



Parameter	Rating	Units
Blocking Voltage	400	V <sub>p</sub>
Load Current	120	mA <sub>rms</sub> / mA <sub>DC</sub>
On-Resistance (max)	30	Ω

### Features

- 0.4mm Distance Through Insulation (Supplementary Isolation Requirement of EN60950)
- 1500V<sub>rms</sub> 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 CPC1225N is a miniature normally-open, single-pole, (1-Form-A) solid state relay that employs IXYS Integrated Circuits Division's patented, optically isolated OptoMOS architecture to provide 1500V<sub>rms</sub> of input-to-output isolation. A highly efficient infrared LED controls the optically coupled output. The device also complies with the Supplementary Isolation requirements of EN/IEC 60950-1.

The CPC1225N uses IXYS Integrated Circuits Division's state of the art double molded vertical construction to produce one of the world's smallest 4-pin relays. It offers board space savings approaching 20% over the competitor's larger 4-pin SOP relay.

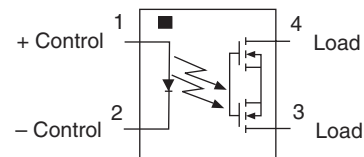
### Approvals

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

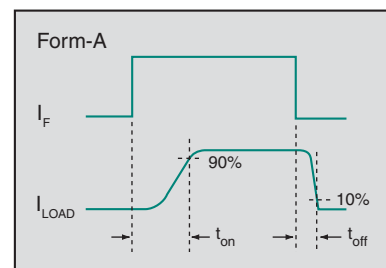
### Ordering Information

Part #	Description
CPC1225N	4-Pin SOP (100/tube)
CPC1225NTR	4-Pin SOP (2000/reel)

### Pin Configuration



### Switching Characteristics of Normally-Open Devices



**Absolute Maximum Ratings @ 25°C**

Parameter	Ratings	Units
Blocking Voltage (Peak)	400	V <sub>P</sub>
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation <sup>1</sup>	400	mW
Isolation Voltage, Input to Output	1500	V <sub>rms</sub>
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

<sup>1</sup> 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**

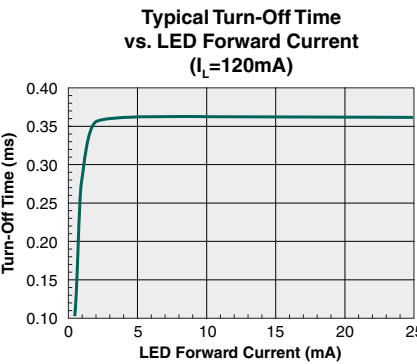
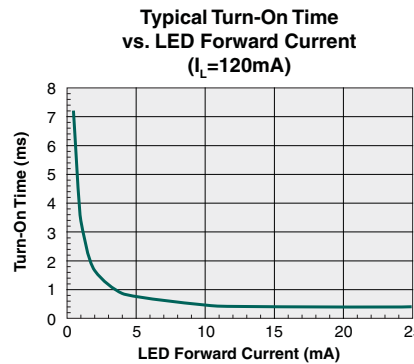
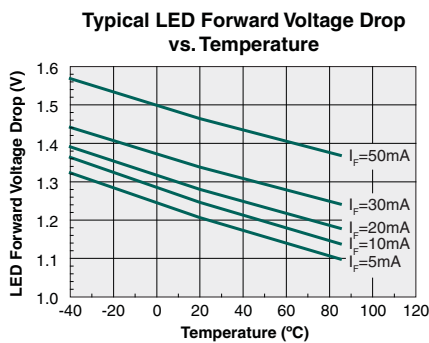
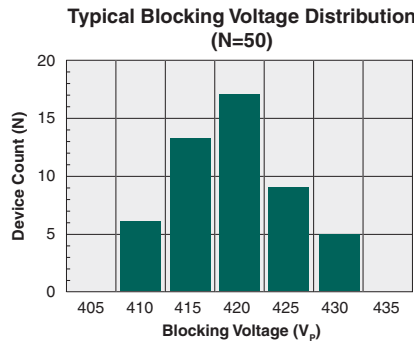
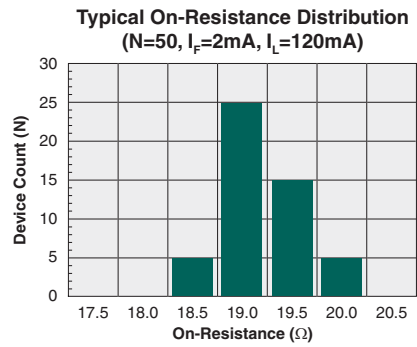
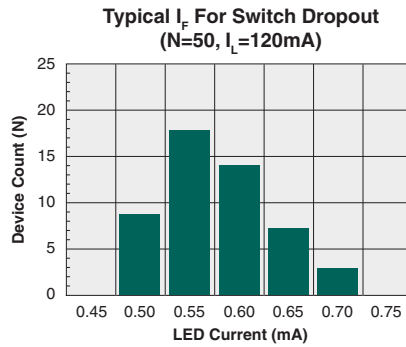
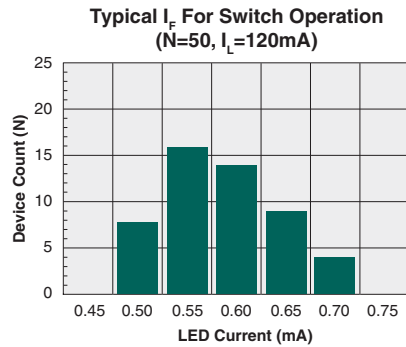
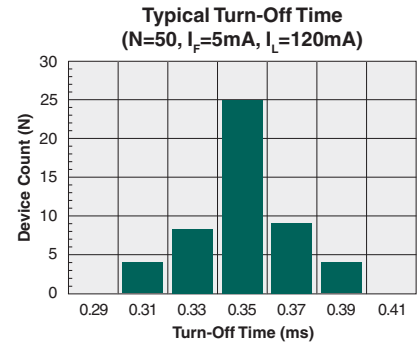
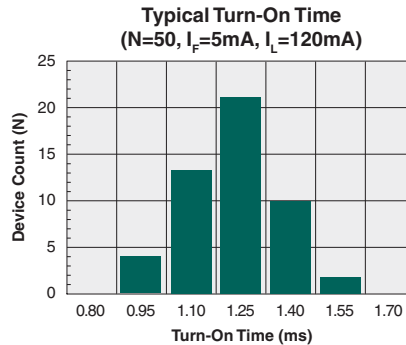
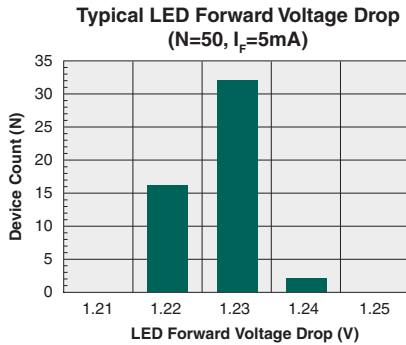
Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics</b>						
Load Current						
Continuous <sup>1</sup>	-	I <sub>L</sub>	-	-	120	mA <sub>rms</sub> / mA <sub>DC</sub>
Peak	t=10ms	I <sub>LPK</sub>	-	-	±350	mA <sub>P</sub>
On-Resistance <sup>2</sup>	I <sub>L</sub> =120mA	R <sub>ON</sub>	-	20	30	Ω
Off-State Leakage Current	V <sub>L</sub> =400V <sub>P</sub>	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	t <sub>on</sub>	-	1.25	2	ms
Turn-Off		t <sub>off</sub>	-	0.35	1	
Output Capacitance	I <sub>F</sub> =0mA, V <sub>L</sub> =50V, f=1MHz	C <sub>OUT</sub>	-	9	-	pF
<b>Input Characteristics</b>						
Input Control Current to Activate <sup>3</sup>	I <sub>L</sub> =120mA	I <sub>F</sub>	-	0.6	2	mA
Input Control Current to Deactivate	-	I <sub>F</sub>	0.3	0.55	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input 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>	-	1	-	pF

<sup>1</sup> Load current derates linearly from 120mA @ 25°C to 80mA @ 85°C.

<sup>2</sup> Measurement taken within 1 second of on-time.

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

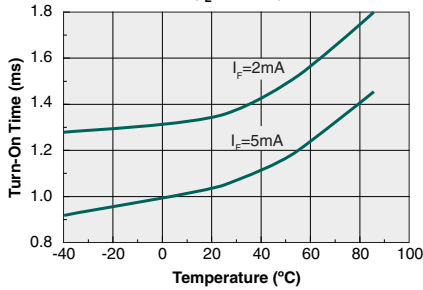
PERFORMANCE DATA @ 25°C (Unless Otherwise Noted)\*



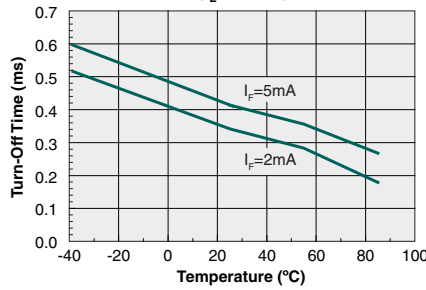
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

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

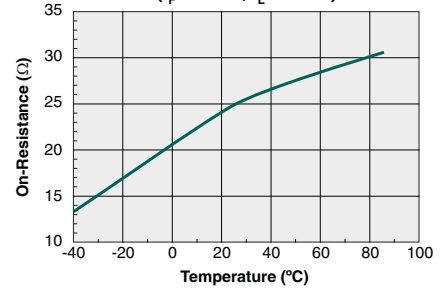
Typical Turn-On Time vs. Temperature  
( $I_L=80\text{mA}$ )



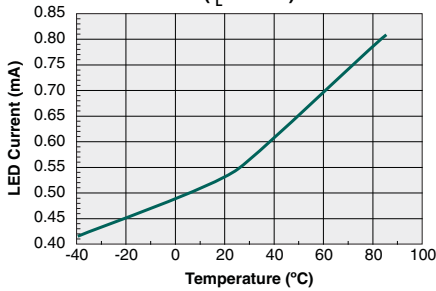
Typical Turn-Off Time vs. Temperature  
( $I_L=80\text{mA}$ )



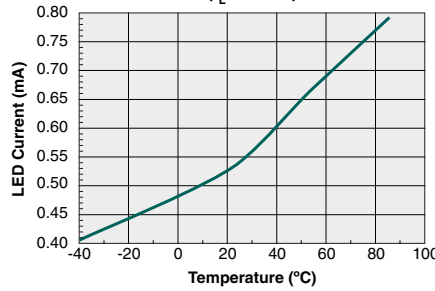
Typical On-Resistance vs. Temperature  
( $I_F=10\text{mA}$ ,  $I_L=80\text{mA}$ )



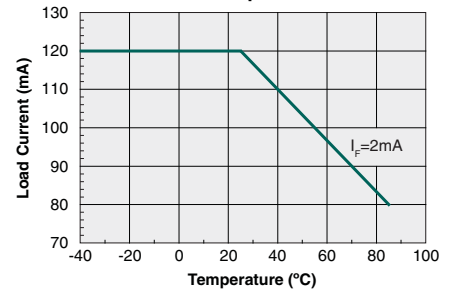
Typical  $I_F$  For Switch Operation vs. Temperature  
( $I_L=80\text{mA}$ )



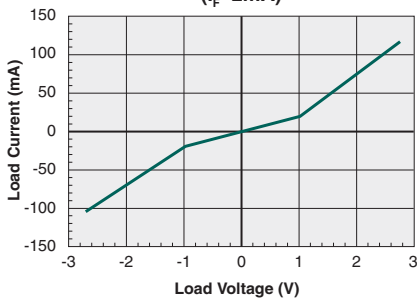
Typical  $I_F$  For Switch Dropout vs. Temperature  
( $I_L=80\text{mA}$ )



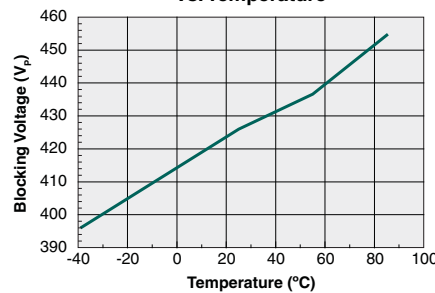
Typical Load Current vs. Temperature



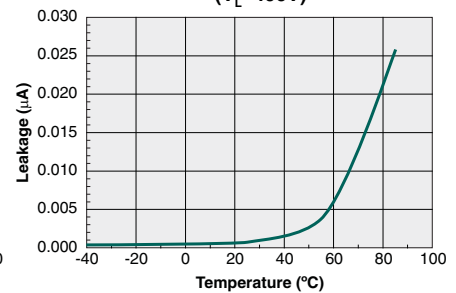
Typical Load Current vs. Load Voltage  
( $I_F=2\text{mA}$ )



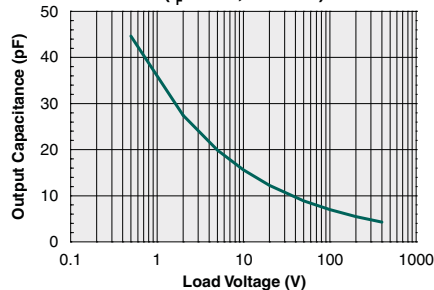
Typical Blocking Voltage vs. Temperature



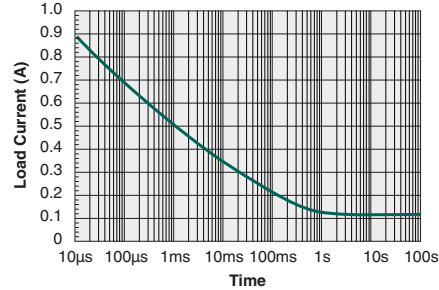
Typical Leakage vs. Temperature Measured Across Pins 3&4  
( $V_L=400\text{V}$ )



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



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
CPC1225N	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
CPC1225N	260°C for 30 seconds	3

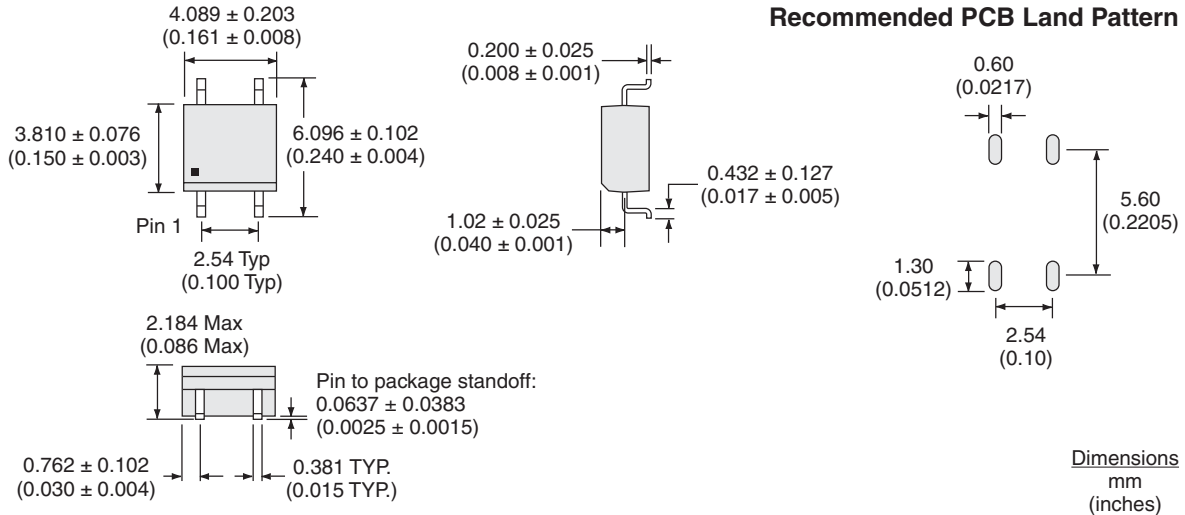
**Board Wash**

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.

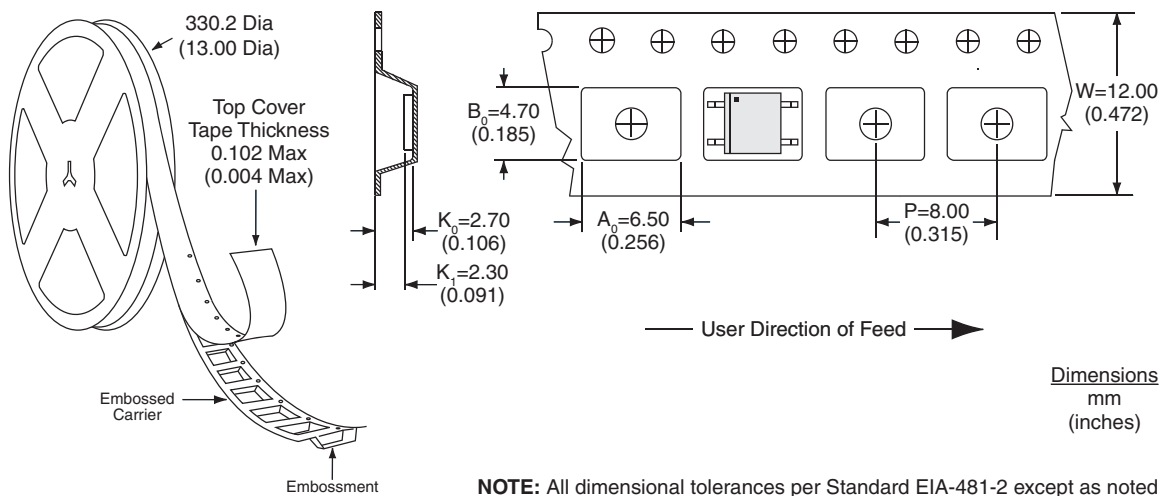


**MECHANICAL DIMENSIONS**

**CPC1225N**



**CPC1225NTR Tape & Reel**



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

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