



Parameter	Rating	Units
Blocking Voltage	400	V <sub>P</sub>
Load Current	100	mA
Max On-Resistance	35	Ω
LED Current to Operate	2	mA

### Features

- 1500V<sub>rms</sub> Input/Output Isolation
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 4-Pin SOP Package
- Machine Insertable, 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

CPC1125N is a miniature single-pole, normally closed (1-Form-B) solid state relay. It uses Clare's patented, optically coupled, OptoMOS architecture to provide 1500V<sub>rms</sub> of input/output isolation in a small 4-Pin SOP package.

CPC1125N uses Clare's state of the art double-molded vertical construction packaging to produce one of the world's smallest relays. It is ideal for replacing larger, less-reliable reed and electromechanical relays.

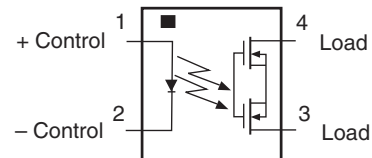
### Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- Certified to:
  - IEC60950-1: 2005
  - EN60950-1: 2006
  - TUV Certificate: B 09 07 49410 006

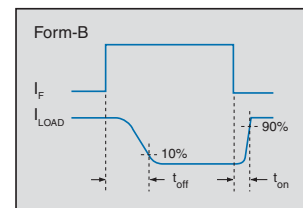
### Ordering Information

Part #	Description
CPC1125N	4-Pin SOP (100/tube)
CPC1125NTR	4-Pin SOP (2000/reel)

### Pin Configuration



### Switching Characteristics of Normally Closed Devices



**Absolute Maximum Ratings @ 25°C**

Parameter	Ratings	Units
Blocking Voltage	400	V <sub>P</sub>
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	150	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

*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.*

<sup>1</sup> Derate linearly 3.33 mw / °C

**Electrical Characteristics @ 25°C**

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics</b>						
Load Current						
Continuous <sup>1</sup>	I <sub>F</sub> =0mA	I <sub>L</sub>	-	-	±100	mA
Peak	t = 10ms	I <sub>LPK</sub>	-	-	±350	
On-Resistance <sup>2</sup>	I <sub>L</sub> =100mA	R <sub>ON</sub>	-	26	35	Ω
Switching Speeds						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	t <sub>on</sub>	-	0.31	2	ms
Turn-Off		t <sub>off</sub>	-	0.30	2	
Off-State Leakage Current	V <sub>L</sub> =400V, I <sub>F</sub> =2mA	I <sub>LEAK</sub>	-	-	1	μA
Output Capacitance	I <sub>F</sub> =2mA, V <sub>L</sub> = 50V, f=1MHz	C <sub>OUT</sub>	-	6	-	pF
<b>Input Characteristics</b>						
Input Control Current <sup>3</sup>	I <sub>L</sub> =100mA	I <sub>F</sub>	-	-	2	mA
Input Dropout Current	-	I <sub>F</sub>	0.1	-	-	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	-	C <sub>IO</sub>	-	1	-	pF

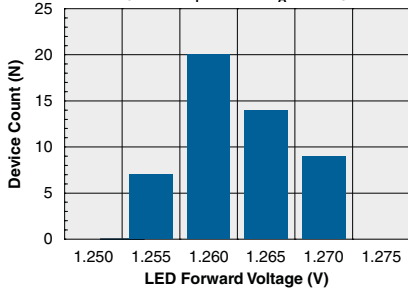
<sup>1</sup> Load current derates linearly from 100mA @ 25°C to 60mA @ 85°C.

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

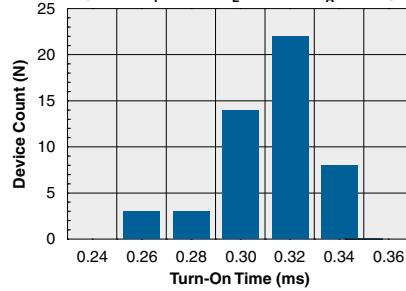
<sup>3</sup> For applications requiring high temperature operation (greater than 60°C) a LED drive current of 4mA is recommended.

**PERFORMANCE DATA\***

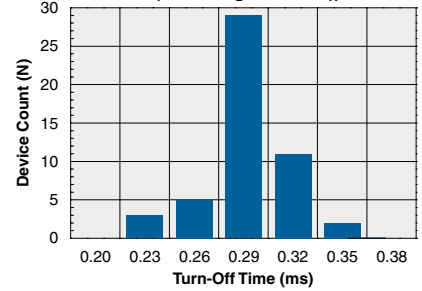
**Typical LED Forward Voltage Drop**  
(N=50,  $I_F=5\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



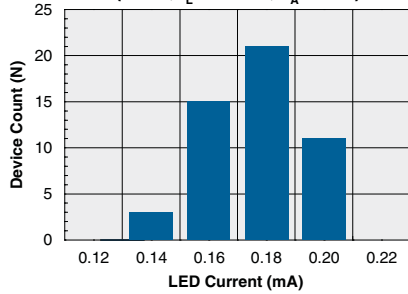
**Typical Turn-On Time**  
(N=50,  $I_F=5\text{mA}$ ,  $I_L=60\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



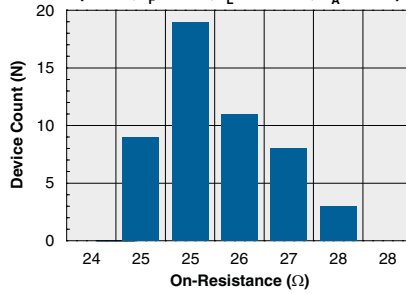
**Typical Turn-Off Time**  
(N=50,  $I_F=5\text{mA}$ ,  $I_L=60\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



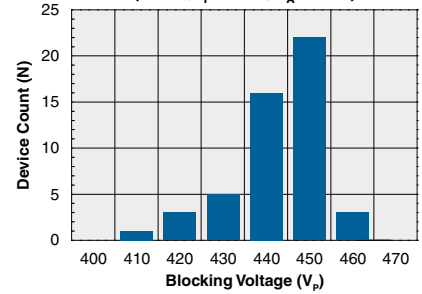
**Form-B  $I_F$  for Switch Operation**  
(N=50,  $I_L=120\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



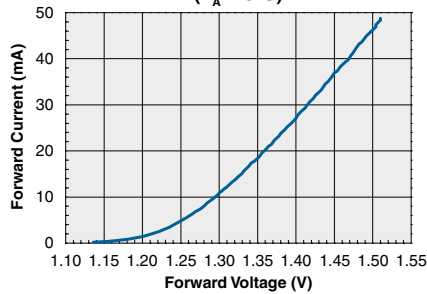
**Typical On-Resistance Distribution**  
(N=50,  $I_F=0\text{mA}$ ,  $I_L=100\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



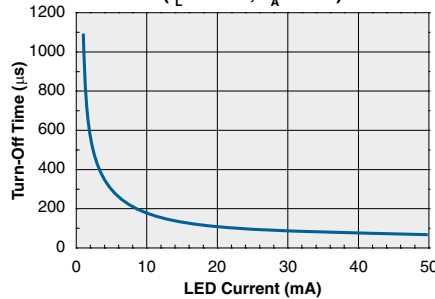
**Typical Blocking Voltage Distribution**  
(N=50,  $I_F=2\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



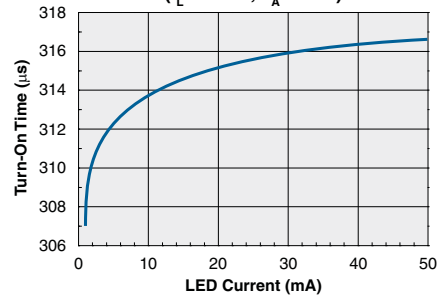
**Typical LED Forward Voltage vs. Forward Current**  
( $T_A=25^\circ\text{C}$ )



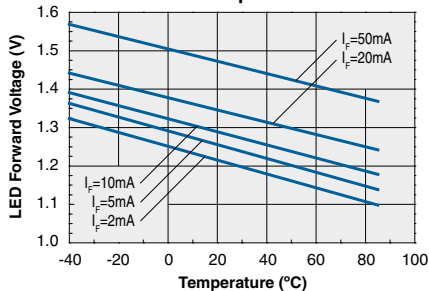
**Typical Turn-Off Time vs. LED Forward Current**  
( $I_L=60\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



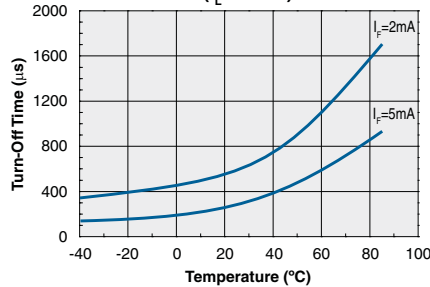
**Typical Turn-On Time vs. LED Forward Current**  
( $I_L=60\text{mA}$ ,  $T_A=25^\circ\text{C}$ )



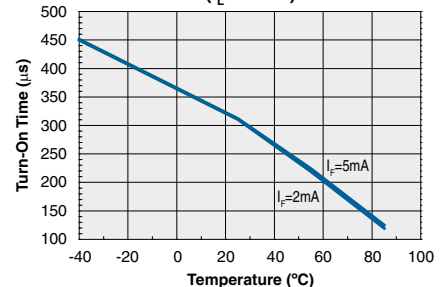
**Typical LED Forward Voltage Drop vs. Temperature**



**Typical Turn-Off Time vs. Temperature**  
( $I_L=60\text{mA}$ )

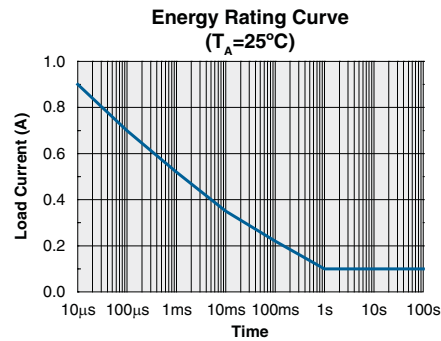
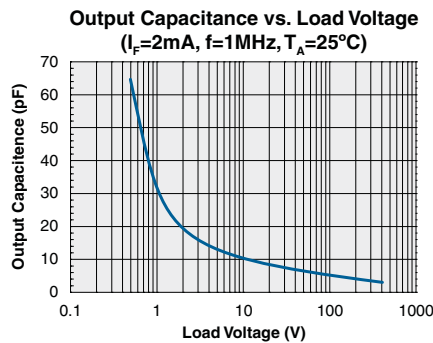
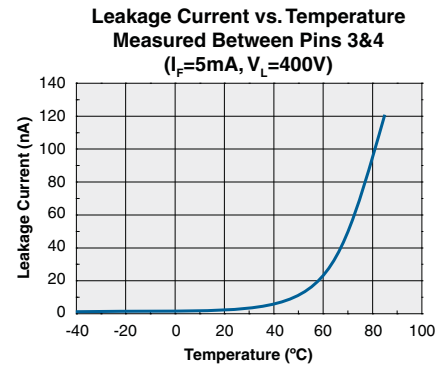
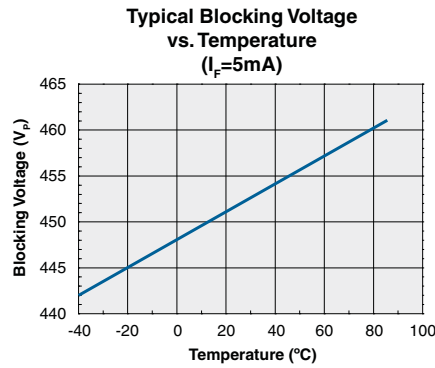
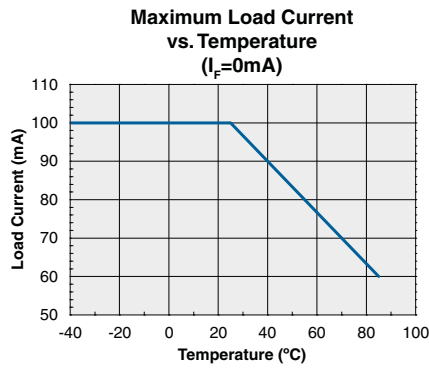
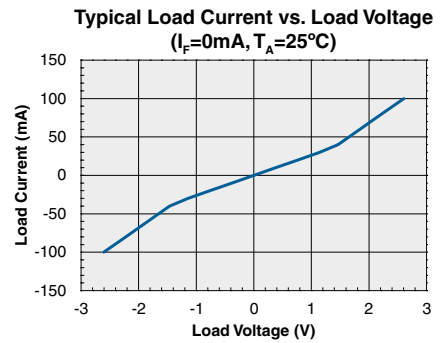
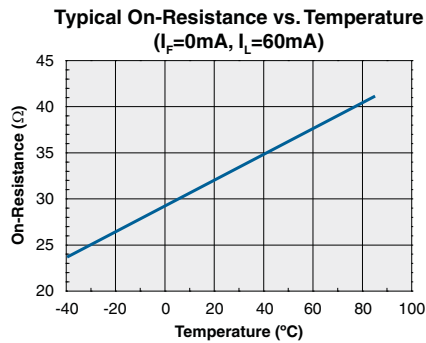
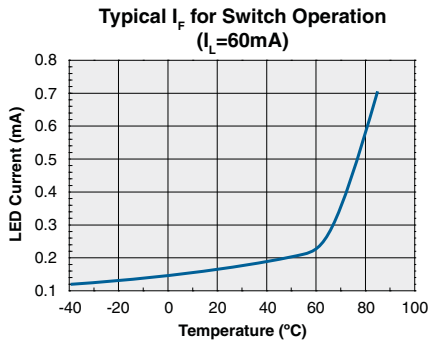


**Typical Turn-On Time vs. Temperature**  
( $I_L=60\text{mA}$ )



\*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\***



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**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 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
CPC1125N	MSL 3

**ESD Sensitivity**



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

**Reflow 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
CPC1125N	260°C for 30 seconds

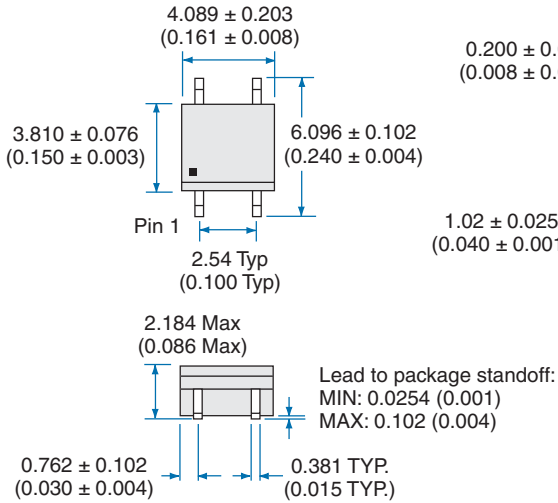
**Board Wash**

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.

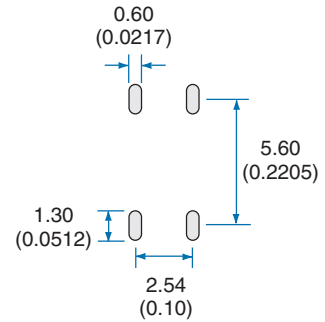


**MECHANICAL DIMENSIONS**

**CPC1125N**

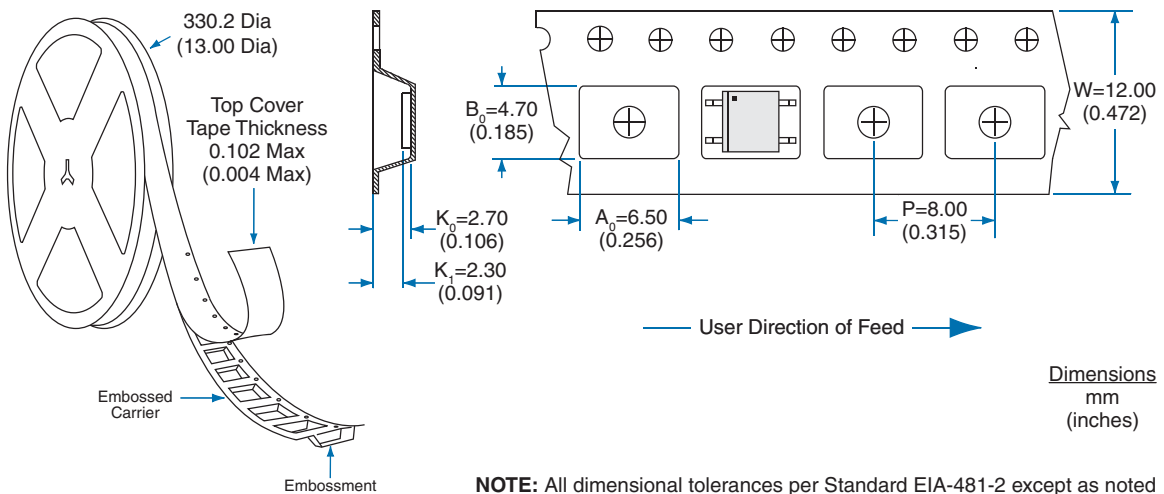


**Recommended PCB Land Pattern**



Dimensions  
mm  
(inches)

**CPC1125N Tape & Reel**



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8/10/2011