



Parameter	Rating	Units
Blocking Voltage	60	V <sub>P</sub>
Load Current	75	mA
Max On-Resistance	10	Ω
LED Current to Operate	0.5	mA

### Features

- Designed for EN50130-4 Compliant Security Systems
- Only 0.5mA of LED Current Required to Operate
- Small 4-Pin SOP Package
- 1500V<sub>rms</sub> Input/Output Isolation
- TTL/CMOS Compatible Input
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Immune to Radiated EM Fields
- SMD Pick & Place, Wave Solderable
- Tape & Reel Version Available

### Applications

- Security
  - Passive Infrared Detectors (PIR)
  - Data Signalling
  - 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 CPC1106N is a miniature, single-pole, normally closed (1-Form-B) solid state relay in a 4-Pin SOP package that employs optically coupled MOSFET technology to provide 1500V<sub>rms</sub> of input/output isolation.

The relay outputs are constructed with efficient MOSFET switches and photovoltaic die that use Clare's patented OptoMOS architecture while the input, a highly efficient GaAlAs infrared LED, provides the optically coupled control.

The CPC1106N, using Clare's state of the art double-molded vertical construction packaging to produce one of the world's smallest relays, offers board space savings of at least 20% over the competitor's larger 4-pin SOP relay.

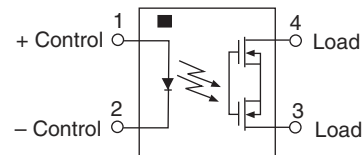
### Approvals

- UL Recognized Component: File # E76270
- CSA Certified Component: Certificate # 1172007
- EN/IEC 60950-1 Certified Component:  
TUV Certificate B 09 07 49410 004

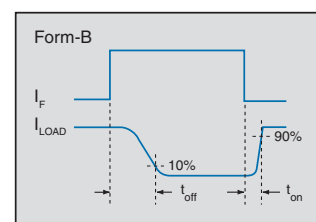
### Ordering Information

Part #	Description
CPC1106N	4-Pin SOP (100/tube)
CPC1106NTR	4-Pin SOP (2000/reel)

### Pin Configuration



### Switching Characteristics of Normally Closed Devices



## Absolute Maximum Ratings

Parameter	Ratings	Units
Blocking Voltage	60	V <sub>P</sub>
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Disipation	70	mW
Total Power Dissipation <sup>1</sup>	400	mW
Isolation Voltage, Input to Output	1500	V <sub>rms</sub>
ESD Rating, Human Body Model	8	kV
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

<sup>1</sup> Derate Linearly 3.33 mW / °C

Electrical absolute maximum ratings are at 25°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.*

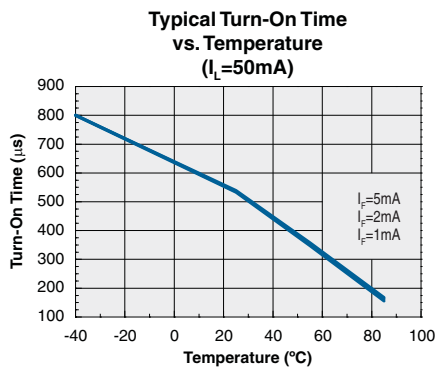
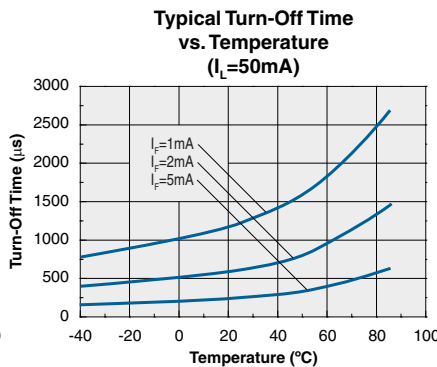
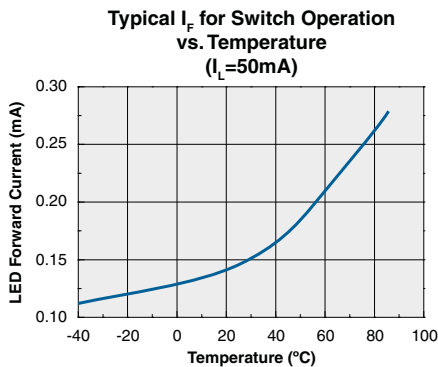
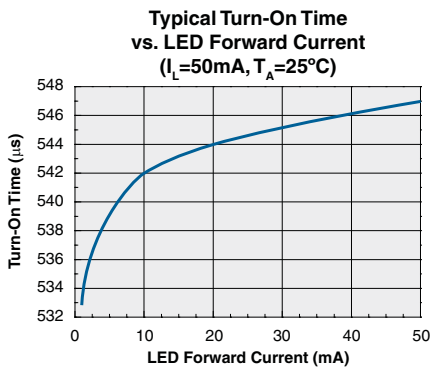
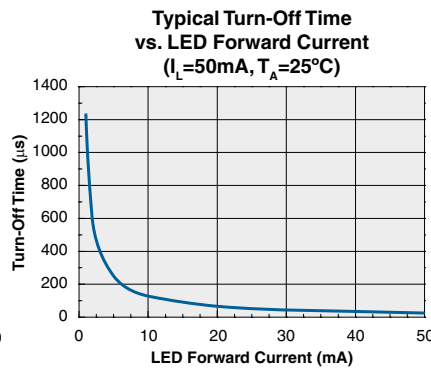
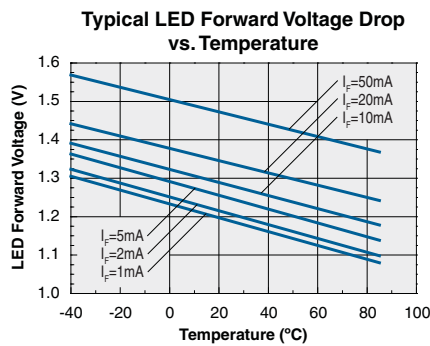
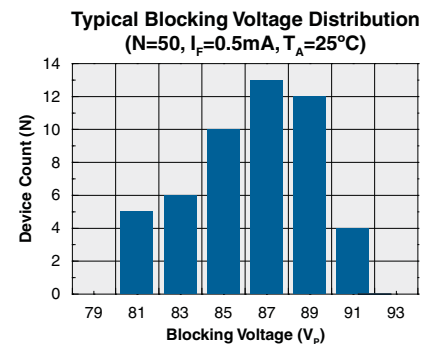
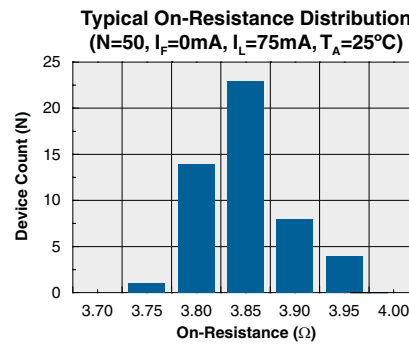
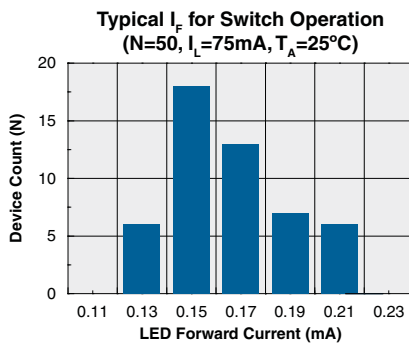
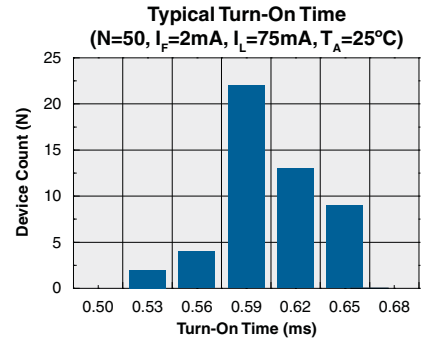
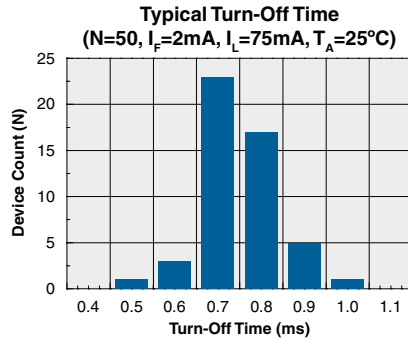
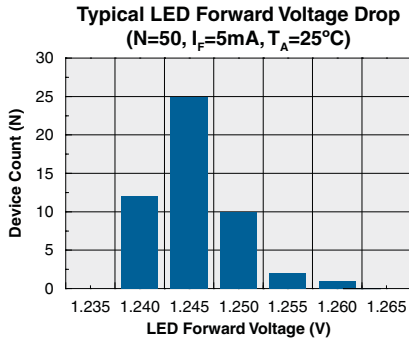
## Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current						
Continuous	I <sub>F</sub> =0mA	I <sub>L</sub>	-	-	75	mA
Peak	t=10ms	I <sub>LPK</sub>	-	-	350	
On-Resistance <sup>1</sup>	I <sub>F</sub> =0mA, I <sub>L</sub> =75mA	R <sub>ON</sub>	-	3.85	10	Ω
Off-State Leakage Current	I <sub>F</sub> =0.5mA, V <sub>L</sub> =60V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds (See Figure 2.)						
Turn-On	I <sub>F</sub> =2mA, V <sub>L</sub> =10V	t <sub>on</sub>	-	-	10	ms
Turn-Off		t <sub>off</sub>	-	-	10	
Output Capacitance	I <sub>F</sub> =0.5mA, V <sub>L</sub> =50V, f=1MHz	C <sub>OUT</sub>	-	10	-	pF
<b>Input Characteristics @ 25°C</b>						
Input Control Current <sup>2</sup>	-	I <sub>F</sub>	-	0.16	0.5	mA
Input Dropout Current	I <sub>L</sub> =75mA	I <sub>F</sub>	0.05	-	-	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 @ 25°C</b>						
Capacitance Input to Output	-	-	-	1	-	pF

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

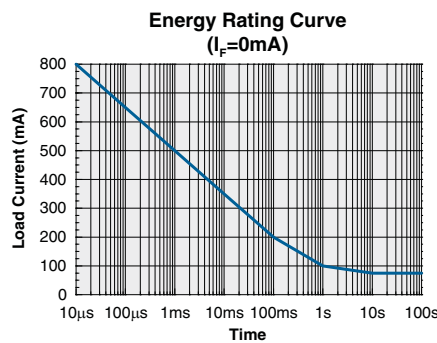
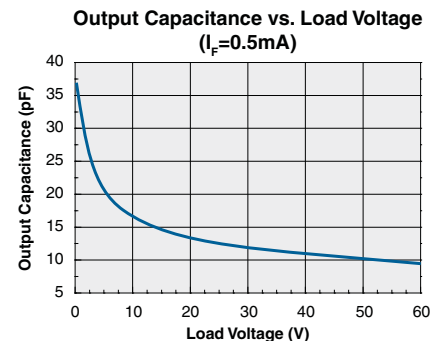
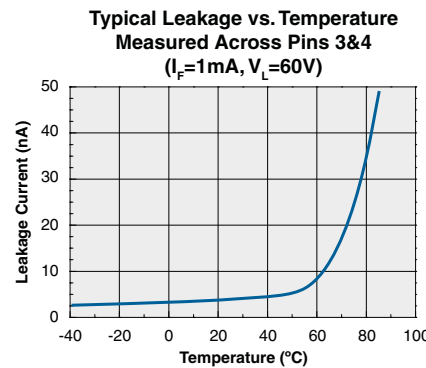
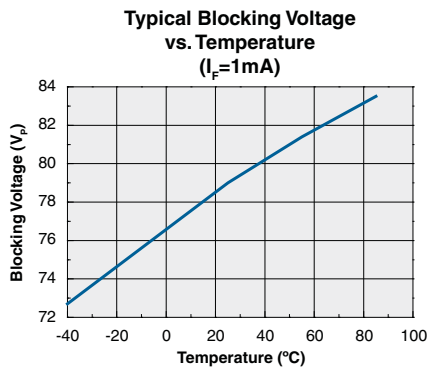
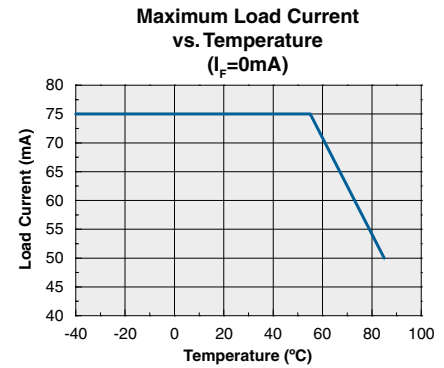
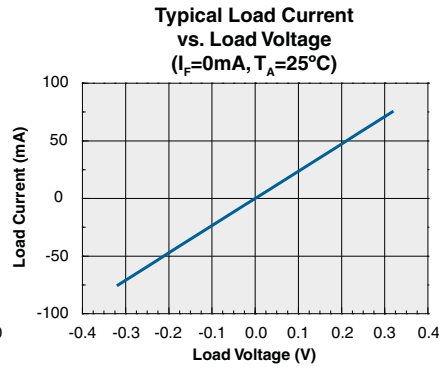
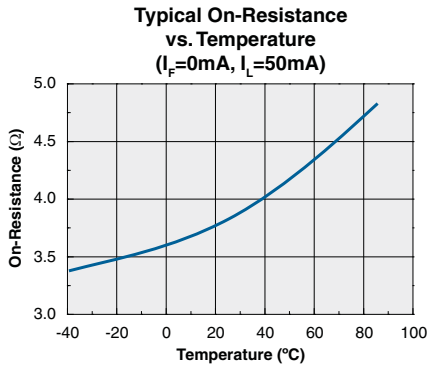
<sup>2</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 2mA is recommended.

**PERFORMANCE DATA\***



\*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\***



\*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. Clare 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 is rated **Moisture Sensitivity Level 3 (MSL 3)**, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

### ESD Sensitivity



This product is tested in accordance with **JESD22-A114**, and should be handled according to the industry standard **JESD-625**.

### Reflow Profile

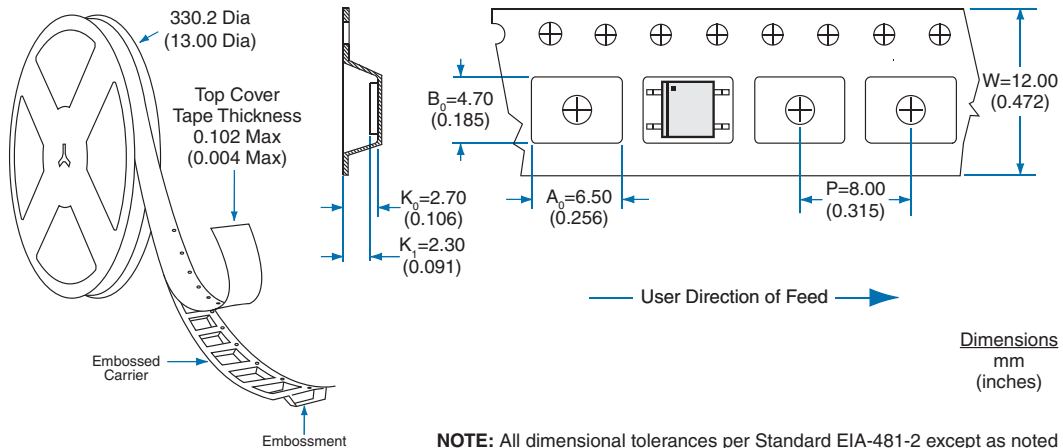
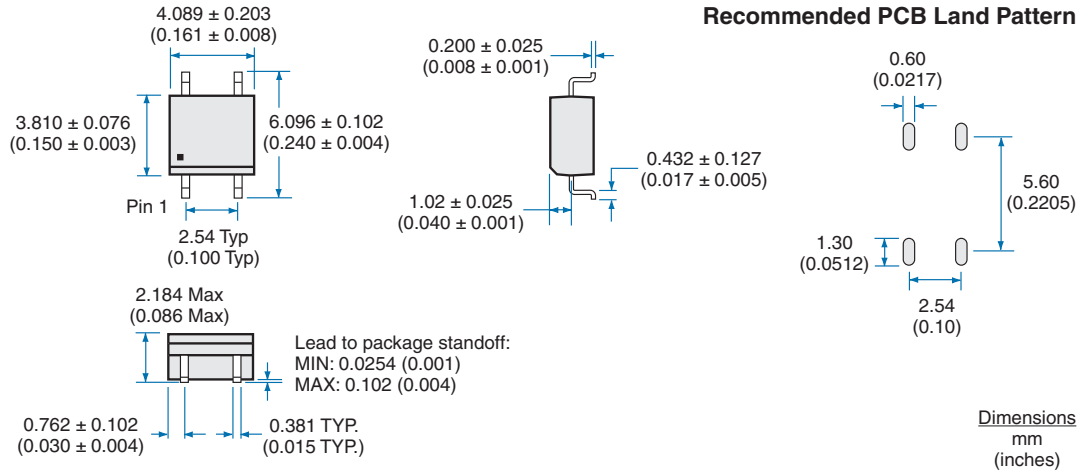
This product has a maximum body temperature rating of **260°C for a maximum of 30 seconds**. All other guidelines of **J-STD-020** must be observed.

### Board Wash

Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare 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**



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

Clare, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to specifications and product descriptions at any time without notice. Neither circuit patent licenses nor indemnity are expressed or implied. Except as set forth in Clare's Standard Terms and Conditions of Sale, Clare, Inc. assumes no liability whatsoever, and disclaims any express or implied warranty, relating to its products including, but not limited to, the implied warranty of merchantability, fitness for a particular purpose, or infringement of any intellectual property right.

The products described in this document are not designed, intended, authorized or warranted for use as components in systems intended for surgical implant into the body, or in other applications intended to support or sustain life, or where malfunction of Clare's product may result in direct physical harm, injury, or death to a person or severe property or environmental damage. Clare, Inc. reserves the right to discontinue or make changes to its products at any time without notice.