



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_{rms} 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_{rms} 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.

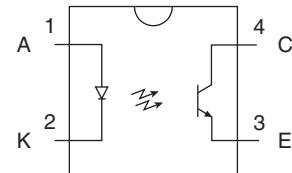
Approvals

- 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 _P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Power Dissipation ²		
Input ¹	150	mW
Phototransistor ²	150	
Isolation Voltage, Input to Output	5000	V _{rms}
Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate linearly 1.33 mW / °C

² 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.

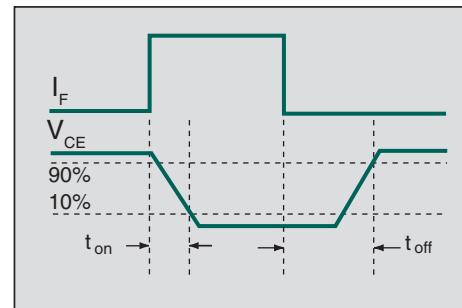
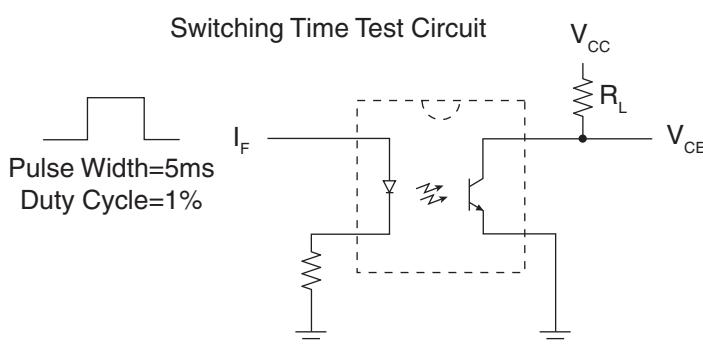
Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements..

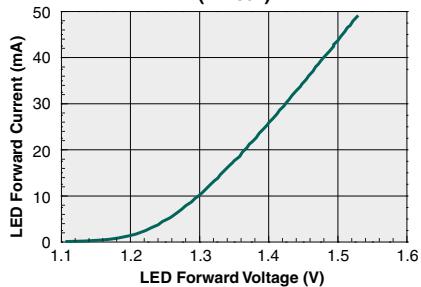
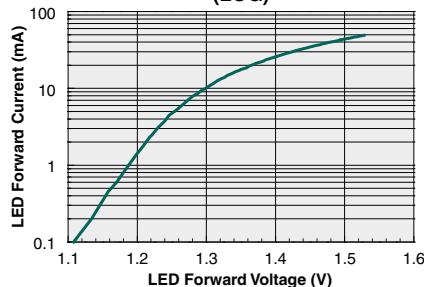
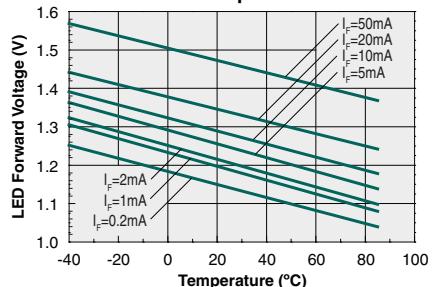
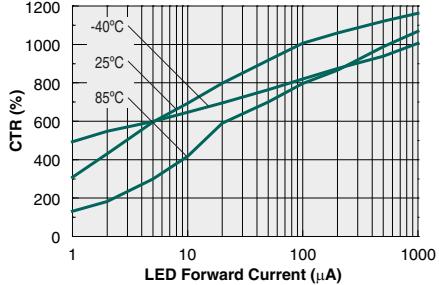
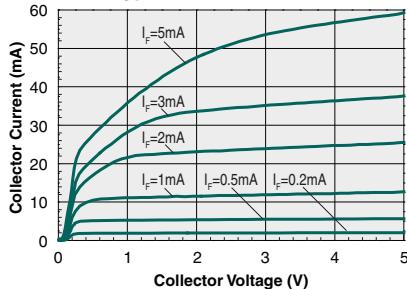
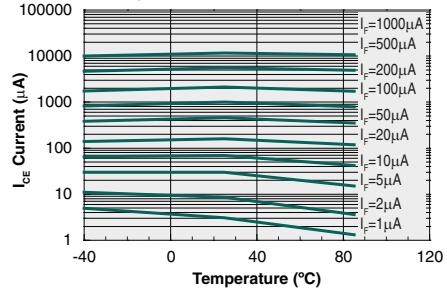
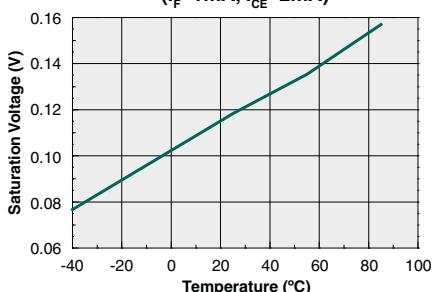
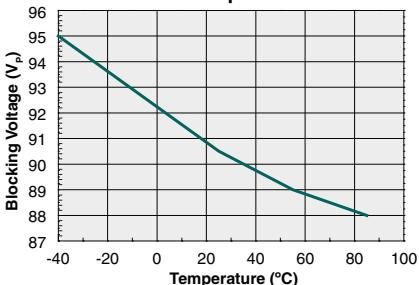
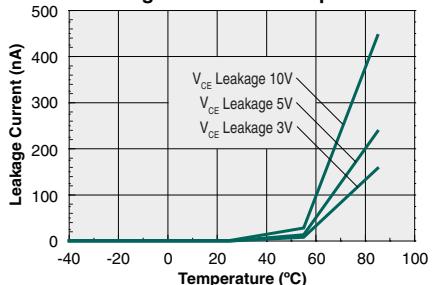
Electrical Characteristics @ 25°C

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

Switching Characteristics @ 25°C

Characteristic	Symbol	Test Condition	Typ	Units
Turn-On Time	t _{on}	V _{CC} =5V, I _F =1mA, R _L =500Ω	2	μs
Turn-Off Time	t _{off}		8	



PERFORMANCE DATA @ 25°C (Unless Otherwise Noted)*
LED Voltage vs. LED Current (Linear)

LED Voltage vs. LED Current (LOG)

LED Forward Voltage vs. Temperature

LED Forward Current vs. CTR

Typical Collector Voltage vs. Typical Collector Current

I_{CE} Current vs. Temperature

Saturation Voltage vs. Temperature (I_F=1mA, I_{CE}=2mA)

Typical Blocking Voltage vs. Temperature

Leakage Current vs. Temperature


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

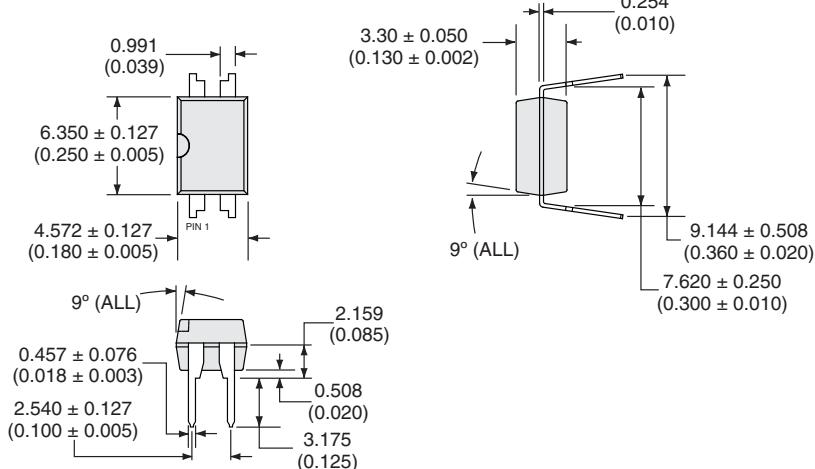
Board Wash

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.

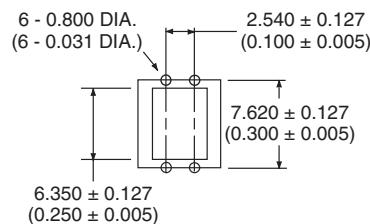


MECHANICAL DIMENSIONS

CPC1303G

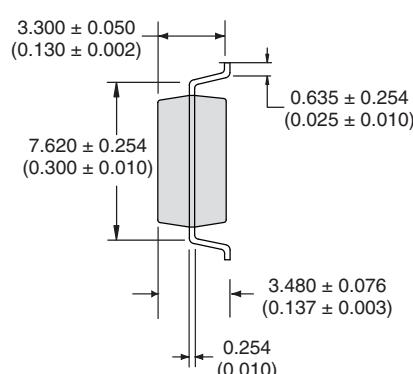
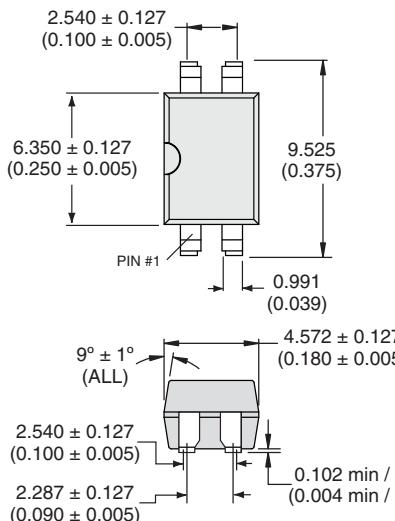


PC Board Pattern (Top View)

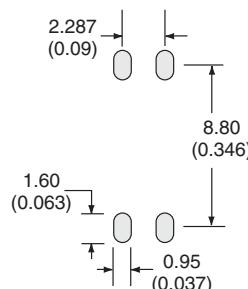


Dimensions
mm
(inches)

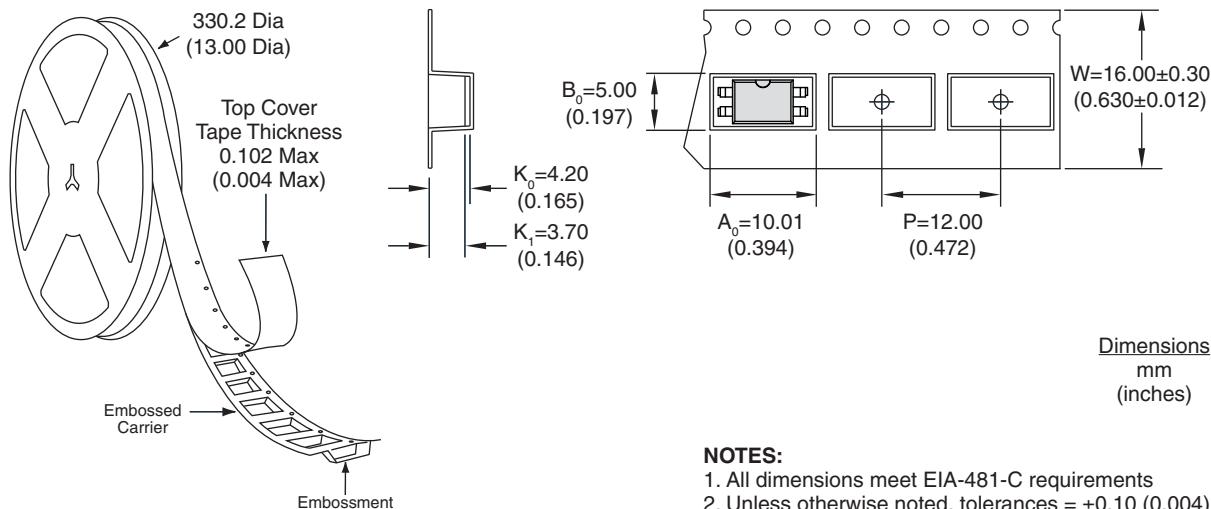
CPC1303GR



PCB Land Pattern



Dimensions
mm
(inches)

CPC1303GRTR Tape & Reel


Dimensions
mm
(inches)

NOTES:

1. All dimensions meet EIA-481-C requirements
2. Unless otherwise noted, tolerances = ± 0.10 (0.004)

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