML-I	TD+	Transmitter Non-Inverted Data Input
19	CML-I	TD-	Transmitter Inverted Data Input
20	-	VeeT	Module Transmitter Ground

Outline Drawing



Dimensions in [inches] mm
 Millimeters are the primary units.
 Tolerances are in accordance with
 SFF-8432 Rev.5

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Ordering Information

Model	Wavelength (nm)	Frequency (THz)	Channel Number	Distance (km)
SFP-10GDWZR-61	1528.77	196.10	61	80
SFP-10GDWZR-60	1529.55	196.00	60	80
SFP-10GDWZR-59	1530.33	195.90	59	80
SFP-10GDWZR-58	1531.12	195.80	58	80
SFP-10GDWZR-57	1531.90	195.70	57	80
SFP-10GDWZR-56	1532.68	195.60	56	80
SFP-10GDWZR-55	1533.47	195.50	55	80
SFP-10GDWZR-54	1534.25	195.40	54	80
SFP-10GDWZR-53	1535.04	195.30	53	80
SFP-10GDWZR-52	1535.82	195.20	52	80
SFP-10GDWZR-51	1536.61	195.10	51	80
SFP-10GDWZR-50	1537.40	195.00	50	80
SFP-10GDWZR-49	1538.19	194.90	49	80
SFP-10GDWZR-48	1538.98	194.80	48	80
SFP-10GDWZR-47	1539.77	194.70	47	80
SFP-10GDWZR-46	1540.56	194.60	46	80
SFP-10GDWZR-45	1541.35	194.50	45	80
SFP-10GDWZR-44	1542.14	194.40	44	80
SFP-10GDWZR-43	1542.94	194.30	43	80
SFP-10GDWZR-42	1543.73	194.20	42	80
SFP-10GDWZR-41	1544.53	194.10	41	80
SFP-10GDWZR-40	1545.32	194.00	40	80
SFP-10GDWZR-39	1546.12	193.90	39	80
SFP-10GDWZR-38	1546.92	193.80	38	80
SFP-10GDWZR-37	1547.72	193.70	37	80
SFP-10GDWZR-36	1548.52	193.60	36	80
SFP-10GDWZR-35	1549.32	193.50	35	80
SFP-10GDWZR-34	1550.12	193.40	34	80
SFP-10GDWZR-33	1550.92	193.30	33	80
SFP-10GDWZR-32	1551.72	193.20	32	80
SFP-10GDWZR-31	1552.52	193.10	31	80
SFP-10GDWZR-30	1553.33	193.00	30	80
SFP-10GDWZR-29	1554.13	192.90	29	80
SFP-10GDWZR-28	1554.94	192.80	28	80
SFP-10GDWZR-27	1555.75	192.70	27	80
SFP-10GDWZR-26	1556.56	192.60	26	80
SFP-10GDWZR-25	1557.36	192.50	25	80
SFP-10GDWZR-24	1558.17	192.40	24	80
SFP-10GDWZR-23	1558.98	192.30	23	80
SFP-10GDWZR-22	1559.79	192.20	22	80



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Ordering Information

Model	Wavelength (nm)	Frequency (THz)	Channel Number	Distance (km)
SFP-10GDWZR-21	1560.61	192.10	21	80
SFP-10GDWZR-20	1561.42	192.00	20	80
SFP-10GDWZR-19	1562.23	191.90	19	80
SFP-10GDWZR-18	1563.05	191.80	18	80
SFP-10GDWZR-17	1563.86	191.70	17	80

Regulatory and Industry Compliances

Class 1 Laser Product, complies with EN 60825-1 and 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
MSA SFF-8074i; Digital Diagnostic SFF-8472

Certified by one or more of the following agencies: TÜV, UL, CSA

RoHS Directive; China RoHS; California RoHS Law, REACH Directive SVHC; WEEE Directive

The Quality Management System is certified to ISO 9001 by QMI-SAI Global

The Environmental Management System is in compliance with ISO 14001

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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