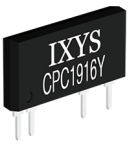
IXYS
INTEGRATED CIRCUITS DIVISION




# CPC1916Y
# 100V, 2.5$A_{rms}$/$A_{DC}$ Single-Pole Normally Open Power SIP Relay

| Parameter | Rating | Units |
|---|---|---|
| Blocking Voltage | 100 | $V_P$ |
| Load Current | 2.5 | $A_{rms}$ / $A_{DC}$ |
| On-Resistance (max) | 0.34 | Ω |

## Features

- Handle Load Currents Up to 2.5$A_{DC}$/$A_{rms}$
- 2500$V_{rms}$ Input/Output Isolation
- Power SIP Package
- High Reliability
- Low Drive Power Requirements
- No EMI/RFI Generation
- Flammability Rating UL 94 V-0

## Applications

- Industrial Controls
- Motor Control
- Robotics
- Medical Equipment—Patient/Equipment Isolation
- Instrumentation
- Multiplexers
- Data Acquisition
- Electronic Switching
- I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- IC Equipment
- Home Appliances

## Description

IXYS Integrated Circuits brings OptoMOS® technology, reliability, and compact size to a new family of high-power, solid state relays. As part of that family, the CPC1916Y is a single-pole, normally open (1-Form-A) solid state relay.

The CPC1916Y employs optically coupled MOSFET technology to provide 2500$V_{rms}$ of input to output isolation. The optically coupled outputs, that use patented OptoMOS architecture, are controlled by a highly efficient infrared LED. The combination of low on-resistance and high load-current handling capabilities makes the relay suitable for a variety of high-performance switching applications.

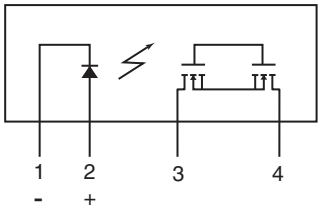
## Approvals

- UL 508 Certified Component: File E69938
- CSA Certified Component: Certificate 1172007

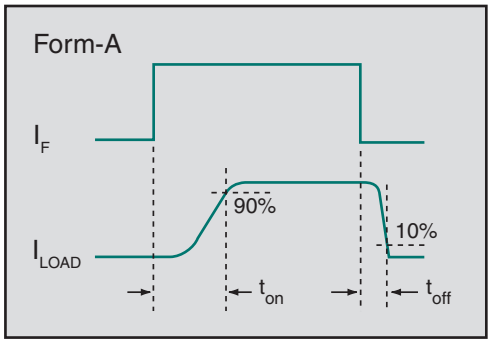
## Ordering Information

| Part # | Description |
|---|---|
| CPC1916Y | 4-Pin (8-Pin Body) Power SIP Package (25 per tube) |

## Pin Configuration




**Switching Characteristics of Normally Open Devices**



## Absolute Maximum Ratings @ 25ºC

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Blocking Voltage | $V_L$ | 100 | $V_P$ |
| Reverse Input Voltage | $V_R$ | 5 | V |
| Input control Current | $I_F$ | 50 | mA |
| Peak (10ms) | | 1 | A |
| Input Power Dissipation [1] | $P_{IN}$ | 150 | mW |
| Total Power Dissipation [2] | $P_T$ | 2400 | mW |
| Isolation Voltage, Input to Output | $V_{ISO}$ | 2500 | $V_{rms}$ |
| Operational Temperature, Ambient | $T_A$ | -40 to +85 | °C |
| Storage Temperature | $T_{STG}$ | -40 to +125 | °C |

[1] Derate linearly 1.33 mW / ºC
[2] Derate output power linearly 20 mW / ºC

*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.*

*Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.*

## Electrical Characteristics @ 25ºC

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Output Characteristics** | | | | | | |
| Blocking Voltage | $I_L$=1µA | $V_{DRM}$ | 100 | - | - | V |
| Load Current | $I_F$=10mA, Free Air | | | | | |
| Continuous | - | $I_L$ | - | - | 2.5 | $A_{rms}$ / $A_{DC}$ |
| Peak | t ≤ 10ms | $I_{LPK}$ | - | - | ±6 | $A_P$ |
| On-Resistance [1] | $I_L$=1A | $R_{ON}$ | - | - | 0.34 | Ω |
| Off-State Leakage Current | $V_L$=100$V_P$ | $I_{LEAK}$ | - | - | 1 | µA |
| Switching Speeds | | | | | | |
| Turn-On | $I_F$=10mA, $V_L$=10V | $t_{on}$ | - | - | 5 | ms |
| Turn-Off | | $t_{off}$ | - | - | 3 | |
| **Input Characteristics** | | | | | | |
| Input Control Current to Activate | $I_L$=1A | $I_F$ | - | 3.3 | 10 | mA |
| Input Control Current to Deactivate | - | $I_F$ | 0.3 | - | - | mA |
| Input Voltage Drop | $I_F$=10mA | $V_F$ | 0.9 | 1.42 | 1.56 | V |
| Reverse Input Current | $V_R$=5V | $I_R$ | - | - | 10 | µA |
| **Common Characteristics** | | | | | | |
| Capacitance, Input/Output | $V_{IO}$=0V, f=1MHz | $C_{IO}$ | - | 2 | - | pF |

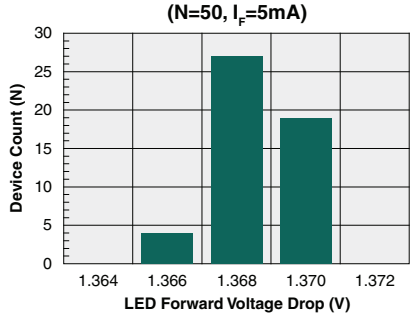
[1] Measurement taken within 1 second of on-time.

## Thermal Characteristics

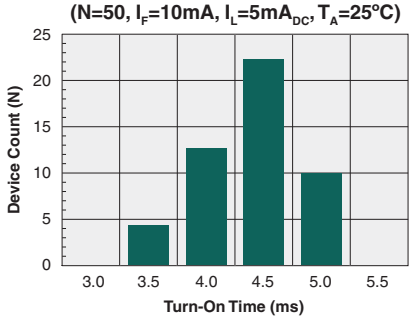
| Parameter | Conditions | Symbol | Rating | Units |
|---|---|---|---|---|
| Thermal Impedance (junction to case) | - | $\theta_{JC}$ | 1.5 | °C/W |

## PERFORMANCE DATA*

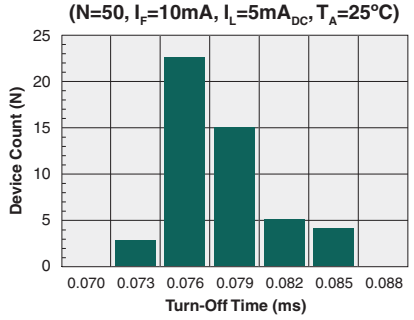
**Typical LED Forward Voltage Drop (N=50, $I_F$=5mA)**



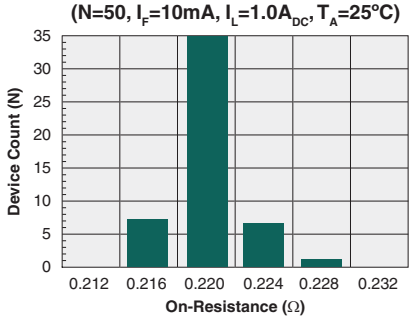

**Typical Turn-On Time (N=50, $I_F$=10mA, $I_L$=5mA$_{DC}$, $T_A$=25°C)**



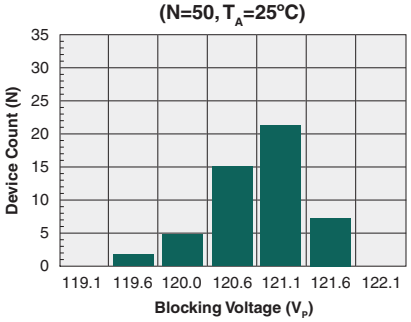

**Typical Turn-Off Time (N=50, $I_F$=10mA, $I_L$=5mA$_{DC}$, $T_A$=25°C)**



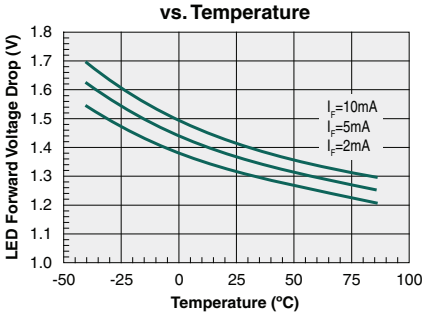

**Typical On-Resistance Distribution (N=50, $I_F$=10mA, $I_L$=1.0A$_{DC}$, $T_A$=25°C)**



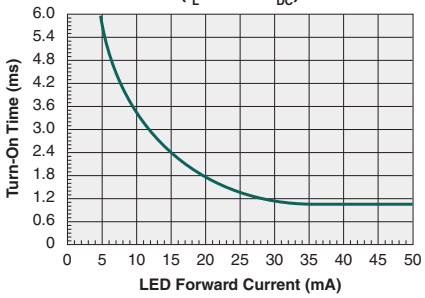

**Typical Blocking Voltage Distribution (N=50, $T_A$=25°C)**



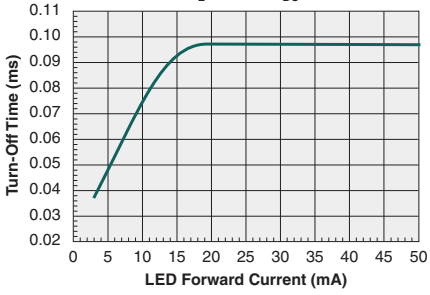

**Typical LED Forward Voltage Drop vs. Temperature**



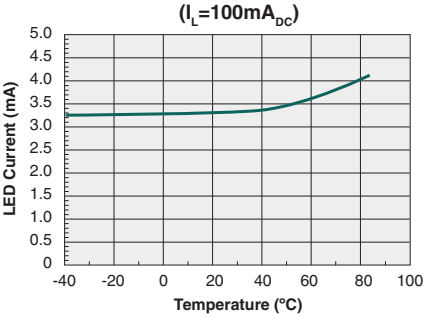

**Typical Turn-On Time vs. LED Forward Current ($I_L$=100mA$_{DC}$)**



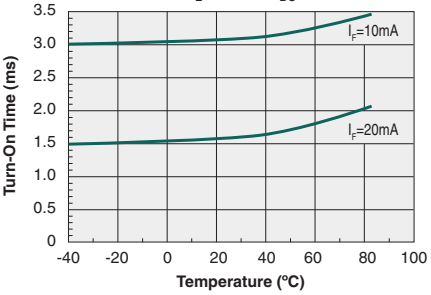

**Typical Turn-Off Time vs. LED Forward Current ($I_L$=100mA$_{DC}$)**



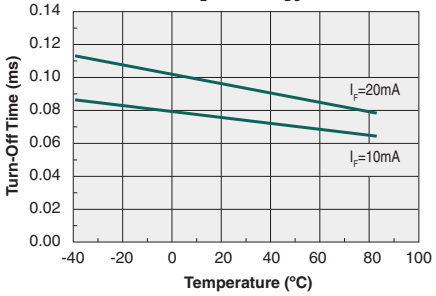

**Typical $I_F$ for Switch Operation vs. Temperature ($I_L$=100mA$_{DC}$)**




**Typical Turn-On Time vs. Temperature ($I_L$=100mA$_{DC}$)**



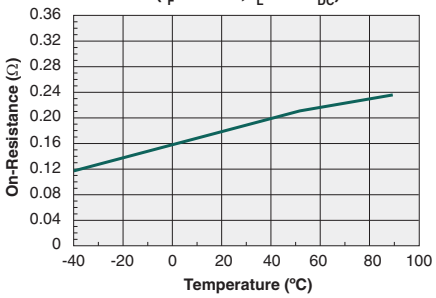

**Typical Turn-Off Time vs. Temperature ($I_L$=100mA$_{DC}$)**



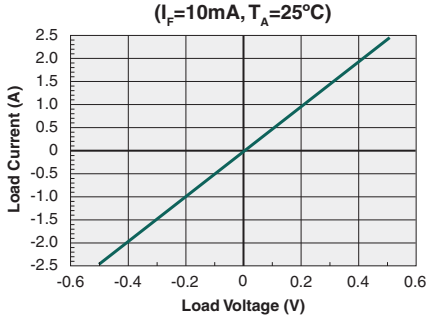

*Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.

## PERFORMANCE DATA*

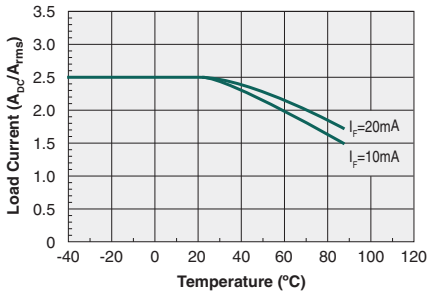
**Typical On-Resistance vs. Temperature ($I_F$=10mA, $I_L$=1.0$A_{DC}$)**



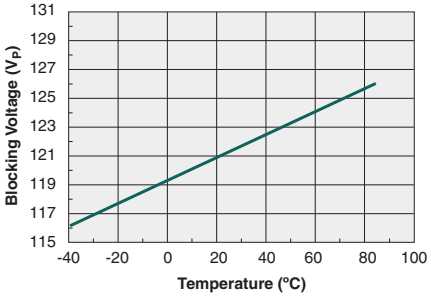

**Typical Load Current vs. Load Voltage ($I_F$=10mA, $T_A$=25°C)**



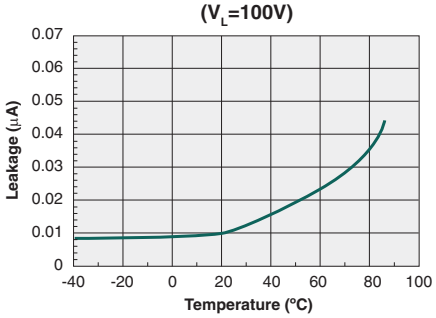

**Maximum Load Current vs. Temperature**



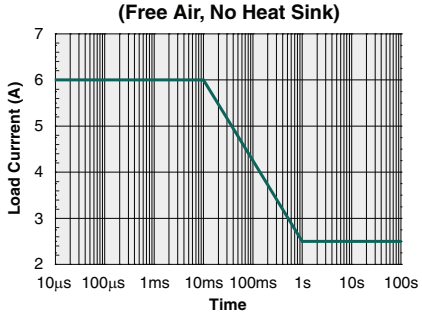

**Typical Blocking Voltage vs. Temperature**




**Typical Leakage vs. Temperature at Measured across Pins 3 & 4 ($V_L$=100V)**




**Energy Rating Curve (Free Air, No Heat Sink)**




*Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.

## Manufacturing Information

### ESD Sensitivity

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

### Soldering Profile

The Maximum Solder Temperature and the Maximum Total Dwell Time in all solder waves the device pins (leads) may be at the Maximum Solder Temperature is given in the table below. The body temperature of the device must not exceed the Maximum Body Temperature shown below at any time during the soldering process.

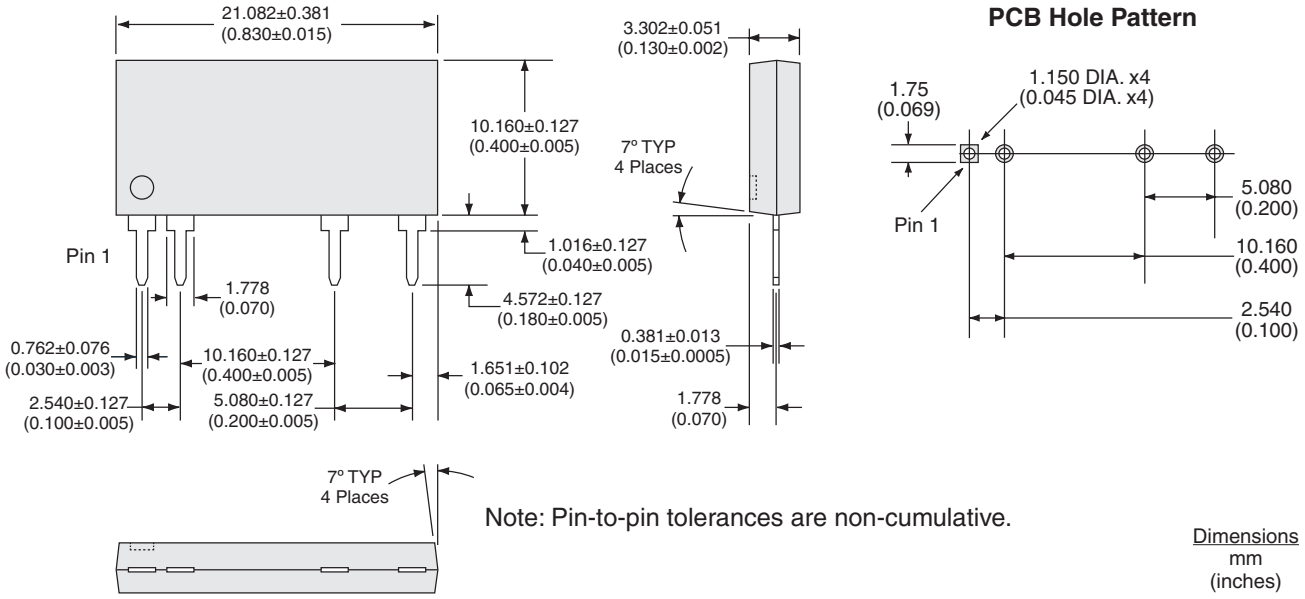
| Device | Maximum Solder Temperature | Maximum Body Temperature | Maximum Total Dwell Time | Wave Cycles |
|---|---|---|---|---|
| CPC1916Y | 260°C | 245°C | 10 seconds | 1 |

### Board Wash

IXYS Integrated Circuits recommends the use of no-clean flux formulations. Board washing to reduce or remove flux residue following the solder reflow process is acceptable provided proper precautions are taken to prevent damage to the device. These precautions include but are not limited to: using a low pressure wash and providing a follow up bake cycle sufficient to remove any moisture trapped within the device due to the washing process. Due to the variability of the wash parameters used to clean the board, determination of the bake temperature and duration necessary to remove the moisture trapped within the package is the responsibility of the user (assembler). Cleaning or drying methods that employ ultrasonic energy may damage the device and should not be used. Additionally, the device must not be exposed to halide flux or solvents.

## MECHANICAL DIMENSIONS

### CPC1916Y




Note: Pin-to-pin tolerances are non-cumulative.

Dimensions
mm
(inches)

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

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