Lightem 8.5Gb/s FC 850nm Multi-mode SFP+ Transceiver
LCS800M85300

FEATURE

- Supports 8.5 Gbps /4.25 Gbps /2.125 Gbps bit rates
- Up to 300 m transmission on M MF
- Power dissipation < 1.0W
- VSCEL laser and PIN receiver
- Metal enclosure, for lower EMI
- 2 wire interface with integrated Digital Diagnostic monitoring
- Hot pluggable SFP + footprint
- Specifications compliant with SFF 8472
- Compliant with SFP+ MSA with LC connector
- Single 3.3V power supply
- Case operating temperature range:
  Commercial: 0 °C to +70°C, Extended: -10°C to +80°C, Industrial: -40°C to +85°C

APPLICATIONS

- Multi-rate 8x / 4x / 2x Fiber Channel

STANDARD

- Compliance with Fiber Channel FC-PI-4 800-SM-LC-L
- Compliant with 8G，4G and, 2G Fiber Channel
- RoHS Compliant

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	°C	
Relative Humidity	RH	5	-	95	%	
Power Supply Voltage	VCC	-0.3	-	+4	V	
Signal Input Voltage		Vcc-0.3	-	Vcc+0.3	V	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0		+70	°C	Commercial
	Tcase	-40		+85	°C	Industrial
Power Supply Voltage	VCC	3.14	3.3	3.47	V	
Power Supply Current	ICC	-		300	mA	
Data Rate	BR	2.125		8.5	Gbps	
Transmission Distance	TD		-	300	m	
Coupled fiber			Multi mode fiber			50/125um MMF

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TELECOM/DATACOM SYSTEM

OPTICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Note
Transmitter						
Optical Wavelength	λ	840	850	860	nm	
Optical Modulation Amplitude(OMA) 8.5Gb/s	POUT	-5.2			dBm	1
4.25 Gb/s	POUT	-6.1			dBm	1
2.125 Gb/s	POUT	-7.1			dBm	1
Average Optical Output Power	POUT	-8.2		0	dBm	
Spectral Width	RMS			0.65	nm	
Optical Extinction Ratio	ER	4			dB	
RIN	RIN			-128	dB/Hz	
Output Eye Mask	Compliant with FC-PI-4					
Receiver						
Unstressed receiver sensitivity (OMA) 8.5Gb/s	ROMA			-11.2	dBm	2
4.25 Gb/s	ROMA			-12.1	dBm	2
2.125 Gb/s	ROMA			-13.1	dBm	2
Average Receiver Power	RxMAX	0			dBm	
Wavelength Range	λC	770	850	860	nm	
Optical Return Loss				12	dB	
LOS De -Assert	LOSD			-13.9	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
2. Measured with a PRBS 231-1 test pattern, @8.5/4.25/2.125Gb/s, BER<10-12 .

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			300	mA	
Transmitter						
Input differential impedance	RIN		100		Ω	1
Single ended data input swing	Vin, pp	180		700	mV	
Transmit disable voltage	VD	Vcc-1.3		Vcc	V	
Transmit enable volatage	VEN	Vee		Vee+0.8	V	2
Receiver						
Differential data output swing	Vout, pp	300		850	mV	3
LOS Fault	VLOS fault	Vcc-1.3		VccHost	V	4
LOS Normal	VLOS norm	Vee		Vee+0.8	V	4

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Or open circuit.
3. Into 100 ohms differential termination.
4. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

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PIN DESCRIPTION

Pin	Symbol	Name /Description	NOTE
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	T FAULT	Transmitter Fault.	2
3	T DIS	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	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.TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3.Laser output disabled on TDIS >2.0V or open, enabled on TDIS<0.8V.
4.Should be pulled up with 4.7kΩ - 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5.Internally pulled down per SFF-8431 Rev 4.1.
6.LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

DIGITAL DIAGNOSTIC FUNCTIONS

Lightem LCS800M85300 transceivers support the 2-wire serial communication protocol as defined in the SFP+ MSA. The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

Additionally, this SFP+ transceivers provide a unique digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The SFP+ MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.
The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

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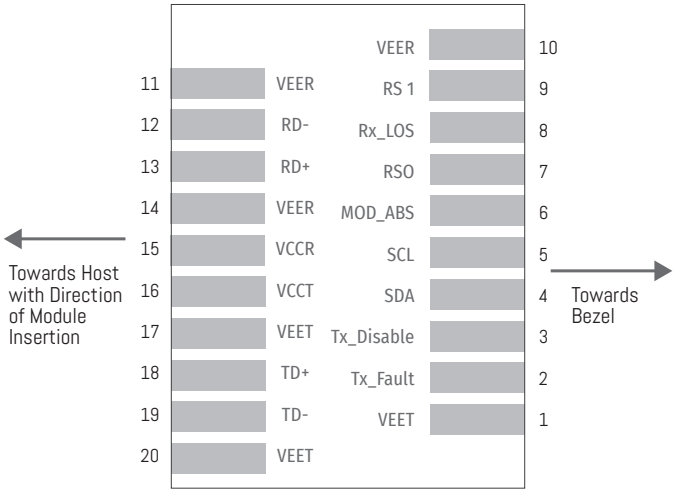
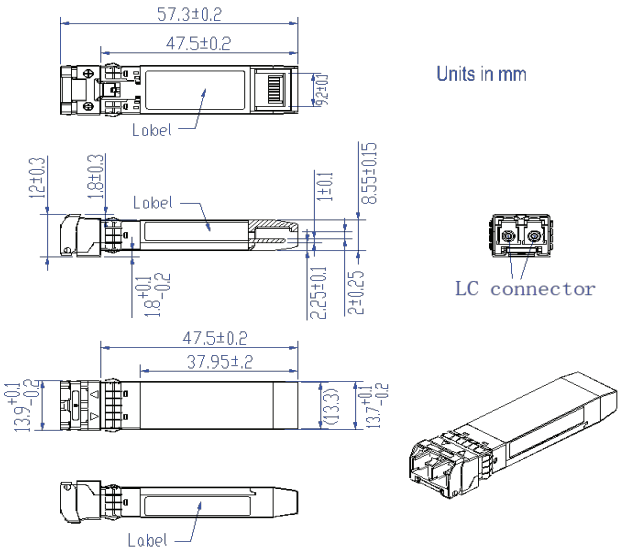
PIN OUT OF CONNECTOR BLACK ON HOST BOARD



MECHANICAL DIMENSIONS



ORDERING INFORMATION

PN	Descriptions
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