



	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_{rms} 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_{rms} 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 GaAIAs 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

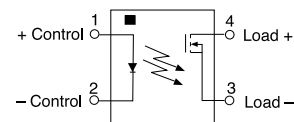
- UL Recognized Component
File #: E76270
- Certified to: EN60950

Ordering Information

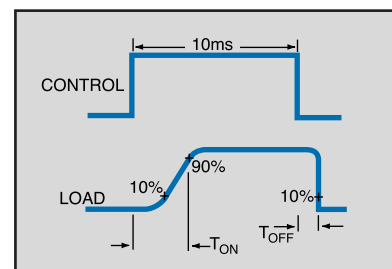
Part #	Description
CPC1004N	4 Pin SOP (100/tube)
CPC1004NTR	4 Pin SOP (2000/reel)

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	A
Input Power Dissipation	70	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 +110	°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

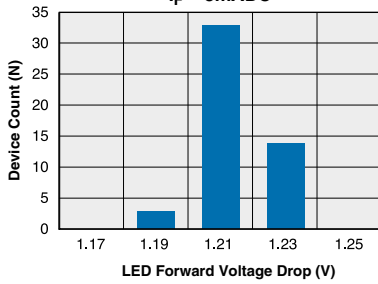
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C (Unless Otherwise Specified)						
Load Current ¹ , Continuous DC	-	I _L	-	-	300	mA
Load Current, Continuous	T=110°C, I _F =10mA	-	-	-	100	mA
Peak Load Current	10ms	I _{LPK}	-	-	350	mA
On-Resistance ²	I _L =300mA	R _{ON}	-	-	4	Ω
Off-State Leakage Current	V _L =100V	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	T _{ON}	-	-	3	ms
Turn-Off	I _F =5mA, V _L =10V	T _{OFF}	-	-	1	ms
Output Capacitance	50V; f=1MHz	C _{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current	I _L =300mA	I _F	2	-	50	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 Voltage	-	V _R	-	-	5	V
Reverse Input Current	V _R =5V	I _R	-	-	10	μA

¹ Load current derates linearly from 300mA @ 25°C to 100mA @ 110°C.

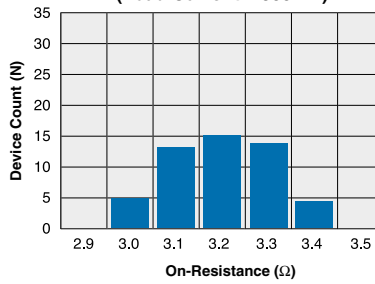
² Measurement taken within 1 second of on time.

PERFORMANCE DATA*

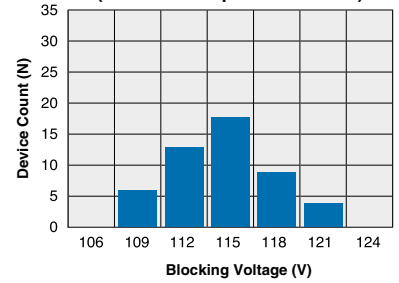
CPC1004N
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
 $I_F = 5\text{mA}$



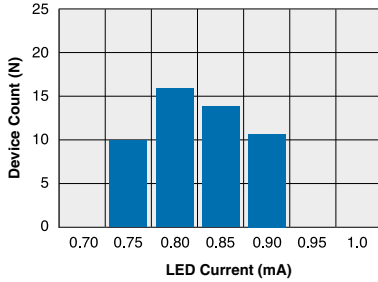
CPC1004N
Typical On-Resistance Distribution
(Ambient Temperature = 25°C)
(Load Current = 300mA)



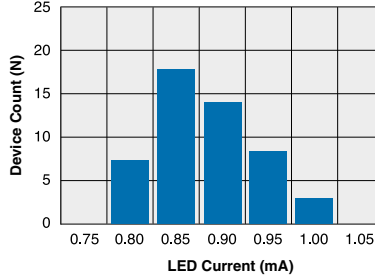
CPC1004N
Typical Blocking Voltage Distribution
(Ambient Temperature = 25°C)



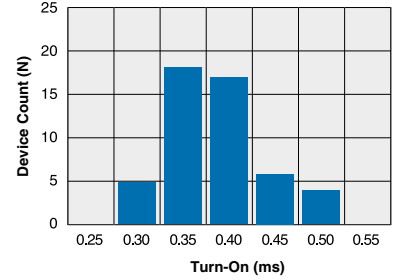
CPC1004N
Typical I_F for Switch Operation
(Ambient Temperature = 25°C)
(Load Current = 300mA)



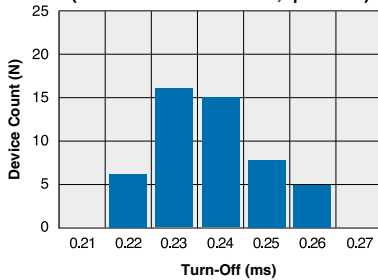
CPC1004N
Typical I_F for Switch Dropout
(Ambient Temperature = 25°C)
(Load Current = 300mA)



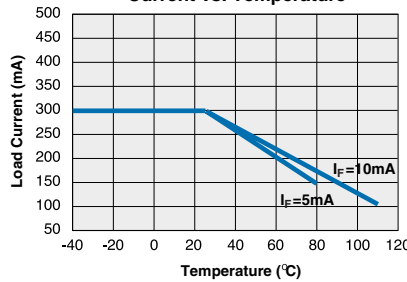
CPC1004N
Typical Turn-On Time
(Ambient Temperature = 25°C)
(Load Current = 300mA; $I_F = 5\text{mA}$)



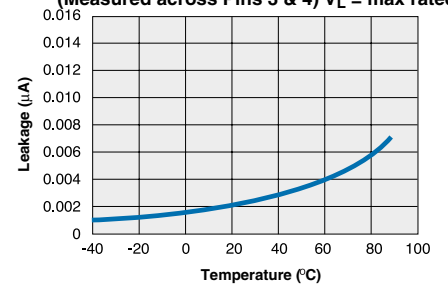
CPC1004N
Typical Turn-Off Time
(Ambient Temperature = 25°C)
(Load Current = 200mA; $I_F = 5\text{mA}$)



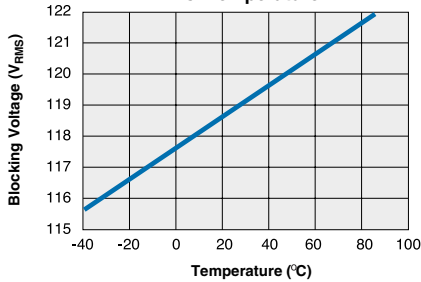
CPC1004N
Typical Maximum Load Current vs. Temperature



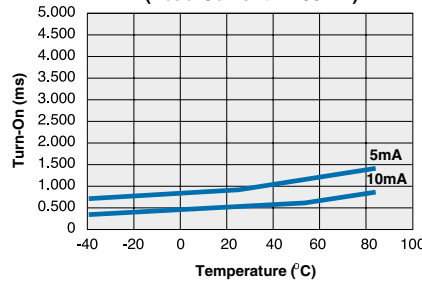
CPC1004N
Typical Leakage vs. Temperature
(Measured across Pins 3 & 4) $V_L = \text{max rated}$



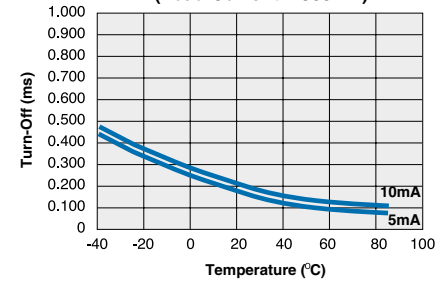
CPC1004N
Typical Blocking Voltage vs. Temperature



CPC1004N
Typical Turn-On vs. Temperature
(Load Current = 200mA)

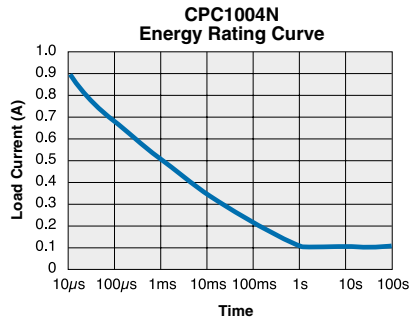
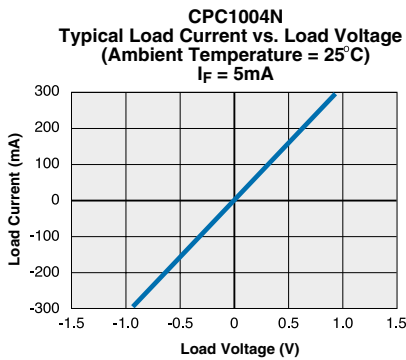
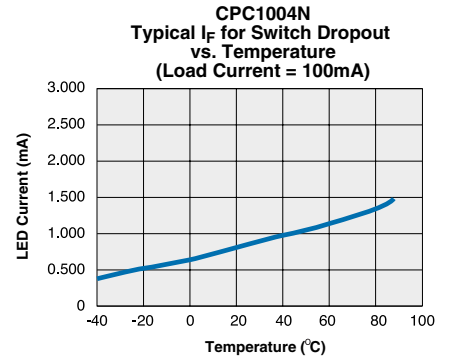
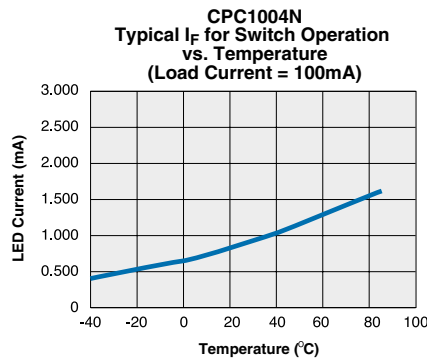
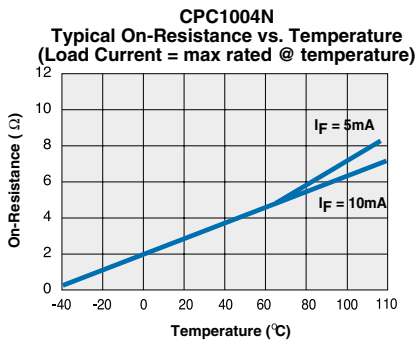
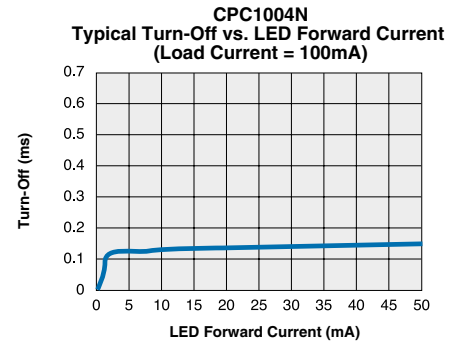
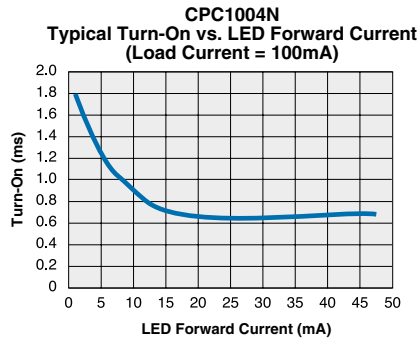
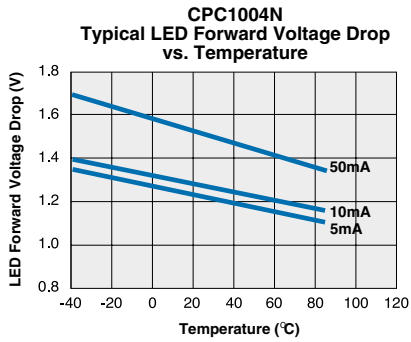


CPC1004N
Typical Turn-Off vs. Temperature
(Load Current = 300mA)



*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.

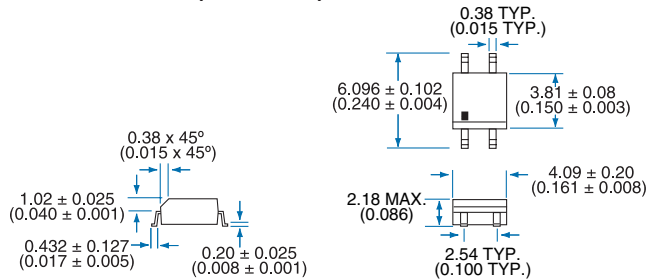


Washing

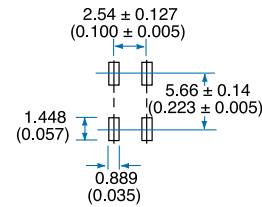
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

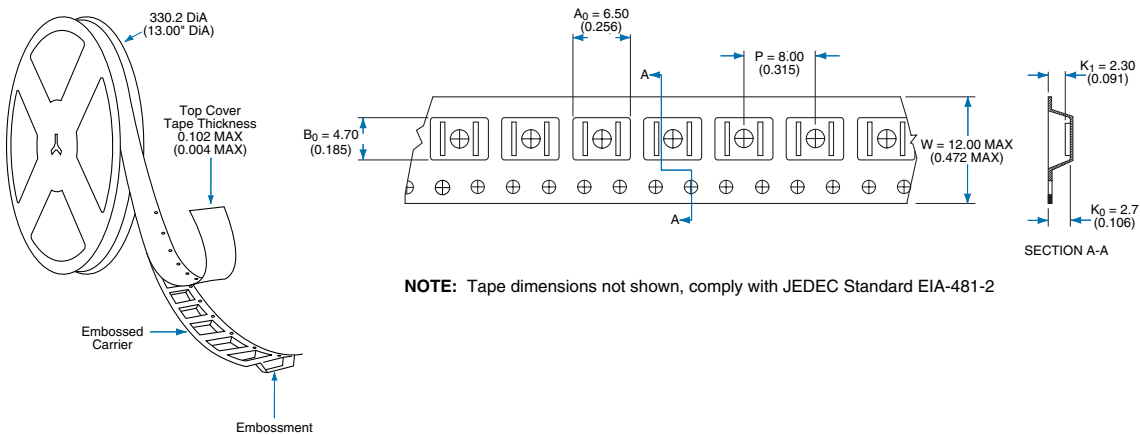
4 Pin SOIC Narrow ("N" Suffix)



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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