

RTXM101&101-5&102&111&111-5&112



3.3V 2×9 155Mbps Transceiver Module

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Features

- Duplex SC receptacle or FC pigtailed optical interface
- Standard 2×9 package
- Single +3.3V power supply
- -20 to 70°C operating temperature range
- LVPECL compatible data input/output interface
- TTL transmitter laser shutdown
- LVPECL receiver signal-detected indication

Application

- SDH STM-1 S1.1, S1.2 and L1.1
- 100M Fast Ethernet

Standard

- Compliant with ITU-T G.957

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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	VI	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	3.13	3.3	3.47
Operating Data Rate		Mbps	-	155.52	-

Specifications (Top=-20°C to 70°C and V_{cc} =3.13V to 3.47V)

Parameter	Symbol	Units	Min	Typ	Max	Notes
Electrical Characteristics						
Supply Current	I_{cc}	mA	-	-	250	
Transmitter Differential Input Voltage	V_D	mV	200	-	1600	
Common-mode Input Voltage	$V_{com}-V_{cc}$	V	-1.49	-	-0.40	
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
Bias current monitor voltage	B_M	mV	-	$10 \cdot I_b$	-	
Back facet monitor voltage	P_M	V	0.6	1.2	2.0	
Transmitter disable voltage	-	V	2.0	-	-	
Transmitter enable voltage	-	V	-	-	0.8	
RTXM101,RTXM111						
Optical transmitter Characteristics						
Mean Launched power(avg.)	P_o	dBm	-15	-	-8	2
Center wavelength	λ_c	nm	1261	1310	1360	
Spectrum width(RMS)	$\Delta\lambda$	nm	-	-	7.7	
Extinction ratio	E_R	dB	8.2	-	-	
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					
Optical receiver Characteristics						
Receiver Sensitivity	S	dBm	-	-	-31	4
Overload Input Power	P_{in}	dBm	-8	-	-	

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Signal Detect-Deasserted	P_D	dBm	-50	-	-	
Signal Detect-Asserted	P_A	dBm	-	-	-36	
Signal Detect-Hysteresis	$P_A - P_D$	dB	0.5	-	6.0	

RTXM101-5,RTXM111-5

Optical transmitter Characteristics

Mean Launched power(avg.)	P_o	dBm	-15	-	-8	2
Center wavelength	λ_c	nm	1430	1550	1576	
Spectrum width(RMS)		nm	-	-	2.5	
Extinction ratio	E_R	dB	8.2	-	-	
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					

Optical receiver Characteristics

Receiver Sensitivity	S	dBm	-	-	-35	4
Overload Input Power	P_{in}	dBm	-8		-	4
Signal Detect-Deasserted	P_D	dBm	-50	-	-	
Signal Detect-Asserted	P_A	dBm	-	-	-36	
Signal Detect-Hysteresis	$P_A - P_D$	dB	0.5	-	6.0	

RTXM102,RTXM112

Optical transmitter Characteristics

Mean Launched power(avg.)	P_o	dBm	-5	-	0	2
Center wavelength	λ_c	nm	1263	1310	1360	
Spectrum width(RMS)	$\Delta\lambda$	nm	-	-	3	
Extinction ratio	E_R	dB	10	-	-	
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					

Optical receiver Characteristics

Receiver Sensitivity	S	dBm	-	-	-35	4
Overload Input Power	P_{in}	dBm	-8		-	4
Signal Detect-Deasserted	P_D	dBm	-50.0	-	-	
Signal Detect-Asserted	P_A	dBm	-	-	-36.0	
Signal Detect-Hysteresis	$P_A - P_D$	dB	0.5	-	6.0	

Note1: Terminated with 50Ω to $V_{CC} - 2V$.

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

Note3: These are unfiltered 10~90% values.

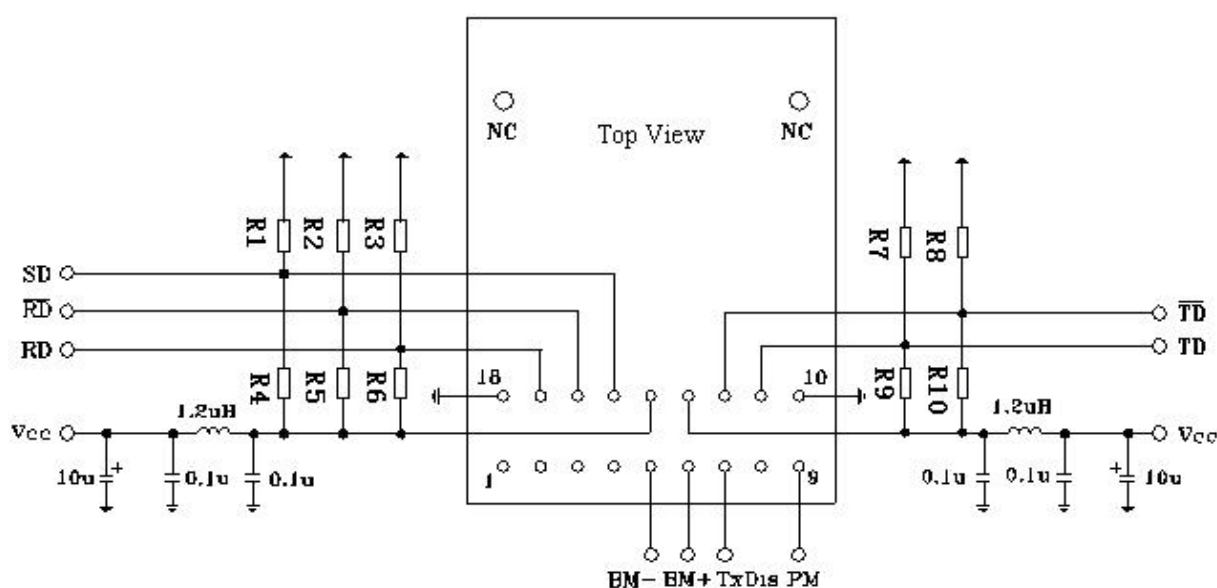
Note4: Sensitivity and overload for $2^{23} - 1$ PRBS and Bit Error Rate better than or equal to $10E-10$.

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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	NC		Pin not connected
9	PM		Back facet monitor voltage. Normally 1.2V
10	V _{EE}		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	V _{CC}		Positive power of transmitter section
14	V _{CC}		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	V _{EE}		Negative power of receiver section, normally grounded

Typical application circuit



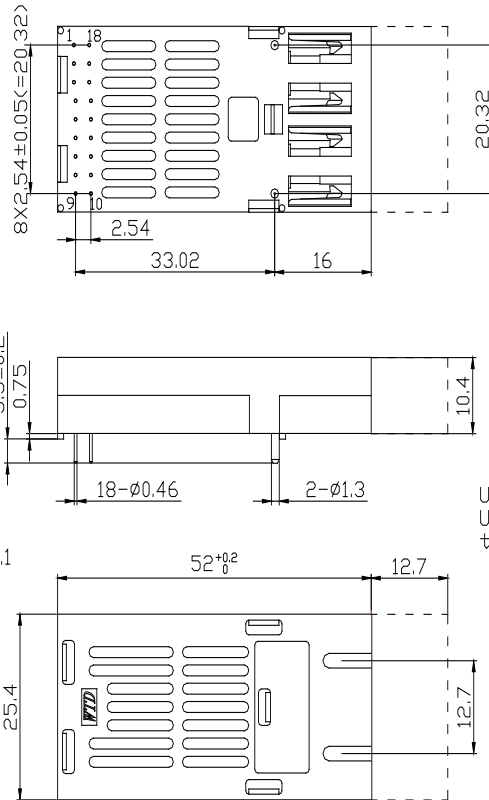
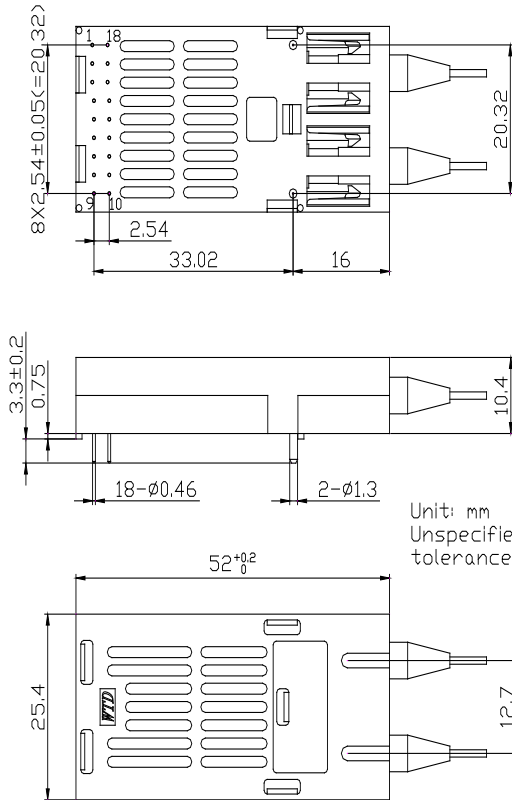
Note: $R1=R2=R3=R7=R8=82\ \Omega$; $R4=R5=R6=R9=R10=130\ \Omega$;

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Package outline (unit: mm)

FC pigtail optical interface

Duplex SC receptacle optical interface



Unit: mm
Unspecified
tolerance is ±0.1

Unit: mm
Unspecified
tolerance is ±0.1

Area reserved
for SC plug

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

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Update Information

From datasheet V3.0 to datasheet V3.1

- Revise the parameter "sensitivity" (in "Specifications" table, page2) from "-31dBm" or "-36dBm" to "-35dBm".
- Revise the parameter "Signal Detect-Asserted" (in "Specifications" table, page2) from "-31dBm" to "-36dBm".

Ordering Information

Part No.	Specification										Application
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Interface	code	
RTXM101	2X9	155Mb/s	1310nm FP-LD	-15~-8dBm	PIN+TIA	-35dBm	-20~70°C	15km	FC pigtail	SDH S-1.1	
RTXM101-5*	2X9	155Mb/s	1550nm FP-LD	-15~-8 dBm	PIN+TIA	-35dBm	-20~70°C	15km	FC pigtail	SDH S-1.2	
RTXM102	2X9	155Mb/s	1310nm FP-LD	-5~0dBm	PIN+TIA	-35dBm	-20~70°C	40km	FC pigtail	SDH L-1.1	
RTXM111	2X9	155Mb/s	1310nm FP-LD	-15~-8dBm	PIN+TIA	-35dBm	-20~70°C	15km	Duplex SC	SDH S-1.1	
RTXM111-5*	2X9	155Mb/s	1550nm FP-LD	-15~-8 dBm	PIN+TIA	-35dBm	-20~70°C	15km	Duplex SC	SDH S-1.2	
RTXM112	2X9	155Mb/s	1310nm FP-LD	-5~0dBm	PIN+TIA	-35dBm	-20~70°C	40km	Duplex SC	SDH L-1.1	

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

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