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IXYS
INTEGRATED CIRCUITS DIVISION



CPC1001N
Optocoupler: Unidirectional Input, Single-Transistor Output

Parameter	Rating	Units
Breakdown Voltage BV_{CEO}	30	V
Current Transfer Ratio (Min)	100	%
Saturation Voltage	0.3	V
Input Control Current	0.2	mA

Description

CPC1001N is a unidirectional input optocoupler with a single transistor output. Current transfer ratios range from 100% to 800%.

Features

- 100mA Continuous Load Rating
- $1500V_{rms}$ Input/Output Isolation
- Small 4-Pin SOP Package
- Tape & Reel Version Available

Approvals

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

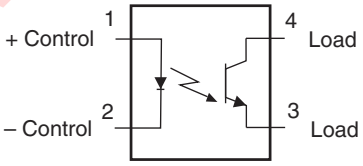
Applications

- Loop Detect
- Ringing Detect
- Sensor Circuitry
- Instrumentation
- Multiplexers
- Data Acquisition
- I/O Subsystems
- Industrial Control

Ordering Information

Part #	Description
CPC1001N	4-Pin SOP (100/Tube)
CPC1001NTR	4-Pin SOP Surface Mount (2000/Reel)

Pin Configuration



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Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Input Power Dissipation [1]	150	mW
Input Control Current	5	mA
Peak (10ms)	1	A
Reverse Input Voltage	5	V
Phototransistor [2]	150	mW
Isolation Voltage, Input to Output	1500	V_{rms}
Operational Temperature, Ambient	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate linearly 1.33 mW / ºC

[2] Derate linearly 2.00 mW / ºC

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.

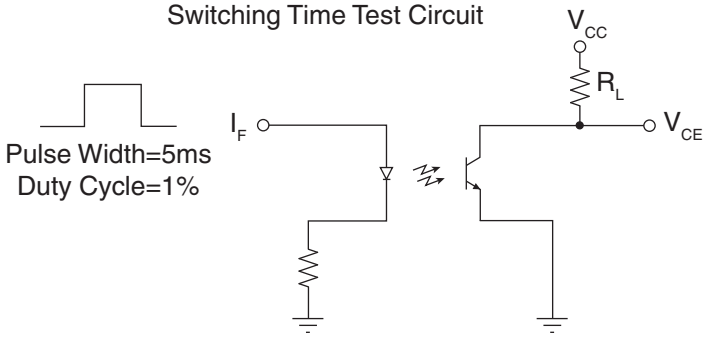
Electrical Characteristics @ 25ºC

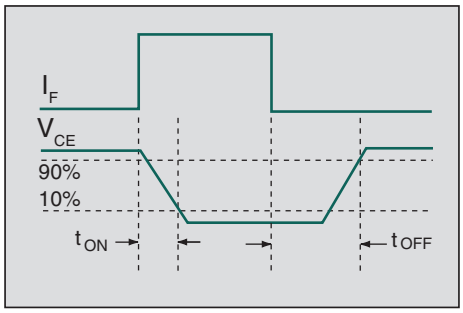
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Phototransistor Blocking Voltage	I_{CEO}=10µA	BV_{CEO}	30	90	-	V_P
Phototransistor Output (Dark) Current	I_F=0mA, V_{CEO}=5V	I_{CEO}	-	9	500	nA
Saturation Voltage	I_F=1mA, I_C=1mA	$V_{CE(sat)}$	-	-	0.3	V
Current Transfer Ratio	I_F=0.2mA, V_{CE}=0.5V	CTR	100	330	800	%
Output Capacitance	V_{CEO}=25V, f=1MHz	C_{OUT}	-	6	-	pF
Input Characteristics						
Input Control Current	I_C=0.2mA, V_{CE}=0.5V	I_F	-	0.1	0.2	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	µA
Common Characteristics						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

Switching Characteristics @ 25ºC

Characteristic	Symbol	Test Condition	Typ	Units
Turn-On Time	t_{on}	I_F=2mA, V_{CC}=5V, R_L=1KΩ	1	µs
Turn-Off Time	t_{off}		30	

Switching Time Test Circuit

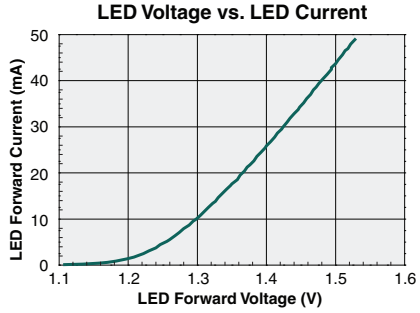




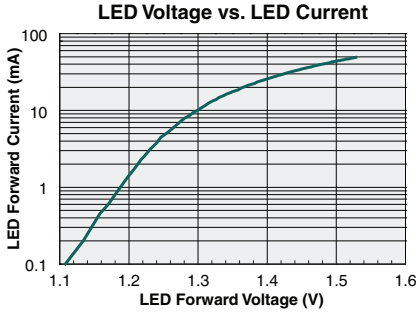
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PERFORMANCE DATA*

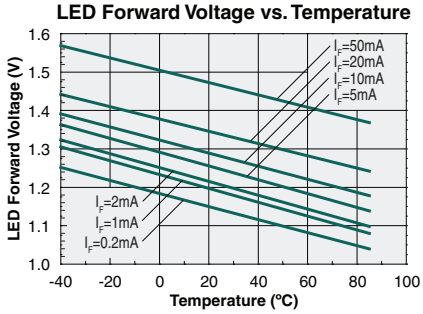
LED Voltage vs. LED Current



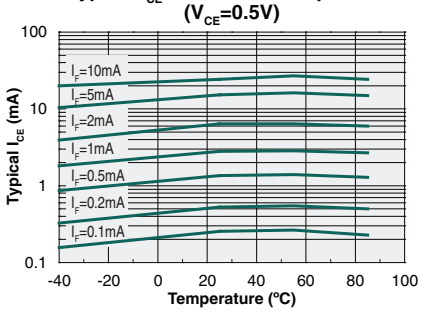
LED Voltage vs. LED Current



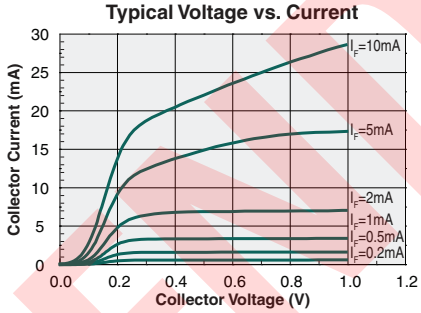
LED Forward Voltage vs. Temperature



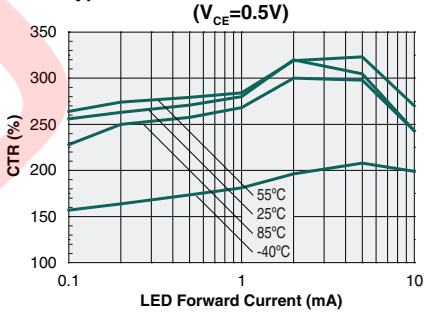
Typical I_{CE} Current vs. Temperature (V_{CE}=0.5V)



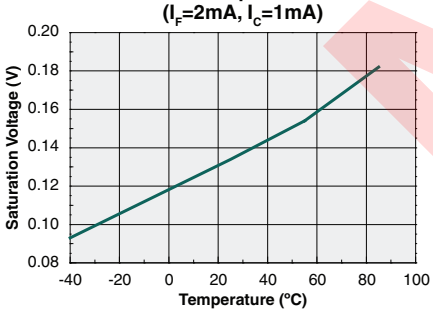
Typical Voltage vs. Current



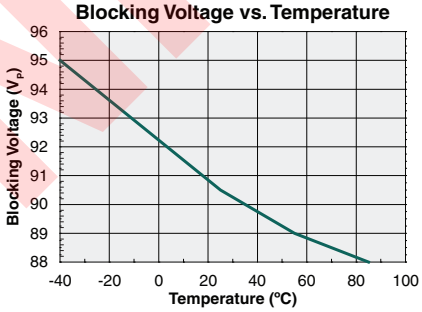
Typical CTR vs. LED Forward Current (V_{CE}=0.5V)



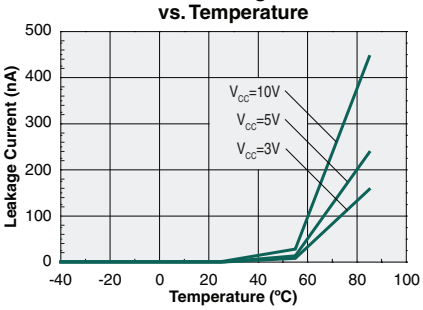
Typical Saturation Voltage vs. Temperature (I_F=2mA, I_C=1mA)



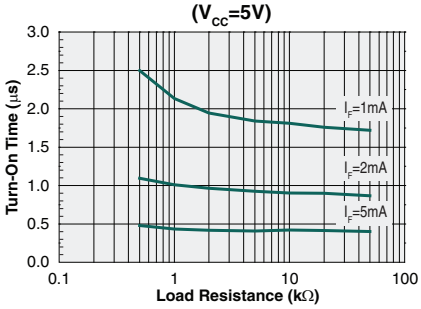
Blocking Voltage vs. Temperature



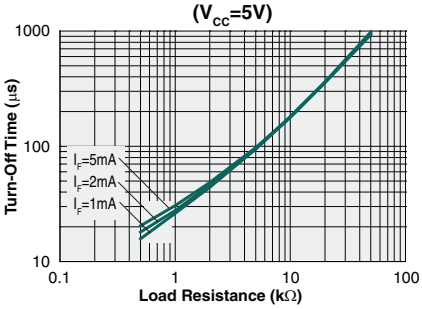
Collector Leakage Current vs. Temperature



Turn-On Time vs. Load Resistance (V_{CC}=5V)



Turn-Off Time vs. Load Resistance (V_{CC}=5V)



Refer to the Test Circuit on the previous page for these two graphs.

*Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.

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Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. 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
CPC1001N	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 **IPC/JEDEC J-STD-020** Classification Temperature (T_C) and the maximum total dwell time (t_P) in all reflow processes that the body temperature of these surface mount devices may be (T_C - 5)°C or greater. The device's body temperature must not exceed the Classification Temperature at any time during reflow soldering processes.

Device	Classification Temperature (T_c)	Dwell Time (t_P)	Max Reflow Cycles
CPC1001N	260°C	30 seconds	3

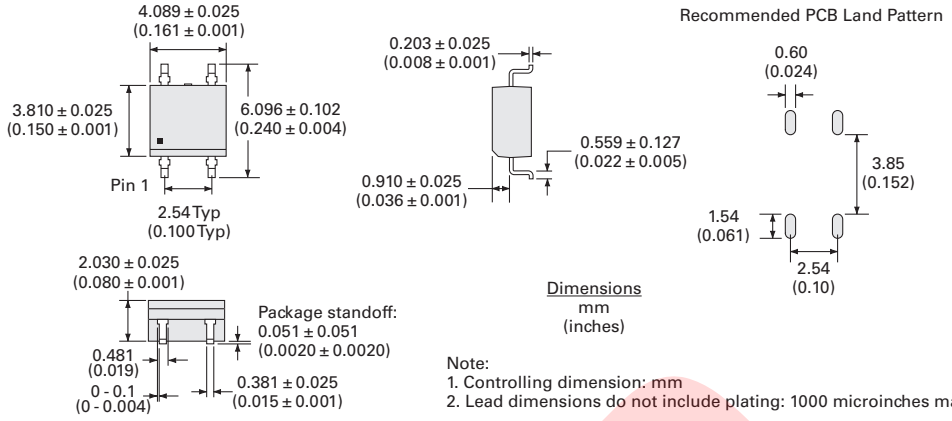
Board Wash

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 halide flux or solvents.

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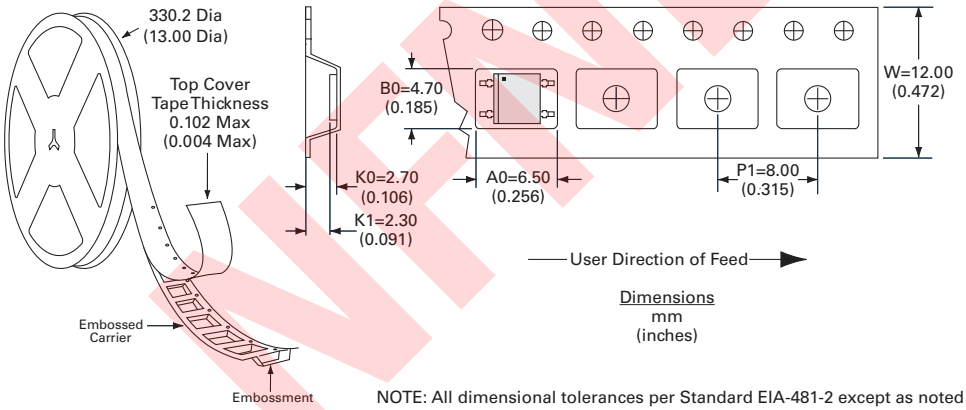
MECHANICAL DIMENSIONS

CPC1001N



Note:
1. Controlling dimension: mm
2. Lead dimensions do not include plating: 1000 microinches max.

CPC1001NTR Tape & Reel



NOTE: All dimensional tolerances per Standard EIA-481-2 except as noted

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For additional information please visit our website at: https://www.ixysic.com

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A Littelfuse Technology

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