

Professional high-speed optical transceiver

OPN-SC1315-03LC

1310 nm TX / 1550 nm RX , 3.3V / 4.25 Gbps 1-Fiber Multi-Mode LC SFP Transceiver

PRODUCT FEATURES

- 1-Fiber Bi-Directional SFP Optical Transceiver
 - Up to 4.25 Gb/s
 - Simplex LC Connector
- Compliant with Fibre Channel FC-PI 400/200/100
- Compliant with IEEE 802.3 ah-2004 1000BASE-BX
 - 1310 nm LD Transmitter
 - 1550 nm Receiver
- Up to 300 m on 50/125 μ m & 62.5/125 μ m MMF
 - AC/AC Coupling according to MSA
 - Single +3.3 V Power Supply
 - 0 to 70°C Operating: OPN-SC1315-03LC
- Class 1 Laser International Safety Standard IEC 60825Compliant

APPLICATIONS

- Fibre Channel Links
- WDM Gigabit Ethernet Links
- SONET/SDH Equipment Interconnect

PRODUCT DESCRIPTION

The OPN-SC1315-03LC series are high performance multi-modemodule for 4x/2x/1x Fibre Channel and 1000BASE-BX Gigabit Ethernet multi-mode fiber communications by using 1310 nm transmitter and 1550 nm receiver. It is withthe SFP 20-pin connector to allow hot plug capability. The transmitter section uses a multiple quantum well 1310 nm laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated 1550 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

ORDER INFORMATION

P/No.	Bit Rate (Gb/s)	Distance (m)	TX (nm)	RX (nm)	Package	Temp (°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
OPN-SC1315-03LC	4 / 2 / 1	300	1310	1550	LC SFP	0 to 70	-2 to -9	-15	Yes

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-50	85	°C	
Operating Case Temperature	Topr	0	70	°C	OPN-SC1315-03LC
Relative Humidity	RH	0	85	%	Non condensing
Power Supply Voltage	Vcc	0	3.6	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	mA	

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Recommended Operating Conditions					
Parameter	Symbol	Min	Typ	Max	Units / Notes
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V
Power Supply Current	I _{CC} (TX+RX)		200	300	mA
Operating Case Temperature	T _{opr}	0		70	°C / OPN-SC1315-03LC
Data Rate		1	4.25		Gb/s

Transmitter Specifications (0°C < T _{opr} < 70°C, 3.13V < V _{CC} < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Optical Transmit Power	P _o	-9	---	-2	dBm	1
Output Center Wavelength	λ	1260	1310	1360	nm	
Output Spectrum Width	σ _λ	---	---	4	nm	RMS (σ)
Optical Rise Time	t _r			90	ps	20% to 80% Values
Optical Fall Time	t _f			90	ps	20% to 80% Values
Relative Intensity Noise	RIN			-118	dB/Hz	
Electrical						
Data Input Current – Low	I _{IL}	-350			μA	
Data Input Current – High	I _{IH}			350	μA	
Differential Input Voltage	V _{IH} - V _{IL}	0.5		2.4	V	Peak-to-Peak
TX Disable Input Voltage – Low	T _{DIS, L}	0		0.5	V	2
TX Disable Input Voltage – High	T _{DIS, H}	2.0		V _{CC}	V	2
TX Disable Assert Time	T _{ASSERT}			10	μs	
TX Disable Deassert Time	T _{DEASSERT}			1	ms	
TX Fault Output Voltage -- Low	T _{FaultL}	0		0.5	V	3
TX Fault Output Voltage -- High	T _{FaultH}	2.0		V _{CC} +0.3	V	3

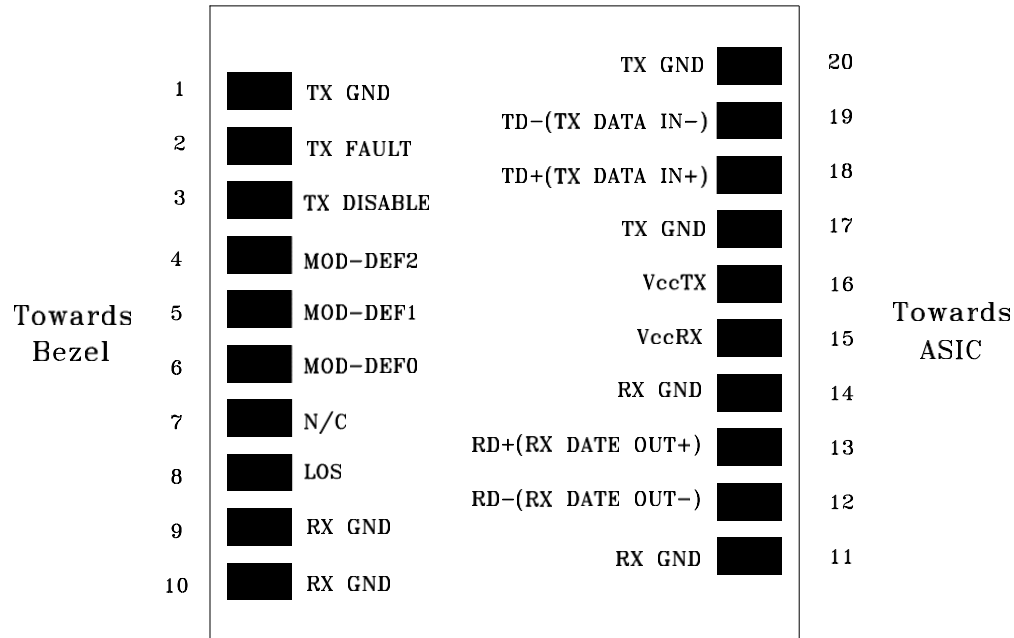
- Notes: 1. Output power is power coupled into a 62.5/125 μm multi-mode fiber.
 2. There is an internal 4.7K to 10K ohm pull-up resistor to V_{CC}TX.
 3. Open collector compatible, 4.7K to 10K ohm pull-up to V_{CC} (Host Supply Voltage).

Receiver Specifications (0°C < T _{opr} < 70°C, 3.13 V < V _{CC} < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Sensitivity	---	---	---	-15	dBm	4
Maximum Input Power	P _{in}	0	---	---	dBm	
Signal Detect -- Asserted	P _a	---	---	-15	dBm	Transition: low to high
Signal Detect -- Deasserted	P _d	-31	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---		dB	
Wavelength of Operation		1480		1580	nm	5
Electrical						
Differential Output Voltage	V _{OH} - V _{OL}	0.6		2.0	V	
Output LOS Voltage -- Low	V _{OL}	0		0.5	V	6
Output LOS Voltage -- High	V _{OH}	2.0		V _{CC} +0.3	V	6
Signal Detect Assert Time	A _S MAX			100	μs	OFF to ON
Signal Detect Deassert Time	A _N SMAX			300	μs	ON to OFF

- Notes: 4. Measured at PRBS 2⁷-1 at BER 1E-12.
 5. At least 30 dB optical isolation for the wavelength 1260 to 1360 nm.
 6. Open collector compatible, 4.7K to 10K ohm pull-up to V_{CC} (Host Supply Voltage).

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CONNECTION DIAGRAM



PIN	Signal Name	Description	PIN	Signal Name	Description
1	TX GND	Transmitter Ground	11	RX GND	Receiver Ground
2	TX Fault	Transmitter Fault Indication	12	RX DATA OUT-	Inverse Receiver Data Out
3	TX Disable	Transmitter Disable (Module disables on high or open)	13	RX DATA OUT+	Receiver Data Out
4	MOD-DFE2	Modulation Definition 2 – Two wires serial ID Interface	14	RX GND	Receiver Ground
5	MOD-DEF1	Modulation Definition 1 – Two wires serial ID Interface	15	Vcc RX	Receiver Power – 3.3V±5%
6	MOD-DEF0	Modulation Definition 0 – Ground in Module	16	Vcc TX	Transmitter Power – 3.3V±5%
7	N/C	Not Connected	17	TX GND	Transmitter Ground
8	LOS	Loss of Signal	18	TX DATA IN+	Transmitter Data In
9	RX GND	Receiver Ground	19	TX DATA IN-	Inverse Transmitter Data In
10	RX GND	Receiver Ground	20	TX GND	Transmitter Ground

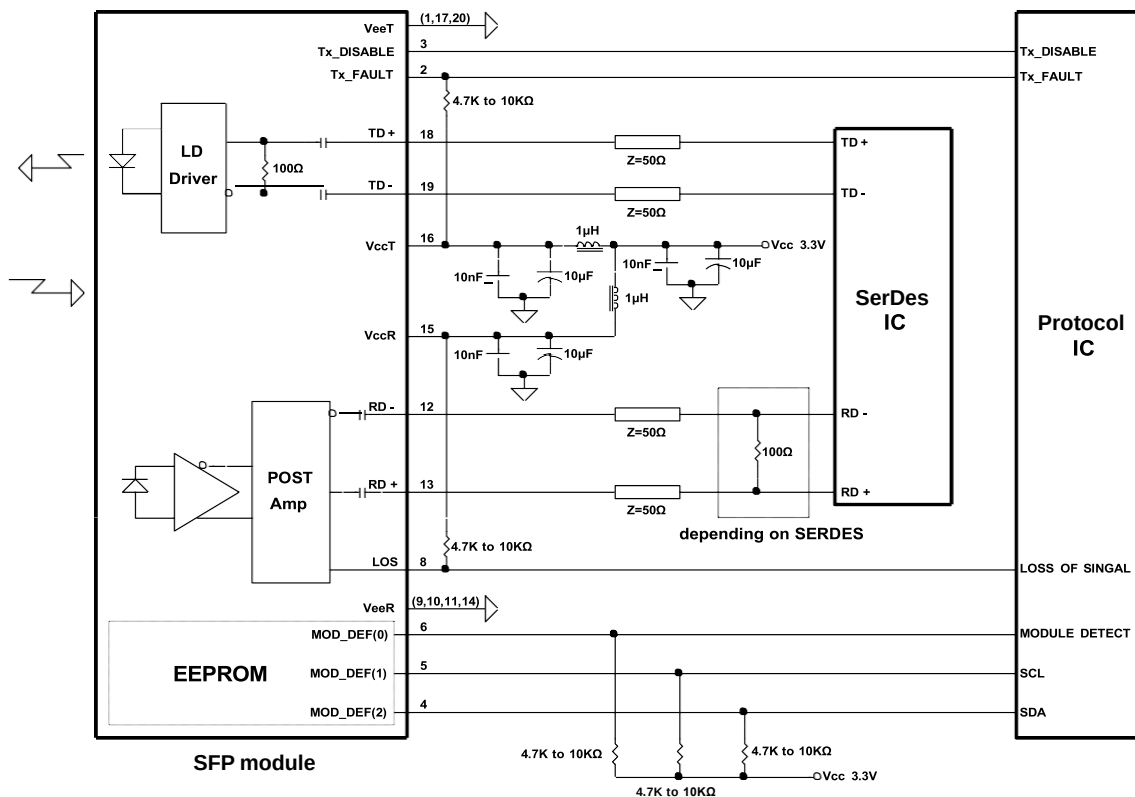
Module Definition

Module Definition	MOD-DEF2 PIN 4	MOD-DEF1 PIN 5	MOD-DEF0 PIN 6	Interpretation by Host
4	SDA	SCL	LV-TTL Low	Serial module definition protocol

Module Definition 4 specifies a serial definition protocol. For this definition, upon power up, MOD-DEF(1:2) appear as no connector (NC) and MOD-DEF(0) is TTL LOW. When the host system detects this condition, it activates the serial protocol. The protocol uses the 2-wire serial CMOS E²PROM protocol of the ATMEL AT24C01A/02/04 family of components.

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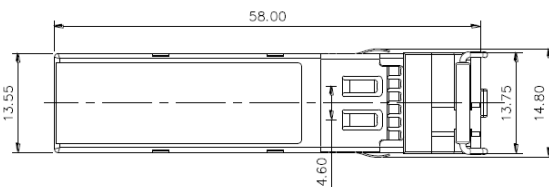
RECOMMENDED CIRCUIT SCHEMATIC



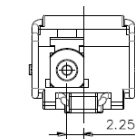
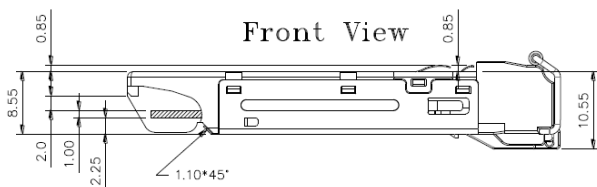
PACKAGE DIAGRAM

Units in mm

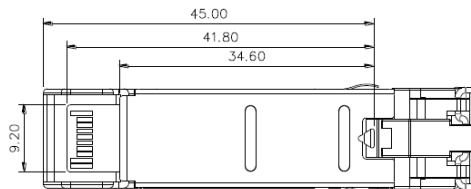
Top View



Front View



Side View



Bottom View

Note: Specifications subject to change without notice.