

DATA SHEET

MODULETEK –SFP-OC3-SR0-C10

OC-3/STM-1 SFP (Small Form Pluggable) MultiMode Transceiver

SFP-OC3-SR0-C10 Overview

ModuleTek's SFP-OC3-SR0-C10 SFP optical transceivers are designed to comply with ATM/SONET/SDH standards at OC-3/STM-1 (155 Mb/s) and Fast Ethernet standards at 125Mb/s data rate. SFP-OC3-SR0-C10 with digital diagnostics monitoring functionality provide a quick and reliable interface for OC-3/STM-1 multimode application. In addition, they comply with the Small Form Factor Pluggable Multi-Source Agreement (MSA).

Product Features

- Up to 155Mb/s bi-directional data links
- Compliant with ANSI-T1.646, ATM and SONET and SDH for OC-3/STM-1 (155Mb/s)
- Compliant with Fast Ethernet standards at 125Mb/s
- Compliant with SFP MSA
- Hot-pluggable SFP footprint
- 1310nm LED transmitter
- Duplex LC connector
- Up to 2km on MMF
- Single power supply 3.3V
- RoHS Compliant
- Class 1 laser product complies with EN 60825–1
- Operating temperature range: 0°C to 70°C

Applications

- SONET OC-3 SR-0/SDH STM-1
- 125Mb/s Fast Ethernet

Ordering Information

Part Number	Description	Color on Clasp
SFP-OC3-SR0-C10	SONET OC-3 SR-0/STM-1 and 100BASE-FX, SFP LC Connectors 1310nm MultiMode 2KM	Gray
For More Information: ModuleTek Limited Web: www.moduletek.com Email: sales@moduletek.com		

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate	DR	125		155	Mb/s	
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T _{OP}	0		70	°C	1
Storage Temperature	T _{STO}	-40		85	°C	2
Supply Current	I _S		165	300	mA	3
Input Voltage	V _{CC}	3.14	3.3	3.46	V	

Notes:

1. Case temperature
2. Ambient temperature
3. For electrical power interface

Optical Characteristics –Transmitter

$V_{CC}=3.14V$ to $3.46V$, $T_C=0^{\circ}C$ to $70^{\circ}C$

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Output Optical Power	P_{TX}	-20		-14	dBm	
Optical Center Wavelength	λ_C	1300	1310	1320	nm	
Extinction Ratio	ER	10			dB	
Optical Rise/Fall Time (20%-80%)	t_r / t_f		1000	3000	ps	
Relative Intensity Noise	RIN			-120	dB/Hz	
Generated Jitter (peak to peak)	GJ_{PP}			0.07	UI	
Generated Jitter (RMS)	GJ_{RMS}			0.007	UI	
Output Eye	Comply with SONET OC-3/SDH STM-1 standard					

Optical Characteristics –Receiver

$V_{CC}=3.14V$ to $3.46V$, $T_C=0^{\circ}C$ to $70^{\circ}C$

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Receiver Power	P_{RX}			-5	dBm	1
Optical Center Wavelength	λ_C	1270		1600	nm	
Receiver Sensitivity@ 155Mb/s	R_{X_SEN1}			-30	dBm	2
Receiver Sensitivity@125Mb/s	R_{X_SEN2}			-31	dBm	2
Optical Return Loss	ORL	12			dB	
Receiver Electrical 3dB Upper cutoff frequency				1500	MHz	
LOS Assert	LOS_A	-45			dBm	
LOS De-Assert	LOS_D			-33	dBm	
LOS Hysteresis	LOS_H	0.5			dB	

Notes:

1. $BER < 10^{-12}$

2. PRBS $2^{-23} - 1$

Electrical - Characteristics - Transmitter

$V_{CC}=3.14V$ to $3.46V$, $T_C=0^{\circ}C$ to $70^{\circ}C$

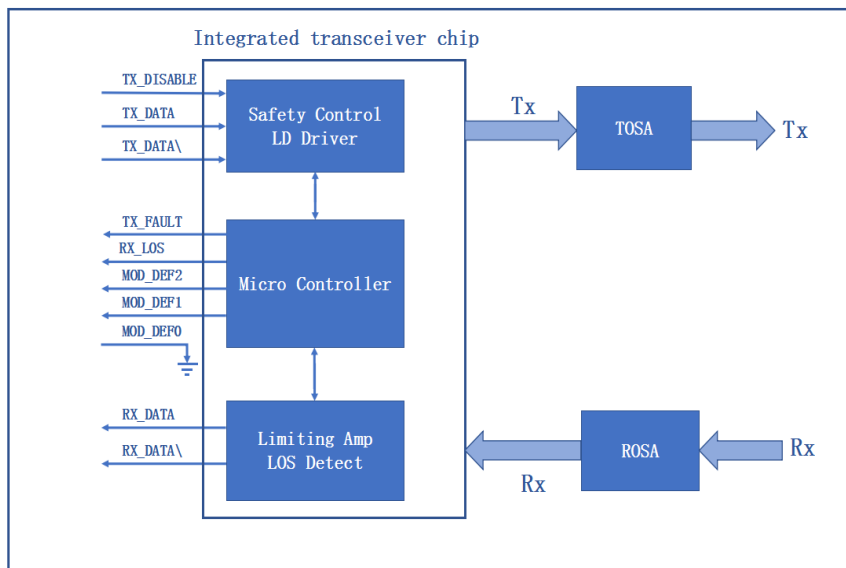
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input differential impedance	R_{IN}		100		Ω	
Single ended data input swing	V_{IN_PP}	250		1200	mV	
Transmit disable voltage	V_D	2		V_{CC}	V	
Transmit enable voltage	V_{EN}	V_{EE}		$V_{EE}+0.8$	V	

Electrical - Characteristics - Receiver

$V_{CC}=3.14V$ to $3.46V$, $T_C=0^{\circ}C$ to $70^{\circ}C$

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Single ended data output swing	V_{OUT_PP}	250	450	900	mV	
Data output rise/fall time (20%-80%)	T_R/T_F	0.6		5	ns	
LOS Assert	V_{LOS_A}	2		V_{CC_HOST}	V	
LOS De-Assert	V_{LOS_D}	V_{EE}		$V_{EE}+0.5$	V	

Block-Diagram-of-Transceiver



Transmitter Section

The laser driver accepts differential input data and provide bias and modulation currents for driving a laser. An automatic power-control (APC) feedback loop is incorporated to maintain a constant average optical power. 1310 nm LED in an eye safe

TX_DISABLE

The TX_DISABLE signal is high (TTL logic "1") to turn off the laser output. The laser will turn on within 1ms when TX_DISABLE is low (TTL logic"0").

TX_FAULT

When the TX_FAULT signal is high, output indicates a laser fault of some kind. Low indicates normal operation.

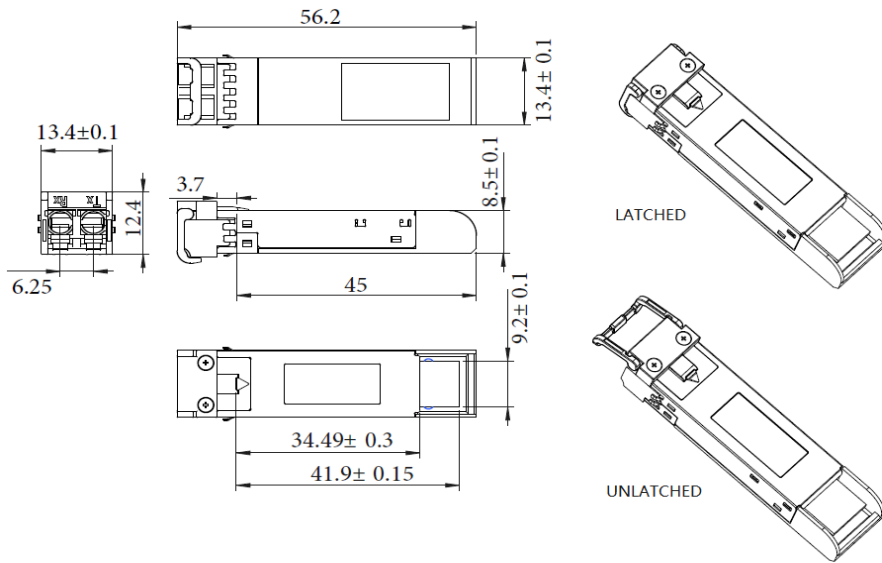
Receiver Section

The receiver utilizes a PIN detector integrated with a trans-impedance preamplifier in an OSA. This OSA is connected to a Limiting Amplifier which providing post-amplification quantization, and optical signal detection. The limiting Amplifier is AC-coupled to the transimpedance amplifier, with internal 100Ω differential termination.

Receive (RX_LOS)

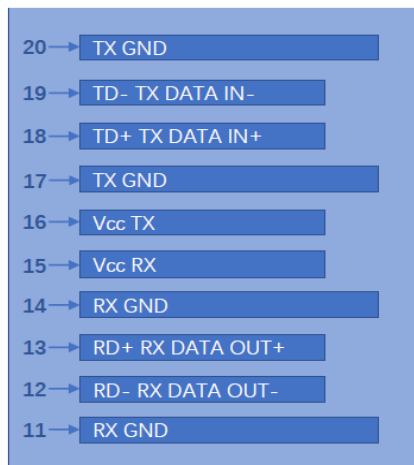
The RX_LOS is high (logic "1") when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

Dimensions

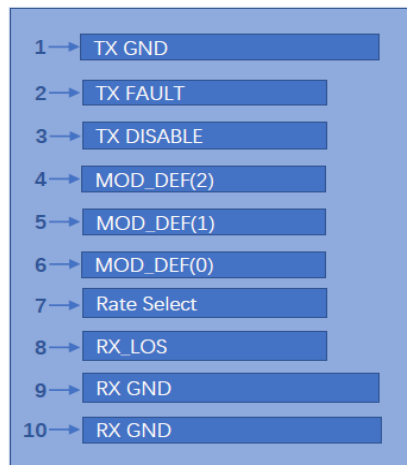


ALL DIMENSIONS ARE ± 0.2 mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

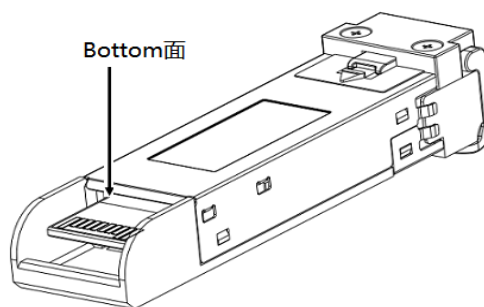
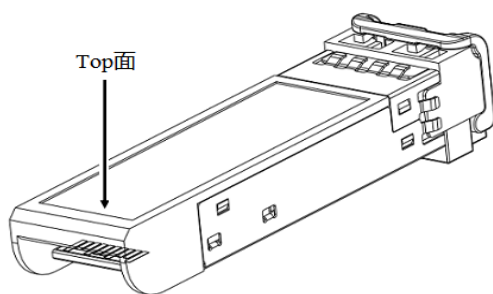
Electrical Pad Layout



Top of Board



Bottom of Board



Pin Assignment

PIN #	Symbol	Description	Remarks
1	V _{EET}	Transmitter ground (common with receiver ground)	1
2	T_FAULT	Transmitter Fault. Not supported	
3	T_DIS	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	V _{EER}	Receiver ground (common with transmitter ground)	1
10	V _{EER}	Receiver ground (common with transmitter ground)	1
11	V _{EER}	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	V _{EER}	Receiver ground (common with transmitter ground)	1
15	V _{CCR}	Receiver power supply	
16	V _{CCT}	Transmitter power supply	
17	V _{EET}	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	V _{EET}	Transmitter ground (common with receiver ground)	1

Notes:

1. Circuit ground is isolated from chassis ground
2. Disabled: T_{DIS}>2V or open, Enabled: T_{DIS}<0.8V
3. Should Be pulled up with 4.7k -10k ohm on host board to a voltage between 2V and 3.6V
4. LOS is open collector output

References

1. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), INF-8074i.
2. ISO/IEC 9314-3 “Information Processing Systems–Fiber Distributed Data Interface (FDDI), Part 3, Physical Layer Medium Dependent (PMD).” 1990.
3. ANSI T1.416.01-1999. “Network to Customer Installation Interfaces–Synchronous Optical NETwork (SONET) Physical Media Dependent Specification: Multi-Mode Fiber” ANSI, 1999.