



Parameter	Rating	Units
Blocking Voltage	60	V _p
Load Current	100	mA
Max On-resistance	16	Ω
LED Current to operate	1	mA

Features

- Designed for use in security systems complying with EN50130-4
- Only 1mA of LED current required to operate
- Small 4-Pin SOP Package
- TTL/CMOS Compatible input
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 1500V_{rms} Input/Output Isolation
- No EMI/RFI Generation
- Immune to radiated EM fields
- SMD Pick & Place, Wave Solderable
- Tape & Reel Version Available

Applications

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

Description

The CPC1017N is a miniature 1-Form-A (single pole, normally open) solid state relay in a 4-pin SOP 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 input is controlled by a highly efficient GaAlAs infrared LED. The CPC1017N uses Clare's state of the art double-molded vertical construction packaging to produce one of the world's smallest relays. The CPC1017N offers board space savings of at least 20% over the competitor's larger 4-pin SOP relay.

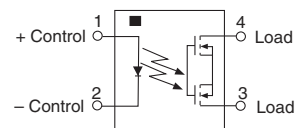
Approvals

- UL Recognized Component: File # E76270
- EN/IEC 60950-1 Compliant
- CSA Certified Component: Certificate # 1172007

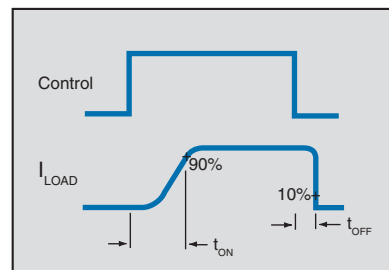
Ordering Information

Part #	Description
CPC1017N	4-Pin SOP (100/tube)
CPC1017NTR	4-Pin SOP (2000/reel)

Pin Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings

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	400	mW
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

Electrical absolute maximum ratings are at 25°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	I _F =2mA	I _L	-	-	100	mA
Peak	t=10ms	I _{LPK}	-	-	350	mA
On-Resistance ²	I _L =100mA	R _{ON}	-	-	16	Ω
Off-State Leakage Current	V _L =60V	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	t _{ON}	-	-	10	ms
Turn-Off	I _F =5mA, V _L =10V	t _{OFF}	-	-	10	ms
Output Capacitance	50V, f=1MHz	C _{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current ³	I _L =100mA	I _F	-	0.4	1	mA
Input Dropout Current	-	I _F	0.3	-	-	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
Common Characteristics @ 25°C						
Capacitance Input to Output	-	C _{I/O}	-	1	-	pF

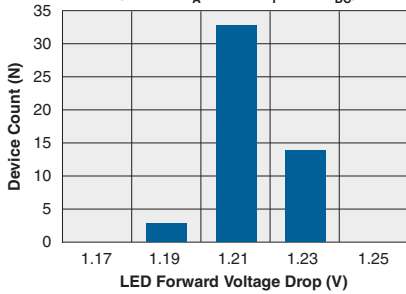
¹ Load current derates linearly from 100mA @ 25°C to 80mA @ 80°C.

² Measurement taken within 1 second of on time.

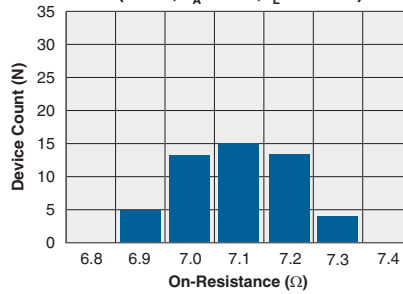
³ For applications requiring high temperature operation (greater than 60°C) an LED drive current of 3mA is recommended.

PERFORMANCE DATA*

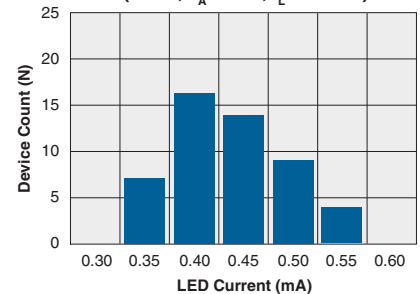
CPC1017N
Typical LED Forward Voltage Drop
(N=50, T_A=25°C, I_F=5mA_{DC})



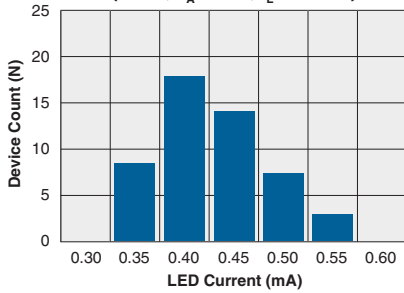
CPC1017N
Typical On-Resistance Distribution
(N=50, T_A=25°C, I_L=100mA)



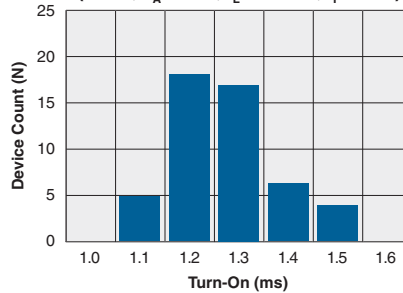
CPC1017N
Typical I_F for Switch Operation
(N=50, T_A=25°C, I_L=100mA)



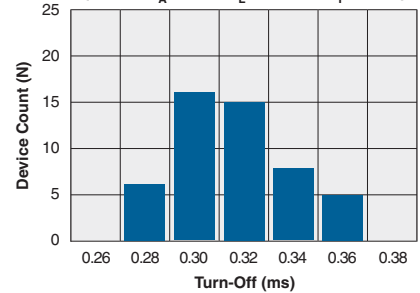
CPC1017N
Typical I_F for Switch Dropout
(N=50, T_A=25°C, I_L=100mA)



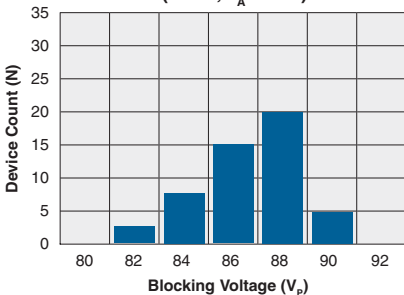
CPC1017N
Typical Turn-On Time
(N=50, T_A=25°C, I_L=100mA, I_F=5mA)



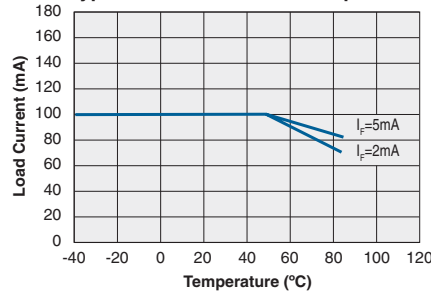
CPC1017N
Typical Turn-Off Time
(N=50, T_A=25°C, I_L=100mA, I_F=5mA)



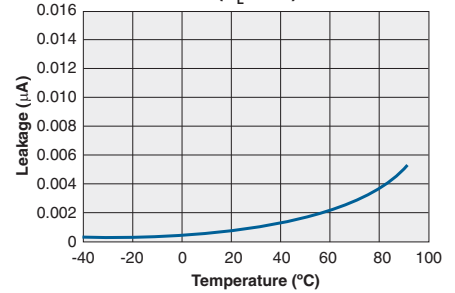
CPC1017N
Typical Blocking Voltage Distribution
(N=50, T_A=25°C)



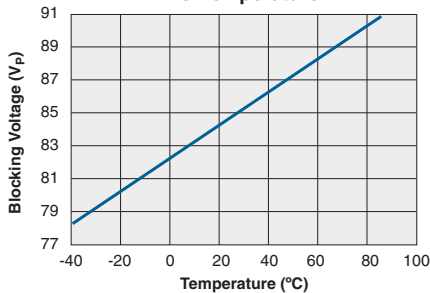
CPC1017N
Typical Load Current vs. Temperature



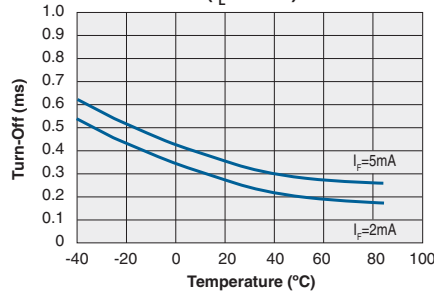
CPC1017N
Typical Leakage vs. Temperature
(Measured Across Pins 3 & 4)
(V_L=60V)



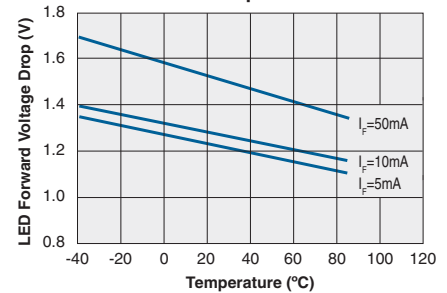
CPC1017N
Typical Blocking Voltage vs. Temperature



CPC1017N
Typical Turn-Off vs. Temperature
(I_L=50mA)

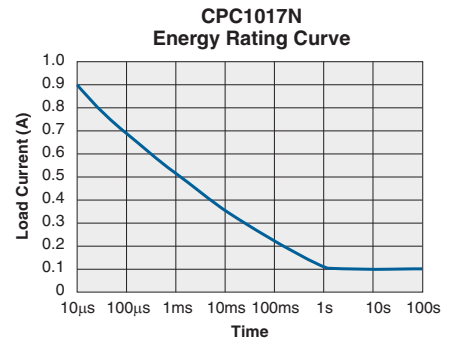
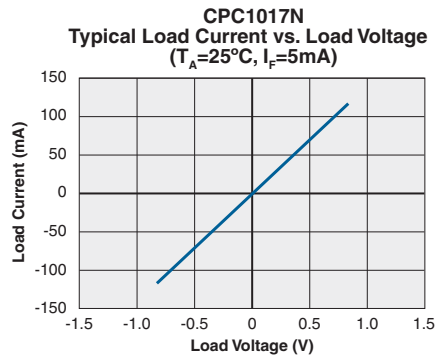
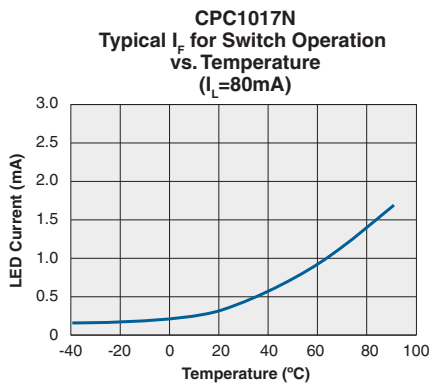
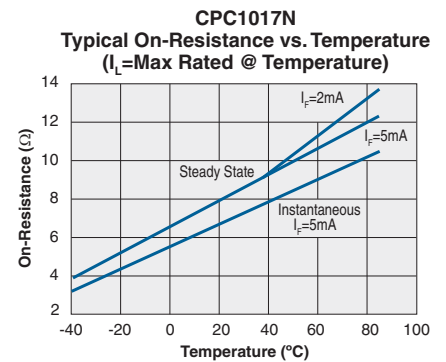
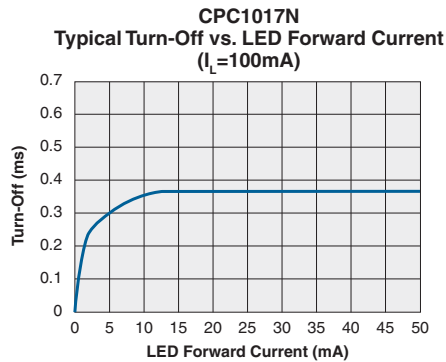
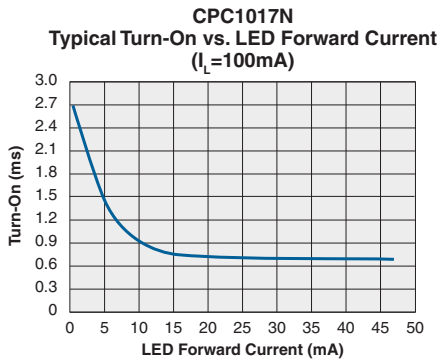


CPC1017N
Typical LED Forward Voltage Drop vs. Temperature



*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

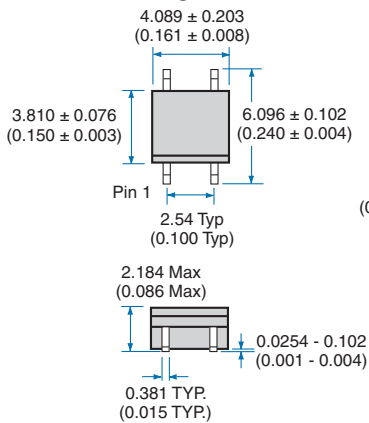
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

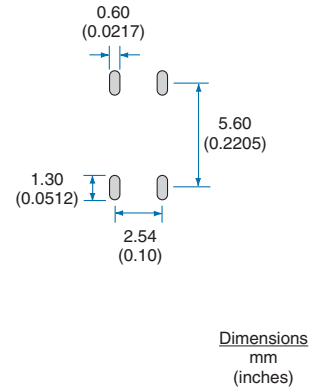
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

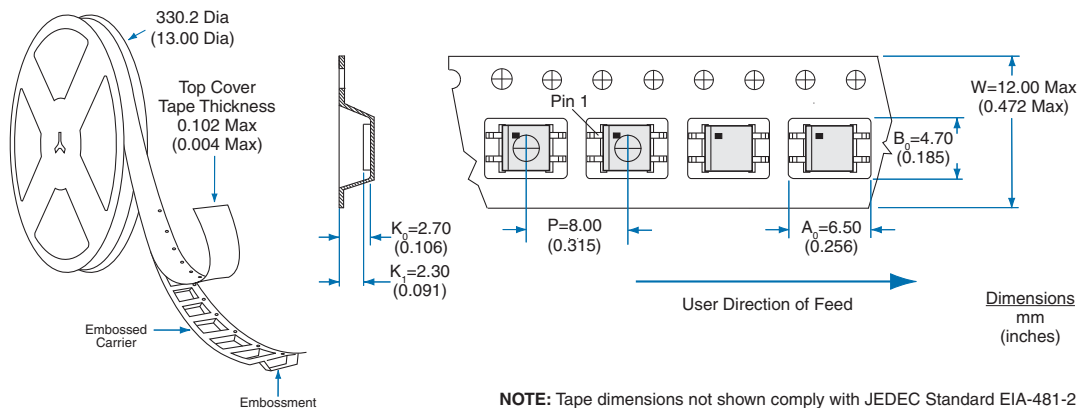
4-Pin SOP Package



Recommended PCB Land Pattern



Tape and Reel Packaging for 4-Pin SOP Package



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

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