

# Optically Coupled Isolator / High Speed Optically Coupled Isolator



## OPI150, OPI153, OPI155

### Features:

- 50 kV electrical isolation
- Choice of phototransistor or photodarlington output
- High speed 5 Mbit/sec (NRZ) OPI155 only
- Hermetically sealed LED and photosensor
- Base contact lead for conventional transistor biasing
- TX and TXV process available (see Hi-Rel section)



### Description:

Each **OPI150** and **OPI153** is an optically coupled isolator that contains an infrared emitting diode and a NPN silicon phototransistor (OPI150) or photodarlington (OPI153), each sealed in an individual hermetically sealed package. The diode and phototransistor or diode and photodarlington are then optically coupled by means of a light pipe and mounted in a high dielectric plastic housing. These devices are designed for applications that require very high isolation between input and output.

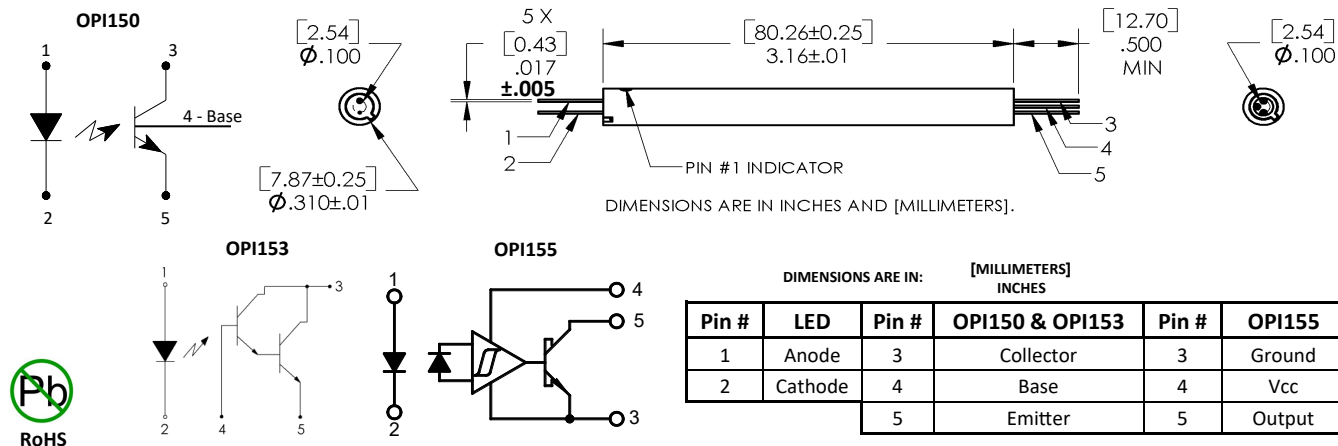
The **OPI155** is a high-speed optical coupled isolator that contains a high speed monolithic photo-IC comprised of a photodiode and a DC amplifier that drives an open collector output Schottky transistor. It is optically coupled by means of an internal light pipe. The LED and sensor are both in separate hermetically sealed packages that are then mounted in a high dielectric plastic housing. This device is designed for applications that require high speed *and* high voltage isolation between the input and output.

TX and TXV devices are available. Please contact your local representative or OPTEK for more information.

### Applications:

- Requiring high voltage isolation between input and output
- Electrical isolation in dirty environments
- Industrial equipment
- Medical equipment
- Office equipment

| Ordering Information |                     |            |                          |               |                               |                             |                       |
|----------------------|---------------------|------------|--------------------------|---------------|-------------------------------|-----------------------------|-----------------------|
| Part Number          | LED Peak Wavelength | Sensor     | Isolation Voltage (,000) | CTR Min / Max | I <sub>F</sub> (mA) Typ / Max | V <sub>CE</sub> (Volts) Max | Lead Length / Spacing |
| OPI150               | 890 nm              | Transistor | 50                       | 10 / NA       | 16 / 50                       | 30                          | 0.40" / 3.16"         |
| OPI153               | 890 nm or 935 nm    | Darlington |                          | 25 / NA       | 30 / 50                       | 15                          |                       |
| OPI155               | 850 nm              | TIA -OC    |                          | 80 / NA       | 10 / 50                       | 18                          |                       |



### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | OPTEK Technology  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.ttelectronics.com | sensors@ttelectronics.com

# Optically Coupled Isolator / High Speed Optically Coupled Isolator



OPI150, OPI153, OPI155

## Electrical Specifications

| <b>Absolute Maximum Ratings</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                             |                  |
|--|------------------|
| Operating Temperature Range  | -40° C to +85° C |
| Storage Temperature Range  | -40° C to +85° C |
| Input-to-Output Isolation Voltage <sup>(1)(2)</sup>  | ±50 kVDC         |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 seconds with soldering iron] <sup>(3)</sup> | 260° C           |
| <b>Input Diode</b>   |                  |
| Continuous Forward Current   | 50 mA            |
| Reverse Voltage  | 3 V              |
| Power Dissipation <sup>(4)</sup>   | 200 mW           |
| <b>Output Phototransistor or Photodarlington (OPI150, OPI153)</b>  |                  |
| Collector-Base Voltage<br>OPI150<br>OPI153   | 30 V<br>20 V     |
| Collector-Emitter Voltage<br>OPI150<br>OPI153  | 30 V<br>15 V     |
| Emitter-Collector Voltage  | 5.0 V            |
| Power Dissipation <sup>(5)</sup>   | 250 mW           |
| <b>Output Photosensor (OPI155)</b>   |                  |
| Supply Voltage   | -0.5 to 7 V      |
| Output Voltage   | -0.5 to 18 V     |
| Output Current   | 25 mA            |
| Open-Collector Power Dissipation   | 40 mW            |
| Power Dissipation <sup>(5)</sup>   | 250 mW           |

**Notes:**

- (1) For OPI150 and OPI153, measured with input leads and output leads shorted.
- (2) For OPI155, measured with input and output leads shorted and relative humidity of less than 50%.
- (3) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (4) Derate linearly 3.33 mW/° C above 25° C.
- (5) Derate linearly 4.17 mW/° C above 25° C.

**General Note**

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | OPTEK Technology  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.ttelectronics.com | sensors@ttelectronics.com

# Optically Coupled Isolator / High Speed Optically Coupled Isolator



OPI150, OPI153, OPI155

## Electrical Specifications

| Electrical Characteristics ( $T_A = 25^\circ \text{C}$ unless otherwise noted)   |   |          |            |            |               |  |
|--|---|----------|------------|------------|---------------|--|
| SYMBOL   | PARAMETER   | MIN      | TYP        | MAX        | UNITS         | TEST CONDITIONS  |
| <b>Input Diode</b> (For OPI150 & OPI153, see OP236 for additional information - for reference only. For OPI155, see OP235W for additional information - for reference only.)   |   |          |            |            |               |  |
| $V_F$  | Forward Voltage<br>OPI150, OPI153<br>OPI155             | -<br>-   | 1.3<br>1.2 | 1.6<br>1.6 | V             | $I_F = 50 \text{ mA}$<br>$I_F = 10 \text{ mA}$   |
| $I_R$  | Reverse Current   | -        | 0.1        | 100        | $\mu\text{A}$ | $V_R = 3 \text{ V}$  |
| <b>Output Phototransistor or Photodarlington</b> (For OPI150, see OP805SL for additional information, for OPI153, see OP830SL for additional information- for reference only.) |   |          |            |            |               |  |
| $V_{(BR)CEO}$  | Collector-Emitter Breakdown Voltage<br>OPI150<br>OPI153 | 30<br>15 | -<br>-     | -<br>-     | V             | $I_C = 1 \text{ mA}$   |
| $V_{(BR)ECO}$  | Emitter-Collector Breakdown Voltage<br>OPI150, OPI153   | 5        | -          | -          | V             | $I_F = 100 \mu\text{A}$  |
| $V_{(BR)CBO}$  | Collector-Base Breakdown Voltage<br>OPI150<br>OPI153    | 30<br>20 | -<br>-     | -<br>-     | V             | $I_C = 100 \mu\text{A}$  |
| $I_{CEO}$  | Collector-Emitter Dark Current<br>OPI150<br>OPI153      | -<br>-   | -<br>-     | 100<br>500 | nA            | $V_{CE} = 10 \text{ V}$  |
| $I_{CBO}$  | Collector-Base Dark Current<br>OPI150                   | -        | -          | -          | nA            | $V_{CB} = 10 \text{ V}$  |
| <b>Coupled (OPI150, OPI153)</b>  |   |          |            |            |               |  |
| $I_C/I_F$  | DC Current Transfer Ratio<br>OPI150<br>OPI153           | 10<br>25 | -<br>-     | -<br>-     | %             | $I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}$<br>$I_F = 20 \text{ mA}, V_{CE} = 5 \text{ V}$ |
| $I_{CB(ON)}$   | Ib0State Photodiode Current<br>OPI150                   | 10       | -          | -          | $\mu\text{A}$ | $I_F = 20 \text{ mA}, V_{CB} = 5 \text{ V}$  |
| $V_{CE(SAT)}$  | Saturation Voltage<br>OPI150<br>OPI153                  | -<br>-   | -<br>-     | 0.5<br>1.2 | V             | $I_F = 16 \text{ mA}, I_C = 1 \text{ mA}$<br>$I_F = 30 \text{ mA}, I_C = 2 \text{ mA}$     |

**General Note**

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | OPTEK Technology  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.ttelectronics.com | sensors@ttelectronics.com

# Optically Coupled Isolator / High Speed Optically Coupled Isolator



OPI150, OPI153, OPI155

## Electrical Specifications

| Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted) |                                     |     |     |     |       |   |
|--|-------------------------------------|-----|-----|-----|-------|---|
| SYMBOL   | PARAMETER                           | MIN | TYP | MAX | UNITS | TEST CONDITIONS   |
| <b>Output Photosensor (OPI155)</b>   |                                     |     |     |     |       |   |
| I <sub>OH</sub>  | High Level Output Current<br>OPI155 | -   | -   | 250 | μA    | V <sub>O</sub> = 18 V, I <sub>F</sub> = 0, V <sub>CC</sub> = Open       |
| I <sub>CCH</sub>   | High Level Supply Current<br>OPI155 | -   | -   | 6.5 | mA    | V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 0, V <sub>O</sub> = Open     |
| I <sub>CCL</sub>   | Low Level Supply Current<br>OPI155  | -   | -   | 10  | mA    | V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 10 mA, V <sub>O</sub> = 0    |
| V <sub>OL</sub>  | Low Level Output Voltage<br>OPI155  | -   | -   | 0.5 | V     | V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 10 mA, I <sub>O</sub> = 8 mA |
| <b>Switching Characteristics (OPI155)</b>                                  |                                     |     |     |     |       |   |
| T <sub>PHL</sub>   | Propagation Delay, High to Low      | -   | 120 | 150 | ns    | V <sub>CC</sub> = 5 V, I <sub>F</sub> = 10 mA, R <sub>L</sub> = 360 Ω   |
| T <sub>PLH</sub>   | Propagation Delay, Low to High      | -   | 70  | 100 |       |   |

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | OPTEK Technology  
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200  
www.ttelectronics.com | sensors@ttelectronics.com

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [High Speed Optocouplers](#) category:*

*Click to view products by [TT Electronics](#) manufacturer:*

Other Similar products are found below :

[HCPL-2201-300](#) [TLP558\(F\)](#) [JAN4N24](#) [610737H](#) [HCPL2630M](#) [HCPL2731SM](#) [HCPL2630SM](#) [PS9817A-1-F3-AX](#) [TLP2766A\(E\)](#)  
[EL816S2\(C\)\(TU\)-F](#) [TLP281-4](#) [TLP290\(V4GBTP,SE\(T](#) [PS9121-F3-AX](#) [PS9123-F3-AX](#) [HCPL2531S](#) [HCPL2631SD](#) [HCPL-4661-500E](#)  
[TLP118\(TPL,E\)](#) [TLP521-2XGB](#) [TLP621-2XGB](#) [4N46-300E](#) [JANTXV4N24U](#) [SFH6318T](#) [6N135-300E](#) [TIL198](#) [TLP2309\(TPL,E\)](#)  
[TLP2355\(TPL,E](#) [TLP521-4GR](#) [TLP521-4XGB](#) [TLP621-4X](#) [TLP621XSM](#) [IS281-4GB](#) [IS181GR](#) [ICPL2631](#) [ICPL2630](#) [ICPL2601](#)  
[TLP714\(F\)](#) [TLP754\(F\)](#) [FOD260LSDV](#) [ACPL-M21L-500E](#) [ACPL-064L-500E](#) [PS2501-1XSM](#) [PS2505-1](#) [PS2561L2-1-F3-A](#) [PS2913-1-F3-](#)  
[AX](#) [PS9821-2-F3-AX](#) [FOD0721R2](#) [FODM8061R2V](#) [6N135SDM](#) [6N137SDM](#)