4.25 Gbps Fibre Channel DWDM SFP Transceiver

Features

- Models available for all 100 GHz C-Band wavelengths on the DWDM ITU grid
- 1.06/2.125/4.25Gbps Fibre Channel support
- 10km, 40km, or up to 80 km reach
- 1.25 Gbps Ethernet compatibility
- SFP MSA compliance (SFF-8074i)
- Digital Diagnostic (SFF-8472)
- Telecordia GR-468 compliance
- Cold start-up wavelength support
- Low power usage up to 1.5W
- -5ºC to 70ºC operating case temperature
- Class 1 Laser
- APD-based receiver sensitivity

General Operating

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V_{cc}	3.135	3.3	3.465	V
Total Current (BOL)	I_{cc}	-	-	375	mA
Power Supply Noise Rejection[a]	PSR	100	-	-	mV_{p-p}
Operating Case Temperature	T_{op}	-5	-	70	ºC
Storage Temperature	T_{st}	-40	-	85	ºC
Data Rate Multirate	MR	-	4.25	-	Gbps

a) 20 Hz to 155 MHz

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{op}	0	2	4	dBm
Average Launch Power (Tx: Off)	P_{off}	-	-	-30	dBm
Channel Spacing	$\Delta\phi$	-	100	-	GHz
Deviation From Central Frequency, EOL	-	-	-	±12	GHz
Spectral Width (20dB)	$\Delta\lambda$	-	-	0.3	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Dispersion Penalty at Specified Distance: **SFPFC4DW08-*xx***[b]	dp	-	-	3	dB
SFPFC4DW04-*xx*[c]	dp	-	-	2	dB
SFPFC4DW01-*xx*[d]	dp	-	-	2	dB
Relative Intensity Noise	RIN	-	-	-135	dB/Hz
Reflection Tolerance[e]	rp	-	-	-	dB

b) Measured at BER of 10^{-12}, PRBS of 2^7-1, at eye center, 4.25Gbps, 80km (1600ps/nm) fiber.
c) Measured at BER of 10^{-12}, PRBS of 2^7-1, at eye center, 4.25Gbps, 40km (800ps/nm) fiber.
d) Measured at BER of 10^{-12}, PRBS of 2^7-1, at eye center, 4.25Gbps, 10km (200ps/nm) fiber.
e) 2dB degradation of receiver sensitivity

Transmitter Specifications (Electical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Input Differential Impedence	R_{in}	80	100	120	Ω
PECL Single-Ended Data Input Swing	$V_{in,p-p}$	250	-	1200	mV
TxFault_Fault	V_{fault}	2	-	V_{cc}	V
TxFault_Normal	V_{normal}	V_{ee}	-	V_{ee}+0.5	V
TxDisable_Disable	Vd	2	-	V_{cc}	V
TxDisable_Enable	Ven	V_{ee}	-	V_{ee}+0.8	V

Receiver Specifications (Optical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Receive Power Low: **SFPFC4DW08-*xx*[f]**	$R_{sens,low}$	-	-26	-24	dBm
SFPFC4DW04-*xx*[f]	$R_{sens,low}$	-	-26	-24	dBm
SFPFC4DW01-*xx*[f]	$R_{sens,low}$	-	-20	-18	dBm
Receive Power High	$R_{sens,high}$	-6	-	-	dBm
Damage Threshold for Receiver	$P_{in,damage}$	4	-	-	dBm
Wavelength	λ	1528	-	1564	nm
Maximum Reflectance of Receiver	RX_r	-	-	-27	dB

f) at 10^{-12} BER, PRBS 2^7-1, 4.25Gbps

Receiver Specifications (Electrical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Single-Ended Data Output	$V_{out, p-p}$	185	-	800	mV

Timing and Electrical					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Tx Disable Negate Time	t_on	-	-	20	ms
Tx Disable Assert Time	t_off	-	-	20	ms
Time to Initialize after Reset of Tx_Fault/ INT in Normal Operation	t_init	-	-	300	ms
Start-up Time	t_startup	-	-	90	secs
Tx Fault/INT Assert Time	t_fault	-	-	50	ms
Tx Disable To Reset	t_reset	10	-	-	µs
LOS Assert Time	t_loss_on	-	-	100	µs
LOS De-assert Time	t_loss_off	-	-	100	µs
Serial ID Clock Rate	f_serial_clock	-	-	100	KHz
RX_LOS Voltage (High)	-	2	-	-	V
RX_LOS Voltage (Low)	-	-	-	0.8	V
LOS Output Voltage-Fault	V_{LOS} fault	2	-	V_{cc}	V
LOS Output Voltage-Normal	V_{LOS}normal	V_{ee}	-	V_{ee}+0.5	V
MOD_DEF (0:2)-High	V_H	2	-	V_{cc}	V
MOD_DEF (0:2)-Low	V_L	V_{ee}	-	V_{ee}+0.5	V

Ordering Information

Model	Description	Data Rate (Mbps)	Bail Latch Color	Distance Range (km)	
				Min.	Max.
SFPFC4DW08-*xx**	SFP DWDM Transceiver	1/2/4 Gbps Fibre Channel/ Gigabit Ethernet	Black	**	80
SFPFC4DW04-*xx**	SFP DWDM Transceiver	1/2/4 Gbps Fibre Channel/ Gigabit Ethernet	Black	**	40
SFPFC4DW01-*xx**	SFP DWDM Transceiver	1/2/4 Gbps Fibre Channel/ Gigabit Ethernet	Black	**	10

* See Wavelength Guide below for "***xx***" values
** Minimum distance is dependant on the insertion loss of a Max/DeMux module used.

λc Wavelength Guide

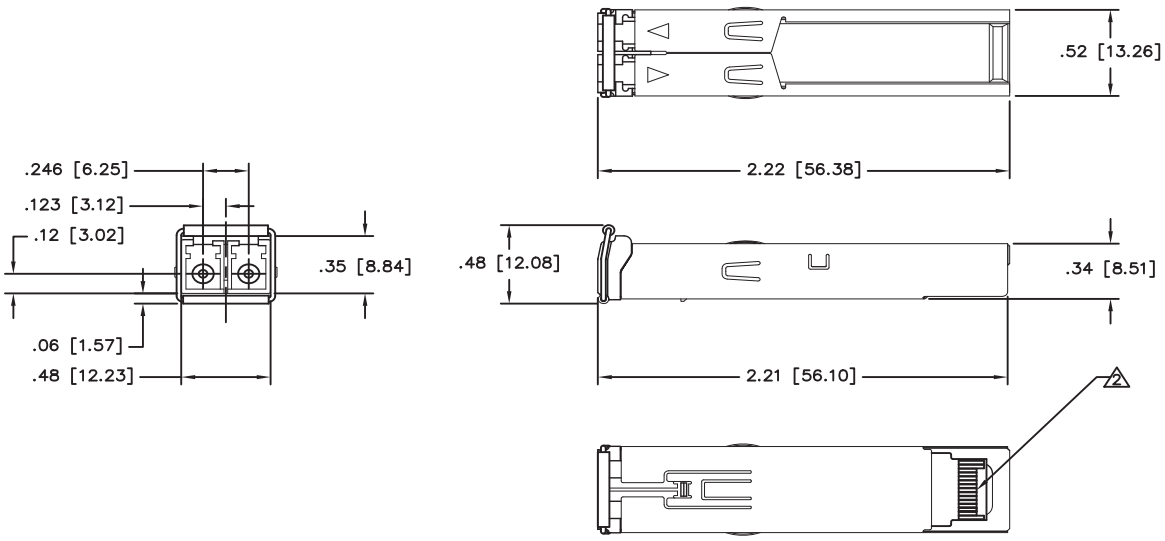
ITU Channel/ Product Code	Frequency (THz)	Wavelength (nm)	ITU Channel/ Product Code	Frequency (THz)	Wavelength (nm)
17	191.7	1563.863	40	194.0	1545.322
18	191.8	1563.047	41	194.1	1544.526
19	191.9	1562.233	42	194.2	1543.730
20	192.0	1561.419	43	194.3	1542.936
21	192.1	1560.606	44	194.4	1542.142
22	192.2	1559.794	45	194.5	1541.349
23	192.3	1558.983	46	194.6	1540.557
24	192.4	1558.173	47	194.7	1539.766
25	192.5	1557.363	48	194.8	1538.976
26	192.6	1556.555	49	194.9	1538.186
27	192.7	1555.747	50	195.0	1537.397
28	192.8	1554.940	51	195.1	1536.609
29	192.9	1554.134	52	195.2	1535.822
30	193.0	1553.329	53	195.3	1535.036
31	193.1	1552.524	54	195.4	1534.250
32	193.2	1551.721	55	195.5	1533.465
33	193.3	1550.918	56	195.6	1532.681
34	193.4	1550.116	57	195.7	1531.898
35	193.5	1549.315	58	195.8	1531.116
36	193.6	1548.515	59	195.9	1530.334
37	193.7	1547.715	60	196.0	1529.553
38	193.8	1546.917	61	196.1	1528.773
39	193.9	1546.119			

Diagnostics			
Parameter	**Range**	**Accuracy**	**Unit**
Temperature	-40 to 102	± 3	°C
Voltage	0 to V_{cc}	0.1	V
Bias Current	0 to 120	5	mA
TX Power	0 to 4	±2	dBm
RX Power: **SFPFC4DW08-*xx***	-24 to -6	±2	dBm
SFPFC4DW04-*xx*	-24 to -6	±2	dBm
SFPFC4DW01-*xx*	-18 to -6	±2	dBm
TEC Current	-1200 to 1200	±60	mA
TEC Temperature[g]	20 to 70	±0.25	°C

g) Relative accuracy. Absolute accuracy is +/-3°C

Pin	Function	Notes
1	$V_{ee}T$	TX Ground
2	TX_FAULT/INT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEF0	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	$V_{ee}R$	RX Ground
10	$V_{ee}R$	RX Ground
11	$V_{ee}R$	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	$V_{ee}R$	RX Ground
15	V_{ccR}	RX Power
16	V_{ccT}	TX Power
17	$V_{ee}T$	TX Ground
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	$V_{ee}T$	TX Ground

Outline Drawing



RoHS directive; China RoHS; USA and Canada UL listing; 21CFR 1040.10; MSA SFF-8074i; SFF-8472; Telecordia GR-468;

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic descharge (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 indeirect radiation.

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