Part Number: SFP-GE-LH70-SM1510-CW

Quick Spec:

Manufacturer Compatibility:	H3C
Form Factor:	SFP
TX Wavelength:	1510nm
Reach:	80km
Cable Type:	SMF
Rate Category:	1000Base
Interface Type:	CWDM
Digital Optical Mon. (DOM):	False
Connector Type:	Dual-LC

FEATURES:

- 1.125Gb/s bi-directional data links
- Hot-pluggable
- RoHS compliant and Lead Free
- Metal enclosure, for lower EMI
- Single 3.3V power supply
- Low power dissipation <700mW typical
- Operating temperature range: -0°C to 70°C

APPLICATIONS:

- Gigabit Ethernet

PRODUCT SELECTION

Transmit Wavelength	Bale latch color
1470	Gray
1490	Violet
1510	Blue
1530	Green
1550	Yellow
1570	Orange
1590	Red
1610	Brown

FluxLight's CWDM-SFP-XXXX Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA)1.

They comply with Gigabit Ethernet as specified in IEEE Std 802. They are RoHS compliant and lead-free per Directive 2002/95/EC5. Digital diagnostics functions are available via the 2-wire serial bus specified in the SFP MSA.

I. Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	VEER	Receiver Ground (Common with Transmitter Ground)	1
10	VEER	Receiver Ground (Common with Transmitter Ground)	1
11	VEER	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground (Common with Transmitter Ground)	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k - 10 kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10 kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		4.5	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TOP	0		70	°C	
Relative Humidity	RH	0		85	%	1

Notes:

1. Non-condensing

III. Electrical Characteristics (TOP = -10 to 70 °C, VCC = 3.00 to 3.60 Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc	3.15		3.60	V	
Supply Current	Icc		200	300	mA	
Transmitter						
Input differential impedance	Rin		100		Ohms	2
Single ended data input swing	Vin,pp	250		1200	mV	
Transmit Disable Voltage	VD	Vcc – 1.3		Vcc	V	
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	3
Transmit Disable Assert Time				10	us	
Receiver						
Single ended data output swing	Vout,pp	300	400	800	mV	4
Data output rise time	tr		100	175	ps	5
Data output fall time	tf		100	175	ps	5
LOS Fault	VLOS fault	Vcc – 0.5		VccHOST	V	6
LOS Normal	VLOS norm	Vee		Vee+0.5	V	6
Power Supply Rejection	PSR	100		mVpp	7	
Deterministic Jitter Contribution	RX-DJ		51.7	ps	8	
Total Jitter Contribution	RX-TJ			122.4	ps	

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Or open circuit.
3. Into 100 ohms differential termination.
4. 20 – 80 %
5. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
6. Receiver sensitivity is compliant with power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the recommended power supply filtering network.
7. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and DJ.

IV. Optical Characteristics (TOP = -10 to 70°C, VCC = 3.00 to 3.60 Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Pwr: 9/125 SMF	POUT	0		5	dBm	1
Optical Wavelength	L	X-6.5	X+1	X+6.5	nm	2
Spectral Width (-20dB)	s			1	nm	
Optical Extinction Ratio	ER	9			dB	
Optical Modulation Amplitude	OMA	174			µW	3
Sidemode Supression ratio	SSRmin	30			dB	
Optical Rise/Fall Time	tr/tf			180	ps	4
Relative Intensity Noise	RIN			-120	dB/Hz	
Deterministic Jitter Contribution	RX-DJ			51.7	ps	5
Total Jitter Contribution	RX-TJ			122.4	ps	
Receiver						
Average Rx Sensitivity @ 1.25 Gb/s (Gigabit Ethernet)	RSENS2			-22	dBm	6, 7
Stressed RX sens. =1.25 Gb/s			-18	-14.5	dBm	
Average Received Power	RxMAX			0	dBm	
Receiver Elec. 3 dB cutoff freq.				1500	MHz	
Optical Center Wavelength	Lc	1270		1600	nm	
Return Loss		12			dB	
LOS De-Assert	LOSD		-23	-19	dBm	
LOS Assert	LOSA	-30	-25		dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Over case temperature of 0 to 70 °C. The Transmitter Center Wavelength "X" is as specified by the customer. The current available wavelengths are: 1470, 1490, 1510, 1530, 1550, 1570, 1590, and 1610 nm. Please see the "Product Selection" section on page 1.
3. Equivalent extinction ratio specification for Fibre Channel. Allows smaller ER at higher average power.
4. Unfiltered, 20-80%.
5. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and DJ.
6. Measured with conformance signals defined in FC-PI 13.0 specifications.
7. Measured with PRBS 27-1 at 10-12 BER

V. General Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Data Rate	BR	1062		2125	Mb/sec	1
Bit Error Rate	BER			10-12		2
Max. Supported Link Length on 9/125µm SMF @ Gigabit Ethernet	LMAX2		88		km	3, 4

Notes:

1. Gigabit Ethernet.
2. Tested with a PRBS 27-1 test pattern.
3. Dispersion limited per FC-PI Rev. 13
4. Attenuation of 0.25 dB/km is used for the link length calculations. Distances are indicative only.

VI. Environmental Specifications

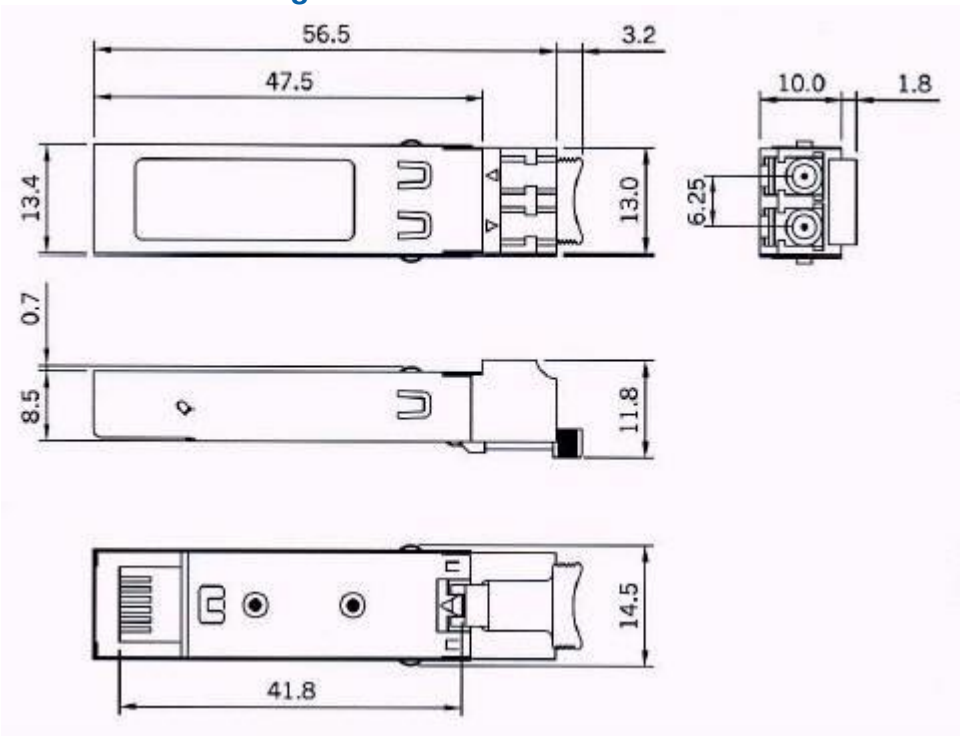
FluxLight's 1550nm SFP transceivers have an extended operating temperature range from –10°C to +70°C case temperature.

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	Top	-0		70	°C	
Storage Temperature	Tsto	-40		85	°C	

VII. Regulatory Compliance

FluxLight transceivers are Class 1 Laser Products and comply with US FDA regulations. These products are certified by TÜV and CSA to meet the Class 1 eye safety requirements of EN (IEC) 60825 and the electrical safety requirements of EN (IEC) 60950. Copies of certificates are available at FluxLight Corporation upon request.

Mechanical Drawing



Dimensions

Dimensions (H x W x D):8.5 x 13.4 x 56.5 mm