



Parameter	Rating	Units
AC Operating Voltage	20 - 240	$V_{rms}$
Load Current	3	$A_{rms}$
On-State Voltage Drop	0.8	$V_{rms}$ (at $I_L = 3A_{rms}$ )
Blocking Voltage	600	$V_P$

### Features

- Load Current up to  $3A_{rms}$
- $600V_P$  Blocking Voltage
- 5mA Sensitivity
- Zero-Crossing Detection
- DC Control, AC Output
- Optically Isolated
- TTL and CMOS Compatible
- Low EMI and RFI Generation
- High Noise Immunity
- Machine Insertable, Wave Solderable

### Applications

- Programmable Control
- Process Control
- Power Control Panels
- Remote Switching
- Gas Pump Electronics
- Contactors
- Large Relays
- Solenoids
- Motors
- Heaters

### Description

CPC1966 is an AC Solid State Switch utilizing dual power SCR outputs. This device also includes zero-cross turn-on circuitry, and is specified with a blocking voltage of  $600V_P$ .

In addition, the tightly controlled zero-cross circuitry ensures low noise switching of AC loads by minimizing the generation of transients. The optically coupled input and output circuits provide  $3750V_{rms}$  of isolation and noise immunity between the control and load circuits. As a result, the CPC1966 is well suited for industrial environments where electromagnetic interference would disrupt the operation of plant facility communication and control systems.

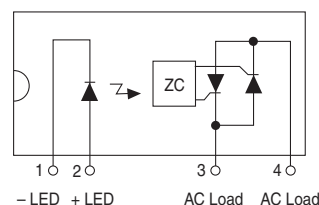
### Approvals

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

### Ordering Information

Part #	Description
CPC1966Y	4-Pin (8-Pin Body) SIP (25/Tube)

### Pin Configuration



## Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage ( $V_{DRM}$ )	600	$V_P$
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation <sup>1</sup>	150	mW
Total Power Dissipation <sup>2</sup>	2400	mW
Isolation Voltage, Input to Output	3750	$V_{rms}$
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

<sup>1</sup> Derate linearly 1.33 mW / °C

<sup>2</sup> Derate linearly 20 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

Parameters	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics</b>						
Load Current, Continuous	$V_L = 120-240V_{rms}$	$I_L$	0.1	-	3	$A_{rms}$
Maximum Surge Current	$t \leq 16ms$	$I_P$	-	-	30	A
Off State Leakage Current	$V_{DRM}$	$I_{LEAK}$	-	-	100	$\mu A_P$
On-State Voltage Drop <sup>1</sup>	$I_L = 2A_P$	-	-	0.88	1.1	$V_P$
Off-State dV/dt	-	dV/dt	500	-	-	V/ $\mu s$
Switching Speeds	$I_F = 5 mA$	$t_{on}$	-	-	0.5	cycles
Turn-on						
Turn-off						
Zero-Cross Turn-On Voltage	1st half-cycle	-	-	5	20	V
	Subsequent half-cycle	-	-	-	5	V
Holding Current	-	$I_H$	-	44	50	mA
Latching Current	-	$I_L$	-	48	75	mA
Operating Frequency <sup>2</sup>	-		20	-	500	Hz
Load Power Factor for Guaranteed Turn-On <sup>3</sup>	60Hz	PF	0.25	-	-	-
<b>Input Characteristics</b>						
Input Control Current <sup>4</sup>	60Hz	$I_F$	-	-	5	mA
Input Drop-out Voltage	-	-	0.8	-	-	V
Input Voltage Drop	$I_F = 5mA$	$V_F$	0.9	1.2	1.4	V
Reverse Input Current	$V_R = 5V$	$I_R$	-	-	10	$\mu A$
<b>Common Characteristics</b>						
Input to Output Capacitance	-	$C_{I/O}$	-	-	3	pF

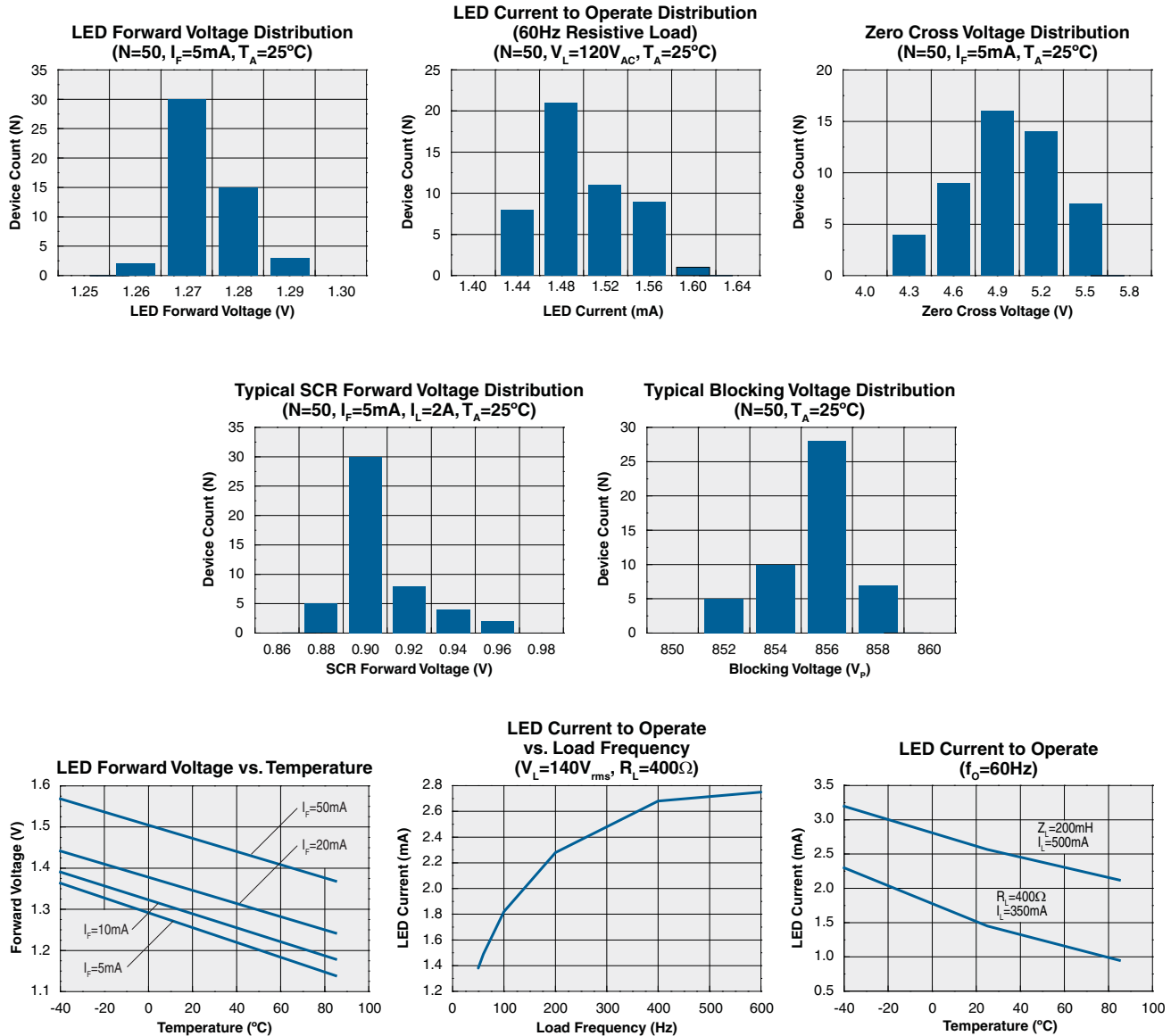
<sup>1</sup> Tested at a peak value equivalent.

<sup>2</sup> Zero Cross 1st half-cycle @ <100Hz.

<sup>3</sup> Snubber circuits may be required at low power factors.

<sup>4</sup> For high-noise environments, or for high-frequency operation, use  $I_F \geq 10mA$ .

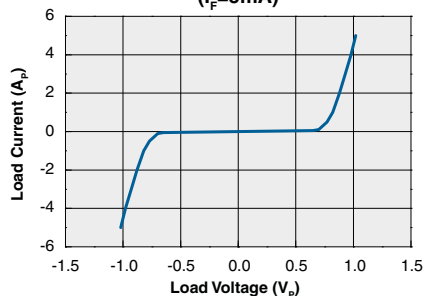
**PERFORMANCE DATA\***



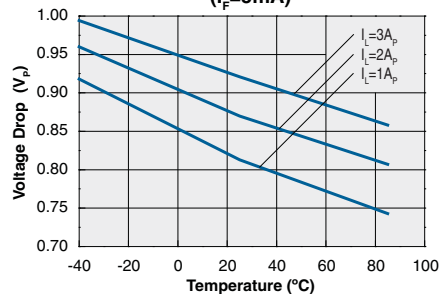
\* The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

# PERFORMANCE DATA \*

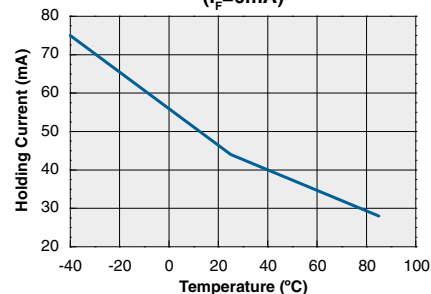
**Typical Load Voltage vs. Load Current**  
( $I_F=5\text{mA}$ )



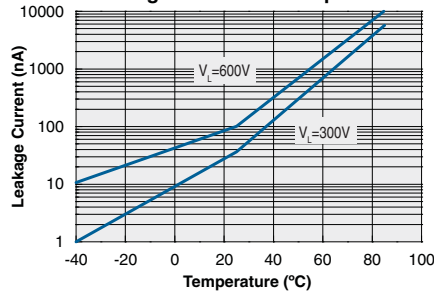
**Voltage Drop vs. Temperature**  
( $I_F=5\text{mA}$ )



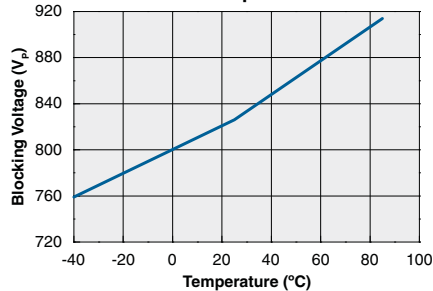
**Holding Current vs. Temperature**  
( $I_F=0\text{mA}$ )



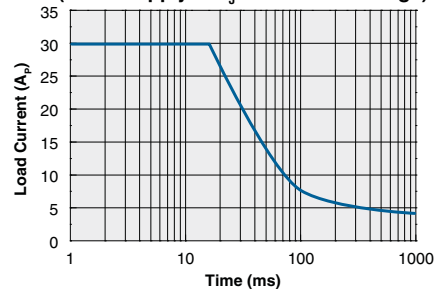
**Leakage Current vs. Temperature**



**Typical Blocking Voltage vs. Temperature**



**Maximum Surge Current**  
(Non-Repetitive)  
(Values Apply to  $T_J=50^{\circ}\text{C}$  Before Surge)



\* 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
CPC1966Y	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
CPC1966Y	245°C for 30 seconds

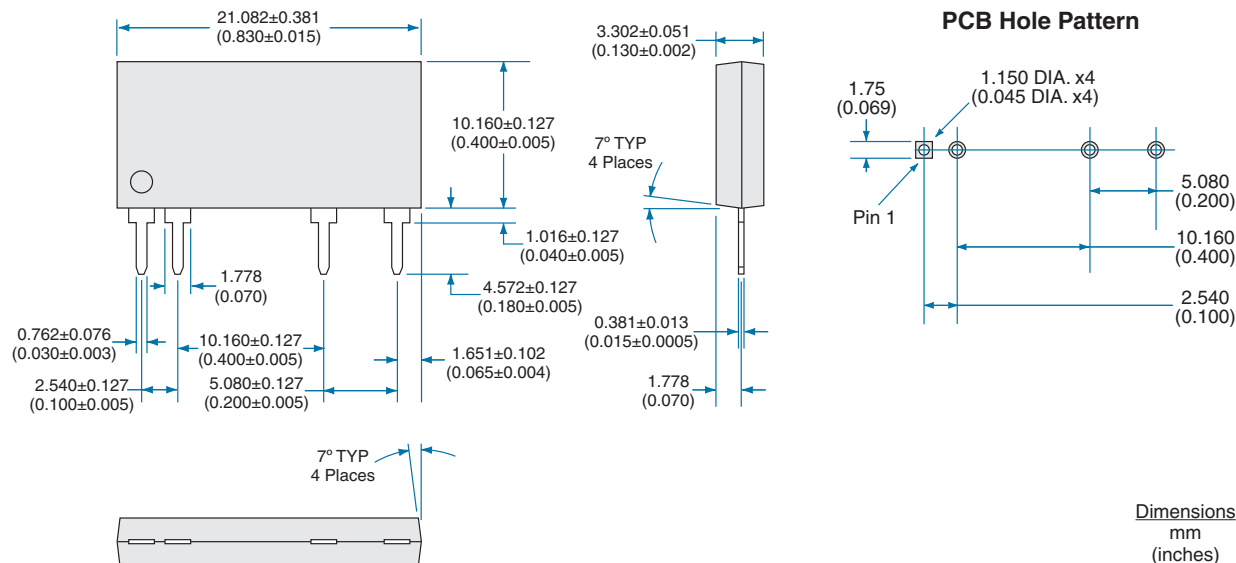
### Board Wash

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 may 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

### CPC1966Y



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