

	CPC1004N	Units
Blocking Voltage (DC)	100	V
Load Current (DC)	300	mA
Max On-resistance	4	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**

- Instrumentation
  - Multiplexers
  - Data Acquisition
  - · Electronic Switching
  - I/O Subsystems
  - · Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Security Systems
- Aerospace
- Industrial Controls
- · Reed Relay Replacement

#### **Description**

CPC1004N is a miniature low voltage, low on resistance 1-Form-A DC solid state relay in a 4 pin SOP package. The relay uses optically coupled MOSFET technology to provide 1500V<sub>rms</sub> of input to output isolation. The efficient MOSFET switch and photovoltaic die use Clare's patented OptoMOS® architecture. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED. The CPC1004N uses Clare's state of the art double molded vertical construction packaging to produce the world's smallest relay. The CPC1004N is ideal for replacing larger less reliable reed and electromechanical relays.

#### **Approvals**

 UL Recognized Component File #: E76270

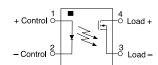
Certified to: EN60950

#### **Ordering Information**

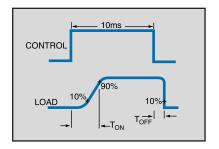
Part #	Description
CPC1004N	4 Pin SOP (100/tube)
CPC1004NTR	4 Pin SOP (2000/reel)

#### **Pin Configuration**

#### **CPC1004N Pinout**



#### Switching Characteristics of Normally Open (Form A) Devices











## Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units	
Blocking Voltage	100	V	
Reverse Input Voltage	5	V	
Input Control Current	50	mA	
Peak (10ms)	1	Α	
Input Power Dissipation	70	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 +110	°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.

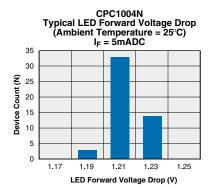
#### **Electrical Characteristics**

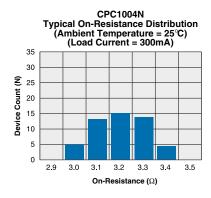
Parameter	Conditions	Symbol	Min	Тур	Max	Units			
Output Characteristics @ 25°C (Unless Otherwise Specified)									
Load Current <sup>1</sup> , Continuous DC	-	IL	-	-	300	mA			
Load Current, Continuous	T=110°C, I <sub>F</sub> =10mA	-	-	-	100	mA			
Peak Load Current	10ms	I <sub>LPK</sub>	-	-	350	mA			
On-Resistance <sup>2</sup>	I <sub>L</sub> =300mA	R <sub>on</sub>	-	-	4	Ω			
Off-State Leakage Current	V <sub>L</sub> =100V	I <sub>LEAK</sub>	-	-	1	μA			
Switching Speeds		22711							
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>on</sub>	-	-	3	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			
Input Characteristics @ 25°C									
Input Control Current	I <sub>L</sub> =300mA	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 Voltage	-	V <sub>R</sub>	-	-	5	V			
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA			

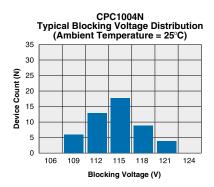
Load current derates linearly from 300mA @ 25°C to 100mA @ 110°C.
Measurement taken within 1 second of on time.

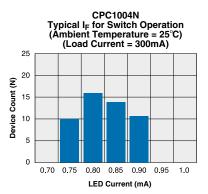


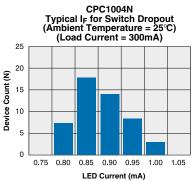
#### **PERFORMANCE DATA\***

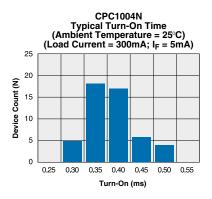


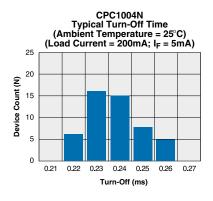


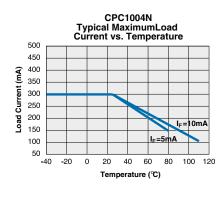


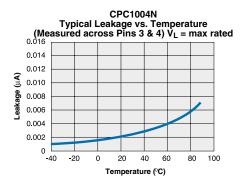


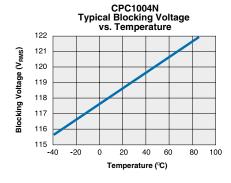


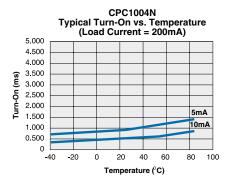


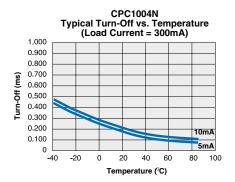








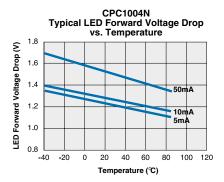


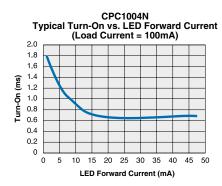


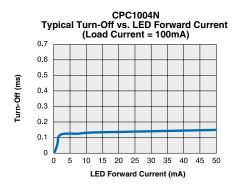
<sup>\*</sup>The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

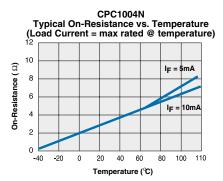


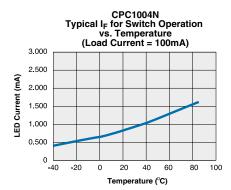
#### **PERFORMANCE DATA\***

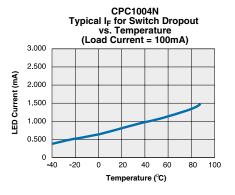


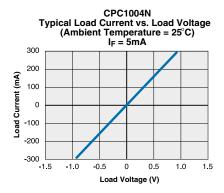


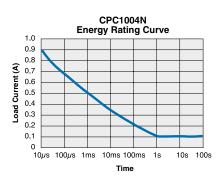












<sup>\*</sup>The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.



#### **Manufacturing Information**

#### Soldering

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

# Pb



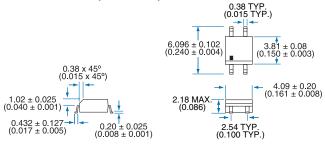


#### Washing

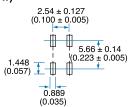
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

#### **MECHANICAL DIMENSIONS**

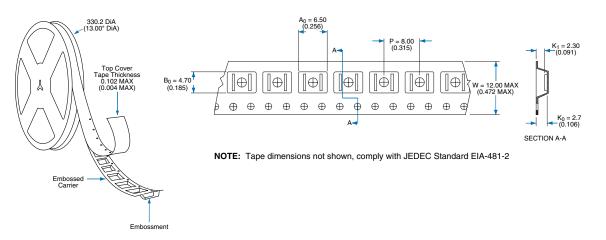
#### 4 Pin SOIC Narrow ("N" Suffix)



# PC Board Pattern (Top View)



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



Dimensions: mm (inches)

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