

### Product Description

**Neton's** 1414TZ transmitter optical fiber devices, combined with 850nm multimode optical fiber, provide high performance and low cost optical fiber communication links for industrial, power generation, medical, transportation, and game applications. 1414TZ is driven by 60 mA current with a minimum transmission distance of 2500 meters.

The 1414TZ Series supports industrial standard ST fiber ports with threaded option. The 1414 TZ series fits multiple modes of fibers with fiber core diameter, including 50/125  $\mu$  m, 62.5/125  $\mu$  m, 100 / 140  $\mu$  m and 200  $\mu$  m.

The 1414TZ is a transmitter, packaged of a high power LED chip with wavelength of 850nm. The 850nm multi-mode fiber with 62.5/125 $\mu$ m core diameter output an optical power typical value of -13.5dBm driven by 60 mA current.



### Product Features

- Data transfer rate: DC-50 MBd, up to 160 MBd
- Minimum transmission distance: 2500 m
- The output waveform pulse width is stable
- Compliance the RoHS criteria
- Power supply support is + 5V
- ST connector with thread
- Operating temperature range (Industrial: -40°C to +85°C)

### Order information

Type	Fiber type	wavelength (nm)	interface type
1414TZ	MM	850	transmitter, ST with thread

Contact us now for more information:

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## DC-50MBd Transmitter Module

1414TZ

## Application

- Factory automation
- Industrial networks and the fieldbus
- Audio and video applications / game applications

## Absolute Maximum Ratings

Table 1--- Absolute Maximum Conditions

Parameter	Symbol	Min	Max	Units	Note
Storage Temperature	Ts	-55	+85	℃	-
Operating Temperature	Ta	-40	+85	℃	-
Forward DC current	IF	-	100	mA	-
Backward voltage	VR	-	10	V	T=25℃
Soldering temperature(electric-soldering-iron)	-	-	350	℃	-
Soldering duration(electric-soldering-iron)	-	-	5	Sec	-

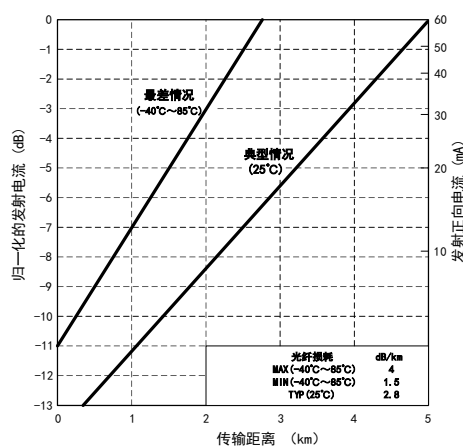
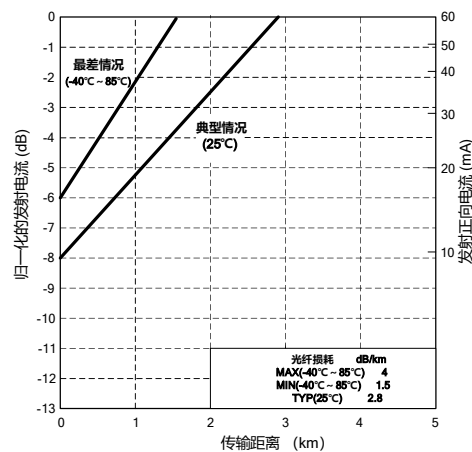
Table 2--- 1414TZ Electrical Characteristics

(Ambient Operating Temperature Ta=+25±5℃, VCC = 3.3±0.2V or 5.0±0.2V )

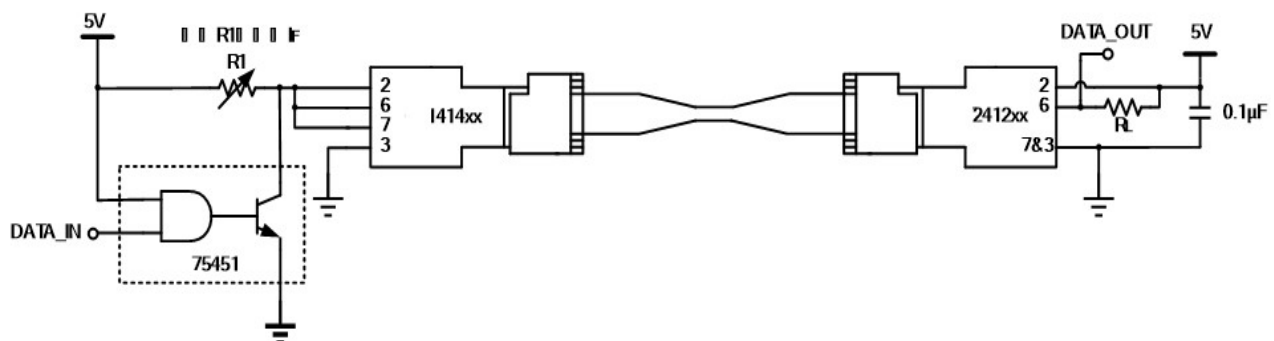
parameter	Symbol	Min	Typ	Max	Units	Note
Data rate	Sr	DC	-	50	MBd	-
Output is from low to high time delay	TPLH	-	72	-	ns	Fiber length of 1m, PR=-21dBm
Output from high to ground delay	TPHL	-	50	-	ns	Fiber length of 1m, PR=-21dB m
pulse length	TP	-	-22	-	ns	PR=-21dBm
		-	-13	-	ns	PR=-23dB m

**Table3--- 1414TZ Transmitter Optical Characteristics**(Ambient Operating Temperature  $T_a=+25\pm5^\circ\text{C}$ ,  $V_{CC} = 5.0\pm0.2\text{V}$  )

parameter	Symbol	Min	Typ	Max	Units	Note
50 /125 $\mu\text{m}$ optical fiber output	PT50	-20	-18	-17	dBm	IF=60mA , $T=25^\circ\text{C}$
		-21	-	-16		
62.5/125 $\mu\text{m}$ fiber output	PT 62	-17	-15.5	-13.5	dBm	IF=60mA , $T=25^\circ\text{C}$
		-18	-	-13		
A 100 /140 $\mu\text{m}$ optical fiber output	PT 100	-13	-11	-10	dBm	IF=60mA , $T=25^\circ\text{C}$
		-14	-	-9		
The 200 $\mu\text{m}$ HCS optical fiber output	PT 200	-7	-5	-4	dBm	IF=60mA , $T=25^\circ\text{C}$
		-8	-	-3		
Output optical power temperature coefficient	PT/T	-	-0.3	-	%/ $^\circ\text{C}$	-
Peak radiation wavelength	PK	845	850	855	nm	-
direct voltage	VF	1.4	1.59	1.8	V	IF=60mA

Figure 1 with 62.5/125  $\mu\text{m}$  core diameter optical fiberFigure 2 with 62.5/125  $\mu\text{m}$  core diameter optical fiber

1414TZ / 2412TZ transmission distance limit 1414TZ / HFBR-2412 transmission distance limit

**Typical application diagram****Figure 3 1414TZ / 2412TZ**

By adjusting the R1 resistance value, it can compromise between the power consumption and the transmission distance, and examples are given below

If the maximum transmission distance is 1300 m, according to Figure 1, the driving current of 1,1414 TZ should be 20 mA, and from Figure 4, when the driving current of 1414 TZ is 20 mA, the positive current of 1414 TZ is 1.43V, then

$$R1 = \frac{V_{CC} - V_F}{I_F} = \frac{5V - 1.43V}{20mA} = 178\Omega$$

The worst case when mixing 1414 TZ / 2412 TZ with HFBR-1414 / 2412 of AVAGO occurred when emitted 1414 TZ and received HFBR-2412. Figure 2 shows the transmission distance value for the 1414 TZ and HFBR-2412, and the R1 value can be reasonably selected according to the required transmission distance.

The transmission distance given in Figure 1 and 2 does not account for additional system loss. If there is additional system loss, the transmission distance limit should be calculated by displacement of additional system loss value (in dB) in Figure 1 and 2, For example:

When the driving current of 1414 TZ is 20 mA, it can be obtained from Figure 1 that the transmission distance can guarantee 1300 meters under full temperature. If there is an additional 2dB system loss, the transmission distance can still be guaranteed to be 800 meters at full temperature.

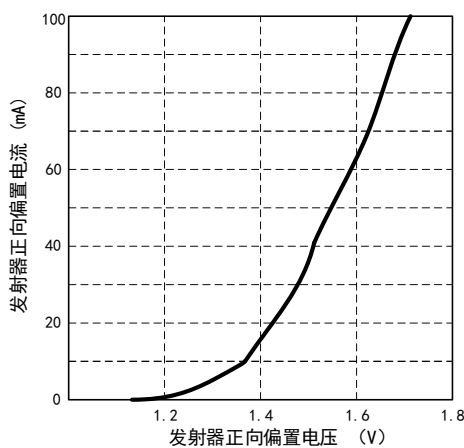


Figure 4 Positive voltage and current curve

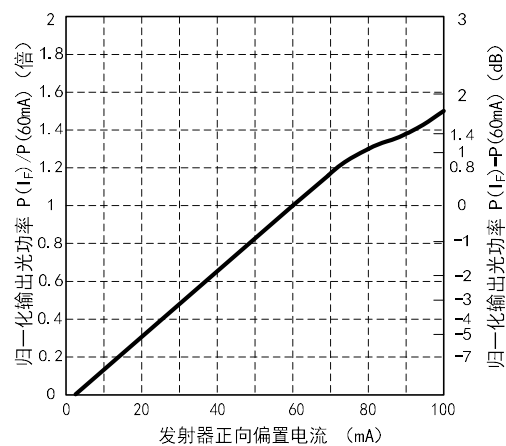


Figure 5 Positive current and normalized output optical power curve

Figure 5 shows the 1414 TZ positive guide current and normalized output optical power curve. The corresponding output optical power when the normalized reference is 60 mA driving current, the left coordinate is the fold change, and the right coordinate is the dB change.

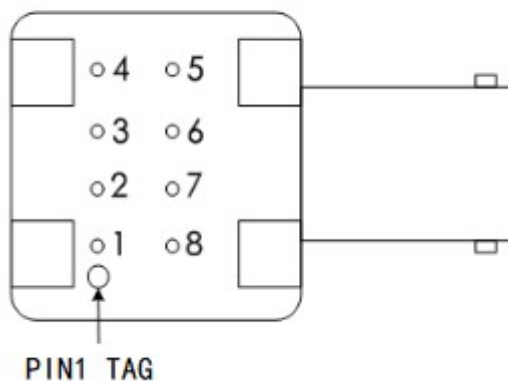
The output optical power corresponding to other driving currents can be calculated by FIG. 5, for example below

At normal temperature, the typical output optical power of 1414 TZ under the driving current of 60mA is -15.5dBm. If the driving current of 1414 TZ drops to 30mA, it can be seen that the output optical power is 0.5 times of the output optical power under the driving current of 60mA. It can be seen from the right coordinate that the output optical power changes from the driving current of 60mA by -3dBm, which is -18.5dBm.

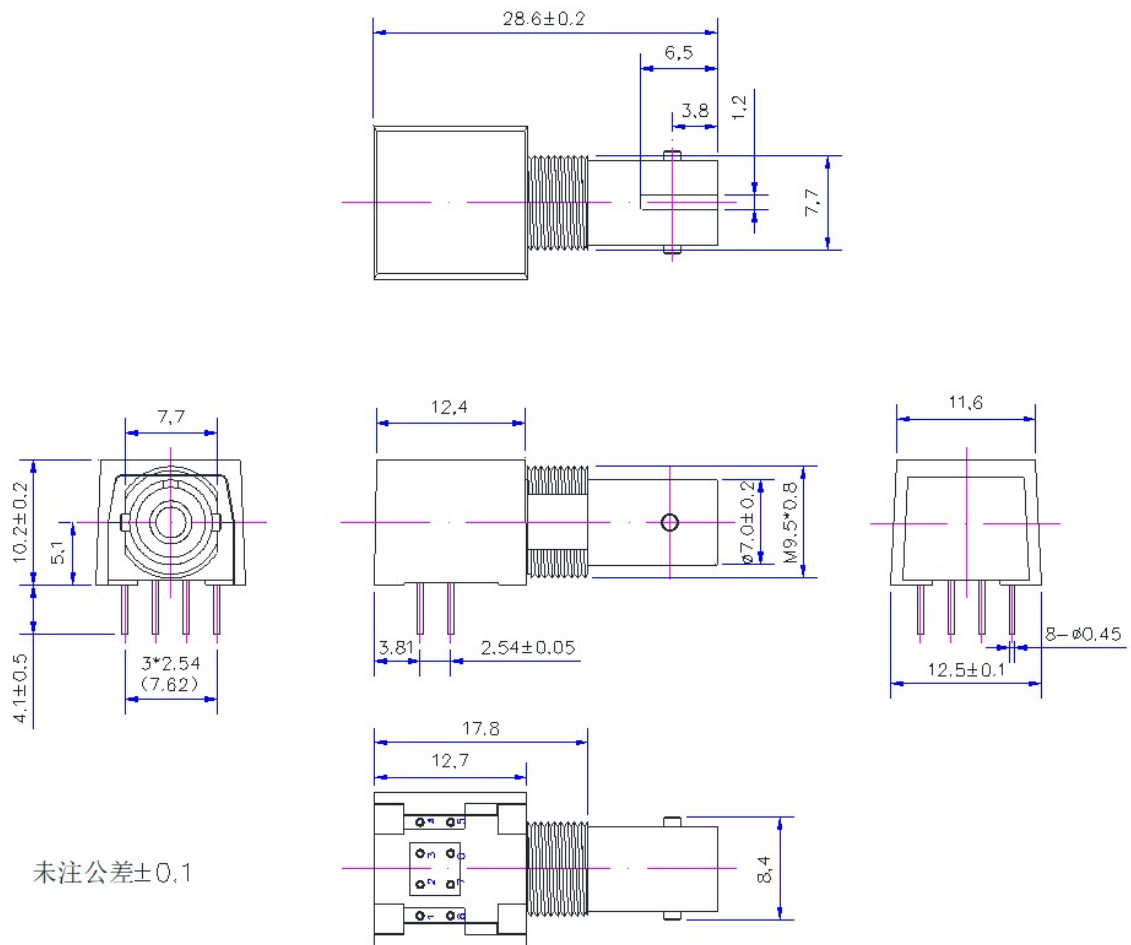
### Transmitter Pin Definitions

Pin #	Pin Name	Description
1	NC	NC
2	Anode	LED positive pole
3	Cathode	LED negative pole
4	NC	NC
5	NC	NC
6	Anode	LED positive pole
7	Anode	LED positive pole
8	NC	NC

**Bottom VIEW**



# Outline dimension drawing of ST interface with thread (1414 TZ) unit: mm



### Product Description

Neton's 2412TZ Receiver optical fiber devices, combined with 1414XX and 850nm multi-mode optical fiber, provide high performance and low cost optical fiber communication links for industrial, power generation, medical, transportation, and game applications. The 1414XX is driven by 60 mA current with a minimum transmission distance of 2500 meters.

The 2412 TZ Series supports industrial standard ST fiber ports with threaded options. 2412 For a variety of fiber core diameter, including 50/125 $\mu$ m, 62.5/125 $\mu$ m, 100 / 140 $\mu$ m and 200 $\mu$ m.

The 2412 TZ series is a receiver, consisting of a high-gain span resistance amplifier with an integrated photodiode. The output stage is an open-leakage MOSFET structure.



### Product Features

- Data transfer rate: DC-5MBd
- Minimum transmission distance: 2500 m
- The output waveform pulse width is stable
- Compliance the RoHS criteria
- Power supply support is + 5V
- ST connector with thread
- Operating temperature range (Industrial: -40°C to +85°C)

### Order information

Type	Fiber type	wavelength (nm)	interface type
2412TZ	MM	850	Receive, ST with thread

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## DC-5MBd Receiver Module

2412TZ

## Application

- Factory automation
- Industrial networks and the fieldbus
- Audio and video applications / game applications

## Absolute Maximum Ratings

Table 1--- Absolute Maximum Conditions

Parameter	Symbol	Min	Max	Units	Note
Storage Temperature	Ts	-55	+85	°C	-
Operating Temperature	Ta	-40	+85	°C	-
supply voltage	VCC	-0.5	7	V	-
Fan out capability (TTL)	N	-	5	-	-
Soldering temperature(electric-soldering-iron)	-	-	350	°C	-
Soldering duration(electric-soldering-iron)	-	-	5	Sec	-

Table 2--- 2412TZ Receiver Optical Characteristics

(Ambient Operating Temperature Ta=+25±5°C, VCC = 5.0±0.2V )

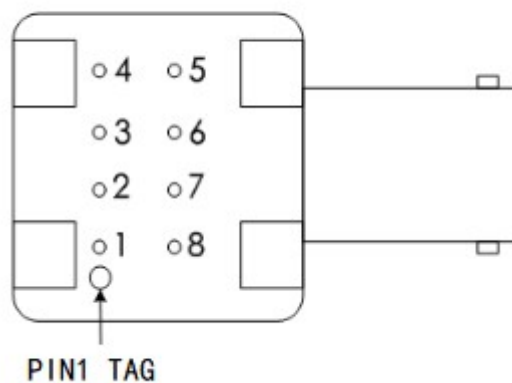
parameter	Symbol	Min	Typ	Max	Units	Note
Peak wavelength	$\lambda$	-	850	-	nm	
Data rate	DR	DC	-	5	MBd	
Receiver Sensitivity	P <sub>RL</sub>	-28	-	-1	dBm	T=25°C, IO L=8m A
		-27	-	-2	dBm	I <sub>OL</sub> =8m A
Input power at the output of 1	P <sub>RH</sub>	-	-	-35	dBm	V <sub>OL</sub> =5V
Output current at the high output level	I <sub>OH</sub>	-	5	250	μ A	V <sub>O</sub> =5V ,PR=0
Output voltage at low output	V <sub>OL</sub>	-	0.3	0.4	V	I <sub>OL</sub> =8mA, PR=PRLmin
Power supply current at high output	I <sub>CCH</sub>	-	5.2	6	mA	VCC=5V ,PR=0
Output the power supply current at a low level	I <sub>CCL</sub>	-	5.5	6	mA	VCC=5V ,PR=-16d B m.5



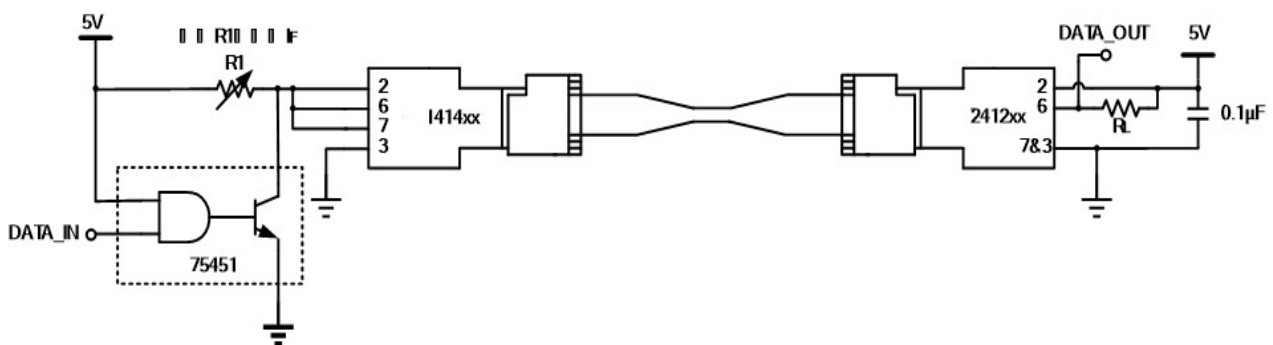
## Receiver Pin Definitions

Pin #	Pin Name	Description
1	NC	NC
2	V CC	power supply
3	GND	Ground
4	NC	NC
5	NC	NC
6	V O	TTL output
7	GND	Ground
8	NC	NC

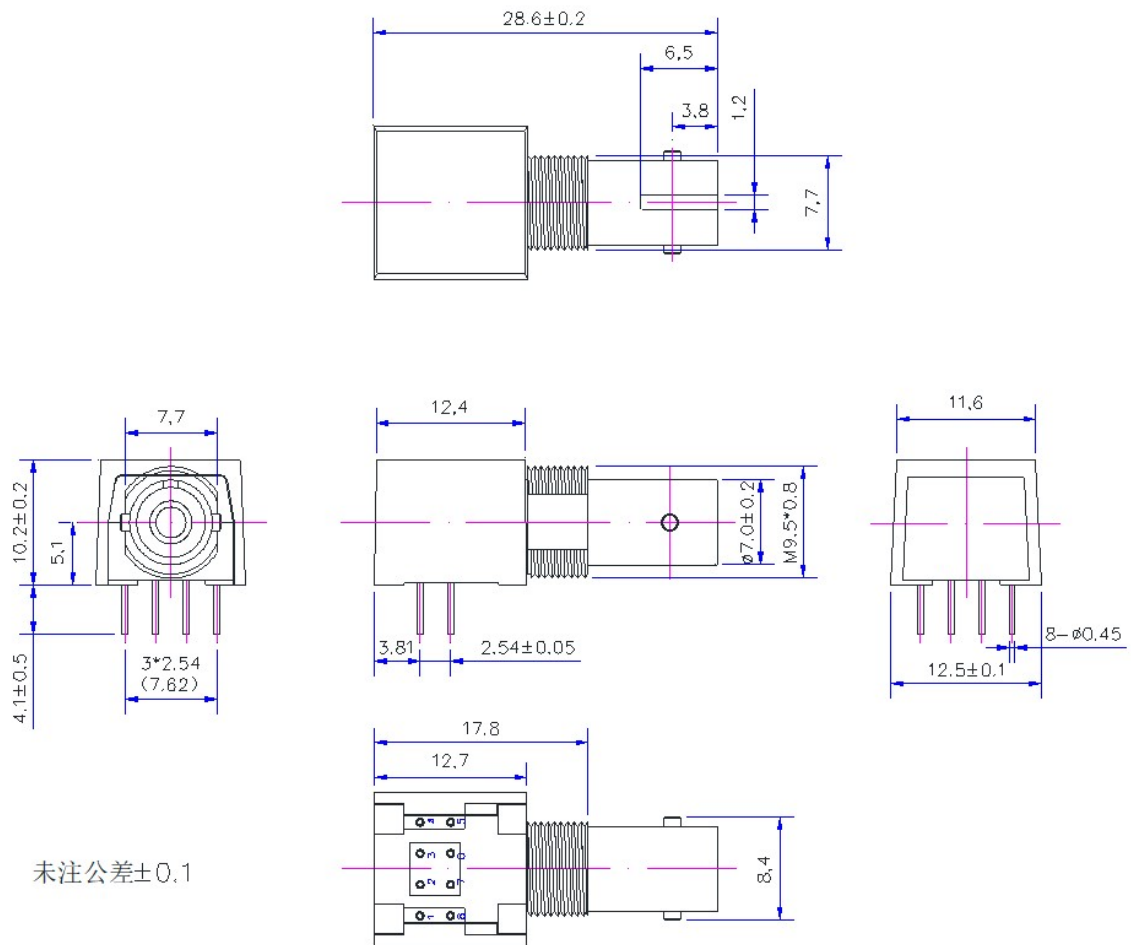
### Bottom VIEW



## Typical application diagram



# Outline dimension drawing of ST interface with thread (2412 TZ) unit: mm



### Product Description

**Neton's** 2418TZ Receiver optical fiber devices, combined with 1414XX and 850nm multi-mode optical fiber, provide high performance and low cost optical fiber communication links for industrial, power generation, medical, transportation, and game applications. The 1414XX is driven by 60 mA current with a minimum transmission distance of 2000 meters.

The 2418 TZ Series supports industrial standard ST fiber ports with threaded options. 2418 For a variety of fiber core diameter, including 50/125  $\mu$  m, 62.5/125  $\mu$  m, 100 / 140  $\mu$  m and 200  $\mu$  m.

The 2418 TZ series consists of a high-gain span resistance amplifier with an integrated photodiode and delivers a CMOS / TTL logic output, providing a power monitoring function (RSSI). To improve the stability of the output pulse width of the receiver, the receiver chip has designed the automatic artery width calibration circuit with the pulse width distortion within  $\pm 5$ ns.

### Order information

Type	Fiber type	wavelength (nm)	interface type
2418TZ	MM	850	Receive, ST with thread



### Product Features

- Data transfer rate: DC-50 MBd
- Minimum transmission distance: 2000 m
- The output waveform pulse width is stable
- Provides the RSSI monitoring
- Compliance the RoHS criteria
- Power supply support is + 3.3V or + 5V
- ST connector with thread
- Operating temperature range (Industrial: -40°C to +85°C)

## DC-50MBd Receiver Module

2418TZ

## Application

- Factory automation
- Industrial networks and the fieldbus
- Audio and video applications / game applications

## Absolute Maximum Ratings

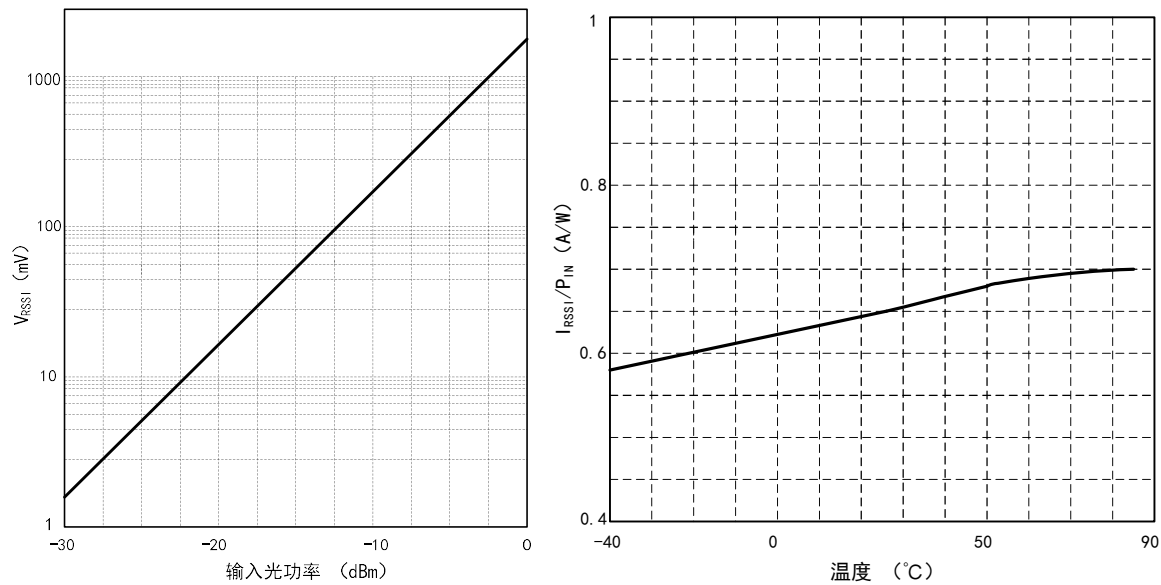
Table 1--- Absolute Maximum Conditions

Parameter	Symbol	Min	Max	Units	Note
Storage Temperature	Ts	-55	+85	°C	-
Operating Temperature	Ta	-40	+85	°C	-
supply voltage	VCC	-0.5	5.5	V	-
Maximum DC output current	IO	-	10	mA	-
Soldering temperature(electric-soldering-iron)	-	-	350	°C	-
Soldering duration(electric-soldering-iron)	-	-	5	Sec	-

Table 2--- 2418TZ Receiver Optical Characteristics

(Ambient Operating Temperature Ta=+25±5°C, VCC = 3.3±0.2V or 5.0±0.2V )

parameter	Symbol	Min	Typ	Max	Units	Note
Peak wavelength	$\lambda$	-	850	-	nm	
Data rate	DR	DC	-	50	MBd	
Receiver Sensitivity	PRL	-24	-	+2	dBm	DR=50MBd
Supply Current	IOH	-	20	30	m A	
Output Voltage – High	VO H	2.4	-	VCC	V	RL=2kΩ
Output Voltage – Low	VOL	-	0.2	0.4	V	RL=2kΩ
Output rise time	TR	-	-	5	ns	CL=10pF
Output drop time	TF	-	-	5	ns	CL=10pF
Duty cycle deviation	PWD	-5	-	5	ns	
RSSI output responsiveness	I <sub>RSSI</sub> /P <sub>IN</sub>	-	0.65	-	A/W	
RSSI port voltage	V <sub>RSSI</sub>	0	-	VCC-1	V	

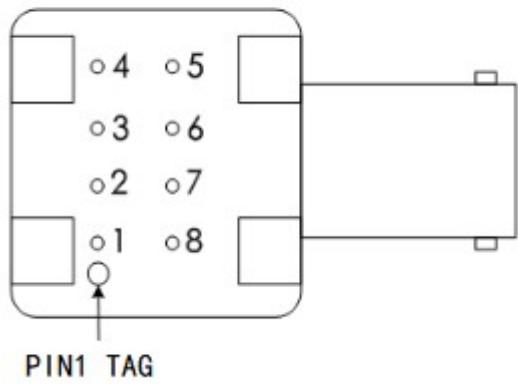


RSSI output port voltage with input light power relationship RSSI responsiveness with temperature

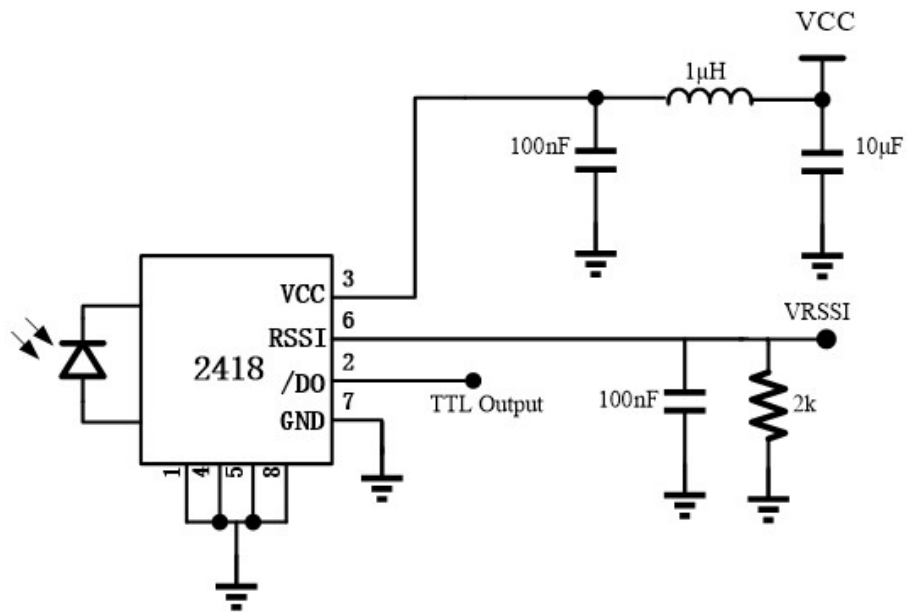
Receiver Pin Definitions

Pin #	Pin Name	Description
1	NC	NC
2	/D O	Reverse output
3	V CC	power supply
4	NC	NC
5	NC	NC
6	RSSI	RSSI monitoring
7	GND	Ground
8	NC	NC

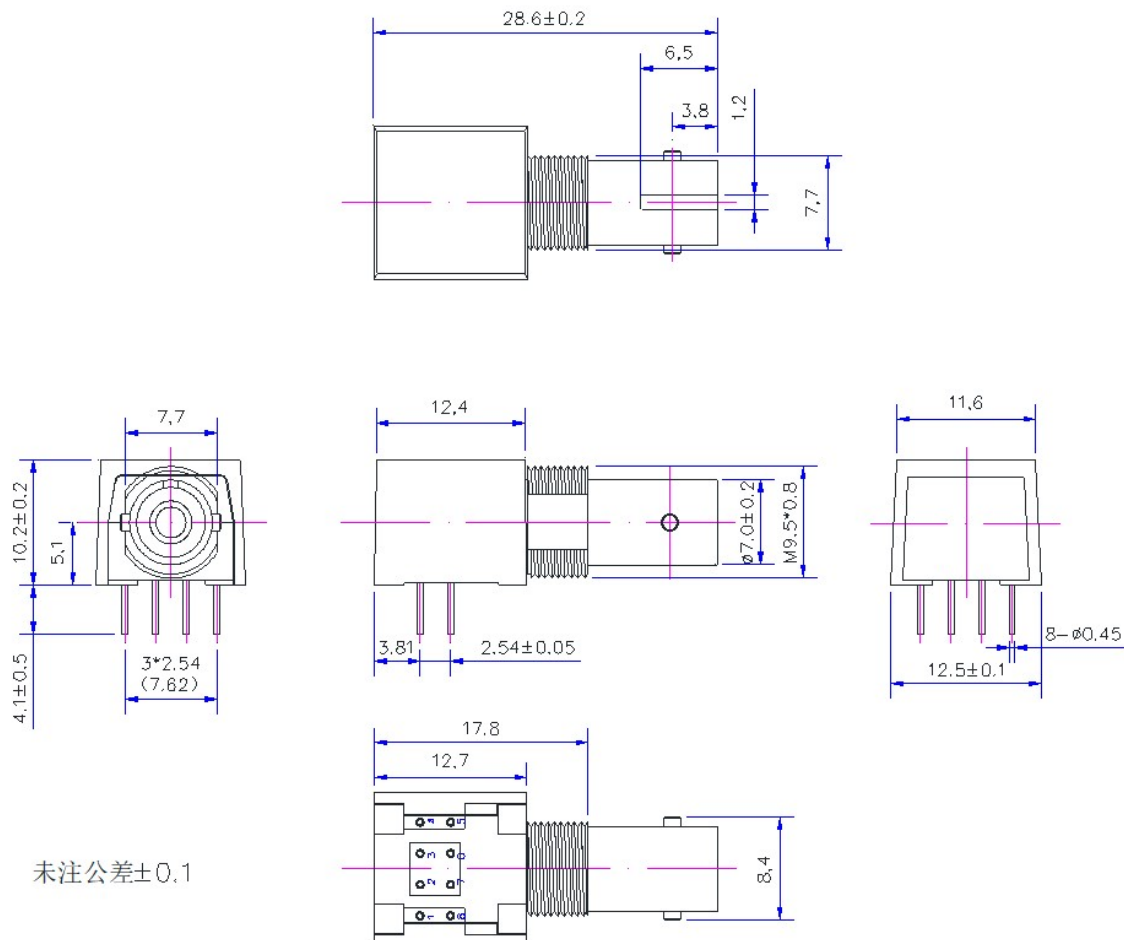
Bottom VIEW



## Typical application diagram



## Outline dimension drawing of ST interface with thread (2418 TZ) unit: mm



# Products

## Transceiver in Smart Grid

850nm MMF

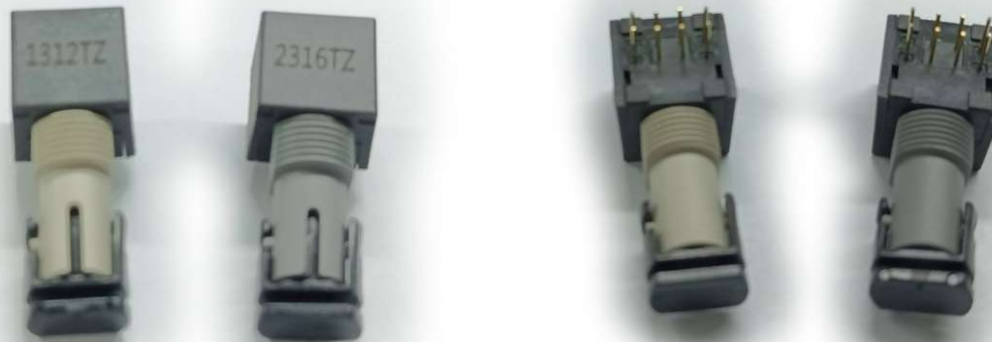


P / N	Type	Speed	Wavelength	Description
1412TZ	Tx	DC-5MBd	850nm	Application: Smart Grid. Character: low power consumption, wide temperature range
2412TZ	Rx	DC-5MBd	850nm	
1414TZ	Tx	DC-50MBd	850nm	
2418TZ	Rx	DC-50MBd	850nm	

# Products

## Transceiver in Smart Grid

1300nm MMF



P / N	Type	Speed	Wavelength	Description
1312TZ	Tx	155MBd	1300nm	Application: Smart Grid.  Character: low power consumption, wide temperature range.
2316TZ	Rx	155MBd	1300nm	