IXYS
INTEGRATED CIRCUITS DIVISION


# CPC2017N
# Dual Normally Open 8-Pin SOIC OptoMOS® Relay

| Parameter | Rating | Units |
|---|---|---|
| Blocking Voltage | 60 | $V_P$ |
| Load Current | 120 | $mA_{rms}$ / $mA_{DC}$ |
| On-Resistance (max) | 16 | Ω |
| LED Current to operate | 1 | mA |

## Features
- Designed for use in Security Systems Complying with EN50130-4
- 1500$V_{rms}$ 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 CPC2017N 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 1500$V_{rms}$ of input/output isolation.

Optically coupled outputs that use the patented OptoMOS architecture are controlled by a highly efficient GaAlAs infrared LED.

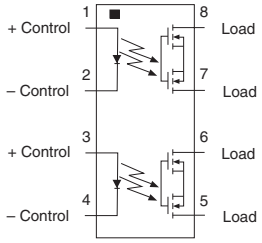
The CPC2017N uses IXYS Integrated Circuits Division's state of the art, double-molded, vertical construction packaging to produce one of the world's smallest relays. The CPC2017N offers substantial board space savings over the competitor's larger 8-Pin SOIC relay.

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

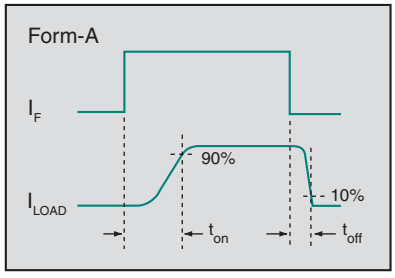
## Ordering Information

| Part # | Description |
|---|---|
| CPC2017N | 8-Pin SOIC (50/tube) |
| CPC2017NTR | 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 | 50 | mA |
| Peak (10ms) | 1 | A |
| 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.*

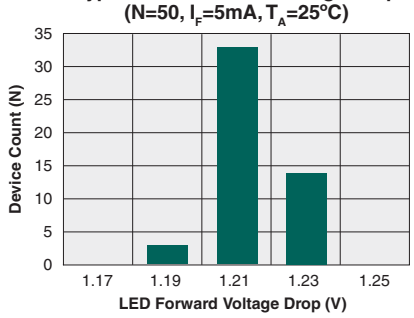
## Electrical Characteristics @ 25°C

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Output Characteristics** | | | | | | |
| Load Current | | | | | | |
| Continuous [1] | $I_F$=1mA | $I_L$ | - | - | 120 | $mA_{rms}$ / $mA_{DC}$ |
| Peak | t =10ms | $I_{LPK}$ | - | - | ±350 | $mA_P$ |
| On-Resistance [2] | $I_L$=120mA | $R_{ON}$ | - | 7.1 | 16 | Ω |
| Off-State Leakage Current | $V_L$=60$V_P$ | $I_{LEAK}$ | - | - | 1 | µA |
| Switching Speeds | | | | | | |
| Turn-On | $I_F$=5mA, $V_L$=10V | $t_{on}$ | - | 1.25 | 3 | ms |
| Turn-Off | | $t_{off}$ | - | 0.45 | 3 | |
| Output Capacitance | $V_L$=50V, f=1MHz | $C_{OUT}$ | - | 25 | - | pF |
| Capacitance Input to Output | - | - | - | 1 | - | pF |
| **Input Characteristics** | | | | | | |
| Input Control Current to Activate [3] | $I_L$=120mA | $I_F$ | - | 0.40 | 1 | mA |
| Input Control Current to Deactivate | - | $I_F$ | 0.1 | 0.35 | - | 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 |

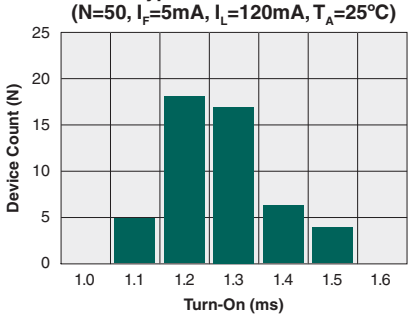
[1] Load current derates linearly from 120mA @ 25ºC to 60mA @80ºC, and must be derated for both poles operating simultaneously.
[2] Measurement taken within 1 second of on-time.
[3] For applications requiring high temperature operation (greater than 60ºC) a LED drive current of 3mA is recommended.

## PERFORMANCE DATA*

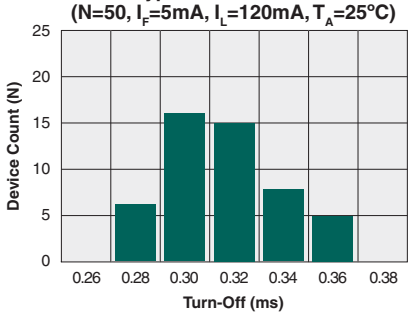
**Typical LED Forward Voltage Drop (N=50, $I_F$=5mA, $T_A$=25°C)**



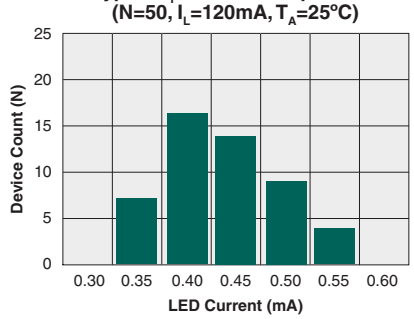

**Typical Turn-On Time (N=50, $I_F$=5mA, $I_L$=120mA, $T_A$=25°C)**



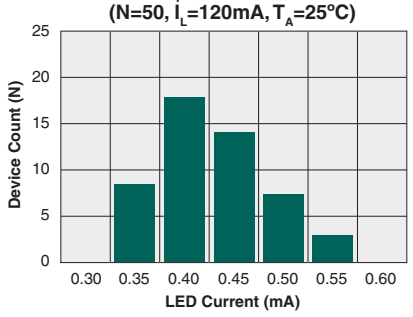

**Typical Turn-Off Time (N=50, $I_F$=5mA, $I_L$=120mA, $T_A$=25°C)**



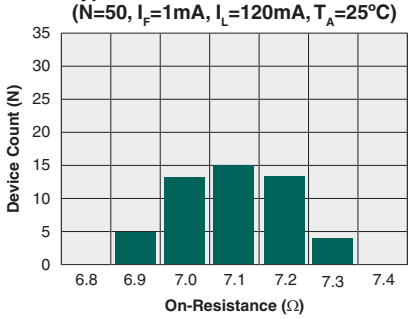

**Typical $I_F$ for Switch Operation (N=50, $I_L$=120mA, $T_A$=25°C)**



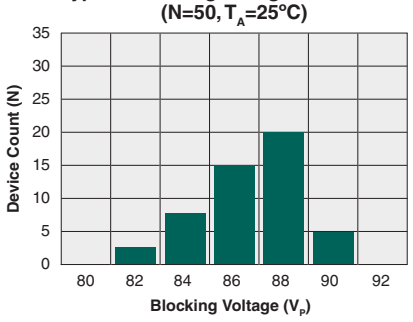

**Typical $I_F$ for Switch Dropout (N=50, $I_L$=120mA, $T_A$=25°C)**



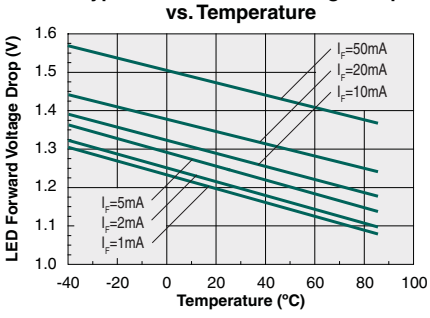

**Typical On-Resistance Distribution (N=50, $I_F$=1mA, $I_L$=120mA, $T_A$=25°C)**



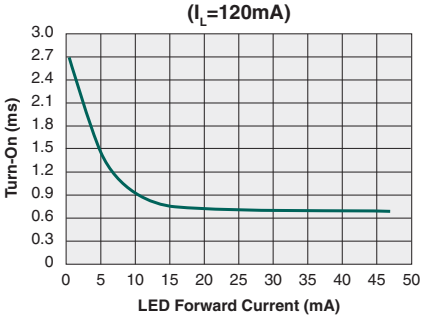

**Typical Blocking Voltage Distribution (N=50, $T_A$=25°C)**



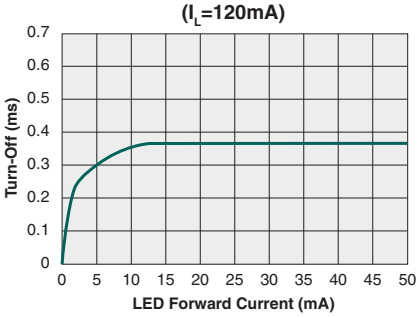

**Typical LED Forward Voltage Drop vs. Temperature**




**Typical Turn-On vs. LED Forward Current ($I_L$=120mA)**



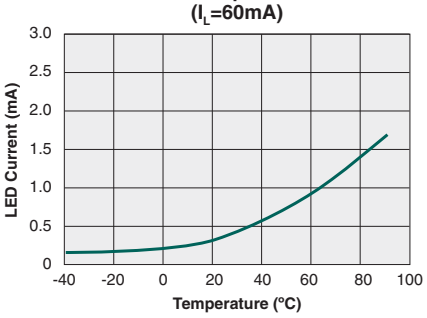

**Typical Turn-Off vs. LED Forward Current ($I_L$=120mA)**



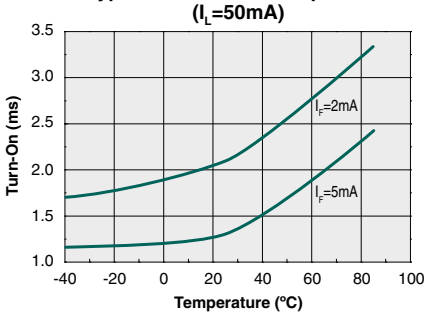

*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## PERFORMANCE DATA*

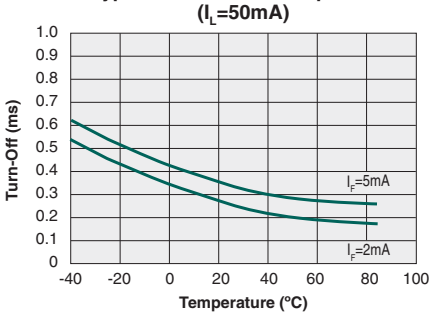
Typical $I_F$ for Switch Operation vs. Temperature ($I_L$=60mA)



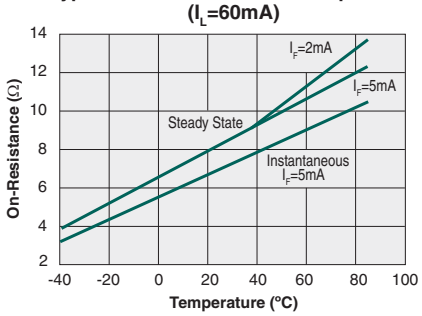

Typical Turn-On vs. Temperature ($I_L$=50mA)



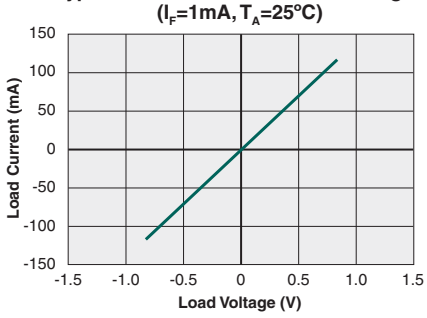

Typical Turn-Off vs. Temperature ($I_L$=50mA)



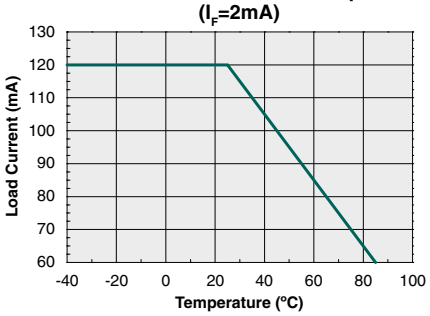

Typical On-Resistance vs. Temperature ($I_L$=60mA)



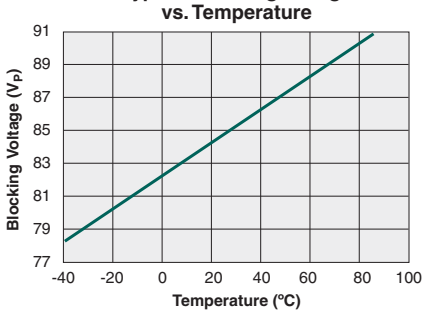

Typical Load Current vs. Load Voltage ($I_F$=1mA, $T_A$=25°C)



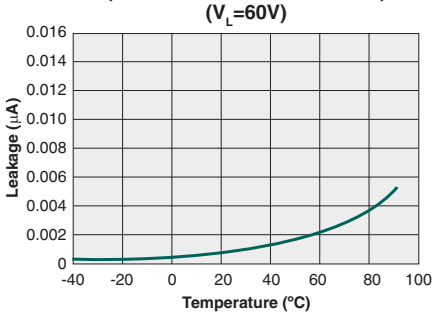

Maximum Load Current vs. Temperature ($I_F$=2mA)



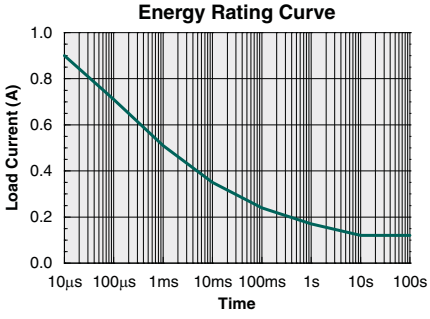

Typical Blocking Voltage vs. Temperature




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




Energy Rating Curve




*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

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. IXYS Integrated Circuits Division 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 |
|---|---|
| CPC2017N | 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.

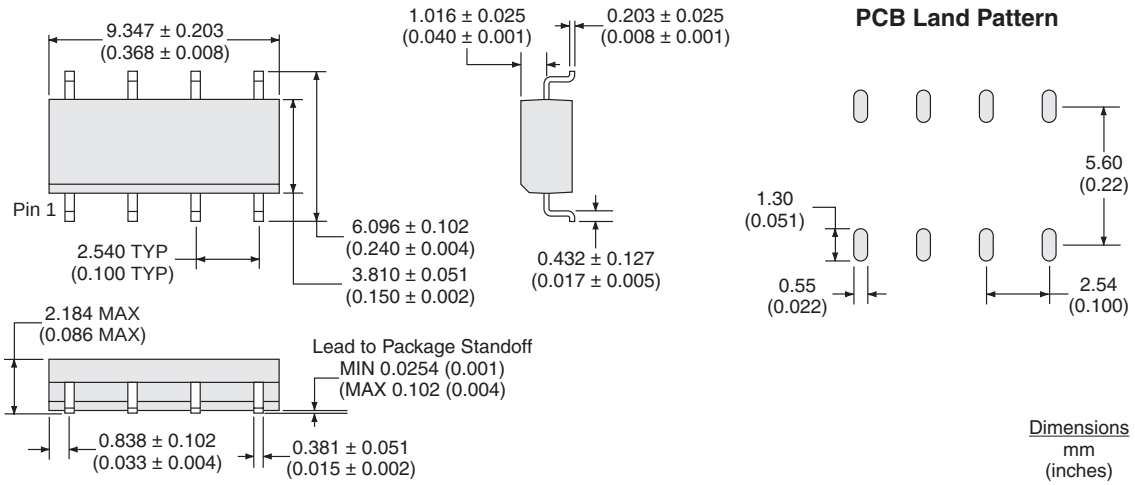
| Device | Maximum Temperature x Time |
|---|---|
| CPC2017N | 260°C for 30 seconds |

### Board Wash

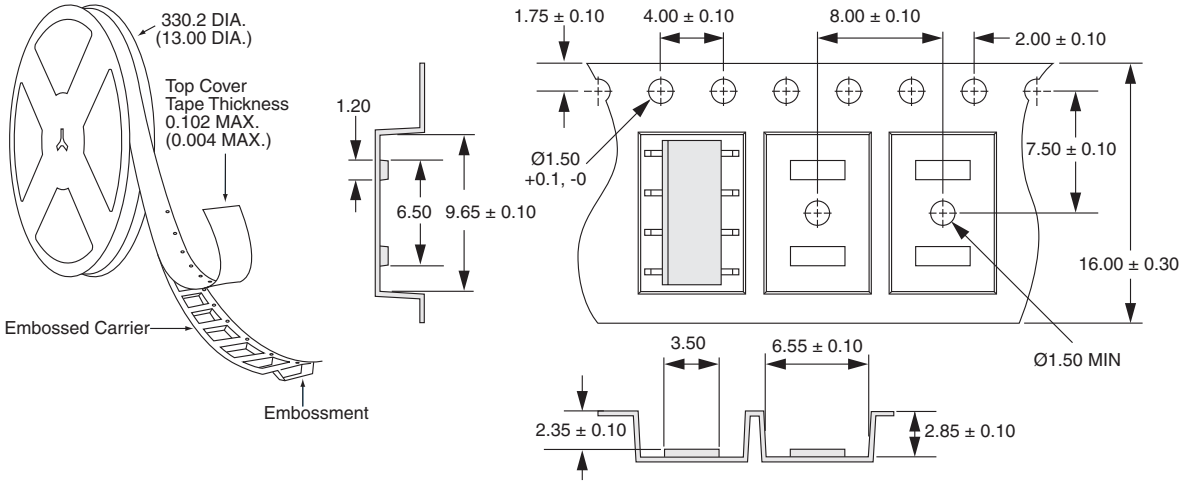
IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a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

# MECHANICAL DIMENSIONS

## CPC2017N




## CPC2017N Tape & Reel




NOTES:
1. All dimensions in millimeters
2. 10 sprocket hole pitch cumulative tolerance ± 0.20.
3. Carrier camber is within 1mm in 250mm.
4. Tape material : Black Conductive Polystyrene Alloy.
5. All dimensions meet EIA-481-C requirements.
6. Thickness : 0.30 ± 0.05mm.
7. Component load per 13" reel : 2000 pcs.

**For additional information please visit our website at: www.ixysic.com**



Specification: DS-CPC2017N-R03

12/17/2012

# Mouser Electronics

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