

SFP-MR-SR1



Features

- Single 3.3 V supply
- 10 dB min. link budget
- Commercial and Industrial temperature available
- 1310nm FP laser
- SFP MSA SFF-8074i compliant
- GR 253/STM G.957 compliant
- Digital Diagnostic SFF-8472 compliant
- Bellcore GR-468 compliant

General Operating

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Total Current	I_{CC}	-	-	300	mA
Power Supply Noise Rejection ^a		100	-	-	mVp-p
Operating Temperature(case)(-T)	T_{op}	-40	-	85	°C
Operating Temperature(case)	T_{opr}	-5	-	70	°C
Storage Temperature	T_{stg}	-40	-	85	°C
Data Rate	DR	100	-	2700	Mbps

a) 20Hz to 155MHz

Transmitter Specifications, Optical

Parameter	Symbol	Min	Typical	Max	Unit
Optical power	P_{op}	-10	-6	-3	dBm
Average Launch power of off Tx	P_{off}	-	-	-30	dBm
Extinction Ratio	ER	9	-	-	dB
Eye Mask		IEEE 802.3z, SONET/SDH compliant			
Optical Jitter generation	J_{gen}	-	-	0.007	UI
Optical Rise time ^b	t_r	-	-	160	ps
Optical Fall time ^b	t_f	-	-	160	ps
Mean Wavelength	λ	1266	1310	1360	nm
Spectral width (RMS)	$\Delta\lambda$	-	-	4	nm
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Reflectance Tolerance ^c	rp	-24	-	-	dB

b) 20%-80% values

c) 1 dB degradation of receiver sensitivity

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Transmitter Specifications , Electrical

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	V_d	2	-	V_{cc}	V
TxDisable_Enable	V_{en}	V_{ee}	-	$V_{ee} + 0.8$	V

Receiver Specifications, Optical

Parameter	Symbol	Min	Typical	Max	Unit
Receiver Power Low ^d	$R_{sens, low}$	-20	-22	-	dBm
Receiver Power High	$R_{sens, high}$	-	-	-3	dBm
Damage Threshold for Receiver	$P_{in, damage}$	-	-	4	dBm
Wavelength ^e	λ	1260	1310	1360	nm
Maximum Reflectance of Receiver	RX_r	-	-	-27	dB
LOS Assert	-	-30	-	-	dBm
LOS De-assert	-	-	-	-20	dBm
LOS hysteresis	-	0.5	-	-	dB

d) at 10^{-10} BER, PRBS 2²³-1 for SONET, 10^{-12} BER, PRBS 2⁷-1 for Gigabit ethernet

e) Operational over 1200-1625 nm range

Electrical Output

Parameter	Symbol	Min	Typical	Max	Unit
PECL Single ended data output swing	$V_{out, p-p}$	400	-	800	mV
Data output rise time	t_r	-	-	175	ps
Data output fall time	t_f	-	-	175	ps

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Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate time	t_on	-	-	1	ms
Tx Disable assert time	t_off	-	-	10	μs
Time to initialize, including reset of Tx fault	t_init	-	-	300	ms
Tx fault Assert time	t_fault	-	-	100	μs
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)	Rx_LOS _H	2	-	-	V
RX_LOS Voltage (low)	Rx_LOS _L	-	-	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

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Formula
Temperature	-40 to 102	±3	°C	Internal	T _c (C) = T _{ad} (16 bit signed twos complement)/256
Voltage	0 to V _{cc}	0.1	V	Internal	V(Volts) = V _{ad} (16 bit unsigned integer)*0.1
Bias Current	0 to 120	5	mA	External	I(mA) = I _{slope} * I _{ad} (16 bit unsigned integer)+I _{offset}
Tx Power	0 to 0.5mW	±3dB	mW	External	Tx_PWR(μW) = Tx_PWR _{slope} *Tx_PWR _{ad} (16 bit unsigned integer)+Tx_PWR _{offset}
Rx Power	-20 to -3dBm	±3dB	mW	External	Rx_PWR(μW) = A0+A1*x+A2*x^2+A3*x^3+A4*x^4

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EEPROM Serial ID

Name of Field	Discription of Field	Address	Hex	ASCII
Vendor Name	SFPVendor name (ASCII)	20	4C	L
		21	55	U
		22	4D	M
		23	49	I
		24	4E	N
		25	45	E
		26	4E	N
		27	54	T
Vendor OUI	IEEE vendor OUI code for LuminentOIC Inc.	37	00	
		38	06	
		39	B5	
Vendor PN	Part number in ASCII, e.g. SFP-MR-SR1	40	53	S
		41	46	F
		42	50	P
		43	4D	M
		44	52	R
		45	53	S
		46	52	R
		47	31	1

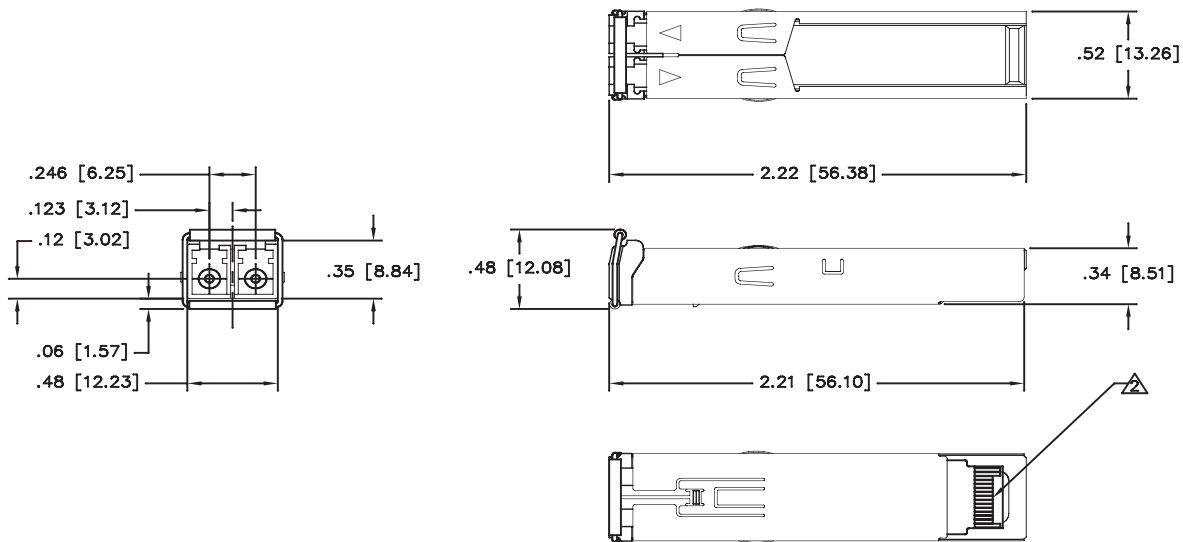
Pinout Definitions

Pin	Function	Notes
1	V _{ee} T	TX GND
2	TX_FAULT	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 GND
15	V _{CC} R	RX Power
16	V _{CC} T	TX Power
17	V _{ee} T	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	V _{ee} T	TX GND

SFP-MR-SR1

Outline Drawing

Units in inches [mm]



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Ordering Information

Available Options:

SFP-MR-SR1
 SFP-MR-SR1-T
 SFP-MR-SR1-D1
 SFP-MR-SR1-D1-T

Part numbering Definition:

SFP-MR-SR1 - **Digital Diagnostics** - **Temperature Range** - **Customer Specific**

- Blank=No Diagnostic
 D1= External Calibration
 D2= Internal Calibration
- Blank=Commercial
 T=Industrial Temperature (-40 to 85)
 R=Reduced Industrial Temperature (-20 to 85)
- Blank=Standard Procedure
 Labelling, Serial number, or Shipping Instructions etc.

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.

Legal Notes:

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