



## 3.3V 1×9 1310nm Multimode Transceiver module

### ***RTXM135MM&135BMM***

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#### Features

- *Duplex SC receptacle optical interface*
- *1310nm multi-mode LED*
- *Single +3.3V power supply*
- *Standard 1×9 package*
- *0 to 70°C operating temperature range*
- *LVPECL compatible data input/output interface*
- *LVPECL receiver signal-detected indication*
- *RoHS compliant*

#### Application

- *SDH STM-1 I-1*
- *100M Fast Ethernet*

#### Standard

- *ITU-T G.957*

## Absolute maximum ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	0	95
Power Supply Voltage	Vcc	V	-0.5	+4.5
Lead Solder Temperature	-	°C	-	260
Lead Solder Duration	-	S	-	10
Voltage on any input/output pin	VI	V	0	Vcc

## Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Temperature Range	Top	°C	0	-	70
Power Supply Voltage	Vcc	V	3.14	3.3	3.47
Operating Data Rate		Mbps	-	155.52	-

## Specifications (Top= 0°C to 70°C and VCC=3.13V to 3.47V)

Parameter	Symbol	Unit	Min	Type	Max	Note
<b>Electrical Characteristics</b>						
Supply Current	Icc	mA	-	-	250	
Transmitter Differential Input Voltage	VD	mV	300	-	2000	
Common-mode Input Voltage	Vcom-V <sub>CC</sub>	V	-2.2		-1.2	
PECL Output Voltage-Low	VOL-V <sub>CC</sub>	V	-1.810	-	-1.620	1
PECL Output Voltage-High	VOH-V <sub>CC</sub>	V	-1.025	-	-0.880	1
<b>Optical transmitter Characteristics</b>						
Center Wavelength Range	λ <sub>c</sub>	nm	1260	1310	1360	
Launch Optical Power	P <sub>o</sub>	dBm	-23.5		-14	2
Extinction Ratio	EX	dB	8.2	-	-	
Spectral Width	Δλ	nm	-	-	80	
Optical Rise Time	t <sub>R</sub>	ns	-	-	2	3
Optical Fall Time	t <sub>F</sub>	ns	-	-	2	3
Eye Diagram	ITU recommendation G.957 STM-1/OC-3					
<b>Optical receiver Characteristics</b>						
Receiver Sensitivity	S	dBm	-	-	-31.0	4
Overload Input Power	P <sub>in</sub>	dBm	-8	-	-	4
Signal Detect-Deasserted	PD	dBm	-45.0	-	-	
Signal Detect-Asserted	PA	dBm	-	-	-32.0	
Signal Detect-Hysteresis	PA-PD	dB	0.5	-	6	

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

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

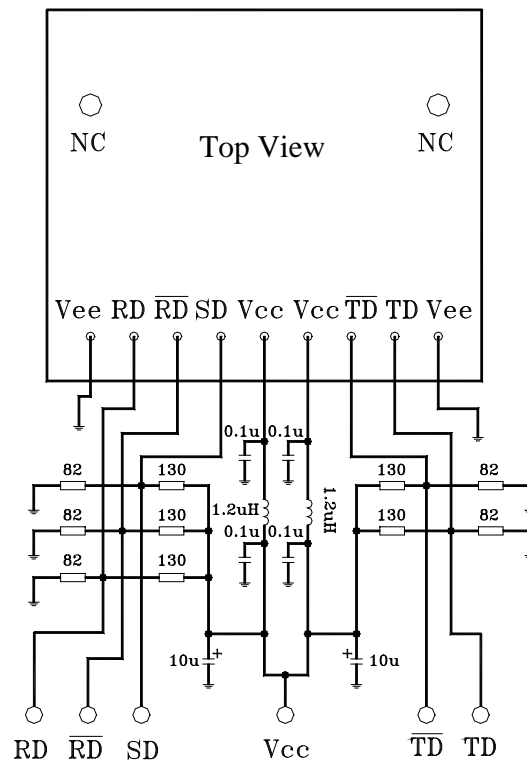
**Note3:** These are unfiltered 10~90% values.

**Note4:** Sensitivity and overload for 223-1 PRBS and Bit Error Rate better than or equal to 10E-10.

## Pin Description

Pin Name	Level	Description
1	Vee	Negative power of receiver section, normally grounded
2	RD+	LVPECL Data output of receiver section
3	RD-	LVPECL Reverse data output of receiver section
4	SD	LVPECL Optical alarm of receiver section, High level when normal, low level when no light
5	Vcc	Positive power of receiver section, normally +3.3V
6	Vcc	Positive power of transmitter section, normally +3.3V
7	TD-	LVPECL Reverse data input of transmitter section
8	TD+	Data input of transmitter section
9	Vee	Negative power of transmitter section, normally grounded

## Typical Application Circuit



## Package outline (unit: mm)

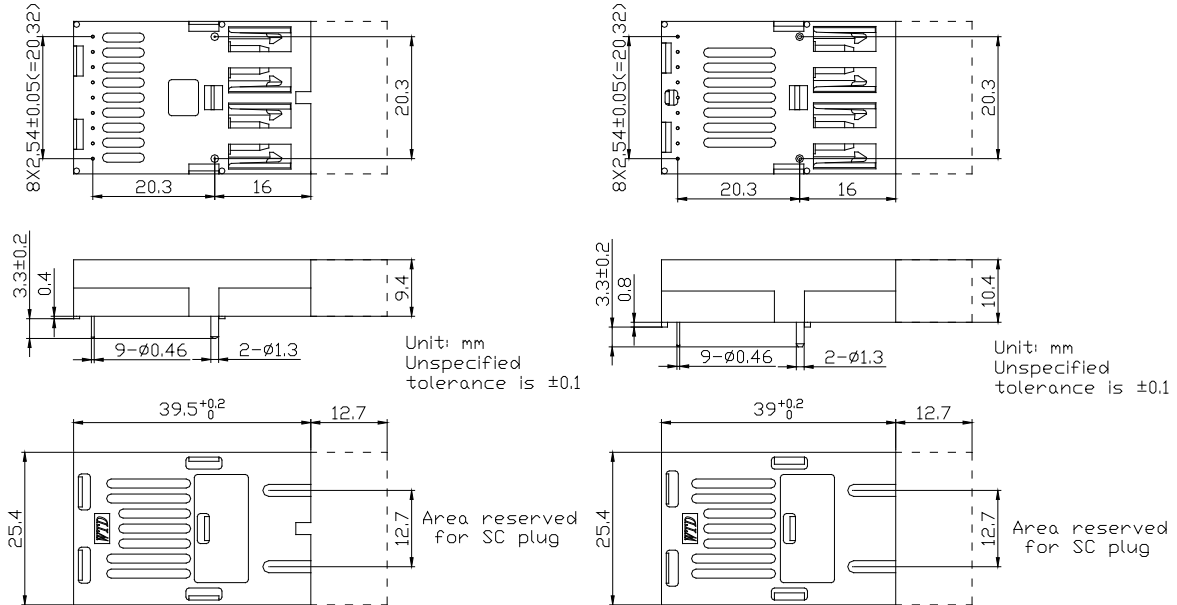
Duplex SC receptacle optical interface

Thin type package

RTXM\*\*\*B

Thick type package

RTXM\*\*\*



## 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 UL TUV EN 60825-1	Compliant with Class 1 laser product UL No. E239070

## Update Information

From datasheet V3.0 to datasheet V3.1

Revise the parameter "Signal Detect-Asserted" (in "Specifications" table, page2) from "-31dBm" to "-32dBm".

From datasheet V3.1 to datasheet V3.2

Changes in format only, and no virtual change in contents.

## Ordering information

Part No.	Specifications								
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Interface
RTXM135MM *	1×9 thick type	155Mb/s	1310nmLED	-23.5~-14dBm	PIN+TIA	-31.0dBm	0~70°C	2km	Duplex SC
RTXM135BMM *	1×9 thin type	155Mb/s	1310nmLED	-23.5~-14dBm	PIN+TIA	-31.0dBm	0~70°C	2km	Duplex SC

*\*: the product marked with \* needs further confirmation with sales upon each order.*

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