



Parameter	Rating	Units
Blocking Voltage	350	V _p
Load Current	120	mA
Max On-resistance	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_{rms} 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 CPC1130N is a miniature 1-Form-B solid state relay which uses optically coupled MOSFET technology to provide 1500V_{rms} 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 GaAlAs infrared LED. The CPC1130N offers board space savings of at least 20% versus competitive 4-Pin SOP solid state relay.

Approvals

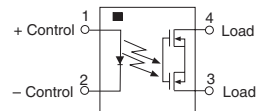
- UL Recognized Component: File #E76270
- Certified to EN60950

Ordering Information

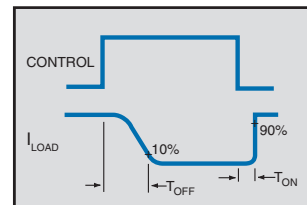
Part #	Description
CPC1130N	4-Pin SOP (100/tube)
CPC1130NTR	4-Pin SOP (2000/reel)

Pin Configuration

CPC1130N Pinout



Switching Characteristics of Normally Closed (Form B) Devices



Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Blocking Voltage	350	V _P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	150	mW
Total Power Dissipation ¹	400	mW
Capacitance Input to Output	1	pF
Isolation Voltage Input to Output	1500	V _{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ 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
Output Characteristics @ 25°C						
Load Current						
Continuous ¹	-	I _L	-	-	120	mA
Peak	t = 10ms	I _{LPK}	-	-	350	
On-Resistance ²	I _L = 120mA	R _{ON}	-	25	30	Ω
Off-State Leakage Current	V _L = 350V, I _F = 2mA	I _{LEAK}	-	-	5	μA
Switching Speeds						
Turn-On	I _F = 5mA, V _L = 10V	T _{ON}	-	-	2	ms
Turn-Off		T _{OFF}	-	-	2	
Output Capacitance	50V; f = 1MHz	C _{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current ³	I _L = 120mA	I _F	-	-	2	mA
Input Dropout Current	-	I _F	0.3	0.9	-	mA
Input Voltage Drop	I _F = 5mA	V _F	0.9	1.2	1.4	V
Reverse Input Current	V _R = 5V	I _R	-	-	10	μA

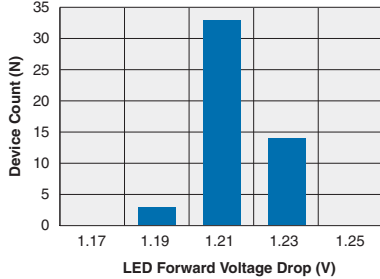
¹ Load current derates linearly from 120mA @ 25°C to 80mA @ 85°C.

² Measurement taken within 1 second of on time.

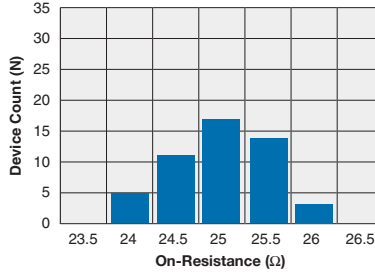
³ For applications requiring high temperature operation (greater than 60°C) an LED drive current of 5mA is recommended.

PERFORMANCE DATA*

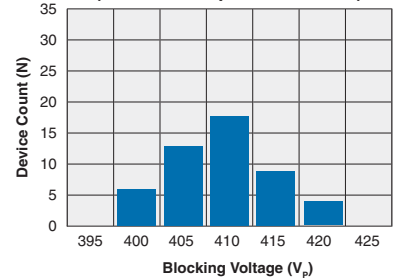
CPC1130N
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
 $I_F = 5\text{mA}$



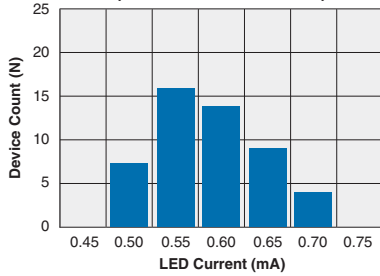
CPC1130N
Typical On-Resistance Distribution
(Ambient Temperature = 25°C)
(Load Current = 120mA)



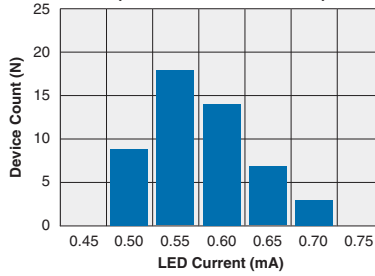
CPC1130N
Typical Blocking Voltage Distribution
(Ambient Temperature = 25°C)



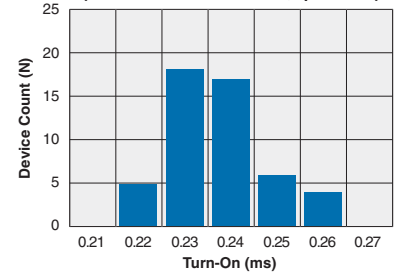
CPC1130N
Typical I_F for Switch Operation
(Ambient Temperature = 25°C)
(Load Current = 120mA)



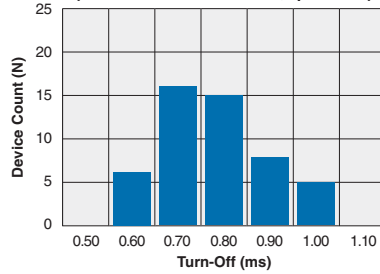
CPC1130N
Typical I_F for Switch Dropout
(Ambient Temperature = 25°C)
(Load Current = 120mA)



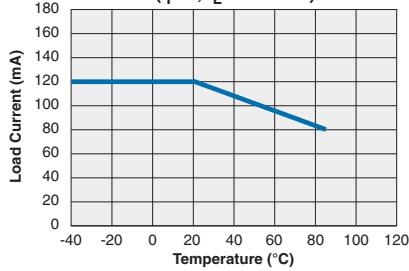
CPC1130N
Typical Turn-On Time
(Ambient Temperature = 25°C)
(Load Current = 120mA; $I_F = 5\text{mA}$)



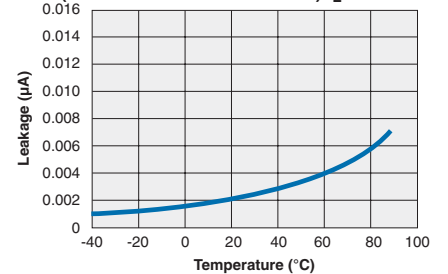
CPC1130N
Typical Turn-Off Time
(Ambient Temperature = 25°C)
(Load Current = 120mA; $I_F = 5\text{mA}$)



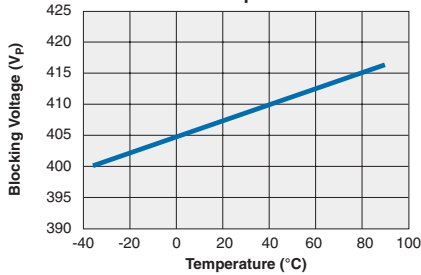
CPC1130N
Typical Load Current vs. Temperature
($I_F=0$, $I_L=AC$ Peak)



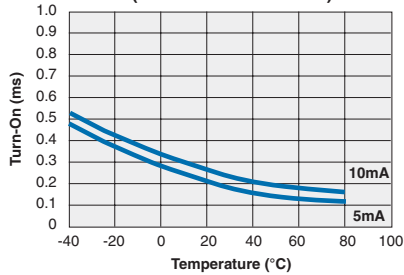
CPC1130N
Typical Leakage vs. Temperature
(Measured across Pins 3 & 4) $I_L = \text{max rated}$



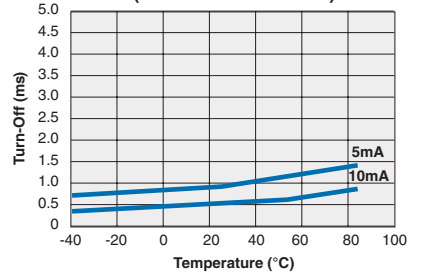
CPC1130N
Typical Blocking Voltage vs. Temperature



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

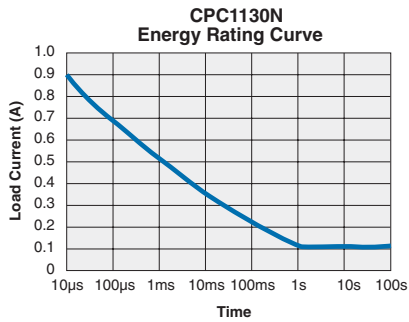
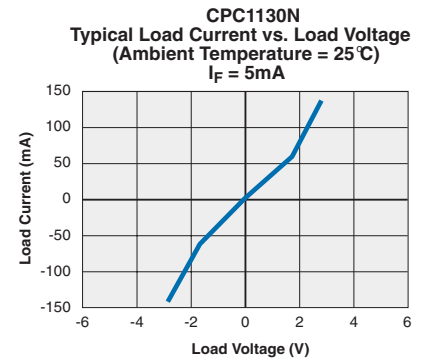
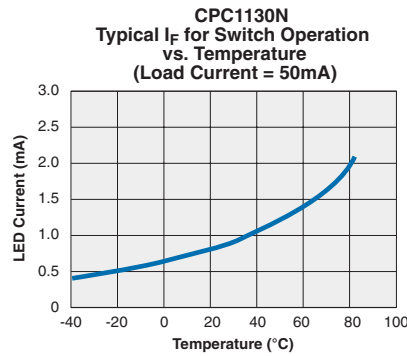
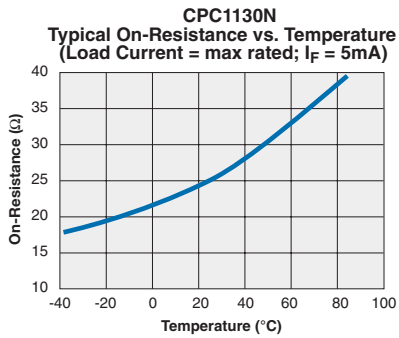
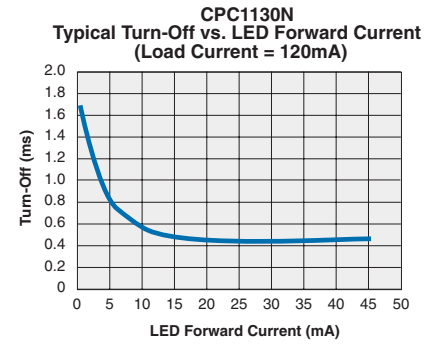
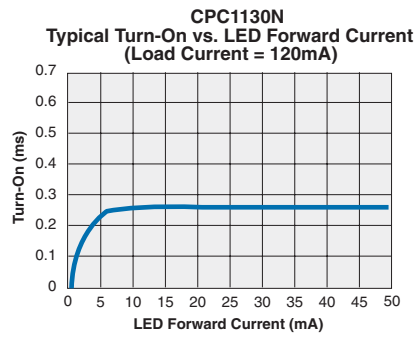
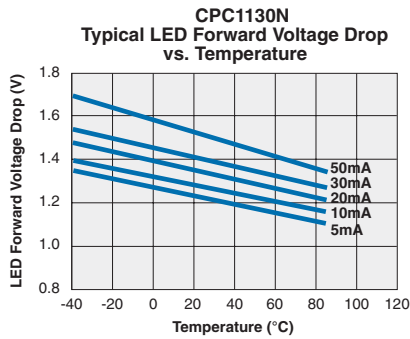


CPC1130N
Typical Turn-Off vs. Temperature
(Load Current = 50mA)



*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.

MANUFACTURING INFORMATION

Moisture Sensitivity

Clare has characterized the moisture reflow sensitivity of this package, and has determined that this component must be handled in accordance with IPC/JEDEC standard J-STD-033 moisture sensitivity level (MSL), level 3 classification.



Soldering Reflow Profile

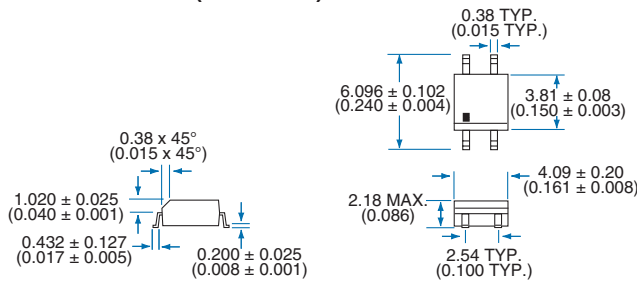
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

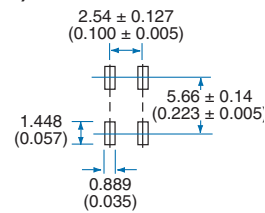
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

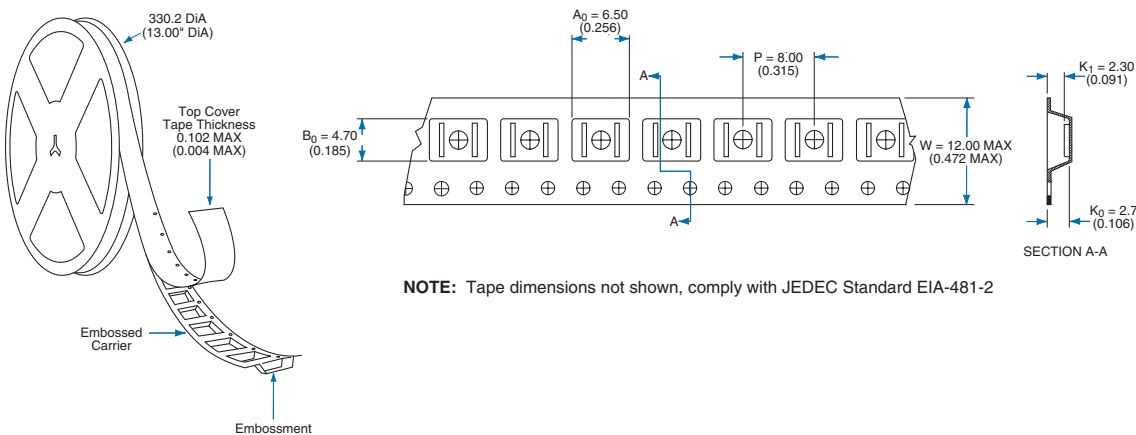
4-Pin SOIC Narrow ("N" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 4-pin SOP package



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

Dimensions:
mm
(inches)

For additional information please visit our website at: 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.