



| Parameter | Rating | Units |
|------------------|--------|------------------|
| Blocking Voltage | 100 | V_p |
| Load Current | 2.5 | A_{DC}/A_{rms} |
| On-Resistance | 0.34 | Ω |

Features

- Handle Load Currents Up to $2.5A_{DC}/A_{rms}$
- $2500V_{rms}$ Input/Output Isolation
- Power SIP Package
- High Reliability
- No Moving Parts
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

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

Clare and IXYS have combined to bring OptoMOS® technology, reliability, and compact size to a new family of high-power, solid state relays. As part of that family, the CPC1916 is a single-pole, normally open (1-Form-A) solid state relay. The CPC1916 employs optically coupled MOSFET technology to provide $2500V_{rms}$ of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture, while the output is controlled by a highly efficient GaAlAs 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.

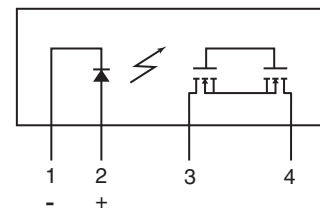
Approvals

- UL 508 Certified Component: File E69938

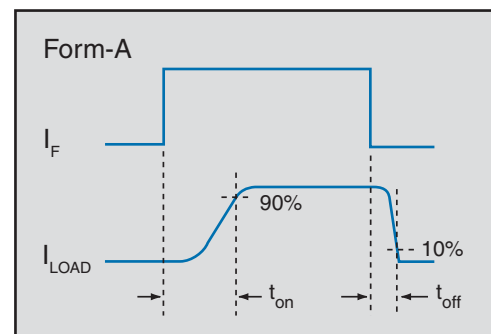
Ordering Information

| 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 @ 25°C

| Parameter | Ratings | Units |
|--------------------------------------|-------------|------------------|
| Blocking Voltage | 100 | V _P |
| Reverse Input Voltage | 5 | V |
| Input control Current | 50 | mA |
| Peak (10ms) | 1 | A |
| Input Power Dissipation ¹ | 150 | mW |
| Isolation Voltage, Input to Output | 2500 | 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 @ 25°C

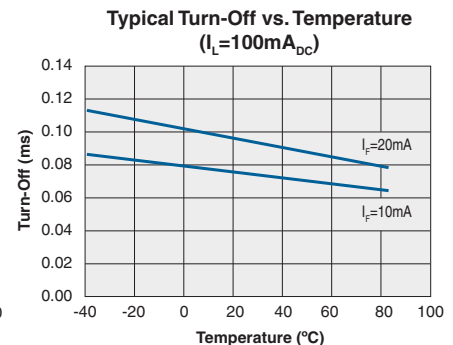
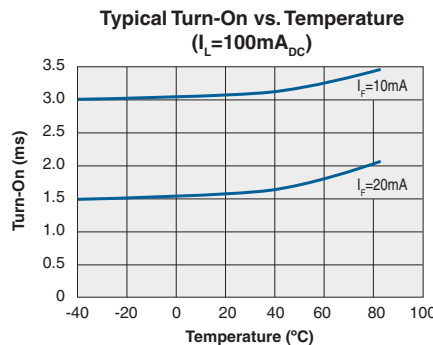
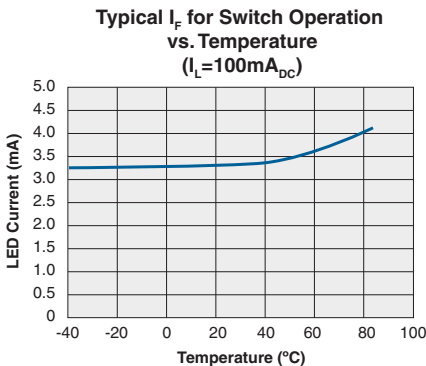
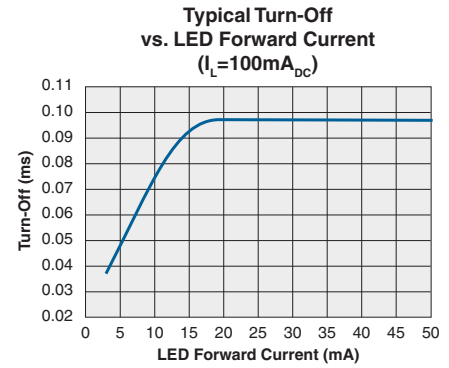
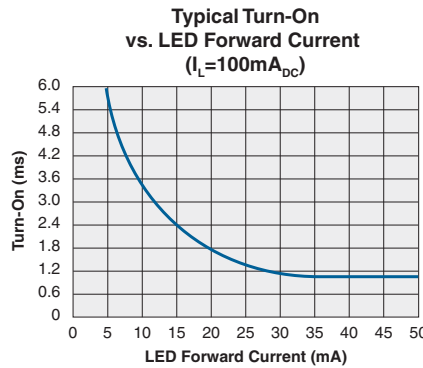
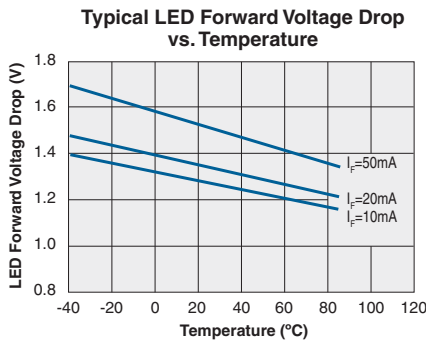
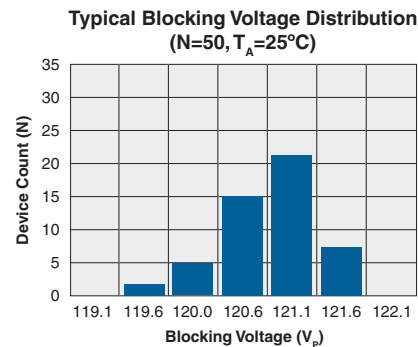
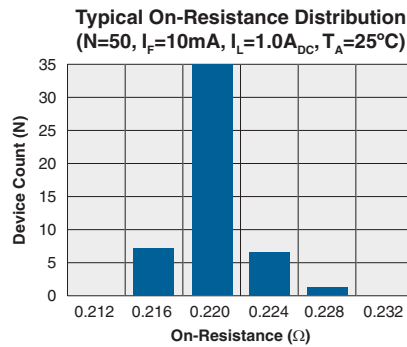
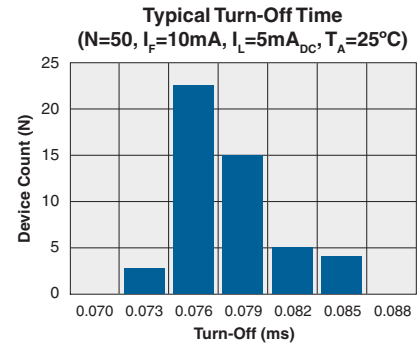
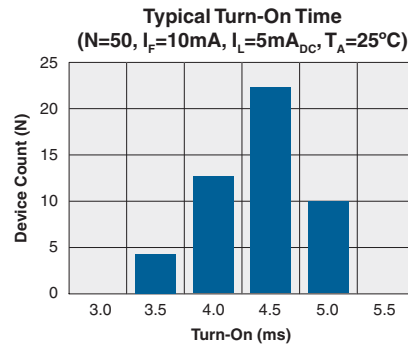
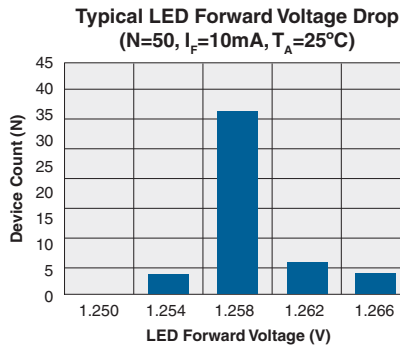
| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|-------------------------------|---|-------------------------------------|-----|-----|--------|-----------------------------------|
| Output Characteristics | | | | | | |
| Load Current, Continuous | Free air | I _L | - | - | 2.5 | A _{DC} /A _{rms} |
| Peak Load Current | t ≤ 10ms | I _{LPK} | - | - | 6 | A _P |
| On-Resistance ¹ | I _L =1A | R _{ON} | - | - | 0.34 | Ω |
| Off-State Leakage Current | V _L =100V _P | I _{LEAK} | - | - | 1 | μA |
| Switching Speeds | I _F =10mA, V _L =10V | t _{on} t _{off} | - | - | 5 3 | ms |
| Turn-On | | | | | | |
| Turn-Off | | | | | | |
| Input Characteristics | | | | | | |
| Input Control Current | I _L =1A | I _F | - | 3.3 | 10 | 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 | | | | | | |
| Capacitance, Input/Output | - | - | - | 2 | - | pF |

¹ Measurement taken within 1 second of on-time.

Thermal Characteristics

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|---------------------------------------|------------|------------------|-----|-----|-----|-------|
| Thermal Resistance (junction to case) | - | R _{θJC} | - | 1.5 | - | °C/W |

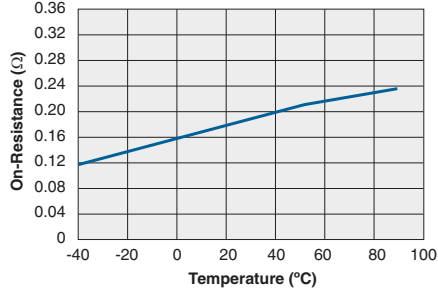
PERFORMANCE DATA*



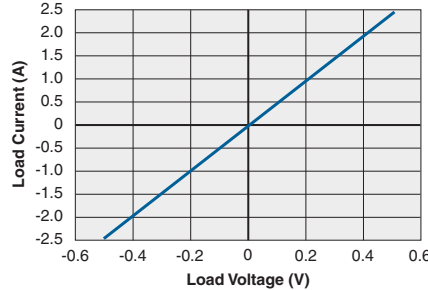
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

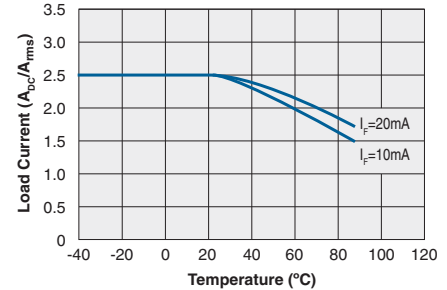
Typical On-Resistance vs. Temperature
($I_F=10\text{mA}$, $I_L=1.0\text{A}_{\text{DC}}$)



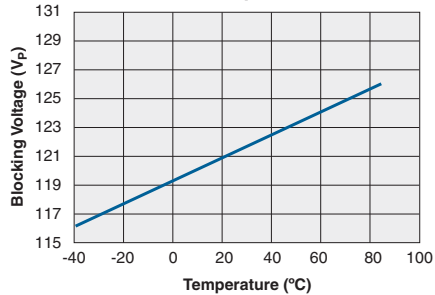
Typical Load Current vs. Load Voltage
($I_F=10\text{mA}$, $T_A=25^\circ\text{C}$)



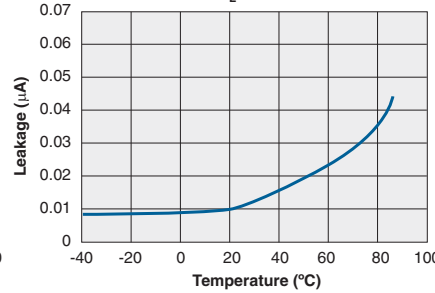
Typical Load Current vs. Temperature



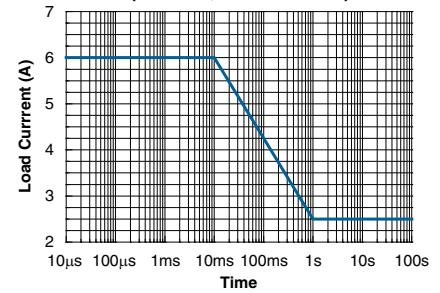
Typical Blocking Voltage vs. Temperature



Typical Leakage vs. Temperature at Measured across Pins 3 & 4
($V_L=100\text{V}$)



Energy Rating Curve (Free Air, No Heat Sink)



*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 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 |
|----------|---|
| CPC1916Y | MSL 1 |

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 |
|----------|----------------------------|
| CPC1916Y | 245°C for 30 seconds |

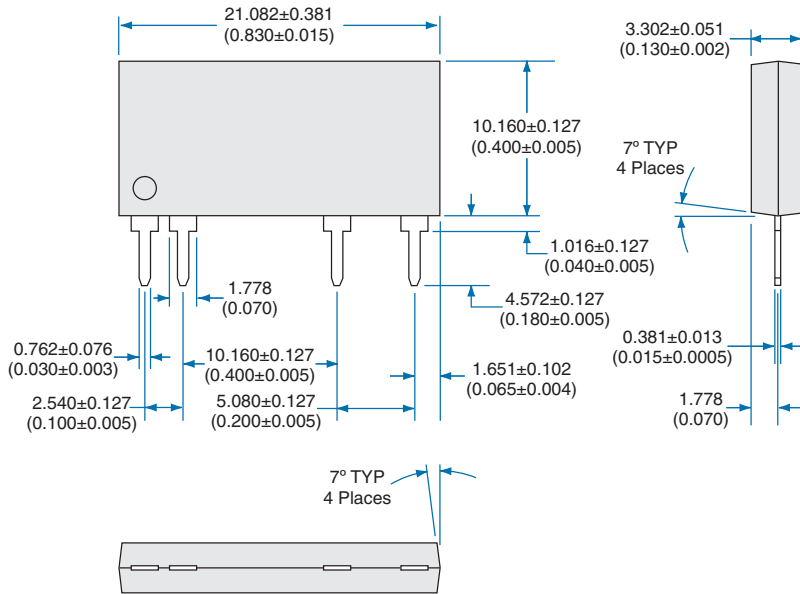
Board Wash

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 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.

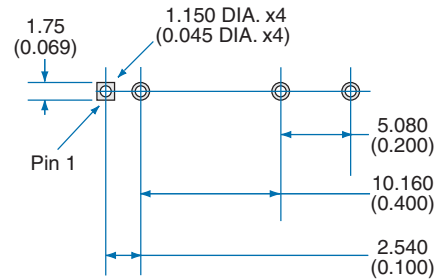


MECHANICAL DIMENSIONS

CPC1916Y



PCB Hole Pattern



Dimensions
mm
(inches)

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

Clare, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to specifications and product descriptions at any time without notice. Neither circuit patent licenses nor indemnity are expressed or implied. Except as set forth in Clare's Standard Terms and Conditions of Sale, Clare, Inc. assumes no liability whatsoever, and disclaims any express or implied warranty, relating to its products including, but not limited to, the implied warranty of merchantability, fitness for a particular purpose, or infringement of any intellectual property right.

The products described in this document are not designed, intended, authorized or warranted for use as components in systems intended for surgical implant into the body, or in other applications intended to support or sustain life, or where malfunction of Clare's product may result in direct physical harm, injury, or death to a person or severe property or environmental damage. Clare, Inc. reserves the right to discontinue or make changes to its products at any time without notice.

Specification: DS-CPC1916-R05
©Copyright 2010, Clare, Inc.
OptoMOS® is a registered trademark of Clare, Inc.
All rights reserved. Printed in USA.
11/17/2010