



5.0V 1×9 155M Transceiver Module *RTXM146&156 Series*

Features

- *Duplex SC receptacle or FC pigtailed optical interface*
- *1550nm DFB laser*
- *Standard 1×9 package*
- *Single 5V power supply*
- *0 to 70 °c operating temperature range*
- *PECL compatible data input/output interface*
- *PECL receiver signal-detected indication*

Application

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

Standard

- *Compliant with ITU-T G.957*

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	T_s	°C	-40	85
Relative Humidity	RH	%	0	95
Power Supply Voltage	V_{cc}	V	-0.5	+6
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	0	-	70
Power Supply Voltage	V_{cc}	V	4.75	5.0	5.25
Operating Data Rate		Mbps	-	155.52	-

Specifications ($T_{op} = 0^{\circ}C$ to $70^{\circ}C$ and $V_{cc} = 4.75V$ to $5.25V$)

Parameter	Symbol	Unit	Min	Typ	Max	Note
Electrical Characteristics						
Supply Current	I_{cc}	mA	-	-	250	
Transmitter Differential Input Voltage	V_D	mV	500	-	1800	
Common-mode Input Voltage	$V_{com}-V_{CC}$	V	-1.4		-1.19	
PECL Output Voltage-Low	$V_{OL}-V_{CC}$	V	-1.8	-	-1.6	1
PECL Output Voltage-High	$V_{OH}-V_{CC}$	V	-1.0	-	-0.8	1
Optical transmitter Characteristics						
Center Wavelength Range	λ_c	nm	1480	1550	1580	
Launch Optical Power	P_o	dBm	-5	-	0	2
Extinction Ratio	EX	dB	10	-	-	
Spectral Width	$\Delta\lambda$	nm	-	-	1	
Side Mode Suppression Ratio	SMSR	dB	30	-	-	
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	-	-	-36.0	4

Overload Input Power	P_{in}	dBm	-10	-	-	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	

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

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

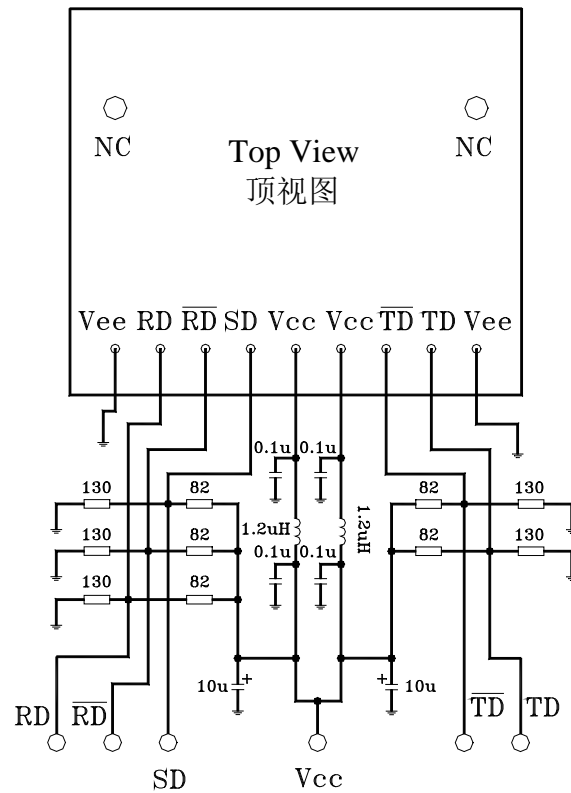
Note3: These are unfiltered 10~90% values.

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

Pin Description

Pin Name	Level	Description
1	Vee	Negative power of receiver section, normally grounded
2	RD+	PECL Data output of receiver section
3	RD-	PECL Reverse data output of receiver section
4	SD	PECL Optical alarm of receiver section, High level when normal, low level when no light
5	Vcc	Positive power of receiver section, normally +5.0V
6	Vcc	Positive power of transmitter section, normally +5.0V
7	TD-	PECL Reverse data input of transmitter section
8	TD+	PECL Data input of transmitter section
9	Vee	Negative power of transmitter section, normally grounded

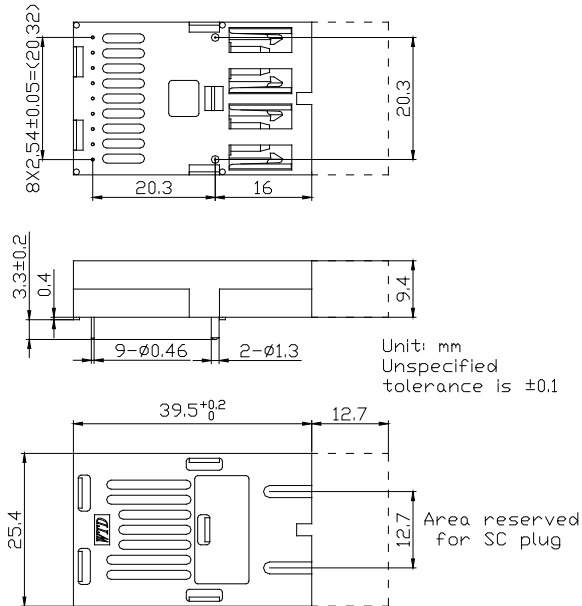
Typical application circuit



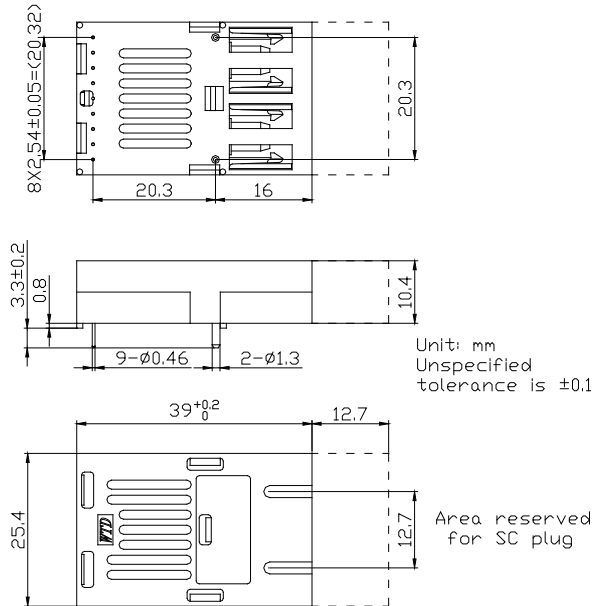
Package outline (unit: mm)

Duplex SC receptacle optical interface

Thin type package
RTXM156B-DFB

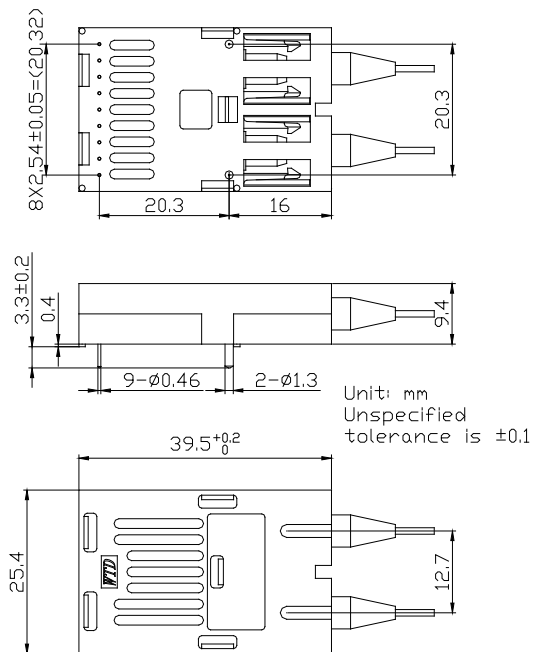


Thick type package
RTXM156-DFB

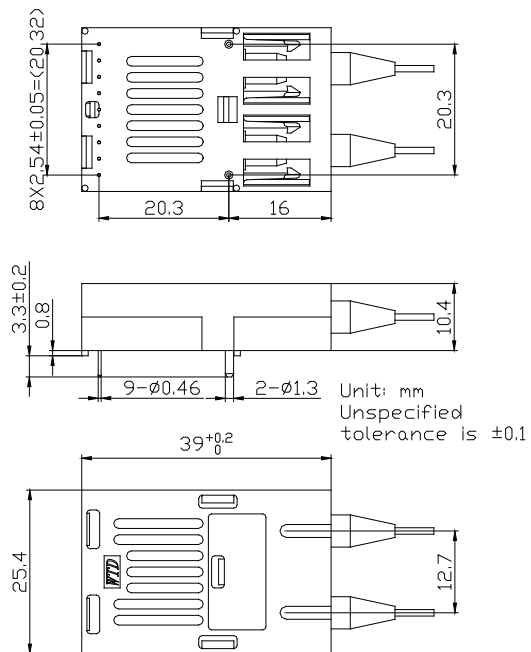


FC pigtailed optical interface

Thin type package
RTXM146B-DFB



Thick type package
RTXM146-DFB



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

Ordering information

Part No.	Specification									Application
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Interface	code
RTXM146-DFB	1×9 thick	155Mb/s	1550nm DFB-LD	-5~0dBm	PIN+TIA	-34.0dBm	0~70°C	80km	FC Pigtail	SDH L-1.2
RTXM146B-DFB*	1×9 thin	155Mb/s	1550nm DFB-LD	-5~0dBm	PIN+TIA	-34.0dBm	0~70°C	80km	FC Pigtail	SDH L-1.2
RTXM156-DFB	1×9 thick	155Mb/s	1550nm DFB-LD	-5~0dBm	PIN+TIA	-34.0dBm	0~70°C	80km	Duplex SC	SDH L-1.2
RTXM156B-DFB	1×9 thin	155Mb/s	1550nm DFB-LD	-5~0dBm	PIN+TIA	-34.0dBm	0~70°C	80km	Duplex SC	SDH L-1.2

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

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