

New Product

FIBER OPTIC TRANSCEIVING MODULE

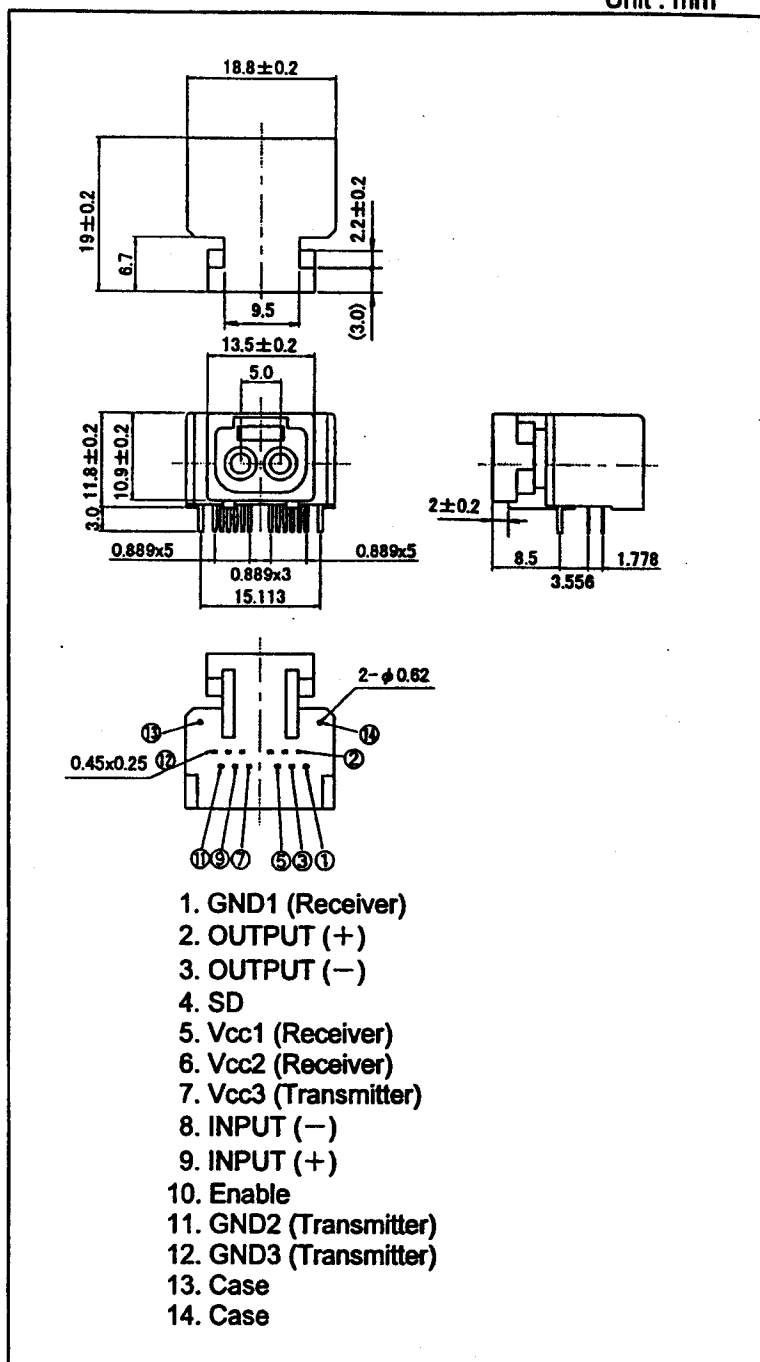
## TODX2402

Unit : mm

○ FIBER OPTIC TRANSCEIVING MODULE  
FOR SMI (Small Multimedia Interface)  
CONNECTOR

- Data Rate : 50 to 250 Mb/s.
- Transmission Distance
  - : Up to 20 m (250Mb/s)
  - Up to 50 m (125Mb/s)\*\*
- Operating Temperature :
  - 0 to 60 °C (250Mb/s)
  - 10 to 70 °C (125Mb/s)
- 3.3V PECL Interface

\*\* Reference value



### Handling precaution

The LED's used in this product contain GaAs (Gallium Arsenide).

Care must be taken to protect the safety of people and the environment when scrapping or terminal processing.

●TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

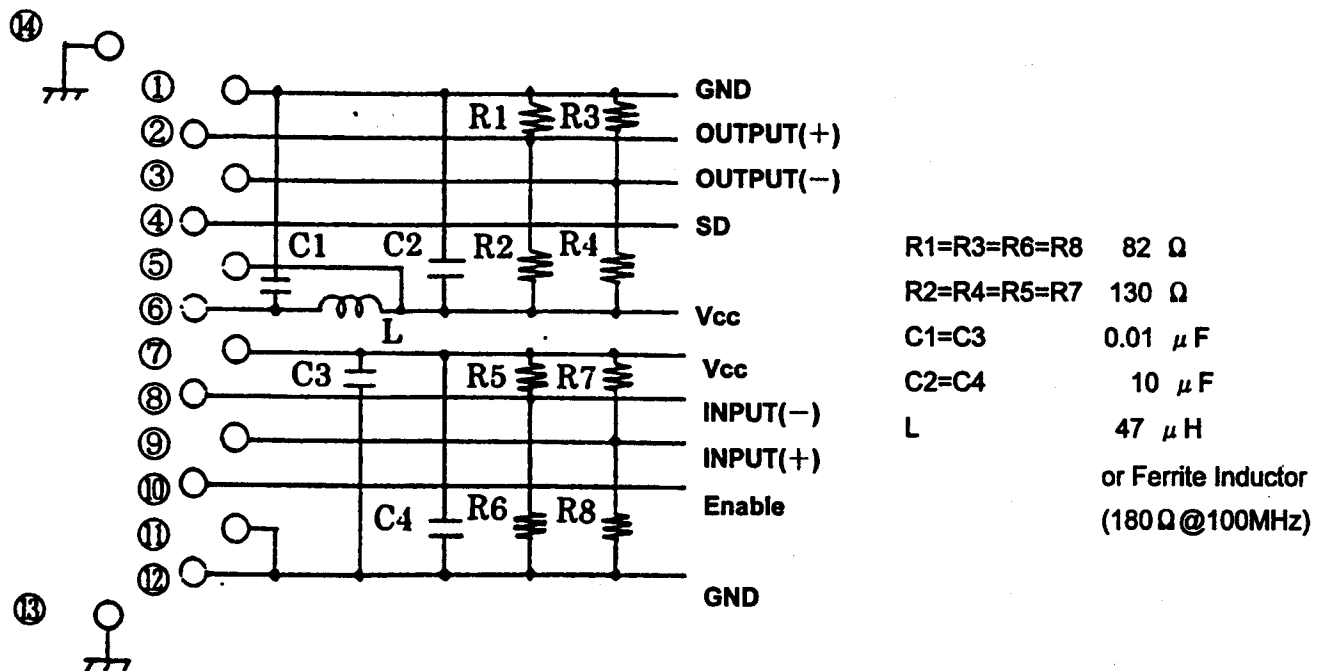
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●Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the product with other industrial waste or with domestic garbage.

●The information contained herein is subject to change without notice.

- Note (2) All Plastic Fiber (NA=0.33,980/1000  $\mu$  m).  
 (3) Measured by standard optical fiber. Averaged value.  
 (4) 2<sup>7</sup>-1 Pattern. BER  $\leq 10^{-9}$ . Averaged Value.  
 (5) 2<sup>7</sup>-1 Pattern. Eye Opening  $\leq 50\%$ . Averaged Value.  
 The value at 125 Mb/s operation is reference value.  
 (6) Without output current.  
 (7) Transmitter is on when Enable is H level or open.  
 (8) Transmitter is off when Disable is L level.  
 (9) The value when SD output changes from L level to H level.  
 (10) The value when SD output changes from H level to L level.

## 5. Application Circuit



## Notes

1. Place termination resistors near receiving input data point.
2. Make differential signal paths short and of the same length with equal termination to Vcc-2V.
3. Signal trace should be 50 ohm transmission lines (microstrip or strip line). Use ground plane (or multi-layer) printed circuit board for best high frequency performance.
4. Use high-frequency monolithic ceramic bypass capacitors and low DC resistance inductors. Locate power supply filter components close to a optical transceiver.
5. Do not directly connect optical transceiver's ECL outputs to the GND without proper current limiting impedance.

## (A) Work environment

- when humidity in the working environment decreases, the human body and other insulators can easily become charged with static electricity due to friction.  
Maintain the recommended humidity of 40% to 60% in the work environment, while also taking into account the fact that moisture-proof-packed products may absorb moisture after unpacking.
- Be sure that all equipment, jigs and tools in the working area are grounded to earth.
- Place a conductive mat over the floor of the work area, or take other appropriate measures, so that the floor surface is protected against static electricity and is grounded to earth. The surface resistivity should be  $10^4$  to  $10^8$   $\Omega$ /sq and the resistance between surface and ground,  $7.5 \times 10^5$  to  $10^8$   $\Omega$ .
- Cover the workbench surface also with a conductive mat (with a surface resistivity of  $10^4$  to  $10^8$   $\Omega$ /sq, for a resistance between surface and ground of  $7.5 \times 10^5$  to  $10^8$   $\Omega$ ). The purpose of this is to disperse static electricity on the surface (through resistive components) and ground it to earth. Workbench surfaces must not be constructed of low-resistance metallic materials that allow rapid static discharge when a charged device touches them directly.
- Pay attention to the following points when using automatic equipment in your workplace:
  - (a) When picking up ICs with a vacuum unit, use a conductive rubber fitting on the end of the pick-up wand to protect against electrostatic charge.
  - (b) Minimize friction on IC package surfaces. If some rubbing is unavoidable due to the device's mechanical structure, minimize the friction plane or use material with a small friction coefficient and low electrical resistance. Also, consider the use of an ionizer.
  - (c) In sections, which come into contact with device, lead terminals, use a material, which dissipates static electricity.
  - (d) Ensure that no statically charged bodies (such as work clothes or the human body) touch the devices.
  - (e) Make sure that sections of the tape carrier which come into contact with installation devices or other electrical machinery are made of a low-resistance material.
  - (f) Make sure that jigs and tools used in the assembly process do not touch devices.
  - (g) In processes in which packages may retain an electrostatic charge, use an ionizer to neutralize the ions.
- Make sure that CRT displays in the working area are protected against static charge, for example by a VDT filter. As much as possible, avoid turning displays on and off. Doing so can cause electrostatic induction in devices.
- Keep track of charged potential in the working area by taking periodic measurements.
- Ensure that work chairs are Protected by an anti-static textile cover and are grounded to the floor surface by a grounding chain. (suggested resistance between the seat surface and grounding chain is  $7.5 \times 10^5$  to  $10^{12}$   $\Omega$ .)
- Install anti-static mats on storage shelf surfaces. (Suggested surface resistivity is  $10^4$  to  $10^8$   $\Omega$ /sq; suggested resistance between surface and ground is  $7.5 \times 10^5$  to  $10^8$   $\Omega$ .)
- For transport and temporary storage of devices, use containers (boxes, jigs or bags) that are made of anti-static materials or materials which dissipate electrostatic charge.
- Make sure that cart surfaces which come into contact with device packaging are made of materials which will conduct static electricity, and verify that they are grounded to the floor surface via a grounding chain.
- In any location where the level of static electricity is to be closely controlled, the ground resistance level should be Class 3 or above. Use different ground wires for all items of equipment, which may come into physical contact with devices.

**(9) Supply voltage**

Use the supply voltage within the typical operating condition ( $V_{cc}=3.3\pm 0.3V$ ).

Make sure that supply voltage does not exceed the maximum rating value of 4.5V, even instantaneously.

**(10) Input voltage**

If a voltage exceeding the maximum rating value ( $V_{cc}+0.5V$ ) is applied to the transmitter input, the internal IC may degrade causing some damage. If excessive voltage due to surges may be added to the input, insert a protective circuit.

**(11) Soldering condition**

Solder at 260°C or less within Three seconds.

**(12) Precaution on waste**

When discarding devices and packing materials, follow procedures stipulated by local regulations in order to protect the environment against contamination.

Compound semiconductors such as GaAs are used as LED materials for this module.

When discarding waste or at final processing, attention must be paid to workers and the environment.

**(13) Precaution on use**

The Toshiba products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, domestic appliances, etc).

These Toshiba products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, industrial instruments, all types of safety devices, etc. Unintended Usage of Toshiba products listed in this document shall be made at the customers' own risk.

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