



TECHNICAL SPECIFICATIONS

1310 nm Single-mode 622Mbps 1×9 Transceiver Module

1×9-6F1310 Series



Revision Record

Document No.	Date of Issue	Description	Incorporated by	Checked by
1×9-6F1310	11/08/2006	Initial issue	R.T.	E.C.

Sennseek Document No.	1×9-6F1310	Page No.	1
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Description

- 1×9-6F1310 is a high performance, cost effective integrated transceiver module with duplex data links through single-mode optical fibers. The transceiver module suitable for OC-12 application includes FP laser diode and PIN-TIA detector that support data rates up to 622Mbps for link distance of 20km. The transceiver module is in compliant with ITU-T G957, G 958 specifications.

Features

- Standard industrial 1×9 package
- 1310nm FP single-mode laser transmitter
- Data rates up to 622Mbps
- Link length of 20km on SM fiber
- Duplex FC/SC/ST connector interface
- LVPECL Signal Detect output
- Single 3.3V or 5V DC power supply operation
- Compliant to class one laser product IEC 60825-1
- Compliant to ITU-T G957, G 958 specifications
- RoHS compliant

Applications

- SONET OC-12 / SDH STM-4 Equipment
- PDH

Technical Specifications

1. Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Storage temperature	T _{stg}	-40~+85	°C
Ambient operating temperature	T _{OP}	0~+70	°C
Power supply voltage	3.3V version	-0.5~4.0	V
	5V version	-0.5~5.25	
Maximum soldering temperature		260	°C

2. Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Ambient operating temperature	T _{OP}	0	—	70	°C
Power supply voltage	3.3V version	3.14	3.3	3.47	V
	5V version	4.75	5.0	5.25	
Data rate		—	622	—	Mbps
Power supply current	I _{CC}	—	—	250	mA

3. Transmitter characteristics (Tc=0~+70 °C, V_{cc}= Recommended operating voltage)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Optical output wavelength	λ	Center wavelength	1260	1310	1360	nm
Spectral width	$\Delta\lambda$	RMS	—	2	4	nm
Optical output power	P _o	Average@1310nm	-14	—	-7	dBm
Extinction ratio	ER	P ₁ /P ₀	10	—	—	dB
Output eye pattern	Compliant to ITU-T G.957					
Output rise, fall time	t _r , t _f	10-90%	—	1	2	ns
Relative intensity noise	RIN		—	—	-116	dB/Hz
Input voltage (Differential)	V _{IH} -V _{IL}		200	—	1600	mV
Data input current - Low	I _{IL}		-350	—	—	μA
Data input current - High	I _{IH}		—	—	350	μA

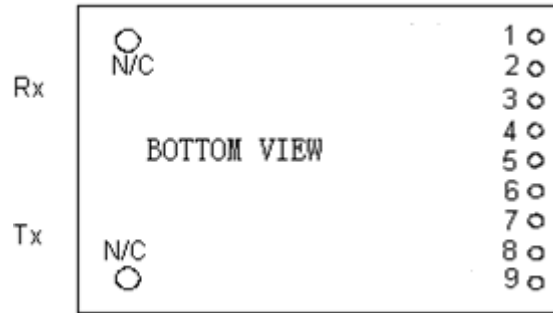
4. Receiver characteristics (Tc=0~+70 °C, V_{cc}= Recommended operating voltage)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Optical input wavelength	λ	Center wavelength	1100	—	1600	nm
Maximum input power	P _{max}	Saturation power	-3	—	—	dBm
Sensitivity	Sen	BER<10 ⁻¹⁰ @622Mbps	—	—	-28	dBm
Signal Detect - Asserted	P _a	Measured on transition – Low to High	—	—	-28	dBm
Signal Detect - De-asserted	P _d	Measured on transition – High to Low	-40	—	—	dBm
Signal Detect - Hysteresis	P _{hys}		0.5	—	5	dB
Data output voltage - Low	V _{OL} -V _{CC}		-1830	—	-1555	mV
Data output voltage - High	V _{OH} -V _{CC}		-1085	—	-880	mV
Signal Detect output voltage - Low	V _{SOL} -V _{CC}		-2.0	—	-1.58	V
Signal Detect output voltage -High	V _{SOH} -V _{CC}		-1.1	—	-0.74	V

5. General specifications (Tc=0~+70 °C, V_{cc}= Recommended operating voltage)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Link length on SM fiber		BER<10 ⁻¹⁰ @622Mbps	20	—	—	km

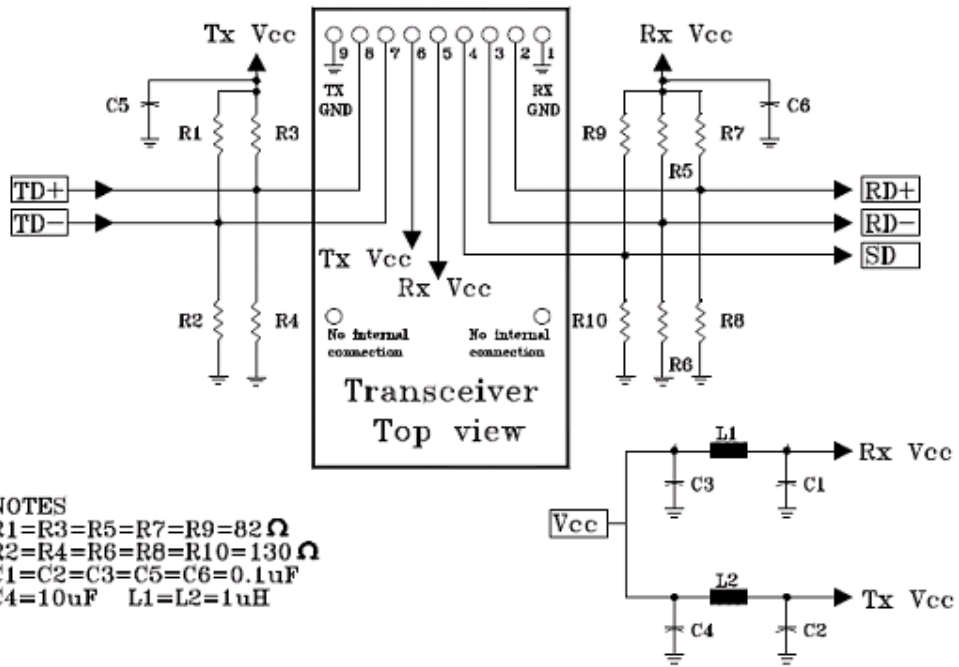
6. Transceiver pin layout



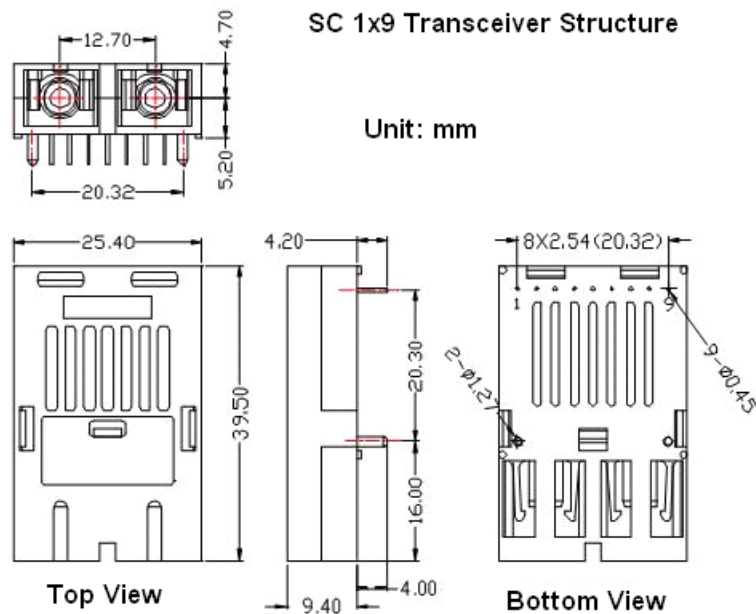
7. Pin Descriptions

Pin No.	Symbol	Descriptions
1	VeeR	Transmitter ground
2	RD+	Receiver data out
3	RD-	Receiver data out bar
4	SD	Signal Detect
5	VccR	Receiver power supply
6	VccT	Transmitter power supply
7	TD-	Transmitter data in bar
8	TD+	Transmitter data in
9	VeeT	Transmitter ground

8. Recommend circuit schematic



9. Mechanical specifications (SC type shown)



10. Ordering information:

1X9 - 6 F 1310 X XX - 20

Voltage Type

3.....3.3V
5.....5V

Connector Type

FC.....FC type
SC.....SC type
ST.....ST type
XX Others, please specify

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