



| Parameter                      | Rating | Units |
|--------------------------------|--------|-------|
| Breakdown Voltage - $BV_{CEO}$ | 30     | $V_P$ |
| Current Transfer Ratio         | 200    | %     |
| Saturation Voltage             | 0.5    | V     |
| Input Control Current          | 0.2    | mA    |

### Features

- 5000V<sub>rms</sub> Input/Output Isolation
- Low Drive Power Requirements
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 4-pin Package

### Applications

- Sensor Circuitry
- Instrumentation
- Multiplexers
- Data Acquisition
- Electronic Switching
- I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- Medical Equipment: Patient/Equipment Isolation
- Aerospace
- Industrial Controls

### Description

The CPC1303 is a unidirectional input optocoupler with a single-transistor output, which uses optically coupled technology to provide an enhanced 5000V<sub>rms</sub> isolation barrier between the input and the output. The optically coupled output is controlled by a highly efficient infrared LED.

This optocoupler satisfies the PD output requirements of IXYS Integrated Circuits Division's CPC1466 Broadband ADSL/VDSL DC Termination IC.

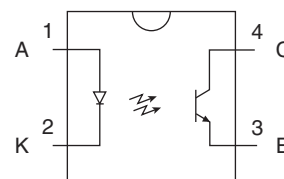
### Approvals

- UL 1577 Approved Component: File E76270
- EN/IEC 60950-1 Certified Component:  
TUV Certificate B 13 12 82667 003

### Ordering Information

| Part Number | Description                                  |
|-------------|----------------------------------------------|
| CPC1303G    | 4-Pin DIP (100/Tube)                         |
| CPC1303GR   | 4-Pin Surface Mount, Tubed (100/Tube)        |
| CPC1303GRTR | 4-Pin Surface Mount, Tape & Reel (1000/Reel) |

### Pin Configuration



## Absolute Maximum Ratings @ 25°C

| Parameter                          | Ratings     | Units            |
|------------------------------------|-------------|------------------|
| Breakdown Voltage                  | 30          | V <sub>P</sub>   |
| Reverse Input Voltage              | 5           | V                |
| Input Control Current              | 50          | mA               |
| Peak (10ms)                        | 1           | A                |
| Power Dissipation <sup>2</sup>     |             |                  |
| Input <sup>1</sup>                 | 150         | mW               |
| Phototransistor <sup>2</sup>       | 150         | mW               |
| Isolation Voltage, Input to Output | 5000        | V <sub>rms</sub> |
| Operating Temperature              | -40 to +85  | °C               |
| Storage Temperature                | -40 to +125 | °C               |

<sup>1</sup> Derate linearly 1.33 mW / °C

<sup>2</sup> Derate linearly 2.00 mW / °C

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

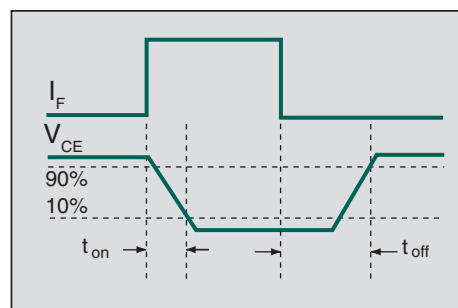
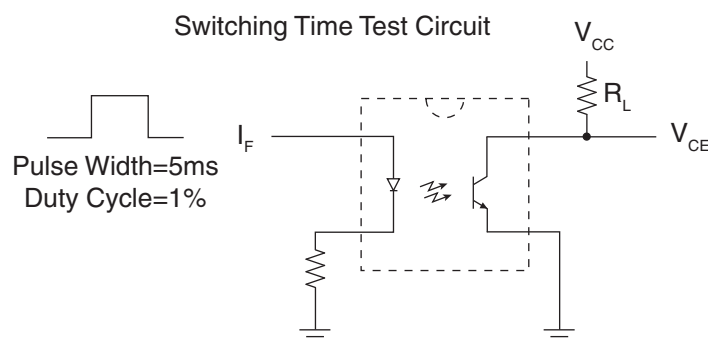
Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements..

## Electrical Characteristics @ 25°C

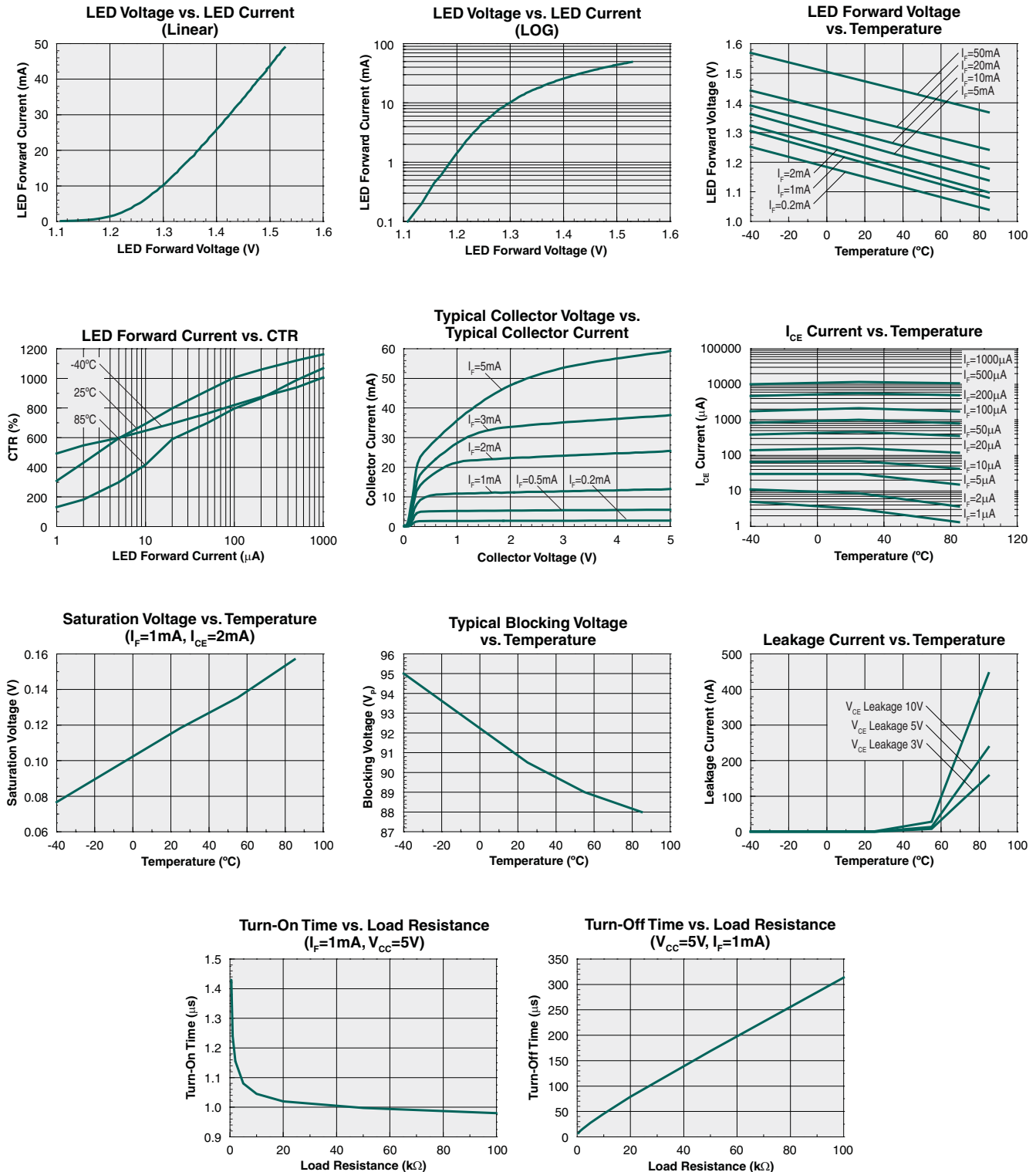
| Parameters                            | Conditions                                   | Symbol             | Min | Typ  | Max  | Units          |
|---------------------------------------|----------------------------------------------|--------------------|-----|------|------|----------------|
| <b>Output Characteristics</b>         |                                              |                    |     |      |      |                |
| Phototransistor Breakdown Voltage     | I <sub>CEO</sub> =10μA                       | BV <sub>CEO</sub>  | 30  | -    | -    | V <sub>P</sub> |
| Phototransistor Output (Dark) Current | V <sub>CEO</sub> =5V, I <sub>F</sub> =0mA    | I <sub>CEO</sub>   | -   | 25   | 500  | nA             |
| Saturation Voltage                    | I <sub>C</sub> =0.4mA, I <sub>F</sub> =0.2mA | V <sub>CEsat</sub> | -   | 0.1  | 0.45 | V              |
|                                       | I <sub>C</sub> =10mA, I <sub>F</sub> =10mA   |                    | -   | 0.12 | 0.5  |                |
| Current Transfer Ratio                | I <sub>F</sub> =0.2mA, V <sub>CE</sub> =0.5V | CTR                | 200 | 1000 | 2500 | %              |
| Output Capacitance                    | I <sub>F</sub> =0mA, V=25V, f=1MHz           | C <sub>OUT</sub>   | -   | 6    | -    | pF             |
| <b>Input Characteristics</b>          |                                              |                    |     |      |      |                |
| Input Control Current                 | I <sub>C</sub> =0.4mA, V <sub>CE</sub> =0.5V | I <sub>F</sub>     | -   | -    | 0.2  | mA             |
| Input Voltage Drop                    | I <sub>F</sub> =5mA                          | V <sub>F</sub>     | 0.9 | 1.2  | 1.4  | V              |
| Input Reverse Current                 | V <sub>R</sub> =5V                           | I <sub>R</sub>     | -   | -    | 10   | μA             |
| <b>Common Characteristics</b>         |                                              |                    |     |      |      |                |
| Capacitance, Input to Output          | V <sub>IO</sub> =0V, f=1MHz                  | C <sub>IO</sub>    | -   | 3    | -    | pF             |

## Switching Characteristics @ 25°C

| Characteristic | Symbol           | Test Condition                                                 | Typ | Units |
|----------------|------------------|----------------------------------------------------------------|-----|-------|
| Turn-On Time   | t <sub>on</sub>  | V <sub>CC</sub> =5V, I <sub>F</sub> =1mA, R <sub>L</sub> =500Ω | 2   | μs    |
| Turn-Off Time  | t <sub>off</sub> |                                                                | 8   |       |



**PERFORMANCE DATA @ 25°C (Unless Otherwise Noted)\***



\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## Manufacturing Information

### Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. IXYS Integrated Circuits Division classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

| Device    | Moisture Sensitivity Level (MSL) Rating |
|-----------|-----------------------------------------|
| CPC1303G  | MSL 1                                   |
| CPC1303GR | MSL 3                                   |

### ESD Sensitivity



This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

### Soldering Profile

Provided in the table below is the Classification Temperature ( $T_C$ ) of this product and the maximum dwell time the body temperature of this device may be above ( $T_C - 5$ )°C. The classification temperature sets the Maximum Body Temperature allowed for this device during lead-free reflow processes. Additionally, for the CPC1303GR, the solder reflow profile given in Technical Brief TB-200 "**Pb-Free Solder Reflow Profile for Select Devices**" must be followed. For the through-hole device, CPC1303G, and any other processes, the guidelines of **J-STD-020** must be observed.

| Device    | Maximum Body Temperature ( $T_C$ ) | Time       |
|-----------|------------------------------------|------------|
| CPC1303GR | 250°C                              | 15 seconds |

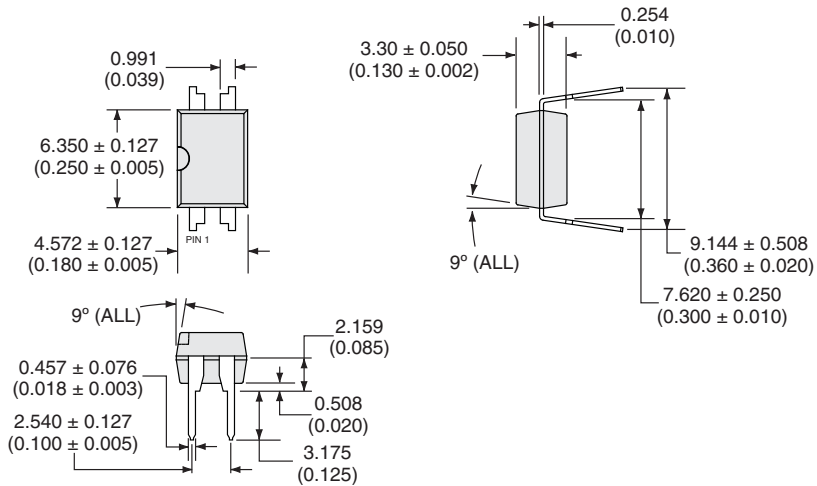
### Board Wash

IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. Board washing to reduce or remove flux residue following the solder reflow process is acceptable provided proper precautions are taken to prevent damage to the device. These precautions include, but are not limited to: using a low pressure wash and providing a follow-up bake cycle sufficient to remove any moisture trapped within the device due to the washing process. Due to the variability of the wash parameters used to clean the board, determination of the bake temperature and duration necessary to remove the moisture trapped within the package is the responsibility of the user (assembler). Cleaning or drying methods that employ ultrasonic energy may damage the device, and should not be used. Additionally, the device must not be exposed to flux or solvents that are Chlorine- or Fluorine-based.

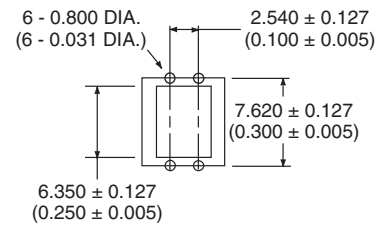


## MECHANICAL DIMENSIONS

### CPC1303G

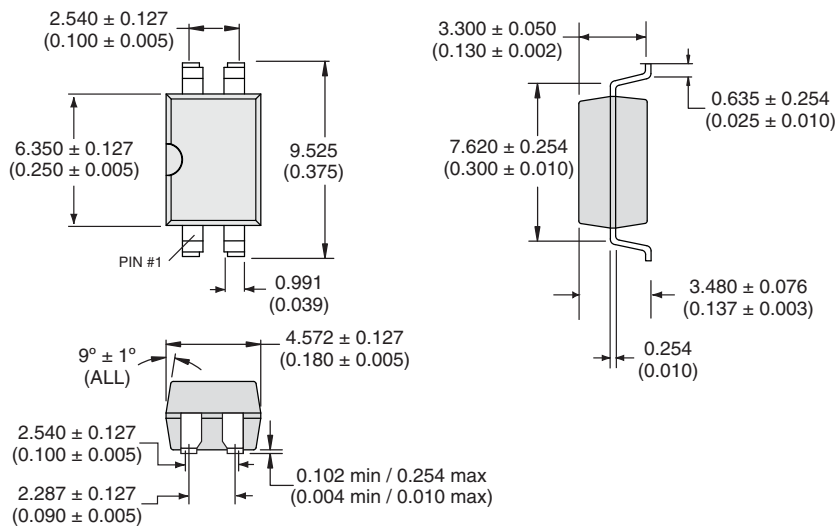


#### PC Board Pattern (Top View)

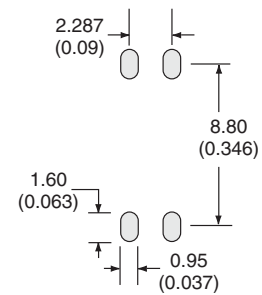


Dimensions  
mm  
(inches)

### CPC1303GR

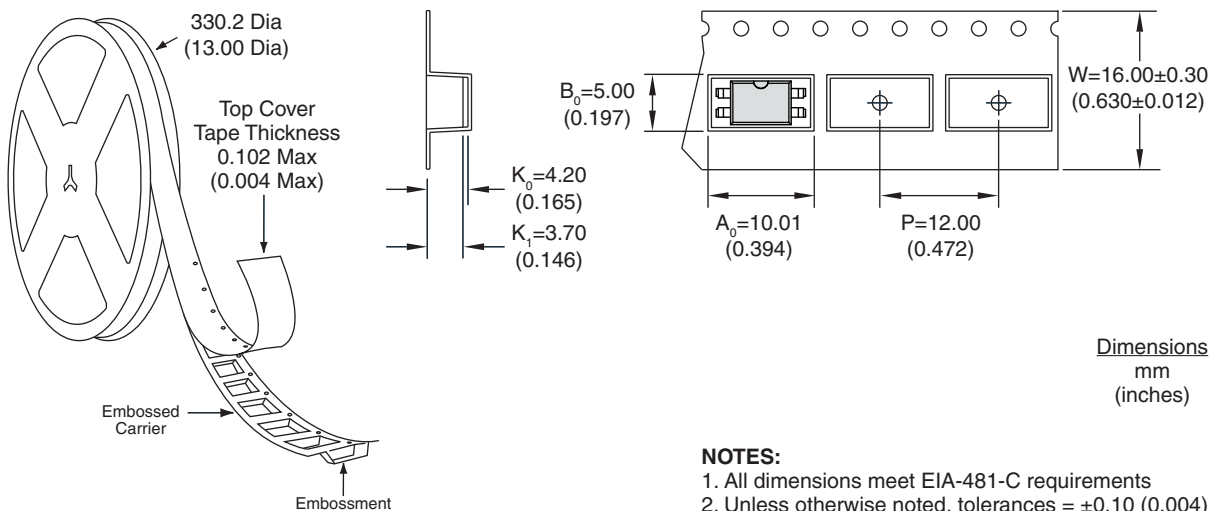


#### PCB Land Pattern



Dimensions  
mm  
(inches)

## CPC1303GRTR Tape & Reel



For additional information please visit our website at: [www.ixysic.com](http://www.ixysic.com)

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