



Parameter	Rating	Units
Blocking Voltage	350	V _P
Load Current	120	mA _{rms} / mA _{DC}
On-Resistance (max)	30	Ω

Features

- 1500V_{rms} Input/Output Isolation
- Small 4-Pin SOP Package
- Low Drive Power Requirements
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Wave Solderable
- Tape & Reel Version Available

Applications

- Telecommunications
 - Telecom Switching
 - Tip/Ring Circuits
 - Modem Switching (Laptop, Notebook, Pocket Size)
 - Hook Switch
 - Dial Pulsing
 - Ground Start
 - Ringing Injection
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

Description

The CPC1030N is a miniature single-pole, normally-open (1-Form-A) solid state relay in a 4-pin SOP package that employs optically coupled MOSFET technology to provide 1500V_{rms} of input to output isolation. The efficient MOSFET switches and photovoltaic die use IXYS Integrated Circuits Division's patented OptoMOS architecture while the optically coupled output is controlled by a highly efficient infrared LED.

IXYS Integrated Circuits Division's state of the art double-molded vertical construction packaging makes the CPC1030N one of the world's smallest relays. It offers board space savings of at least 20% over the competitor's larger 4-pin SOP relay.

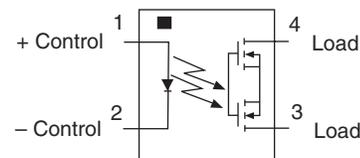
Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component: Certificate B 13 12 82667 003

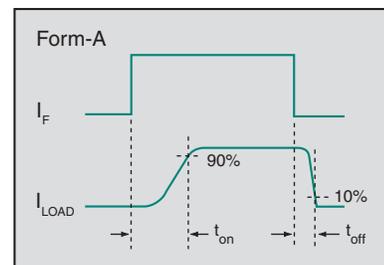
Ordering Information

Part #	Description
CPC1030N	4-Pin SOP (100/tube)
CPC1030NTR	4-Pin SOP (2000/reel)

Pin Configuration



Switching Characteristics of Normally-Open Devices



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage	350	V _p
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation ¹	400	mW
Isolation Voltage, Input to Output	1500	V _{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate linearly 3.33 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

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous ¹	-	I _L			120	mA _{rms} / mA _{DC}
Peak	t=10ms	I _{LPK}	-	-	±350	mA _P
On-Resistance ²	I _L =120mA	R _{ON}	-	19.5	30	Ω
Off-State Leakage Current	V _L =350V _p	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	t _{on}	-	-	2	ms
Turn-Off		t _{off}	-	-	1	
Output Capacitance	I _F =0mA, V _L =50V, f=1MHz	C _{OUT}	-	9	-	pF
Input Characteristics						
Input Control Current to Activate ³	I _L =120mA	I _F	-	0.6	2	mA
Input Control Current to Deactivate	-	I _F	0.3	-	-	mA
Input Voltage Drop	I _F =5mA	V _F	0.9	1.2	1.4	V
Reverse Input Current	V _R =5V	I _R	-	-	10	μA
Input/Output Characteristics						
Capacitance Input to Output	V _{IO} =1V, f=1MHz	C _{IO}	-	1	-	pF

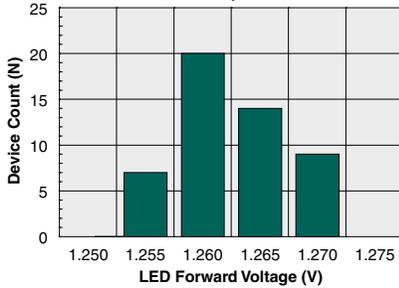
¹ Load current derates linearly from 120mA @ 25°C to 60mA @ 85°C.

² Measurement taken within 1 second of on-time.

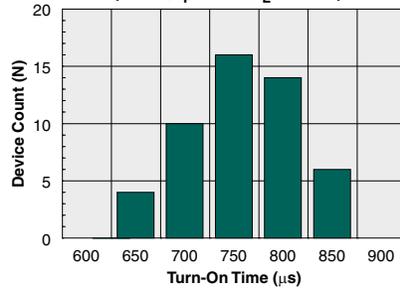
³ For applications requiring high temperature operation (greater than 60°C) a minimum LED drive current of 4mA is recommended.

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

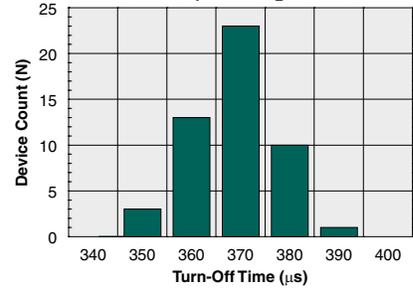
Typical LED Forward Voltage Drop
(N=50, I_F=5mA)



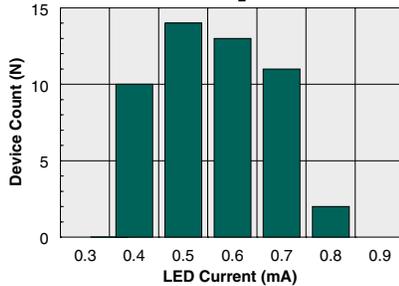
Typical Turn-On Time Distribution
(N=50, I_F=5mA, I_L=60mA)



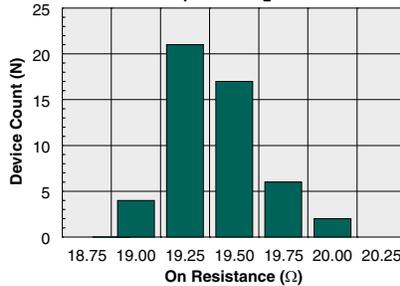
Typical Turn-Off Time Distribution
(N=50, I_F=5mA, I_L=60mA)



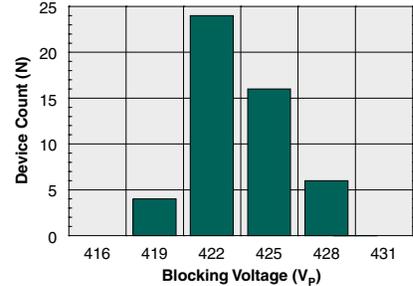
Typical I_F for Switch Operation
(N=50, I_L=120)



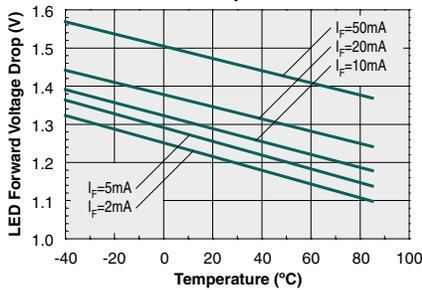
Typical On-Resistance Distribution
(N=50, I_F=5mA, I_L=120mA)



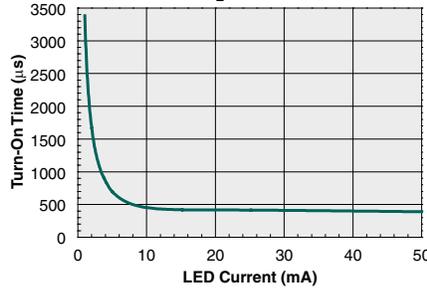
Typical Blocking Voltage Distribution
(N=50, I_F=0mA)



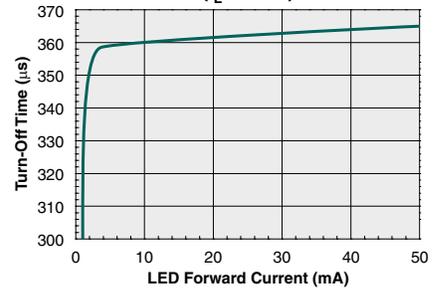
Typical LED Forward Voltage Drop
vs. Temperature



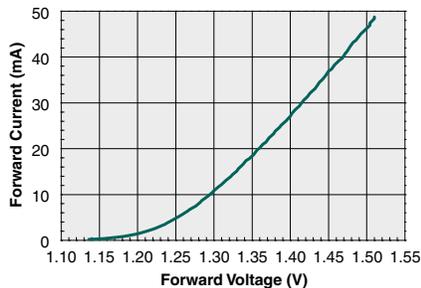
Typical Turn-On Time
vs. LED Forward Current
(I_L=60mA)



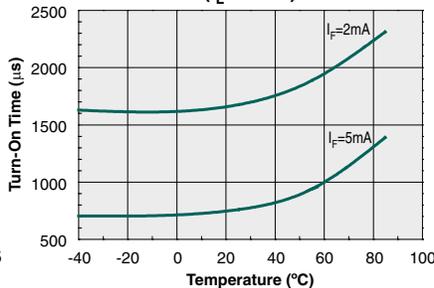
Typical Turn-Off Time
vs. LED Forward Current
(I_L=60mA)



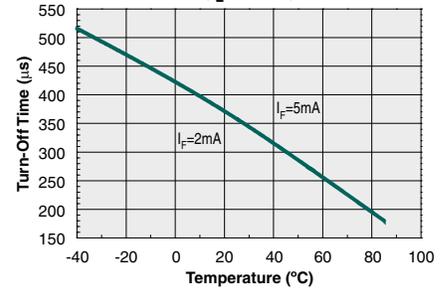
LED Forward Voltage
vs. LED Forward Current



Typical Turn-On Time
vs. Temperature
(I_L=60mA)



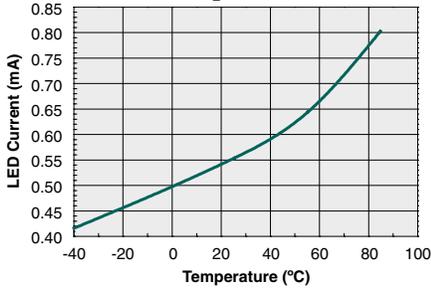
Typical Turn-Off Time
vs. Temperature
(I_L=60mA)



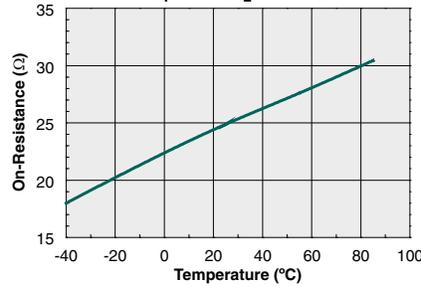
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

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

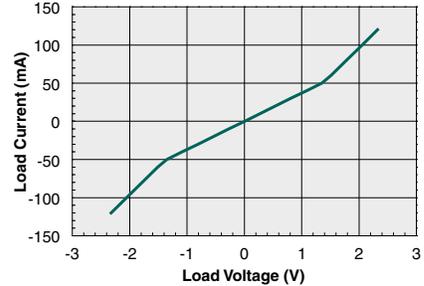
Typical I_F for Switch Operation vs. Temperature ($I_L=60mA$)



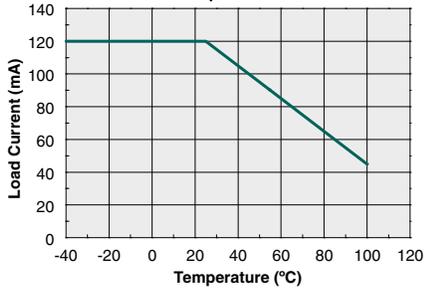
Typical On-Resistance vs. Temperature ($I_F=2mA, I_L=60mA$)



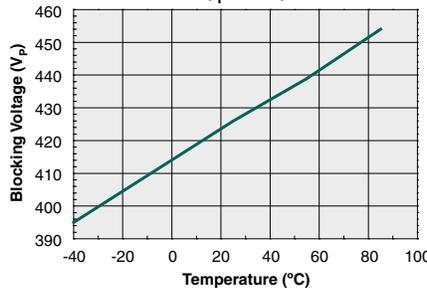
Typical Load Current vs. Load Voltage ($I_F=2mA$)



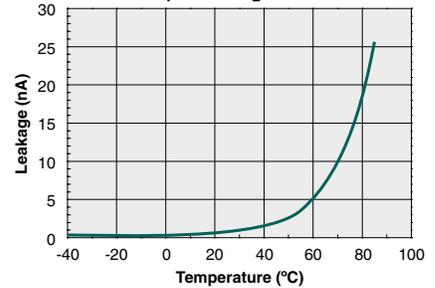
Maximum Load Current vs. Temperature ($I_F=4mA$)



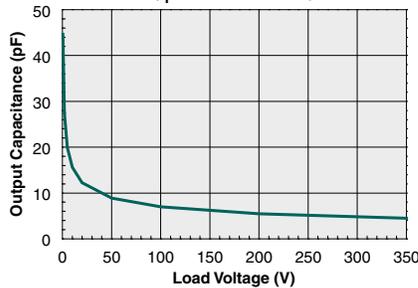
Typical Blocking Voltage vs. Temperature ($I_F=0mA$)



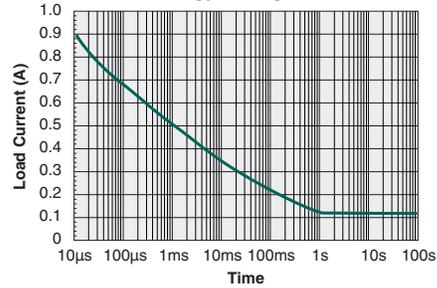
Typical Leakage vs. Temperature Measured Across Pins 3&4 ($I_F=0mA, V_L=350V$)



Output Capacitance vs. Load Voltage ($I_F=0mA, f=1MHz$)



Energy Rating Curve



*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
CPC1030N	MSL 3

ESD Sensitivity



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

Soldering Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

Device	Maximum Temperature x Time	Maximum Reflow Cycles
CPC1030N	260°C for 30 seconds	3

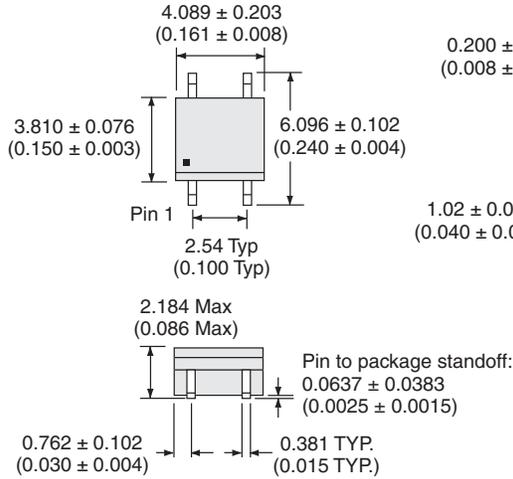
Board Wash

IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake could be necessary if a wash is used after solder reflow processes. Chlorine- or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.

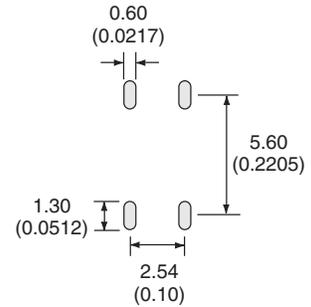


MECHANICAL DIMENSIONS

CPC1030N

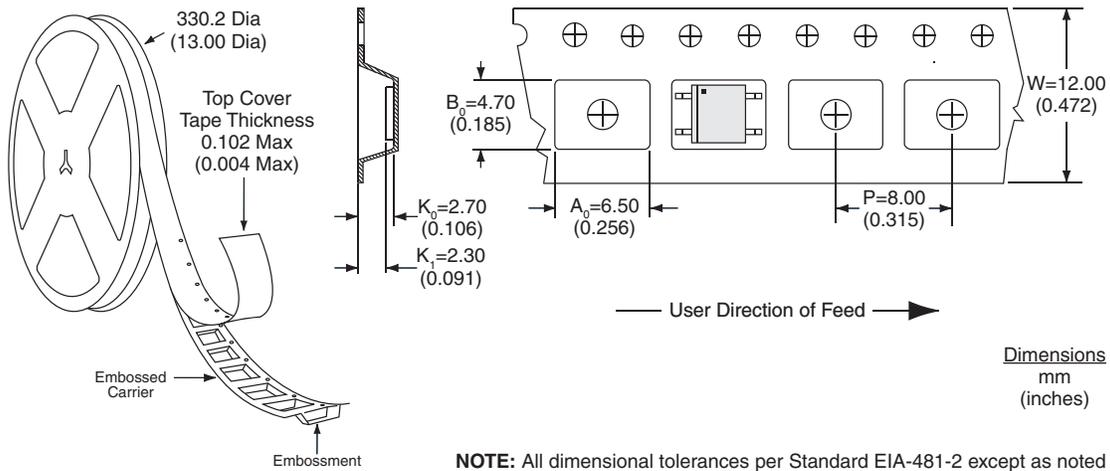


Recommended PCB Land Pattern



Dimensions
mm
(inches)

CPC1030NTR Tape & Reel



Dimensions
mm
(inches)

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

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

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