



Parameter	Rating	Units
Blocking Voltage	60	V _P
Load Current	400	mA
Max On-resistance	2	Ω
LED Current to operate	2	mA

Features

- Designed for use in Security Systems Complying with EN50130-4
- 1500V_{rms} Input/Output Isolation
- TTL/CMOS Compatible Input
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Immune to Radiated EM Fields
- SMD Pick & Place, Wave Solderable
- Tape & Reel Version Available
- Small 8-Pin SOIC Package

Applications

- Security
 - Passive Infrared Detectors (PIR)
 - Data Signalling
 - Sensor Circuitry
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
- Medical Equipment—Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Description

The CPC2014N is a miniature device with two independent 1-Form-A solid state relays in an 8-Pin SOIC package that employs optically coupled MOSFET technology to provide 1500V_{rms} of input/output isolation. The super efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture. The optically coupled outputs are controlled by highly efficient GaAlAs infrared LEDs. The CPC2014N uses Clare's state of the art, double-molded vertical construction packaging to produce one of the world's smallest relays. The CPC2014N offers substantial board space savings over the competitor's larger 8-Pin SOIC relay.

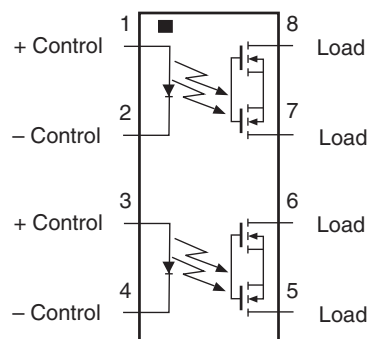
Approvals

- UL Certified Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component:
TUV Certificate B 10 05 49410 006

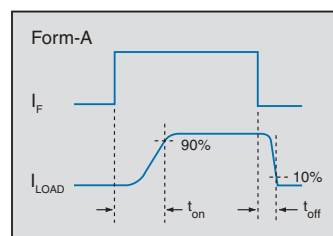
Ordering Information

Part #	Description
CPC2014N	8-Pin SOIC (50/tube)
CPC2014NTR	8-Pin SOIC (2000/reel)

Pin Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage	60	V _P
Reverse Input Voltage	5	V
Input Control Current Peak (10ms)	50	mA
	1	A
Input Power Dissipation	70	mW
Total Power Dissipation ¹	600	mW
Isolation Voltage, Input to Output	1500	V _{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate linearly 5mW / °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 @ 25°C

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current	I _F =2mA	I _L	-	-	400	mA
Continuous ¹	I _F =2mA	I _L	-	-	400	mA
Peak	t ≤ 10ms	I _{LPK}	-	-	1	A _p
On-Resistance ²	I _L =400mA	R _{ON}	-	-	2	Ω
Off-State Leakage Current	V _L =60V _P	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	t _{on}	-	0.47	2	ms
Turn-Off		t _{off}	-	0.22	1	
Output Capacitance	V _L =50V, f=1MHz	C _{OUT}	-	40	-	pF
Capacitance, Input to Output	-	-	-	1	-	pF
Input Characteristics						
Input Control Current ³	I _L =400mA	I _F	-	0.25	2	mA
Input Dropout Current	-	I _F	0.1	0.2	-	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

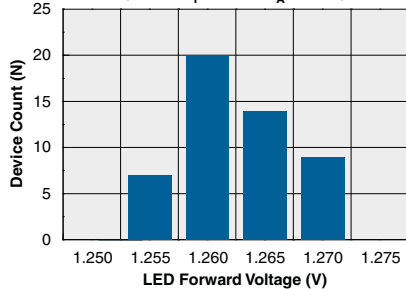
¹ Load current derates linearly from 400mA @ 25°C to 200mA @ 80°C, and must be derated for both poles operating simultaneously.

² Measurement taken within 1 second of on-time.

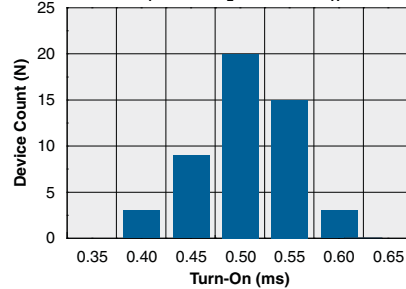
³ For applications requiring high temperature operation (greater than 60°C) a LED drive current of 4mA is recommended.

PERFORMANCE DATA*

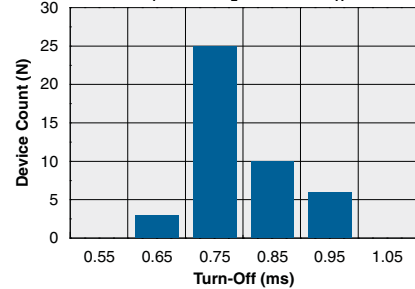
Typical LED Forward Voltage Drop
(N=50, $I_F=5\text{mA}$, $T_A=25^\circ\text{C}$)



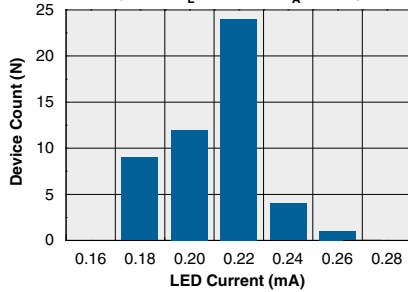
Typical Turn-On Time
(N=50, $I_F=5\text{mA}$, $I_L=100\text{mA}$, $T_A=25^\circ\text{C}$)



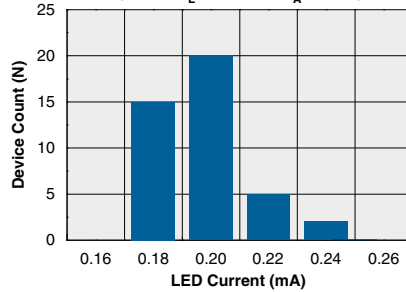
Typical Turn-Off Time
(N=50, $I_F=5\text{mA}$, $I_L=100\text{mA}$, $T_A=25^\circ\text{C}$)



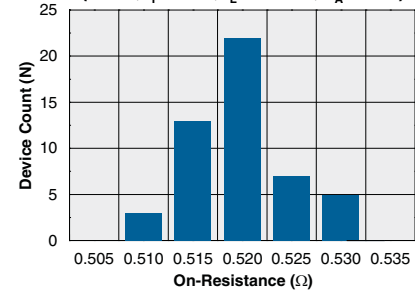
Typical I_F for Switch Operation
(N=50, $I_L=400\text{mA}$, $T_A=25^\circ\text{C}$)



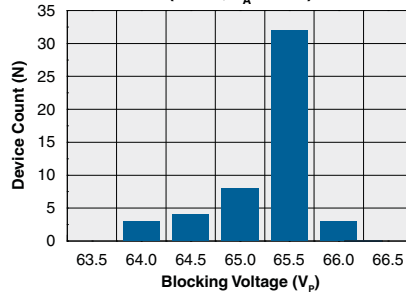
Typical I_F for Switch Dropout
(N=50, $I_L=400\text{mA}$, $T_A=25^\circ\text{C}$)



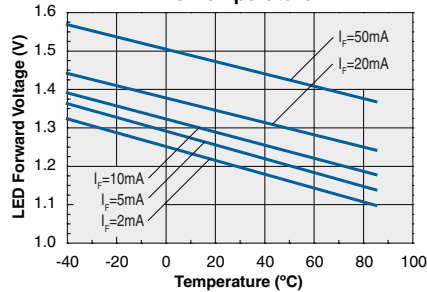
Typical On-Resistance Distribution
(N=50, $I_F=1\text{mA}$, $I_L=400\text{mA}$, $T_A=25^\circ\text{C}$)



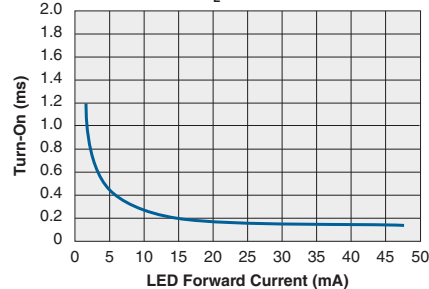
Typical Blocking Voltage Distribution
(N=50, $T_A=25^\circ\text{C}$)



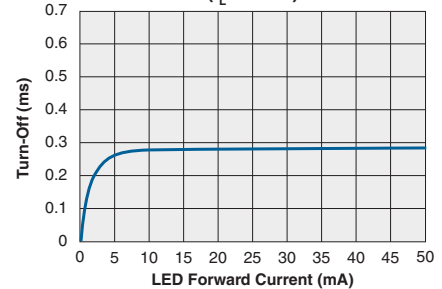
Typical LED Forward Voltage Drop vs. Temperature



Typical Turn-On vs. LED Forward Current
($I_L=80\text{mA}$)

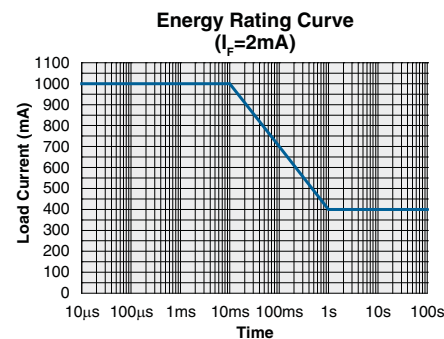
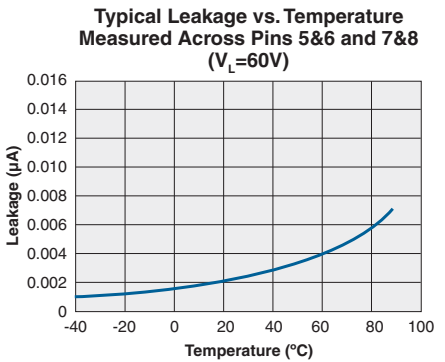
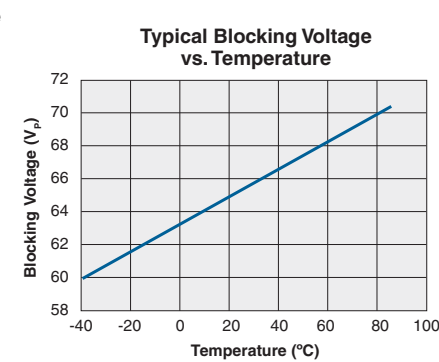
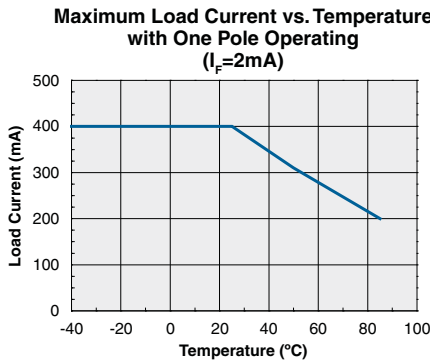
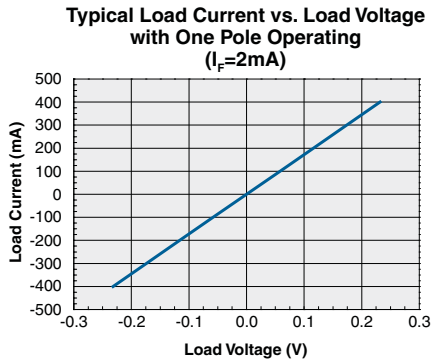
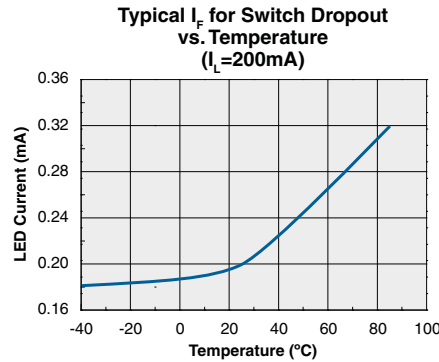
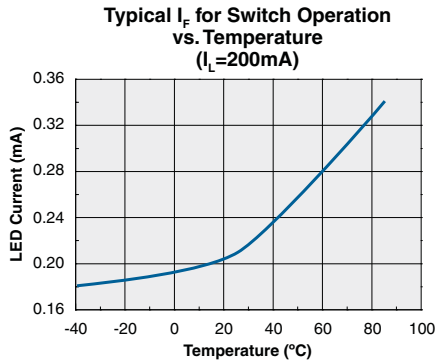
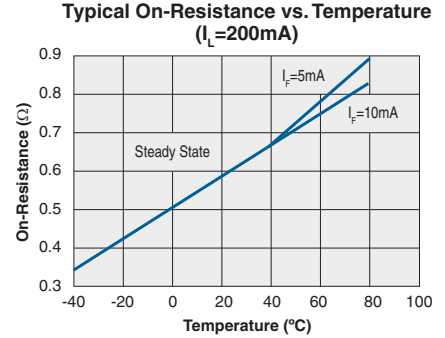
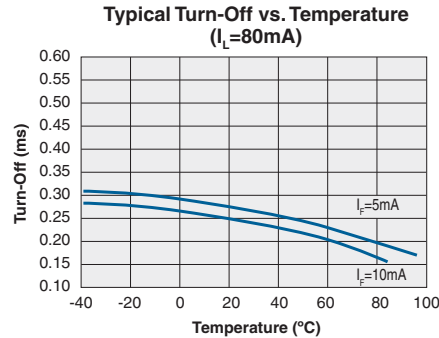
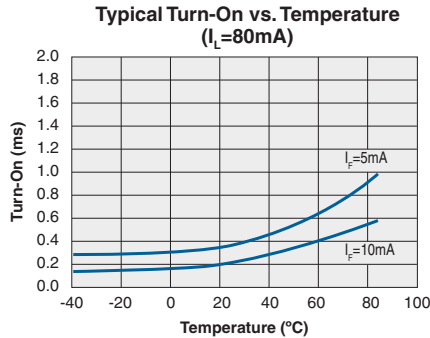


Typical Turn-Off vs. LED Forward Current
($I_L=80\text{mA}$)



*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*



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Manufacturing Information

Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. Clare classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Rating
CPC2014N	MSL 3

ESD Sensitivity



This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Reflow Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

Device	Maximum Temperature x Time
CPC2014N	260°C for 30 seconds

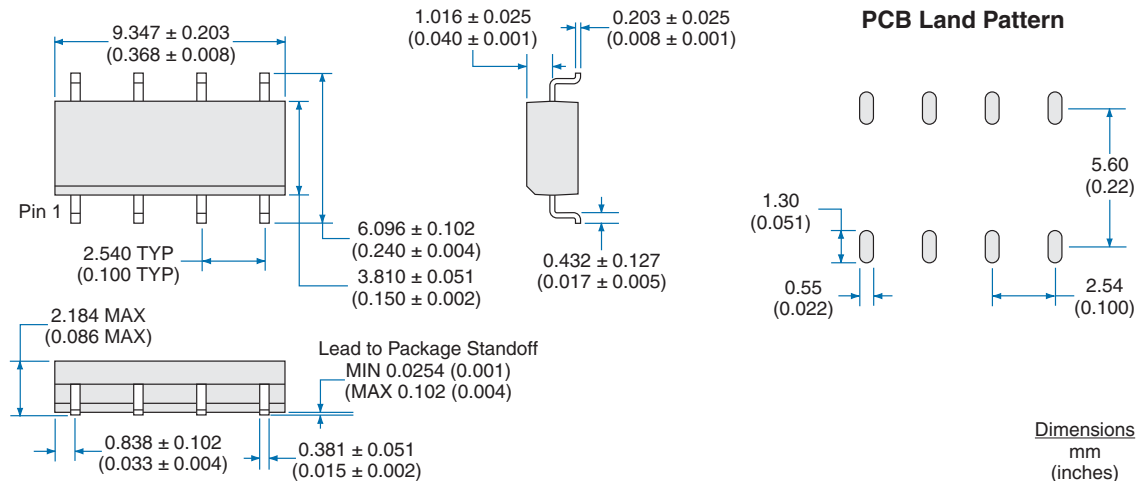
Board Wash

Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake may be necessary if a wash is used after solder reflow processes. Chlorine-based or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.

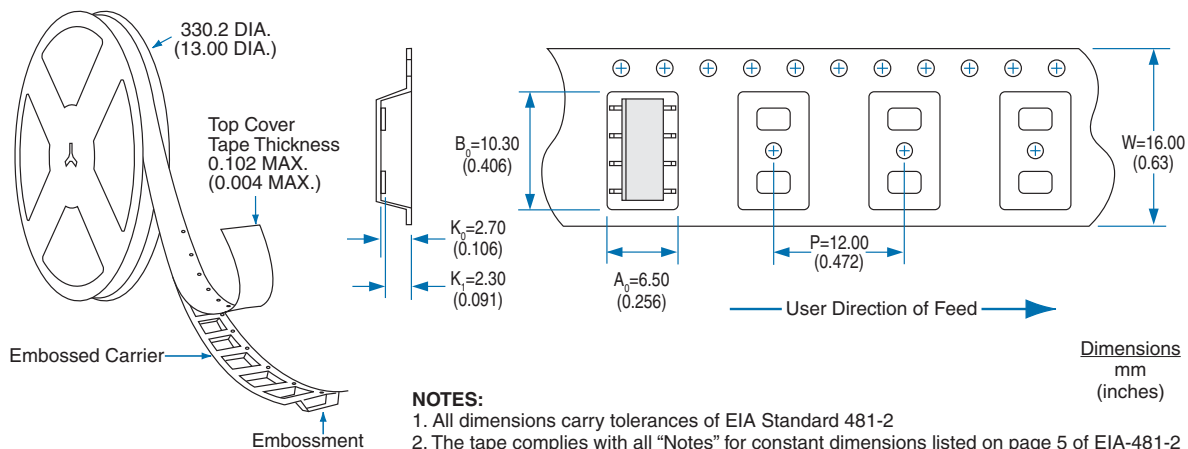


MECHANICAL DIMENSIONS

CPC2014N



CPC2014N Tape & Reel



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