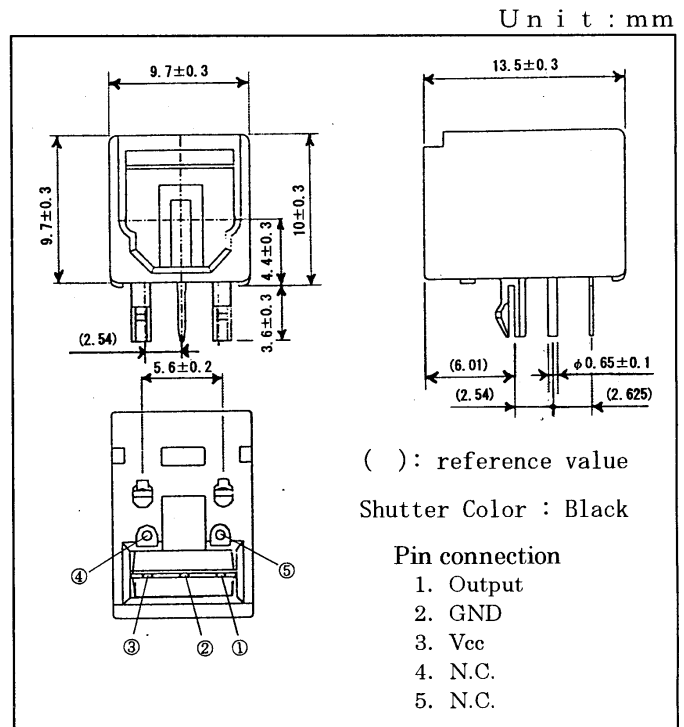


FIBER OPTIC RECEIVING MODULE  
**TORX141PL**

FIBER OPTIC RECEIVING MODULE FOR  
 DIGITAL AUDIO INTERFACE

- Conform to JEITA Standard CP-1201 (For Digital Audio Interfaces including Fiber Optic inter-connections).
- Mini package type with Shutter System



1. Maximum Ratings (Ta=25°C)

ITEM	SYMBOL	RATING	UNIT
Storage Temperature	Tstg	-40 to 70	°C
Operating Temperature	Topr	-20 to 70	°C
Supply Voltage	Vcc	-0.5 to 4.5	V
High Level Output Current	I <sub>OH</sub>	-2	mA
Low Level Output Current	I <sub>OL</sub>	2	mA
Soldering Temperature	Tsol	260 <sup>(1)</sup>	°C

Note <sup>(1)</sup> Soldering time ≤ 10 seconds. (At a distance of 1 mm from the package)

2. Recommended Operating Conditions

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	Vcc	2.7	3.0	3.6	V

3. Electrical and Optical Characteristics (Ta=25°C, Vcc=3V)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Date Rate		NRZ code <sup>(2)</sup>	0.1	—	15	Mb/s
Transmission Distance		Using APF <sup>(3)</sup> and TOTX141PL	0.2	—	10	m
Pulse Width Distortion <sup>(4)</sup>	$\Delta tw$	Pulse Width 67ns Pulse Cycle 134ns CL=10pF Using TOTX141PL	-20	—	20	ns
Maximum Receivable Power <sup>(5)</sup>	$P_{MAX.}$	15Mb/s, Using APF	-14.5	—	—	dBm
Minimum Receivable Power <sup>(5)</sup>	$P_{MIN.}$	15Mb/s, Using APF	—	—	-27	dBm
Current Consumption	$I_{cc}$		—	10	15	mA
High Level Output Voltage	$V_{OH}$		2.1	2.5	—	V
Low Level Output Voltage	$V_{OL}$		—	0.2	0.4	V

Note <sup>(2)</sup> When non-modulated signal (optical all high or all low level signal) is inputted, output signal is not stable. When modulated optical high level signal is received, output signal is high. When modulated optical low level signal is received, output signal is low. The duty factor must be maintained between 25 to 75%.

<sup>(3)</sup> All Plastic Fiber (970/1000  $\mu$ m)

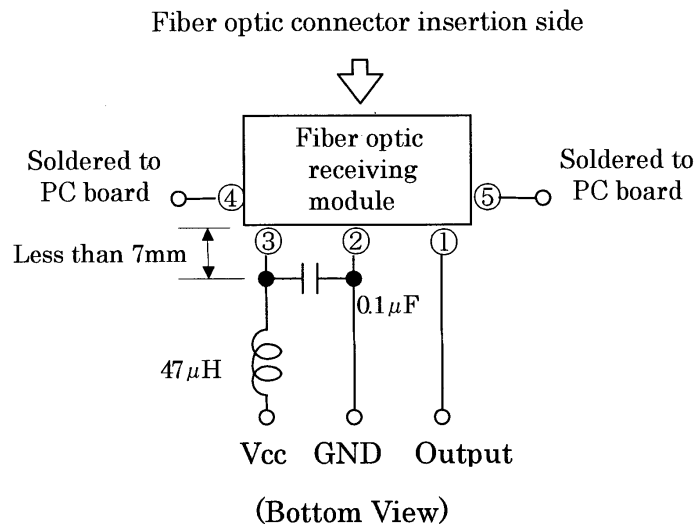
<sup>(4)</sup> Between input of TOTX141PL and output of TORX141PL.

<sup>(5)</sup>  $BER \leq 10^{-9}$ , Peak.value

4. Mechanical Characteristics (Ta=25°C)

ITEM	CONDITION	MIN.	TYP.	MAX.	UNIT
Mating force	Using TOCP172, Initial value	—	—	39.2	N
Unmating force	Using TOCP172, Initial value	5.9	—	39.2	N

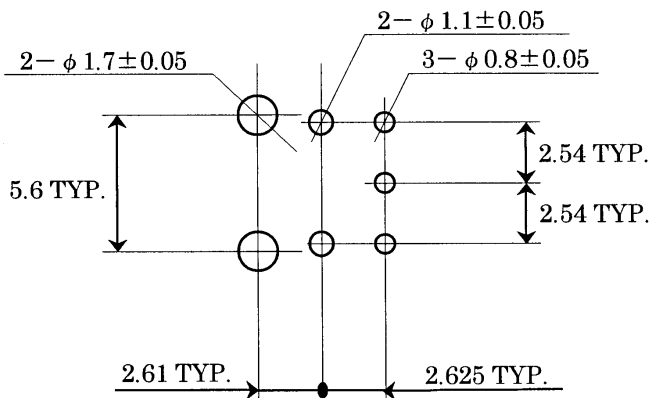
5. Application Circuit



6. Applicable optical fiber with fiber optic connectors.

TOCP172-□□B

## 7. Foot Layout (reference)



Unit : mm

Recommended PCB thickness : 1.6mm

## 8. Precaution on Use

## (1) Maximum Rating

The maximum ratings are the limit values which must not be exceeded during operation of device. None of these rating value must not be exceeded. If the maximum rating value is exceeded, the characteristics of devices may never be restored. In extreme cases, the device may be permanently damages.

## (2) Soldering

Optical modules are comprised of internal semiconductor devices. However, in principle, optical modules are optical components. During soldering, ensure that flux dose not contact with the emitting surface or detecting surface. Also ensure that proper flux removal is conducted after soldering.

Some optical modules come with protective cap. The protective cap is used to avoid malfunction when the optical module is not in use. Note that it is not dust or waterproof. As mentioned before, optical modules are optical components. Thus, in principle, soldering where there may be flux residue or flux removal after soldering is not recommended. Toshiba recommend that soldering be performed without the optical module mounted on the board. Then, after the board has been cleaned, the optical module should be soldered on to the board manually.

If the optical module cannot be soldered manually, use non-halogen (chlorine-free) flux and make sure, without cleaning, there is no residue such as chlorine. This is one of the ways to eliminate the effects of flux. In such a case, check the reliability.

## (3) Noise resistance

It is believed that the use of optical transfer devices improve noise resistance. In theory, optical fiber is not affected by noise at all. However, receiving modules which handle signals whose level is extremely small, are susceptible to noise.

TOSLINK improve noise resistance to use a conductive case. However, the current signal output by the optical receiving module's photodiode is extremely small. Thus, in some environments, shielding the case may not achieve sufficient noise resistance.

For systems which incorporate TOSLINK, Toshiba recommend testing using the actual device to check its noise resistance.

Use a simple noise filter on the TOSLINK fiber optic transceiving module's power line. If the ripple in the power supply used is significant, reinforce the filter.

The optical module is to be used in an area which is susceptible to radiated noise, increase the shielding by covering the optical module and the power line filter with a metallic cover .