



| | CPC1018N | Units |
|------------------------|----------|----------|
| Blocking Voltage | 60 | V |
| Load Current | 600 | mA |
| Max On-resistance | 0.8 | Ω |
| LED Current to operate | 1.0 | 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 CPC1018N is a miniature 1-Form-A solid state relay in a 4-Pin SOP package that employs optically coupled MOSFET technology to provide 1500V_{rms} of input to 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 CPC1018N uses Clare's state of the art double molded vertical construction packaging to produce the world's smallest relay. The CPC1018N offers board space savings of at least 20% over the competitor's larger 4-Pin SOP relay. It boasts the industries' lowest input current to operate in its class.

Approvals

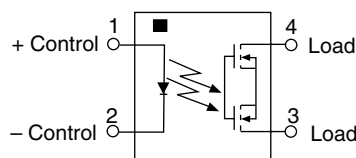
- UL recognized file #E76270
- Certified to EN60950

Ordering Information

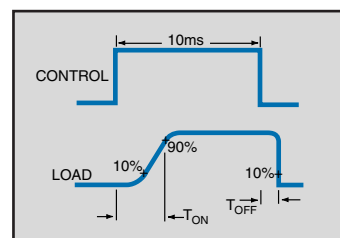
| Part # | Description |
|------------|-----------------------|
| CPC1018N | 4-Pin SOP (100/tube) |
| CPC1018NTR | 4-Pin SOP (2000/reel) |

Pin Configuration

CPC1018N Pinout



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings (@ 25°C)

| Parameter | Ratings | Units |
|--------------------------------------|-------------|------------------|
| Blocking Voltage | 60 | V |
| 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

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 ¹ | I _F =2mA, Continuous | I _L | - | - | 600 | mA |
| Peak Load Current | 10ms | I _{LPK} | - | - | 1.0 | A _{rms} |
| On-Resistance ² | I _L =100mA | R _{ON} | - | - | 0.8 | Ω |
| Off-State Leakage Current | V _L =60V | I _{LEAK} | - | - | 1 | μA |
| Switching Speeds | I _F =5mA, V _L =10V | T _{ON} | - | - | 3 | ms |
| | | | | | | |
| Turn-Off | I _F =5mA, V _L =10V | T _{OFF} | - | - | 2 | ms |
| Output Capacitance | 50V; f=1MHz | C _{OUT} | - | 25 | - | pF |
| Capacitance Input to Output | - | - | - | 1 | - | pF |
| Input Characteristics @ 25°C | | | | | | |
| Input Control Current ³ | I _L =600mA | I _F | 1.0 | - | - | 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 Current | V _R =5V | I _R | - | - | 10 | μA |

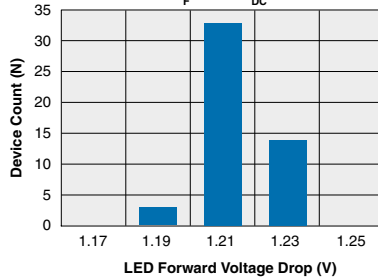
¹ Load current derates linearly from 600mA @ 25°C to 480mA @ 80°C.

² Measurement taken within 1 second of on time.

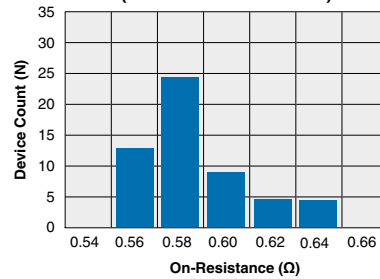
³ For applications requiring high temperature operation (greater than 60°C) an LED drive current of 3mA is recommended.

PERFORMANCE DATA*

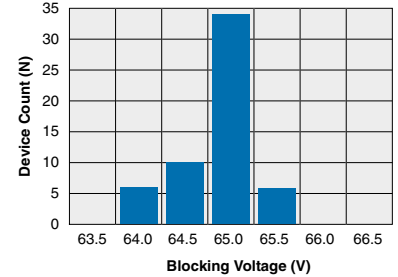
CPC1018N
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
 $I_F = 5\text{mA}_{DC}$



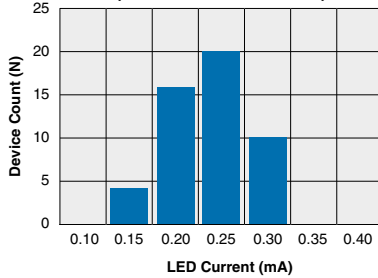
CPC1018N
Typical On-Resistance Distribution
(Ambient Temperature = 25°C)
(Load Current = 100mA)



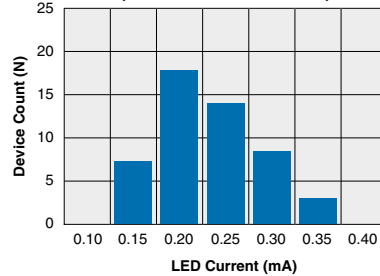
CPC1018N
Typical Blocking Voltage Distribution
(Ambient Temperature = 25°C)



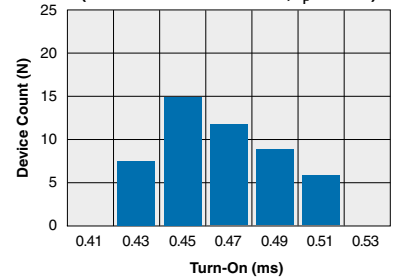
CPC1018N
Typical I_F for Switch Operation
(Ambient Temperature = 25°C)
(Load Current = 600mA)



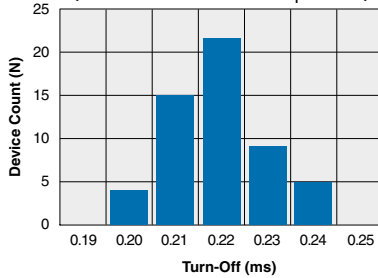
CPC1018N
Typical I_F for Switch Dropout
(Ambient Temperature = 25°C)
(Load Current = 100mA)



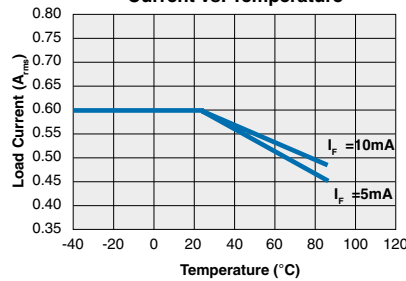
CPC1018N
Typical Turn-On Time
(Ambient Temperature = 25°C)
(Load Current = 100mA; $I_F = 5\text{mA}$)



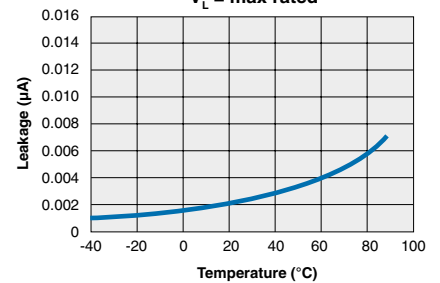
CPC1018N
Typical Turn-Off Time
(Ambient Temperature = 25°C)
(Load Current = 100mA; $I_F = 5\text{mA}$)



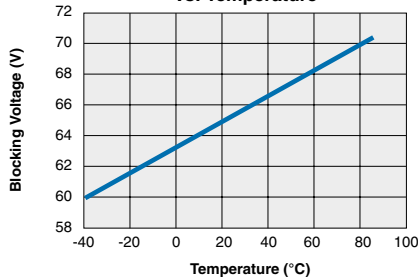
CPC1018N
Typical Maximum Load
Current vs. Temperature



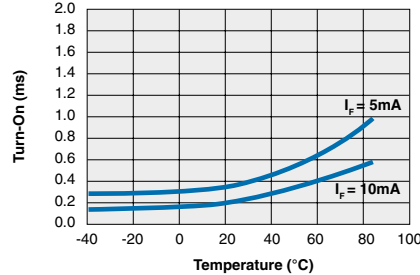
CPC1018N
Typical Leakage vs. Temperature
(Measured across Pins 3 & 4)
 $V_L = \text{max rated}$



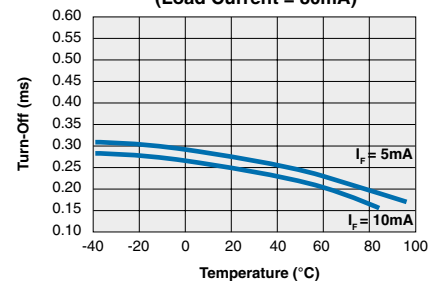
CPC1018N
Typical Blocking Voltage
vs. Temperature



CPC1018N
Typical Turn-On vs. Temperature
(Load Current = 80mA)

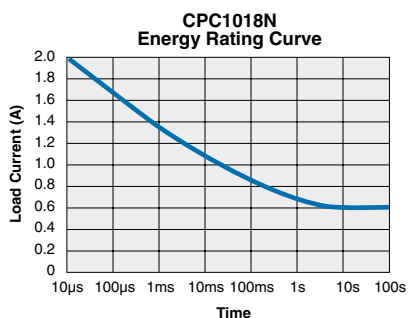
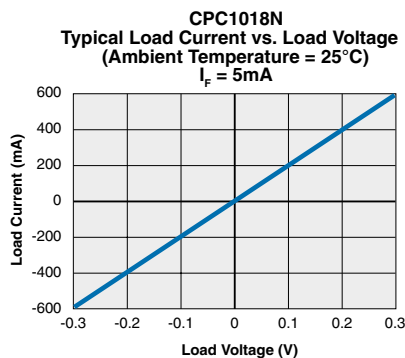
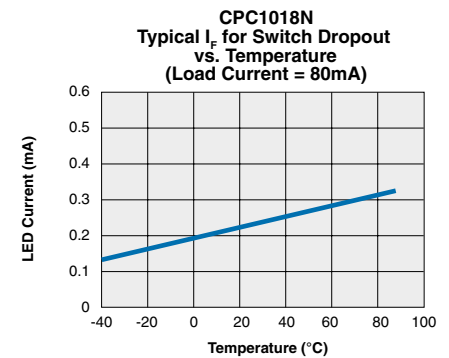
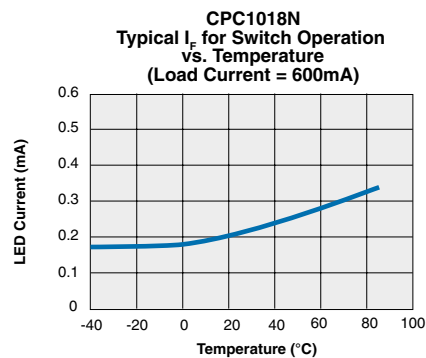
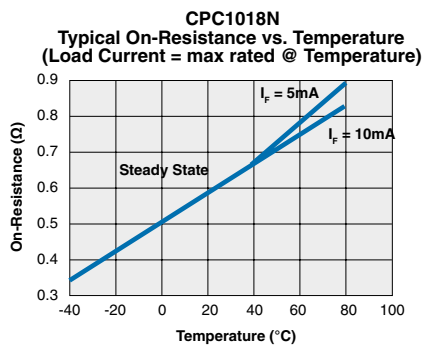
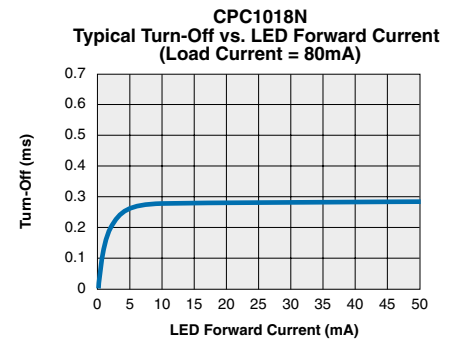
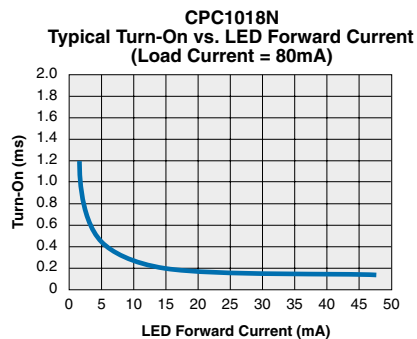
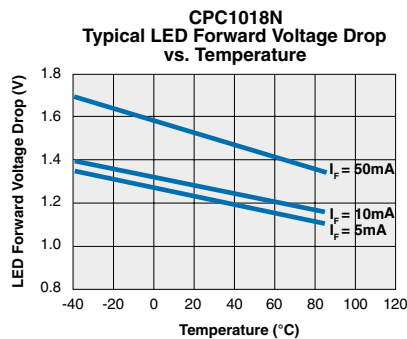


CPC1018N
Typical Turn-Off vs. Temperature
(Load Current = 80mA)



*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.

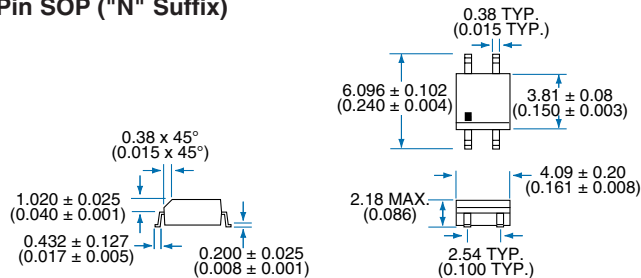


Washing

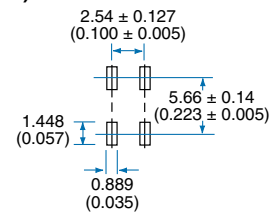
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

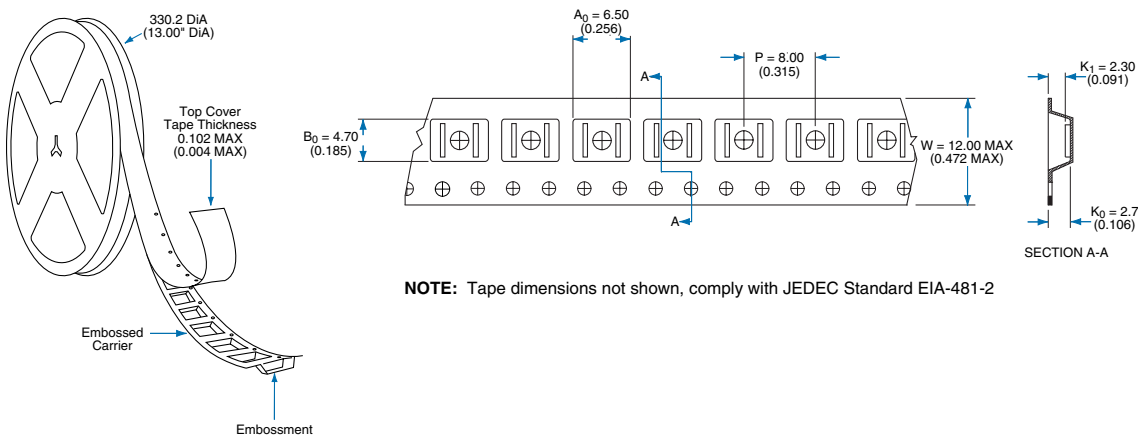
4-Pin SOP ("N" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 4-pin SOP package



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

Dimensions:
mm
(inches)

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9/8/05