



## 3.3V 2×9 155Mbps Transceiver Module

### *RTXM102I&112I Series*

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#### Features

- *Duplex SC receptacle or FC pigtailed optical interface*
- *Standard 2×9 package*
- *Single +3.3V power supply*
- *0 to 70°C operating temperature range*
- *Receiver optical input power monitor*
- *LVPECL compatible data input/output interface*
- *TTL transmitter laser shutdown*
- *LVPECL receiver signal-detected indication*

#### Application

- *SDH STM-1 L1.1 and L1.2*
- *100M Fast Ethernet*

## Standard

- *Compliant with 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	3.13	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	Typ	Max	Note
<b>Electrical Characteristics</b>						
Supply Current	Icc	mA	-	-	250	
Transmitter Differential Input Voltage	VD	mV	300	-	1860	
Common-mode Input Voltage	Vcom-VCC	V	-1.38	-	-0.47	
LVPECL Output Voltage-Low	VOL-VCC	V	-1.810	-	-1.620	1
LVPECL Output Voltage-High	VOH-VCC	V	-1.025	-	-0.880	1
Bias current monitor voltage	BM	mV		10*Ib	-	
Back facet monitor voltage	PM	V	0.6	1.2	2.0	
Transmitter disable voltage	-	V	2.0	-		
Transmitter enable voltage	-	V		-	0.8	
<b>RTXM102I-D,RTXM112I-D</b>						
<b>Optical transmitter Characteristics</b>						
Mean Launched power(avg.)	Po	dBm	-5	-	0	2
Center wavelength	λC	nm	1263	1310	1360	
Spectral Width (-20dB)	Δλ	nm	-	-	1	
Side Mode Suppression Ratio	SMSR	dB	30	-	-	
Extinction ratio	ER	dB	10	-	-	
Optical Rise Time	tR	ns			2.0	3

Optical Fall Time	tF	ns			2.0	3
Eye Diagram	ITU recommendation G.957 STM-1/OC-3					
<b>Optical receiver Characteristics</b>						
Receiver Sensitivity	S	dBm	-	-	-35	4
Overload Input Power	Pin	dBm	-8		-	4
Signal Detect-Deasserted	PD	dBm	-50	-	-	
Signal Detect-Asserted	PA	dBm	-	-	-36	
Signal Detect-Hysteresis	PA – PD	dB	0.5	-	6.0-	
<b>RTXM102I-DFB,RTXM112I-DFB</b>						
<b>Optical transmitter Characteristics</b>						
Mean Launched power(avg.)	Po	dBm	-5	-	0	2
Center wavelength	$\lambda_C$	nm	1480	1550	1580	
Spectral Width (-20dB)	$\Delta\lambda$	nm	-	-	1	
Side Mode Suppression Ratio	SMSR	dB	30	-	-	
Extinction ratio	ER	dB	10	-	-	
Optical Rise Time	tR	ns			2.0	3
Optical Fall Time	tF	ns			2.0	3
Eye Diagram	ITU recommendation G.957 STM-1/OC-3					
<b>Optical receiver Characteristics</b>						
Receiver Sensitivity	S	dBm	-	-	-35	4
Overload Input Power	Pin	dBm	-8		-	4
Signal Detect-Deasserted	PD	dBm	-50	-	-	
Signal Detect-Asserted	PA	dBm	-	-	-36	
Signal Detect-Hysteresis	PA – PD	dB	0.5	-	6.0	

**Note1:** Terminated with 50 $\Omega$  to VCC -2V.

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

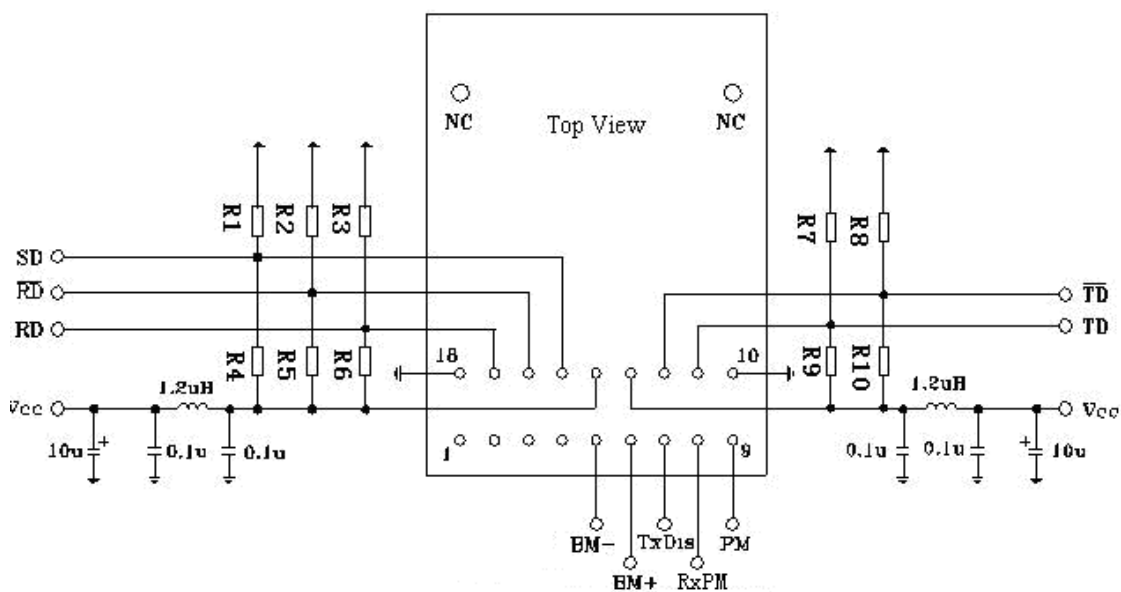
**Note3:** These are unfiltered 10~90% values.

**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	NC		Pin not connected
2	NC		Pin not connected
3	NC		Pin not connected
4	NC		Pin not connected
5	BM-		Negative bias current monitor voltage
6	BM+		Positive bias current monitor voltage
7	TxDis	TTL	Transmitter disable input. A low level switches laser on, a high level switches laser off
8	RxPM		Receiver optical input power monitor. It's proportional to the optical input. It outputs about 2.7V@-20dBm and 2.0V@-40dBm
9	PM		Back facet monitor voltage. Normally 1.2V
10	VEET		Negative power of transmitter section, normally grounded
11	TD+	LVPECL	Data input of transmitter section
12	TD-	LVPECL	Reverse data input of transmitter section
13	VCCT		Positive power of transmitter section
14	VCCR		Positive power of receiver section
15	SD	LVPECL	Optical alarm of receiver section, High level when normal, low level when no light
16	RD-	LVPECL	Reverse data output of receiver section
17	RD+	LVPECL	Data output of receiver section
18	VEER		Negative power of receiver section, normally grounded

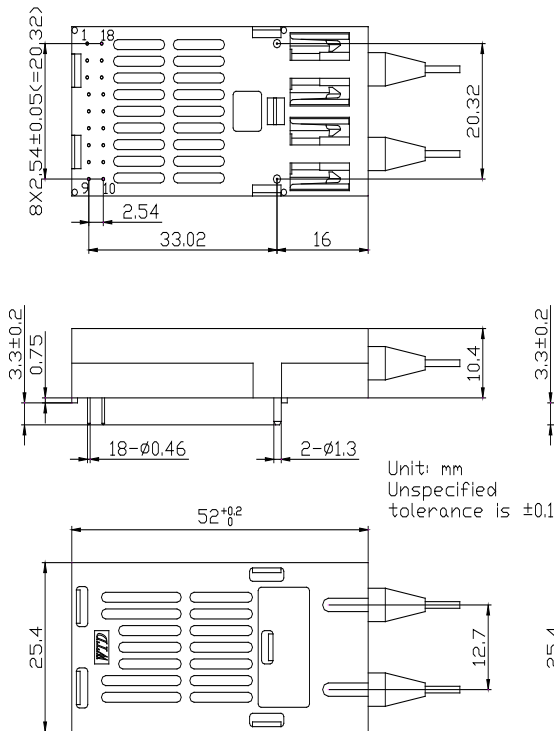
## Typical application circuit



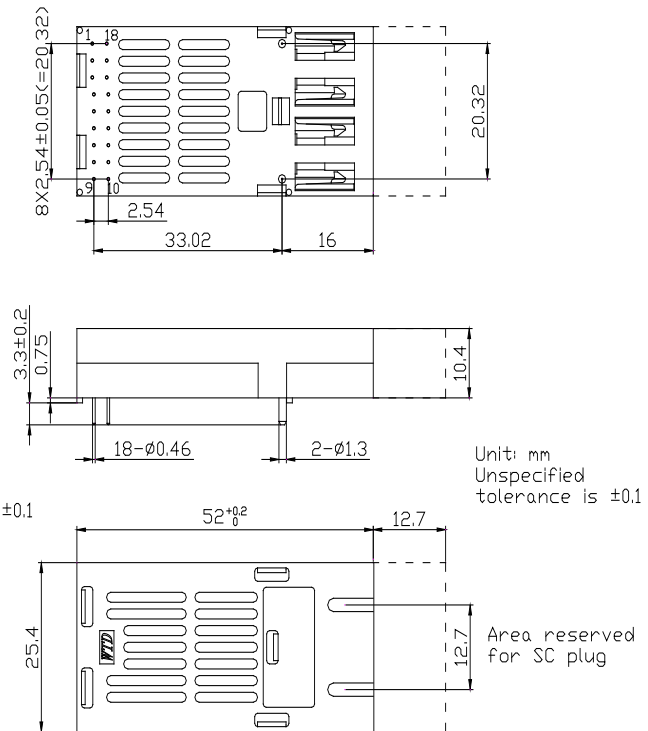
**Note:**  $R1=R2=R3=R7=R8=82\ \Omega$ ;  $R4=R5=R6=R9=R10=130\ \Omega$ ;

## Package outline ( unit: mm)

FC pigtail optical interface



Duplex SC receptacle optical interface



## 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 "sensitivity" (in "Specifications" table, page2) from "-36dBm" to "-35dBm".

## Ordering Information

Part No.	Specification								Application code	
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach		Interface
RTXM102I-D*	2X9	155Mb/s	1310nm DFB-LD	-5~-0dBm	PIN+TIA	-35Bm(max)	0~70oC	40km	FC pigtail	SDH L-1.1
RTXM102I-DFB*	2X9	155Mb/s	1550nm DFB-LD	-5~-0dBm	PIN+TIA	-35Bm(max)	0~70oC	80km	FC pigtail	SDH L-1.2
RTXM112I-D*	2X9	155Mb/s	1310nm DFB-LD	-5~-0dBm	PIN+TIA	-35Bm(max)	0~70oC	40km	Duplex SC	SDH L-1.1
RTXM112I-DFB*	2X9	155Mb/s	1550nm DFB-LD	-5~-0dBm	PIN+TIA	-35Bm(max)	0~70oC	80km	Duplex SC	SDH L-1.2

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

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