



## 622Mb/s SFF Optical Transceiver Module

### ***RTXM133-405-C10***

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#### **Features**

- *Duplex LC receptacle optical interface*
- *SFF 2×5 metallic package*
- *Single +3.3V power supply*
- *-20 to 70°C operating temperature range*
- *LVPECL compatible data input/output interface*
- *LVTTL transmitter laser shutdown*
- *LVTTL receiver signal-detected indication*
- *Compliant with RoHS*

#### **Application**

- *SDH STM-4 S4.1*

#### **Standard**

- *Compliance ITU-T G.957*
- *Compliance SFF MSA July 5,2000*
- *Compliant with IEEE 802.3*

## Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	$T_s$	°C	-40	85
Relative Humidity	RH	%	0	95
Power Supply Voltage	$V_{cc}$	V	-0.5	+4.5
Lead Solder Temperature	-	°C	-	260
Lead Solder Duration	-	S	-	10
Voltage on any input/output pin	$V_I$	V	0	$V_{cc}$

## Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Temperature Range	$T_{op}$	°C	-20	-	70
Power Supply Voltage	$V_{cc}$	V	3.14	3.3	3.47
Operating Data Rate		Mbps	-	622	-

## Specifications ( $T_{op}=-20^{\circ}C$ to $70^{\circ}C$ and $V_{CC}=3.13V$ to $3.47V$ )

Parameter	Symbol	Unit	Min	Typ	Max	Note
Electrical Characteristics						
Supply Current	$I_{cc}$	mA	-	-	250	
Transmitter Differential Input Voltage	$V_D$	mV	300	-	1860	
Common-mode Input Voltage	$V_{com}-V_{CC}$	V	-1.38	-	-0.47	
LVPECL Output Voltage-Low	$V_{OL}-V_{CC}$	V	-1.810	-	-1.620	1
LVPECL Output Voltage-High	$V_{OH}-V_{CC}$	V	-1.025	-	-0.880	1
Signal Detect Output Voltage (LVTTTL)	High	V	$V_{cc}-1.3$	-	$V_{cc}+0.3$	
	Low	V	0	-	0.8	
Optical transmitter Characteristics						
Center Wavelength Range	$\lambda_c$	nm	1274	1310	1356	
Mean Launch Optical Power	$P_o$	dBm	-15	-	-8	2
Extinction Ratio	EX	dB	8.2	-	-	
Spectral Width(RMS)	$\Delta\lambda$	nm	-	-	2.5	
Optical Rise Time	$t_R$	ns	-	-	0.5	3
Optical Fall Time	$t_F$	ns	-	-	0.5	3
Output Jitter HP1+LP		UI p-p	-	-	0.3	
Output Jitter HP2+LP		UI p-p	-	-	0.1	
Eye Diagram	ITU recommendation G.957 STM-4/OC-12					
Optical receiver Characteristics						

Receiver Sensitivity	S	dBm	-	-	-28.0	4
Overload Input Power	P <sub>in</sub>	dBm	-8	-	-	
Signal Detect-Deasserted	P <sub>D</sub>	dBm	-42.0	-	-	
Signal Detect-Asserted	P <sub>A</sub>	dBm	-	-	-28.0	
Signal Detect-Hysteresis	P <sub>A</sub> -P <sub>D</sub>	dB	0.5	-	6	
Optical Path Penalty		dB	-	-	1	

**Note1:** Terminated with 50Ω to V<sub>CC</sub> -2V.

**Note2:** Minimum output optical level is at end of life.

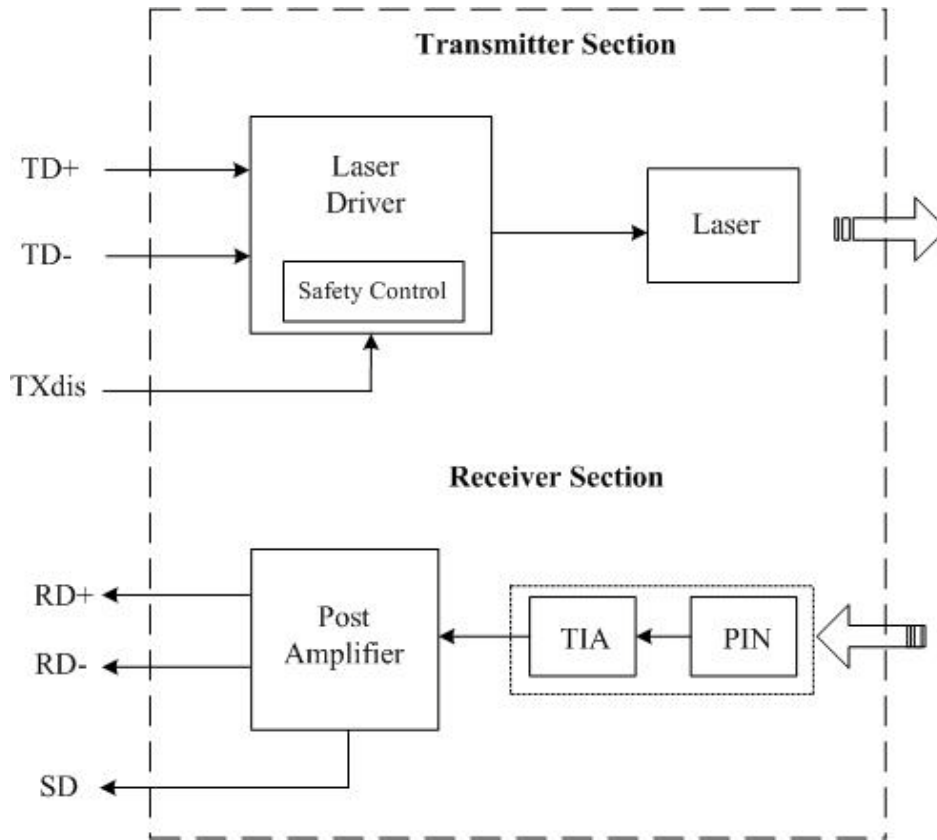
**Note3:** These are unfiltered 10~90% values.

**Note4:** Sensitivity and saturation levels for 2<sup>23</sup>-1 PRBS and BER better than or equal to 10E-10.

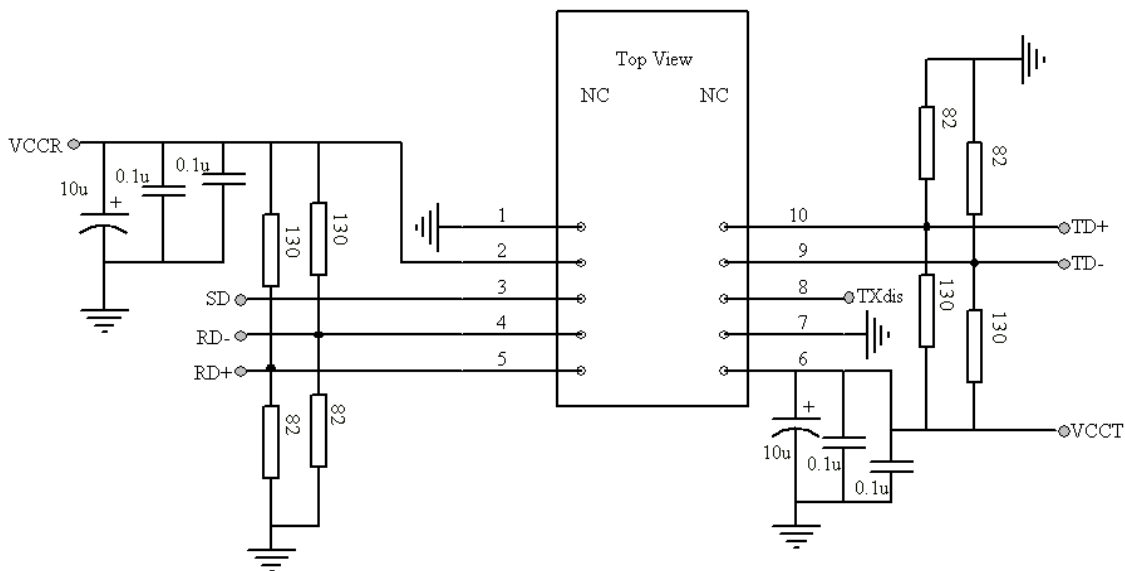
## Pin Description

Pin	Name	Level	Description
1	Vee		Receiver Signal Ground
2	VccR		Receiver Power Supply
3	SD	LVTTTL	Signal Detect Normal Operation: logic "1" output Fault Condition: logic "0" output
4	RD-	LVPECL	Received Data Output Bar
5	RD+	LVPECL	Receiver data output
6	VccT		Transmitter Power Supply
7	Vee		Transmitter Signal Ground
8	TXDis	LVTTTL	Transmitter Disable Normal Operation: logic "0" --Laser On Transmit Disabled: logic "1" --Laser Off
9	TD+	LVPECL	Transmitter Data In
10	TD-	LVPECL	Transmitter data In Bar

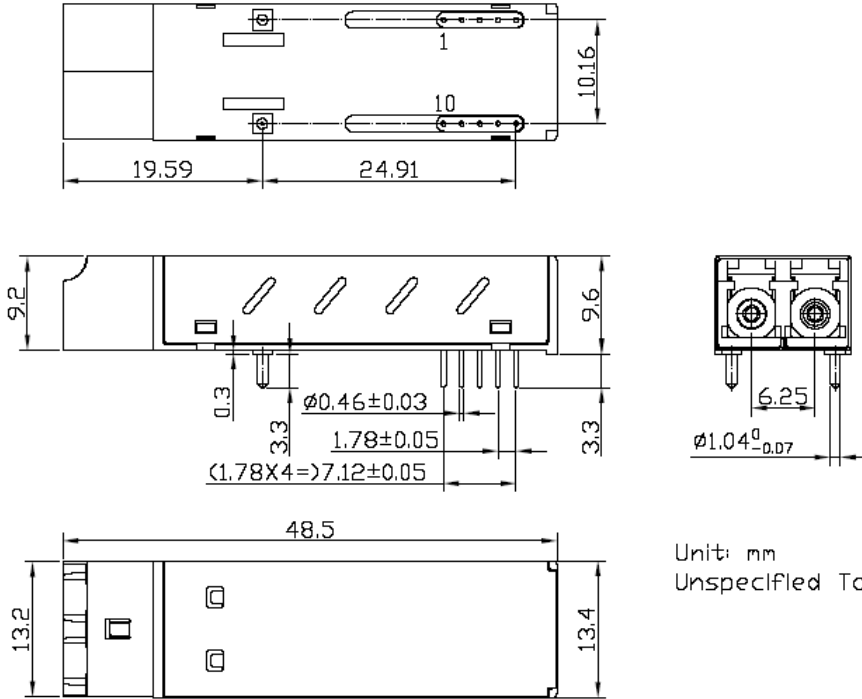
## Block diagram



## Typical application circuit



**Package outline**



Unit: mm  
Unspecified Tolerance: ±0.1mm

**Top Label** (unit: mm)



**Note:** SN on the label is random selected as a sample.

## Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1 (>1.5kV) – Human Body Model
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B EN55022 Class B	Compliant with standards
Immunity	IEC61000-4-3 Class 2 EN55024	Typically show no measurable effect from a 3V/m field swept from 80 to 1000MHz applied to the transceiver without a chassis enclosure.
Eye Safety	FDA 21 CFR 1040.10 and 1040.11 <div style="border: 1px solid black; padding: 2px; display: inline-block;">UL</div> TUV EN 60825-1	Compliant with Class 1 laser product UL No. E239070

## Ordering Information

Part. No	Specifications									Application	
	Pack	Rate	Tx	Pout	Rx	S	Top	Reach	others		
RTXM133-405-C10	2x5 SFF	622M	1310nm	FP-LD	-15~-8dBm	PIN < -28dBm	-20~70°C	15km	TTL SD	RoHS	SDH S-4.1

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