



## **3.3V 1×9 155Mbps Transceiver Module**

### ***RTXM125IP&125BIP&135IP&135BIP***

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#### **Features**

- *Duplex SC or FC pigtailed receptacle optical interface*
- *1310nm single-mode FP-LD*
- *Single +3.3V power supply*
- *Standard 1×9 package*
- *-20 to 70°C operating temperature range*
- *LVPECL differential input and output*
- *LVPECL signal detection output*

#### **Applications**

- *SDH /SONET, ATM*
- *100M Fast Ethernet*

#### **Standards**

- *Reference to ITU-T G.957*

## Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	$T_s$	°C	-40	85
Relative Humidity	RH	%	-	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	-	155.52	-

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

Parameter	Symbol	Unit	Min	Type	Max	Note
<b>Electrical Characteristics</b>						
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
<b>Optical transmitter Characteristics</b>						
Launch Optical Power	$P_O$	dBm	-18	-	-7	2
Center Wavelength Range	$\lambda_c$	nm	1261	1310	1360	
Extinction Ratio	EX	dB	8.2	-	-	
Spectral Width	$\Delta\lambda$	nm	-	-	7.7	
Optical Rise Time	$t_R$	ns	-	-	2.0	3
Optical Fall Time	$t_F$	ns	-	-	2.0	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 Optical Power	$P_{in}$	dBm	-8	-	-	4
Signal Detect-Deasserted	$P_D$	dBm	-50.0	-	-	

Signal Detect-Asserted	$P_A$	dBm	-	-	-32.0
Signal Detect-Hysteresis	$P_A-P_D$	dB	0.5	-	6

**Note 1:** Terminated with  $50\Omega$  to  $V_{CC} - 2V$ .

**Note 2:** Minimum output optical level is at end of life.

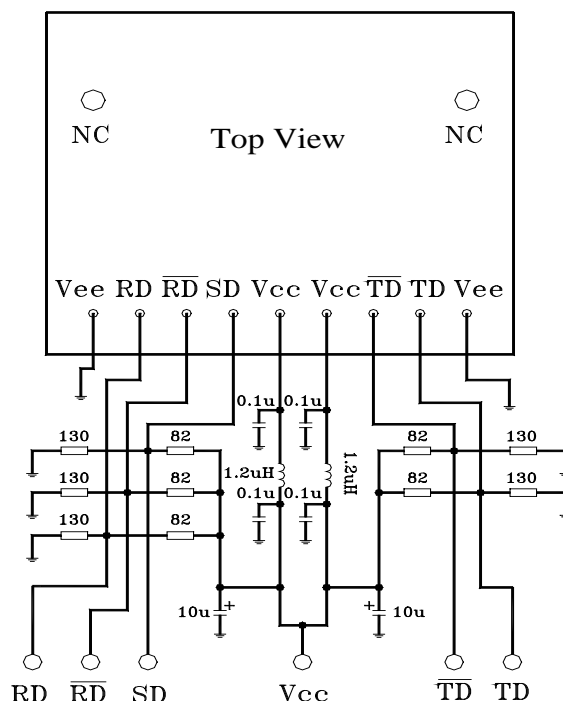
**Note 3:** These are unfiltered 10~90% values.

**Note 4:** Sensitivity and overload for  $2^{23}-1$  PRBS and Bit Error Rate better than or equal to  $10E-10$ .

## Pin Descriptions

Pin Name	Level	Description
1	$V_{ee}$	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	$V_{cc}$	Positive power of receiver section, normally +3.3V
6	$V_{cc}$	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	$V_{ee}$	Negative power of transmitter section, normally grounded

## Typical application circuit

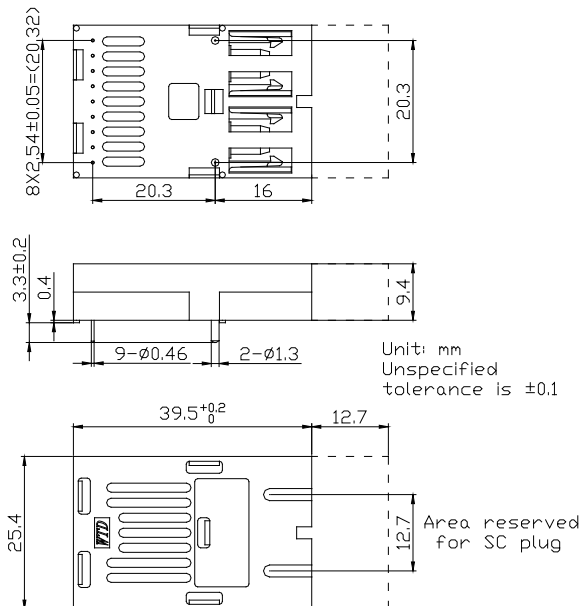


## Package Outline (unit: mm)

Duplex SC receptacle optical interface

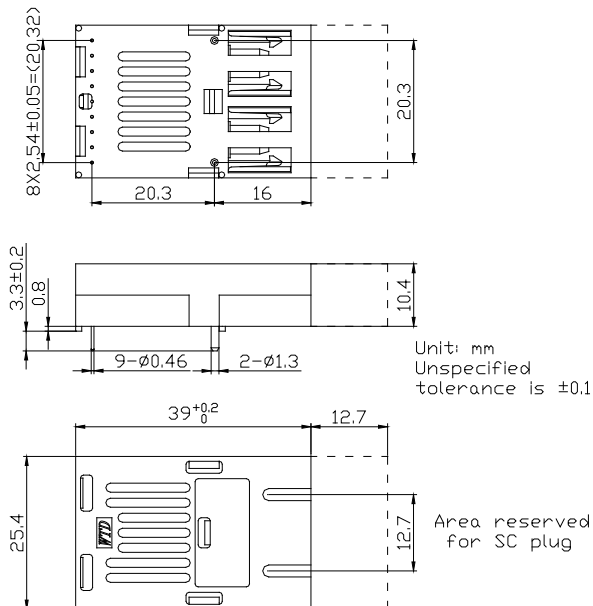
Thin type package

RTXM135BIP



Thick type package

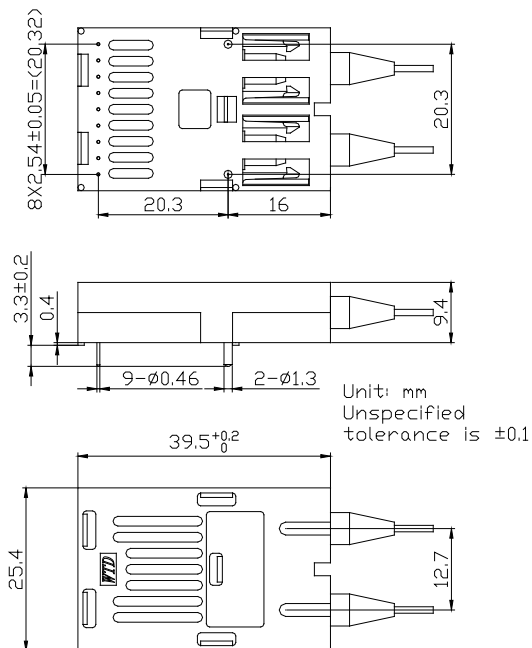
RTXM135IP



FC pigtailed optical interface

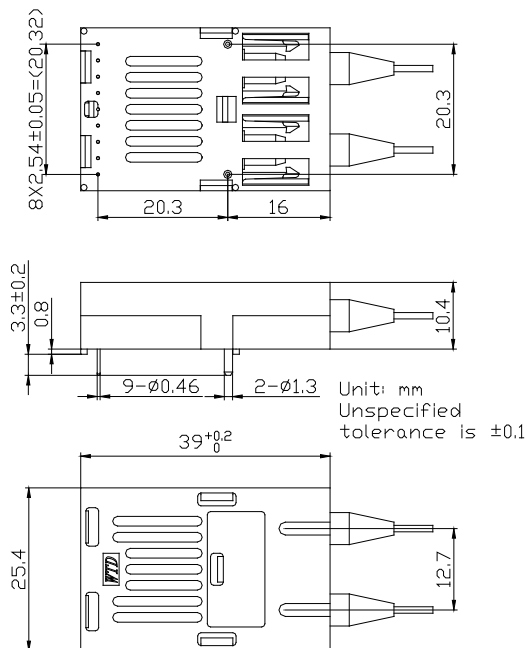
Thin type package

RTXM125BIP



Thick type package

RTXM125IP



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

## Ordering Information

Part No.	Specification								
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Interface
RTXM125IP	1×9 thick	155Mb/s	1310nmFP-LD	-18~-7dBm	PIN+TIA	-31dBm (max)	-20~70°C	10km	FC pigtail
RTXM125BIP*	1×9 thin	155Mb/s	1310nmFP-LD	-18~-7dBm	PIN+TIA	-31dBm (max)	-20~70°C	10km	FC pigtail
RTXM135IP	1×9 thick	155Mb/s	1310nmFP-LD	-18~-7dBm	PIN+TIA	-31dBm (max)	-20~70°C	10km	Duplex SC
RTXM135BIP	1×9 thin	155Mb/s	1310nmFP-LD	-18~-7dBm	PIN+TIA	-31dBm (max)	-20~70°C	10km	Duplex SC

\*: The product marked with \* is not available at present..

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