



	CPC1025N	Units
Blocking Voltage	400	V
Load Current	120	mA
Typical On-resistance	25	$\Omega$

#### Features

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

The CPC1025N is a miniature 1-Form-A solid state relay in a 4-Pin SOP package that employs optically coupled MOSFET technology to provide 1500V<sub>rms</sub> of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS® architecture. The optically coupled input is controlled by a highly efficient GaAIAs infrared LED. The CPC1025N uses Clare's state of the art double molded vertical construction packaging to produce the world's smallest relay. The CPC1025N offers board space savings of at least 20% over the competitor's larger 4-Pin SOP relay.

#### Approvals

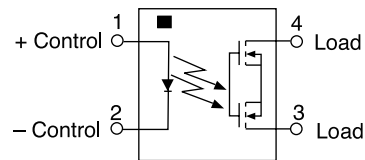
- UL Recognized Component  
File#: E76270
- Certified to: EN60950

#### Ordering Information

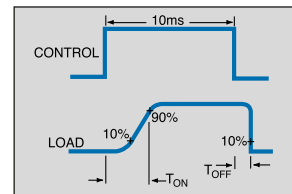
Part #	Description
CPC1025N	4-Pin SOP (100/tube)
CPC1025NTR	4-Pin SOP (2000/reel)

#### Pin Configuration

CPC1025N Pinout



Switching Characteristics of Normally Open (Form A) Devices



### Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Blocking Voltage	400	V
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
Capacitance Input to Output	1	pF
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.

### Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current AC Peak <sup>1</sup>	-	I <sub>L</sub>	-	-	120	mA
Peak Load Current	10ms	I <sub>LPK</sub>	-	-	350	mA
On-Resistance <sup>2</sup>	I <sub>F</sub> =5mA, I <sub>L</sub> =120mA	R <sub>ON</sub>	-	25	30	Ω
Off-State Leakage Current	V <sub>L</sub> =400V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	2	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	1	ms
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
<b>Input Characteristics @ 25°C</b>						
Input Control Current <sup>3</sup>	I <sub>L</sub> =120mA	I <sub>F</sub>	2	-	-	mA
Input Dropout Current	-	I <sub>F</sub>	0.3	0.9	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Voltage	-	V <sub>R</sub>	-	-	5	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA

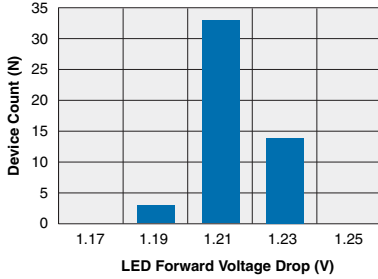
<sup>1</sup> Load current derates linearly from 120mA @ 25°C to 80mA @ 85°C.

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

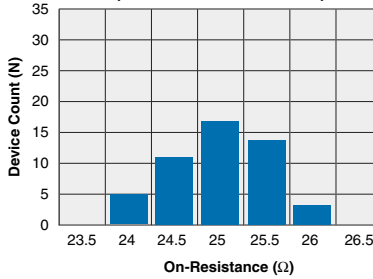
<sup>3</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 5mA is recommended.

**PERFORMANCE DATA\***

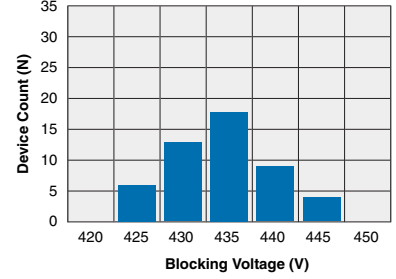
**CPC1025N**  
Typical LED Forward Voltage Drop  
(Ambient Temperature = 25°C)  
 $I_F = 5\text{mA}$



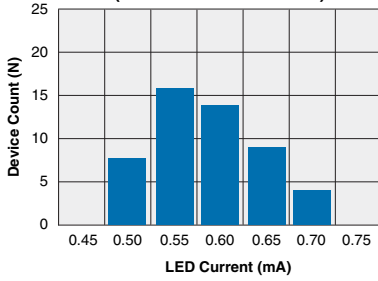
**CPC1025N**  
Typical On-Resistance Distribution  
(Ambient Temperature = 25°C)  
(Load Current = 120mA)



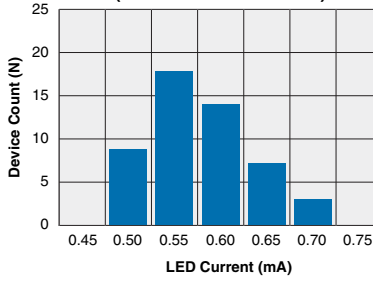
**CPC1025N**  
Typical Blocking Voltage Distribution  
(Ambient Temperature = 25°C)



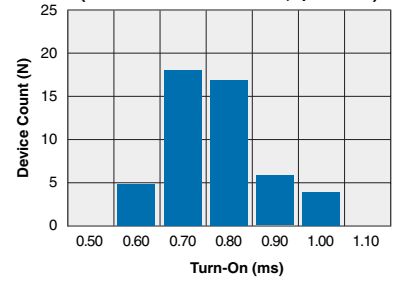
**CPC1025N**  
Typical  $I_F$  for Switch Operation  
(Ambient Temperature = 25°C)  
(Load Current = 120mA)



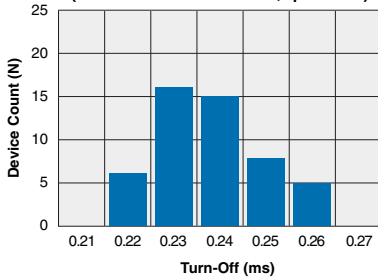
**CPC1025N**  
Typical  $I_F$  for Switch Dropout  
(Ambient Temperature = 25°C)  
(Load Current = 120mA)



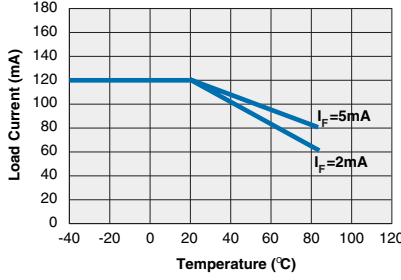
**CPC1025N**  
Typical Turn-On Time  
(Ambient Temperature = 25°C)  
(Load Current = 120mA;  $I_F = 5\text{mA}$ )



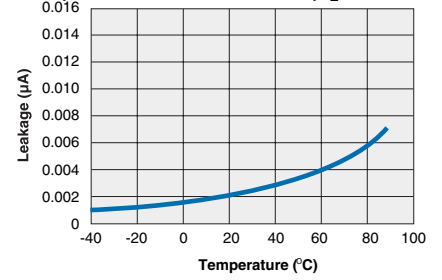
**CPC1025N**  
Typical Turn-Off Time  
(Ambient Temperature = 25°C)  
(Load Current = 120mA;  $I_F = 5\text{mA}$ )



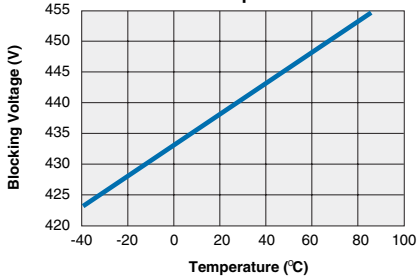
**CPC1025N**  
Typical Load Current vs. Temperature



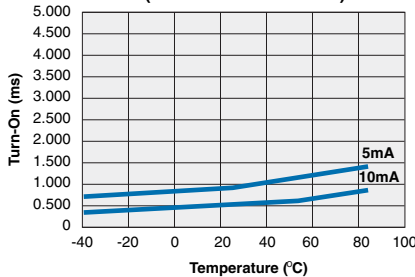
**CPC1025N**  
Typical Leakage vs. Temperature  
(Measured across Pins 3 & 4)  $I_L = \text{max rated}$



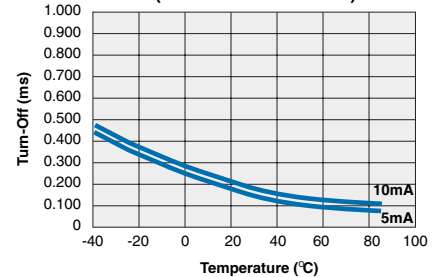
**CPC1025N**  
Typical Blocking Voltage vs. Temperature



**CPC1025N**  
Typical Turn-On vs. Temperature  
(Load Current = 80mA)

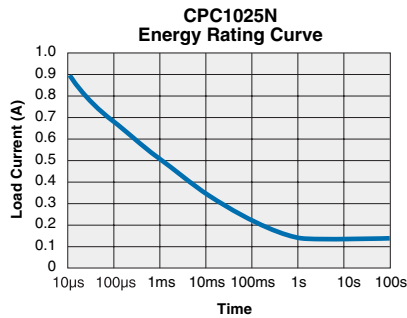
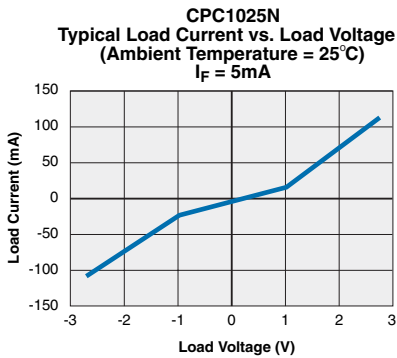
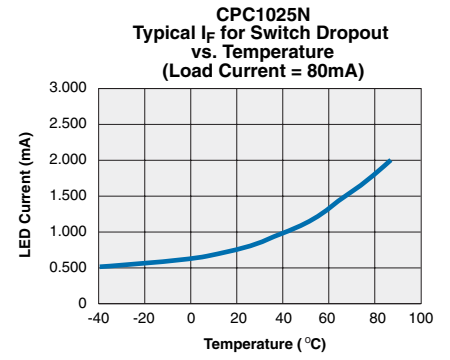
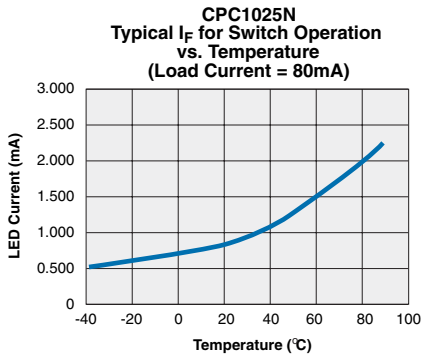
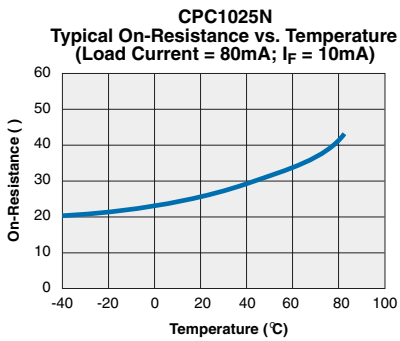
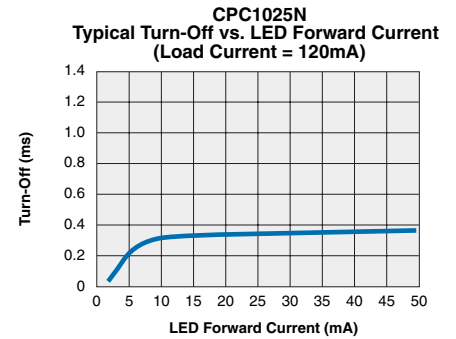
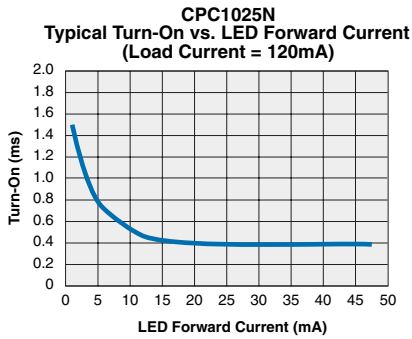
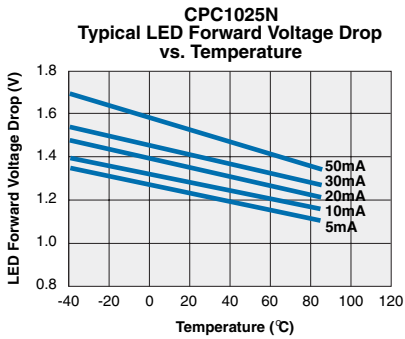


**CPC1025N**  
Typical Turn-Off vs. Temperature  
(Load Current = 80mA)



\*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**

**Soldering**

Recommended soldering processes are limited to 260°C component body temperature for 10 seconds.

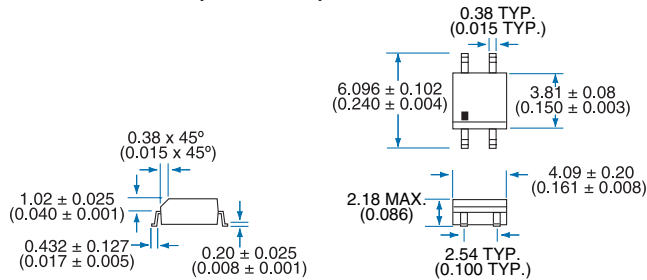


**Washing**

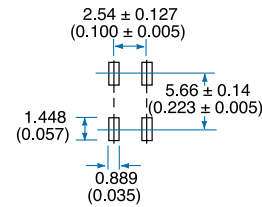
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

**MECHANICAL DIMENSIONS**

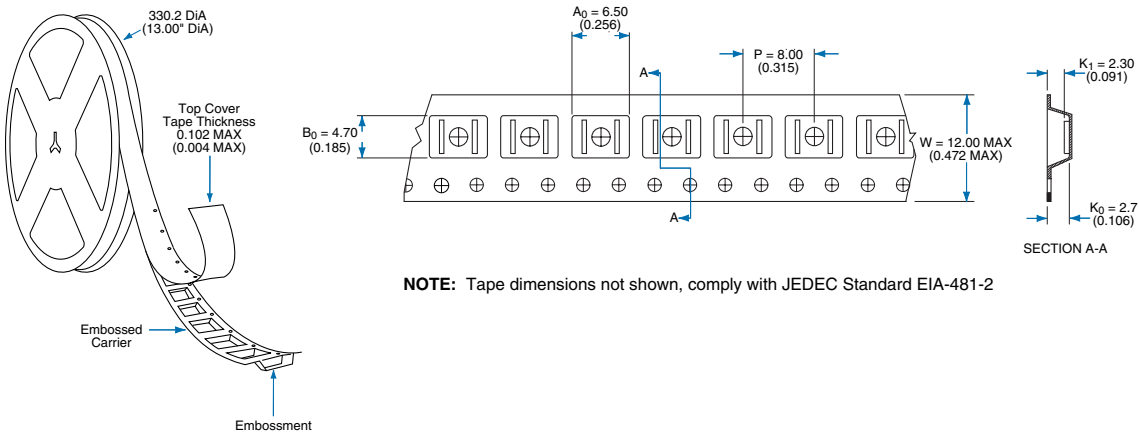
**4-Pin SOIC Narrow ("N" Suffix)**



**PC Board Pattern (Top View)**



**Tape and Reel Packaging for 4 pin SOIC package**



**NOTE:** Tape dimensions not shown, comply with JEDEC Standard EIA-481-2

**Dimensions:**  
mm  
(inches)

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