

Parameter	Rating	Units
Breakdown Voltage - $BV_{CEO}$	350	$V_P$
Current Transfer Ratio - CTR	1000-8000	%

## Features

- 350V<sub>P</sub> Breakdown Voltage
- 3750V<sub>rms</sub> Input/Output Isolation
- Surface Mount Tape & Reel Version Available

## Applications

- Telecom Switching
- Tip/Ring Circuits
- Hook Switch
- Modem Switching (Laptop, Notebook, Pocket Size)
- Loop Detect
- Ringing Detect
- Current Sensing

## Description

The CPC1302 is a dual optocoupler with two identical, independent channels, each having a unidirectional input and a high-voltage Darlington output. Light output from the highly efficient infrared LED activates its associated, optically coupled silicon NPN photo-Darlington output transistor. The input LED and the output transistor are separated by a 3750V<sub>rms</sub> isolation barrier.

With a LED current of only 1mA, a current transfer ratio of 1000% to 8000% is guaranteed at the collector of the 350V Darlington output transistor.

The CPC1302's low input current capability with high current transfer ratios, output voltage capability, and isolation barrier rating make it ideal for many applications such as telecom, industrial, and power control.

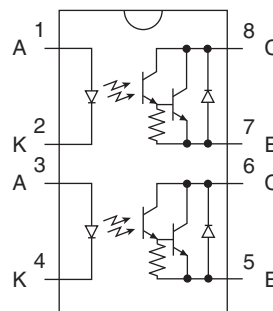
## Approvals

- UL 1577 Approved Component: File E76270
- CSA Certified Component: Certificate 1172007
- TUV EN 62368-1: Certificate B 082667 0008

## Ordering Information

Part Number	Description
CPC1302G	8-Pin DIP (50/Tube)
CPC1302GS	8-Pin Surface Mount (50/Tube)
CPC1302GSTR	8-Pin Surface Mount (1000/Reel)

## Pin Configuration



## Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Breakdown Voltage, $BV_{CEO}$	350	$V_P$
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation <sup>1</sup> (Each)	150	mW
Phototransistor Power Dissipation <sup>2</sup> (Each)	150	mW
Isolation Voltage, Input to Output	3750	$V_{rms}$
Operational 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 1.5 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.

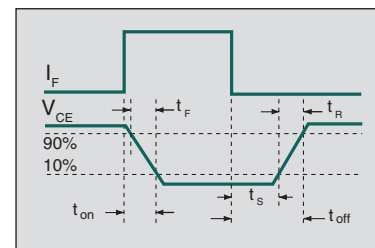
Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

## Electrical Characteristics @ 25°C

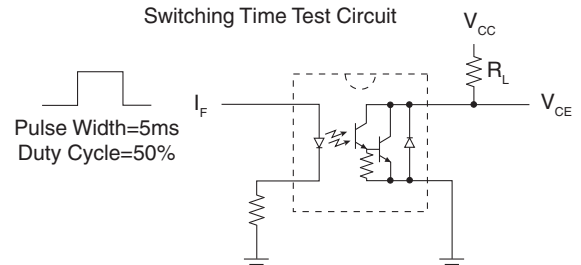
Parameters	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics</b>						
Phototransistor Breakdown Voltage	$I_{CEO}=100\mu A$	$BV_{CEO}$	350	-	-	$V_P$
Emitter-Collector Breakdown Voltage	$I_E=0.1mA$	$BV_{ECO}$	0.3	-	-	V
Phototransistor Output (Dark) Current	$V_{CEO}=200V, I_F=0mA$	$I_{CEO}$	-	-	100	nA
Saturation Voltage	$I_C=10mA, I_F=1mA$	$V_{CE(sat)}$	-	-	1	V
	$I_C=100mA, I_F=10mA$		-	-	1.2	V
Current Transfer Ratio	$I_F=1mA, V_{CE}=1V$	CTR	1000	5500	8000	%
Output Capacitance	$V_{CEO}=50V, f=1MHz$	$C_{OUT}$	-	13	-	pF
<b>Input Characteristics</b>						
Input Control Current	$I_C=10mA, V_{CE}=1V$	$I_F$	-	0.07	1	mA
Input Voltage Drop	$I_F=5mA$	$V_F$	0.9	1.2	1.5	V
Input Reverse Current	$V_R=5V$	$I_R$	-	-	10	$\mu A$
<b>Common Characteristics</b>						
Input to Output Capacitance	-	$C_{IO}$	-	3	-	pF

## Switching Characteristics @ 25°C

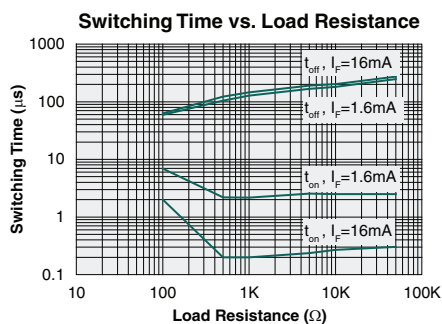
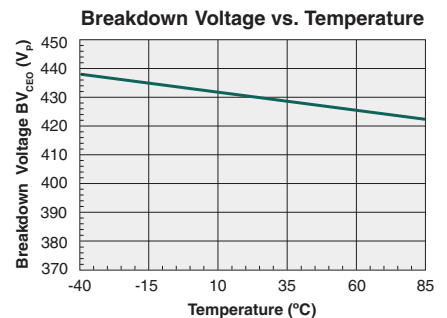
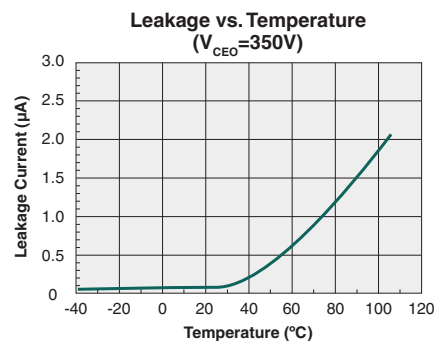
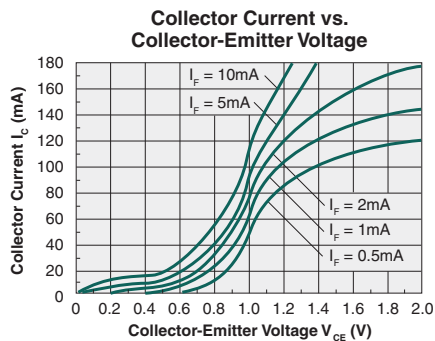
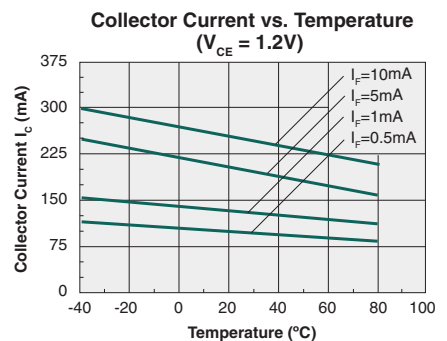
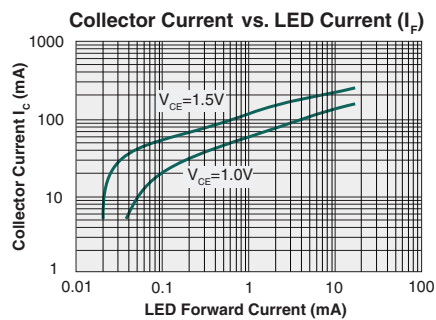
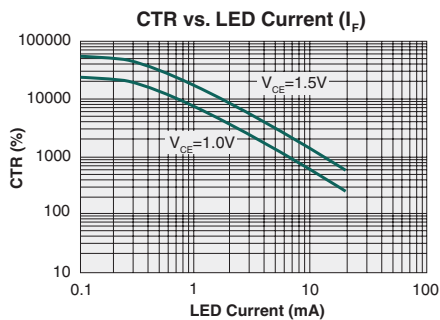
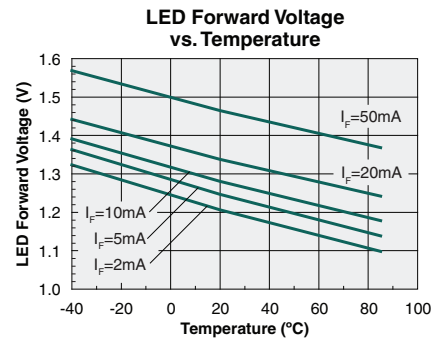
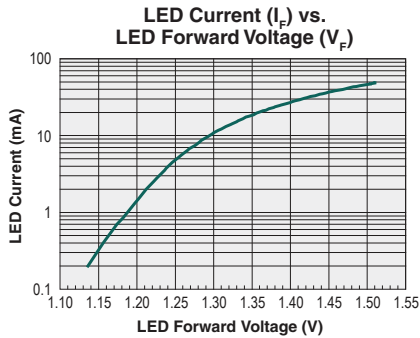
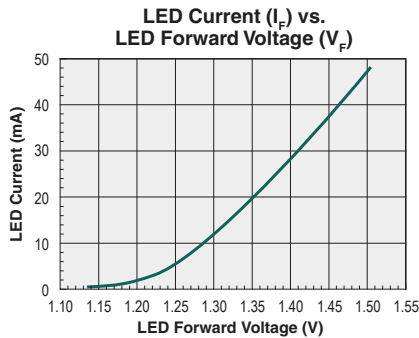
Characteristic	Symbol	Test Condition	Typ	Units
Rise Time	$t_R$	$V_{CC}=10V$ $I_F=10mA$ $R_L=100\Omega$	40	$\mu s$
Fall Time	$t_F$		5	
Turn-On Time	$t_{on}$		5	
Storage Time	$t_S$		20	
Turn-Off Time	$t_{off}$		60	
Turn-On Time	$t_{on}$	$V_{CC}=10V$ $I_F=16mA$ $R_L=180\Omega$	1	$\mu s$
Storage Time	$t_S$		40	
Turn-Off Time	$t_{off}$		80	



Switching Time Test Circuit



# PERFORMANCE DATA\*



\* Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.  
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 classifies 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) classification 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) Classification
CPC1302G / CPC1302GS	MSL 1

### 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 ( $T_C - 5$ )°C or greater. The classification temperature sets the Maximum Body Temperature allowed for this device during lead-free reflow processes. For through-hole devices, and any other processes, the guidelines of **J-STD-020** must be observed.

Device	Classification Temperature ( $T_C$ )	Dwell Time ( $t_p$ )	Max Reflow Cycles
CPC1302G	250°C	30 seconds	1
CPC1302GS	250°C	30 seconds	3

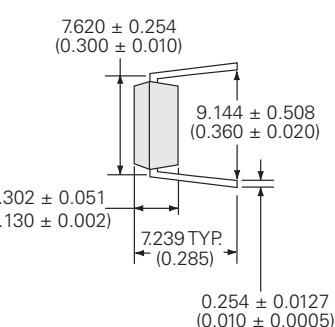
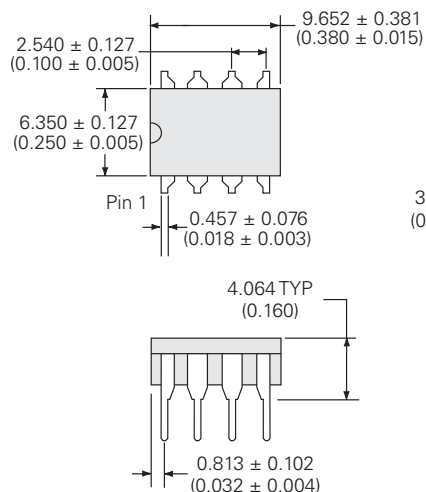
### Board Wash

IXYS Integrated Circuits 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.

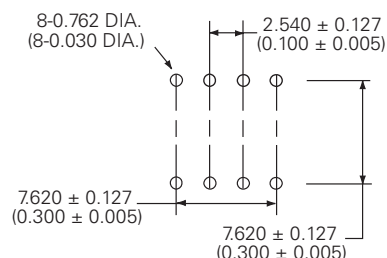


# MECHANICAL DIMENSIONS

## CPC1302G



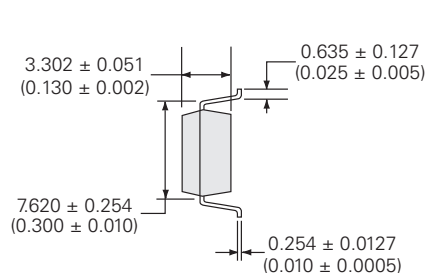
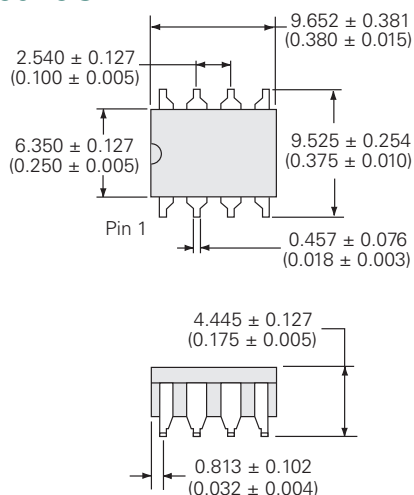
### PCB Hole Pattern



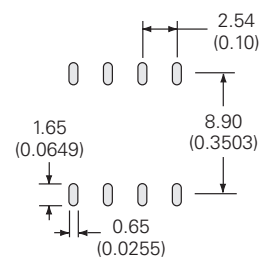
- Notes:
- Controlling dimension: Inches
  - Leadframe thickness does not include solder plating (1000µinches max)

Dimensions  
mm  
(inches)

## CPC1302GS



### PCB Land Pattern

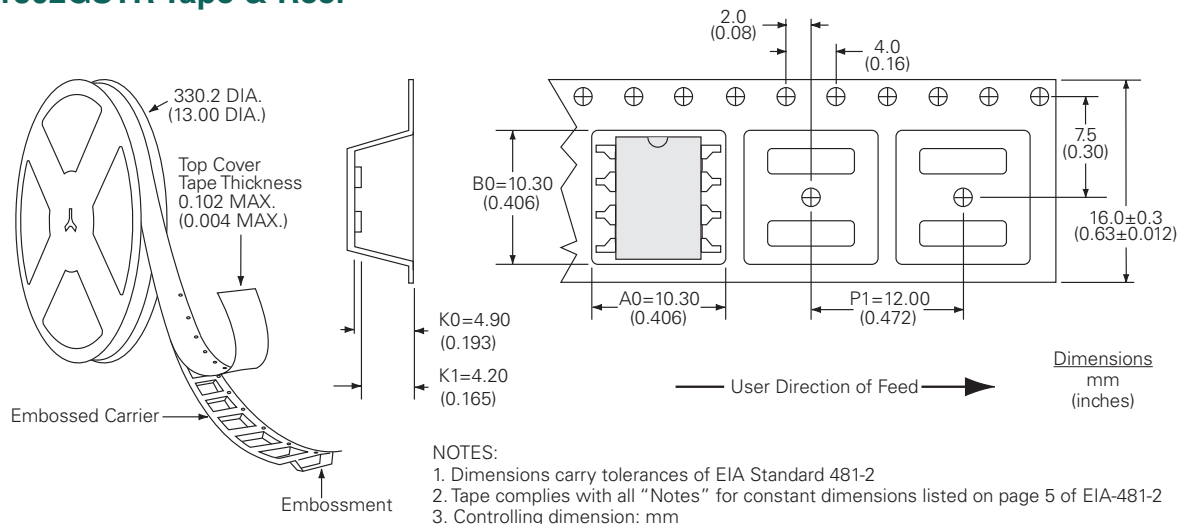


- Notes:
- Controlling dimension: Inches
  - Coplanarity = 0.004" (0.102 mm) max
  - Leadframe thickness does not include solder plating (1000µinches max)

Dimensions  
mm  
(inches)

## MECHANICAL DIMENSIONS

### CPC1302GSTR Tape & Reel



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

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