

# CPC1130N 4-Pin SOP OptoMOS® Relay



	CPC1130N	Units
Blocking Voltage	350	V
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<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® architecture. The optically-coupled input is controlled by a highly efficient GaAIAs infrared LED. The CPC1130N offers board space savings of at least 20% versus competitive 4-Pin SOP solid state relay.

#### **Approvals**

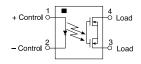
- UL Recognized Component: File #E76270
- Certified to EN60950

## **Ordering Information**

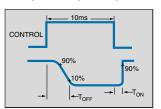
Part #	Description
CPC1130N	4-Pin SOP (100/tube)
CPC1130NTR	4-Pin SOP (2000/reel)

#### **Pin Configuration**

#### **CPC1130N Pinout**



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











# Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units	
Blocking Voltage	350	V	
Reverse Input Voltage	5	V	
Input Control Current	50	mA	
Peak (10ms)	1	Α	
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**

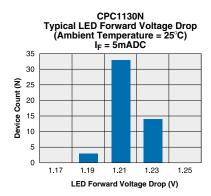
Parameter	Conditions	Symbol	Min	Тур	Max	Units
Output Characteristics @ 25°C	<u>'</u>			'	·	
Load Current AC Peak <sup>1</sup> , Continuous	-	IL	-	-	120	mA
Peak Load Current	10ms	I <sub>LPK</sub>	-	-	350	mA
On-Resistance <sup>2</sup>	I <sub>L</sub> =120mA	R <sub>ON</sub>	-	25	30	Ω
Off-State Leakage Current	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	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	2	ms
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
Input Characteristics @ 25°C						
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>B</sub>	-	-	10	μA

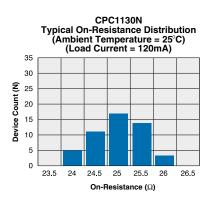
<sup>1</sup> Load current derates linearly from 120mA @ 25°C to 80mA @ 85°C.
2 Measurement taken within 1 second of on time.

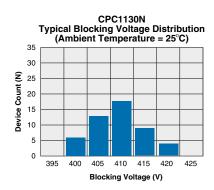
<sup>&</sup>lt;sup>3</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 5mA is recomended.

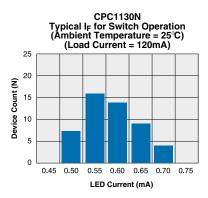


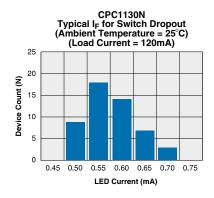
#### **PERFORMANCE DATA\***

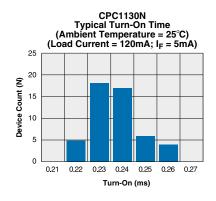


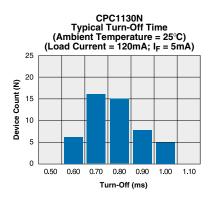


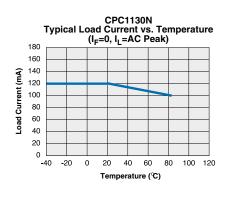


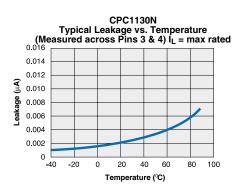


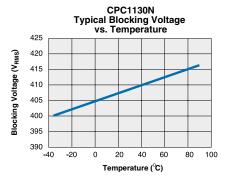


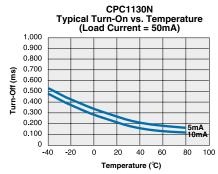


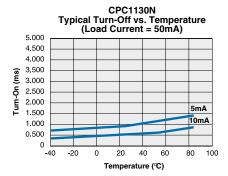








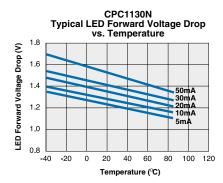


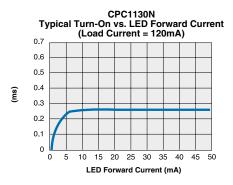


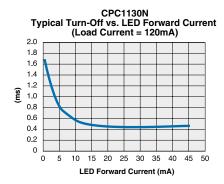
<sup>\*</sup>The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

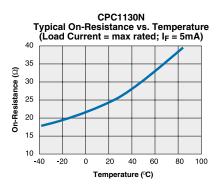


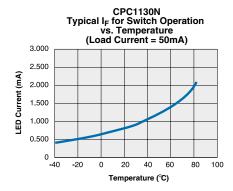
#### **PERFORMANCE DATA\***

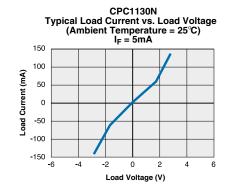


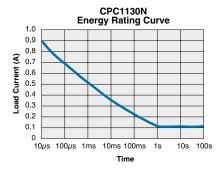












<sup>\*</sup>The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.



### **Manufacturing Information**

#### Soldering

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

# Pb



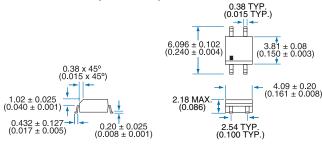


#### Washing

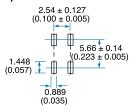
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

#### **MECHANICAL DIMENSIONS**

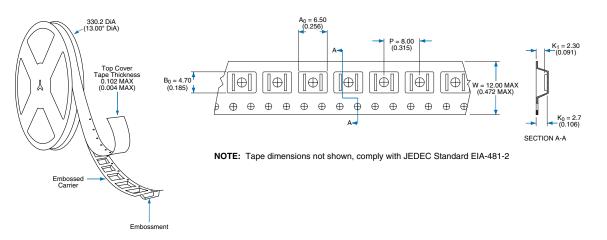
#### 4-Pin SOIC Narrow ("N" Suffix)



# PC Board Pattern (Top View)



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



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.

Specification: DS-CPC1130N-R02 ©Copyright 2005, Clare, Inc. OptoMOS® is a registered trademark of Clare, Inc. All rights reserved. Printed in USA. 8/1/05