



	CPC1130N	Units
Blocking Voltage	350	V
Load Current	120	mA
Max R <sub>ON</sub>	30	Ω

### 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)
  - Hookswitch
  - 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 CPC1130N is a miniature 1-Form-B solid state relay which uses 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<sup>®</sup> architecture. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED. The CPC1130N offers board space savings of at least 20% versus competitive 4 Pin SOP solid state relay.

### Approvals

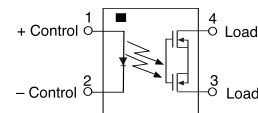
- UL Recognized Component: File #E76270
- Certified to EN60950

### Ordering Information

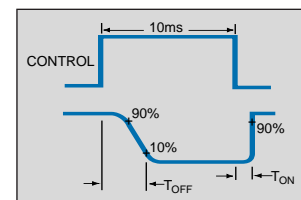
Part #	Description
CPC1130N	4 Pin SOP (100/tube)
CPC1130NTR	4 Pin SOP (2,000/reel)

### Pin Configuration

CPC1130N Pinout



### Switching Characteristics of Normally Closed (Form B) Devices



### Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Input Power Dissipation	150	mW
Input Control Current	50	mA
Peak (10ms)	1	A
Reverse Input Voltage	5	V
Blocking Voltage	350	V
Total Power Dissipation	400 <sup>1</sup>	mW
Isolation Voltage Input to Output	1500	V <sub>RMS</sub>
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C
Soldering Temperature (10 Seconds Max.)	+220	°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 (Continuous)						
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>L</sub> =120mA	R <sub>ON</sub>	-	25	30	Ω
Off-State Leakage Current	V <sub>L</sub> =350V, I <sub>F</sub> =2mA	I <sub>LEAK</sub>	-	-	5	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	2.0	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	2.0	ms
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
Capacitance Input to Output	-	-	-	1	-	pF
<b>Input Characteristics @ 25°C</b>						
Input Control Current <sup>3</sup>	I <sub>L</sub> =120mA	I <sub>F</sub>	2	-	50	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 Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA

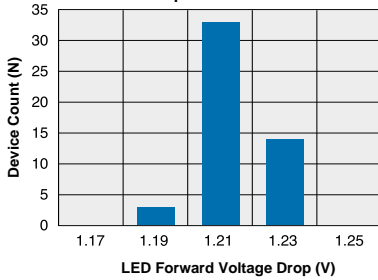
<sup>1</sup> Load current derates linearly from 120mA @ 25°C to 100mA @ 85°C.

<sup>2</sup> Within 1 second of on time.

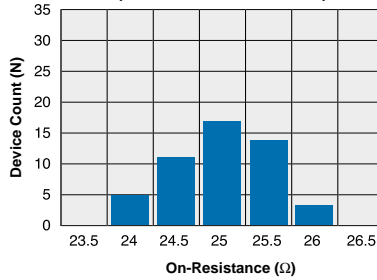
<sup>3</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 5mA is recommended.

**PERFORMANCE DATA\***

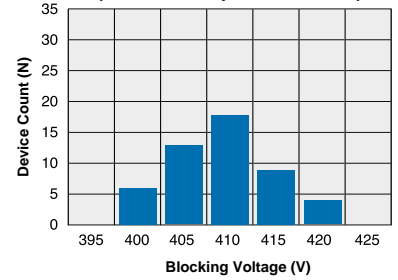
**CPC1130N**  
Typical LED Forward Voltage Drop  
(Ambient Temperature = 25°C)  
 $I_F = 5\text{mA}$



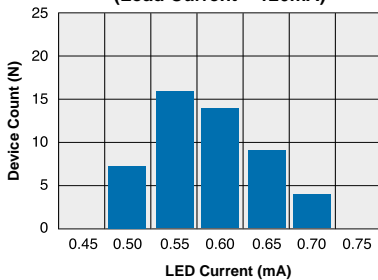
**CPC1130N**  
Typical On-Resistance Distribution  
(Ambient Temperature = 25°C)  
(Load Current = 120mA)



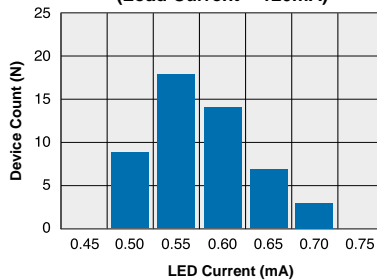
**CPC1130N**  
Typical Blocking Voltage Distribution  
(Ambient Temperature = 25°C)



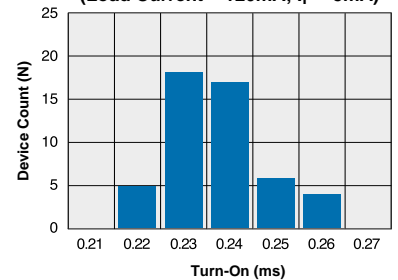
**CPC1130N**  
Typical  $I_F$  for Switch Operation  
(Ambient Temperature = 25°C)  
(Load Current = 120mA)



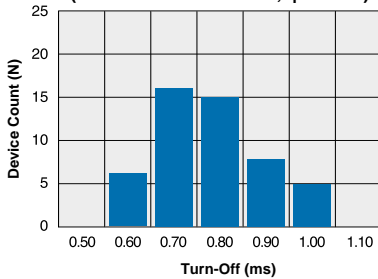
**CPC1130N**  
Typical  $I_F$  for Switch Dropout  
(Ambient Temperature = 25°C)  
(Load Current = 120mA)



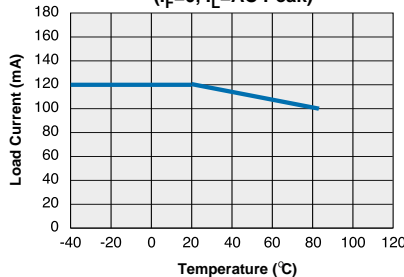
**CPC1130N**  
Typical Turn-On Time  
(Ambient Temperature = 25°C)  
(Load Current = 120mA;  $I_F = 5\text{mA}$ )



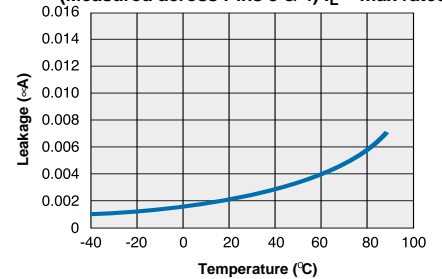
**CPC1130N**  
Typical Turn-Off Time  
(Ambient Temperature = 25°C)  
(Load Current = 120mA;  $I_F = 5\text{mA}$ )



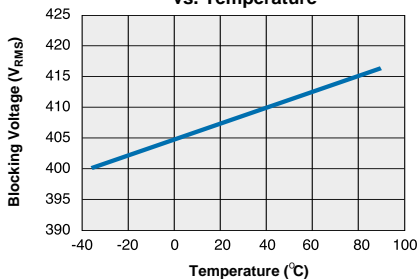
**CPC1130N**  
Typical Load Current vs. Temperature  
( $I_F=0$ ,  $I_L=AC$  Peak)



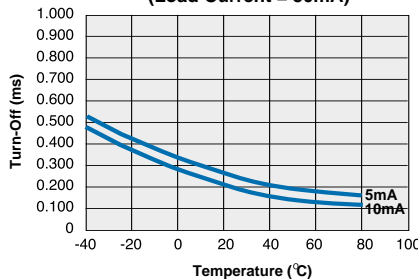
**CPC1130N**  
Typical Leakage vs. Temperature  
(Measured across Pins 3 & 4)  $I_L = \text{max rated}$



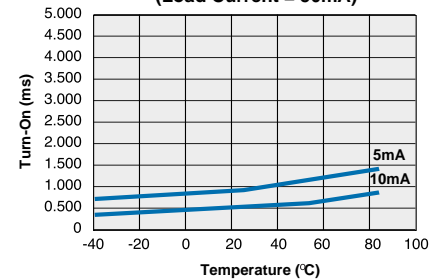
**CPC1130N**  
Typical Blocking Voltage vs. Temperature



**CPC1130N**  
Typical Turn-On vs. Temperature  
(Load Current = 50mA)

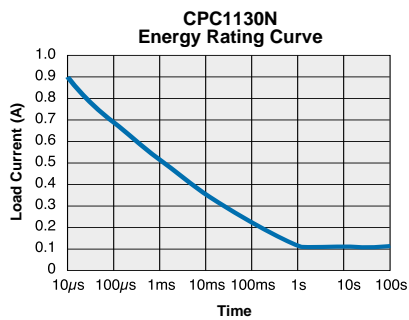
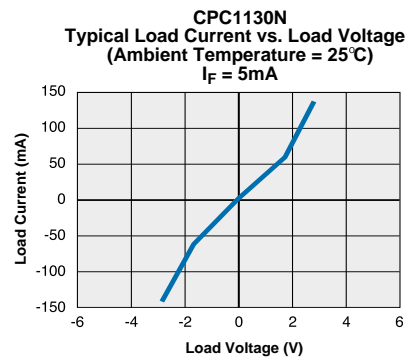
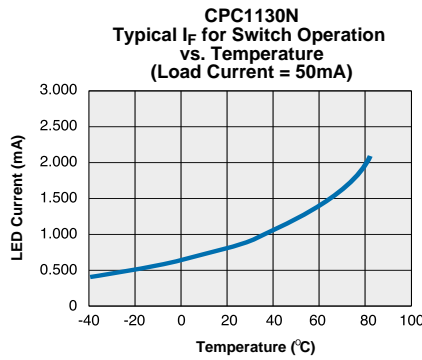
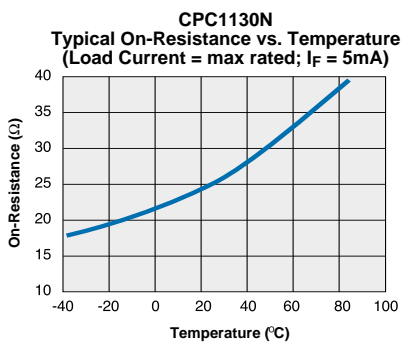
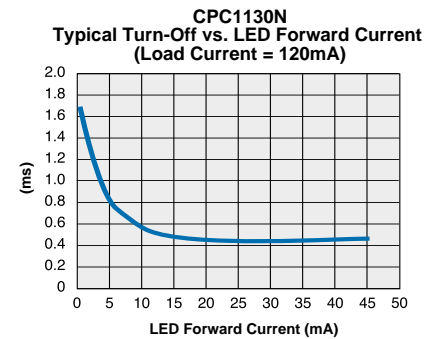
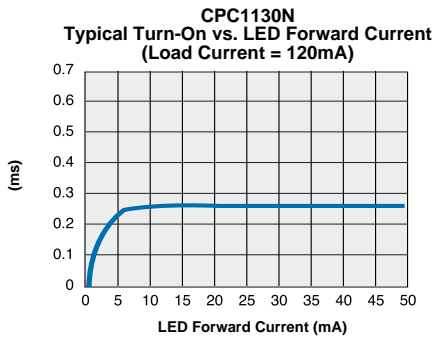
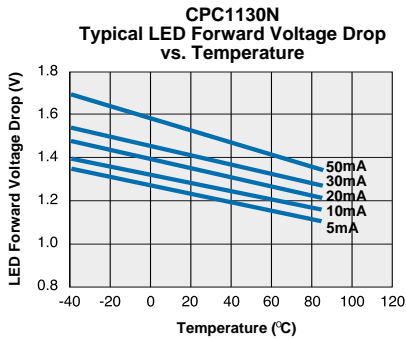


**CPC1130N**  
Typical Turn-Off vs. Temperature  
(Load Current = 50mA)



\*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.

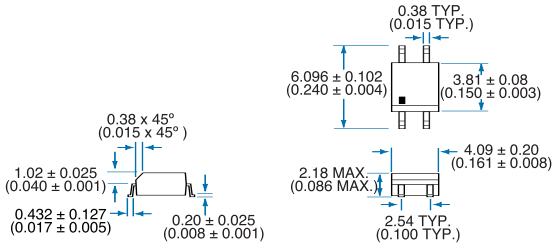
PERFORMANCE DATA\*



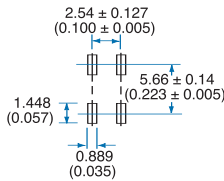
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

**MECHANICAL DIMENSIONS**

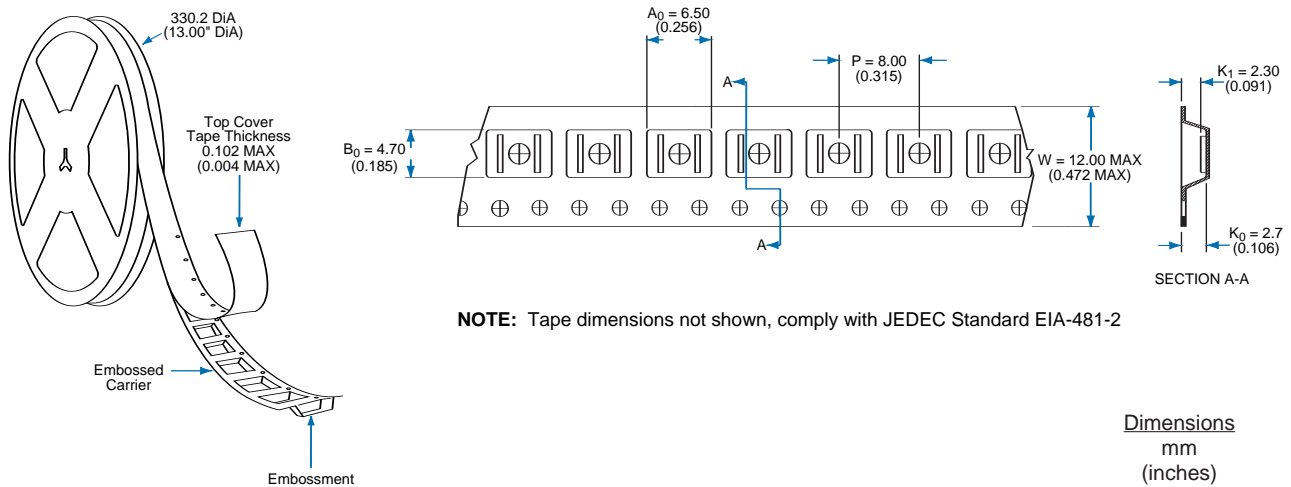
**4 Pin SOIC Narrow (“N” Suffix)**



**PC Board Pattern (Top View)**



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



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