

Parameter	Rating	Units
AC Operating Voltage	20 - 240	V <sub>rms</sub>
Load Current	2	A <sub>rms</sub>
On-State Voltage Drop	1.15	V <sub>rms</sub> (at I <sub>L</sub> = 2A <sub>rms</sub> )
Blocking Voltage	600	V <sub>P</sub>

### Features

- Load Current up to 2A<sub>rms</sub>
- 600V<sub>P</sub> Blocking Voltage
- 5mA Sensitivity
- Zero-Crossing Detection
- DC Control, AC Output
- Optically Isolated
- Low EMI and RFI Generation
- High Noise Immunity
- Flammability Rating UL 94 V-0

### Applications

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

### Description

CPC1976Y is an AC Solid State Switch utilizing dual power SCR thyristor outputs. This device also includes zero-cross turn-on circuitry and is specified with a blocking voltage of 600V<sub>P</sub>.

In addition, 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<sub>rms</sub> of isolation and noise immunity between the control and load circuits. As a result, the CPC1976Y is well suited for industrial environments where electromagnetic interference would disrupt the operation of plant facility communication and control systems.

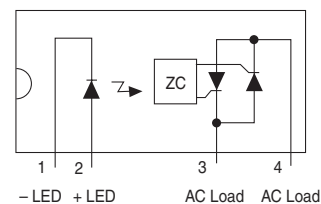
### Approvals

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

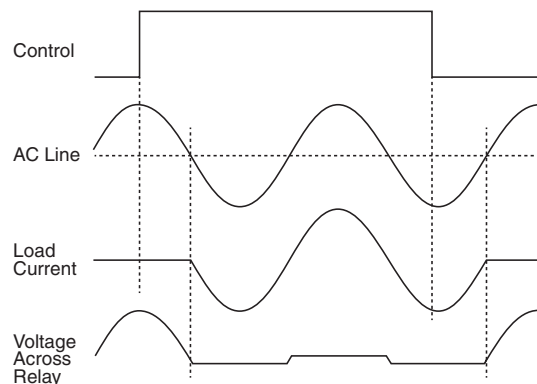
### Ordering Information

Part #	Description
CPC1976Y	4-Pin (8-Pin Body) Power SIP Package (25/Tube)

### Pin Configuration



### Zero-Cross Waveforms



### 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
Input Power Dissipation <sup>1</sup>	150	mW
Total Power Dissipation <sup>2</sup>	2400	mW
Isolation Voltage, Input to Output	3750	$V_{rms}$
ESD, Human Body Model	4	kV
$i^2t$ for Fusing (1/2 Sine Wave, 50Hz)	8	A <sup>2</sup> s
Operational Temperature, Ambient	-40 to +85	°C
Storage Temperature	-40 to +125	°C

<sup>1</sup> Derate linearly 1.33 mW / °C  
<sup>2</sup> Derate output power 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.

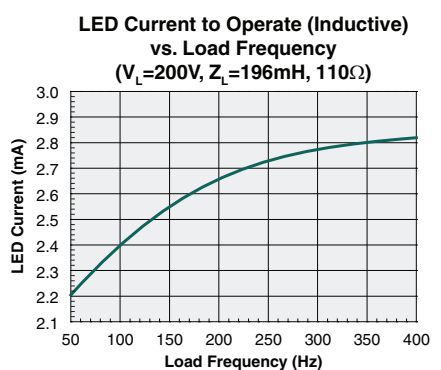
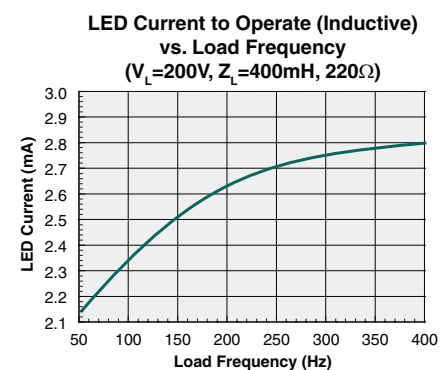
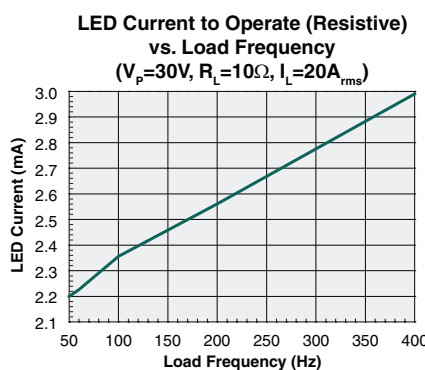
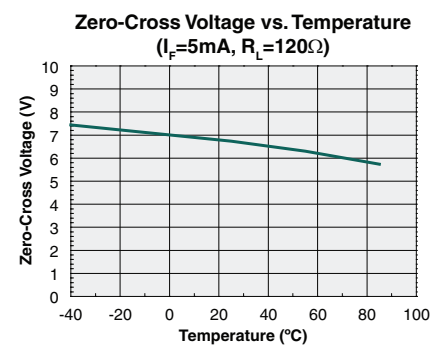
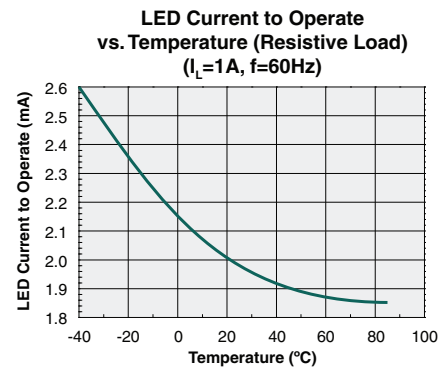
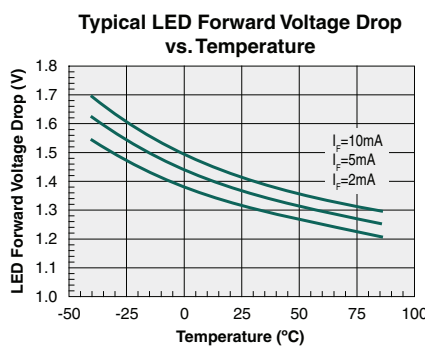
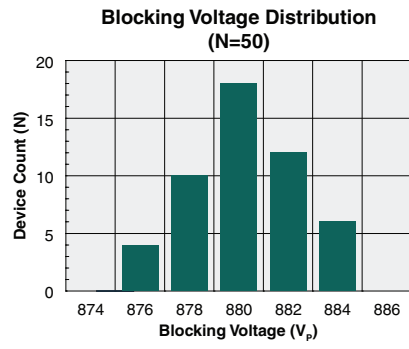
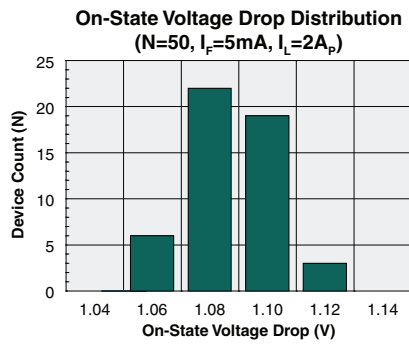
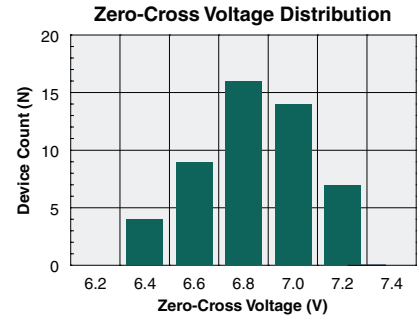
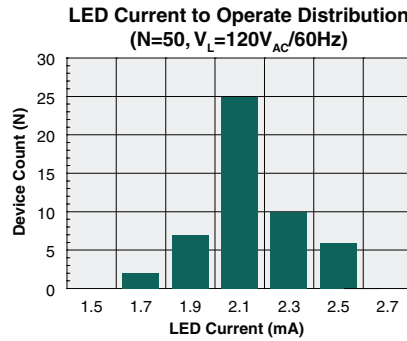
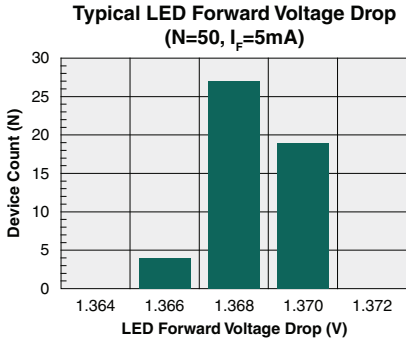
Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

### Electrical Characteristics @ 25°C

Parameters	Conditions	Symbol	Min	Typ	Max	Units	
<b>Output Characteristics</b>							
Blocking Voltage	$I_L=1\mu A$	$V_{DRM}$	600	-	-	V	
Load Current	Free Air, $V_L=120-240V_{rms}$	$I_L$	0.070	-	2	$A_{rms}$	
							Surge
Off State Leakage Current	$V_{DRM}$	$I_{LEAK}$	-	-	10	$\mu A$	
On-State Voltage Drop	$I_L=2A_P$	-	-	1.1	1.25	$V_P$	
Critical Rate of Rise	-	dv/dt	1000	1200	-	V/ $\mu s$	
Switching Speeds	$I_F = 5 mA$	Turn-on	$t_{on}$	-	-	0.5	cycles
		Turn-off	$t_{off}$	-	-	0.5	cycles
Zero-Cross Turn-On Voltage <sup>1</sup>	1st half-cycle	-	-	7	20	V	
	Subsequent half-cycle	-	-	-	5	V	
Holding Current	-	$I_H$	-	-	75	mA	
Latching Current	-	$I_L$	-	-	100	mA	
Operating Frequency	-	-	20	-	500	Hz	
Load Power Factor for Guaranteed Turn-On <sup>2</sup>	60Hz	PF	0.25	-	-	-	
<b>Input Characteristics</b>							
Input Control Current to Activate <sup>3</sup>	60Hz	$I_F$	-	-	5	mA	
Input Drop-out Voltage	-	-	0.8	-	-	V	
Input Voltage Drop	$I_F=5mA$	$V_F$	0.9	1.36	1.5	V	
Reverse Input Current	$V_R=5V$	$I_R$	-	-	10	$\mu A$	
<b>Common Characteristics</b>							
Input to Output Capacitance	$V_{IO}=0V, f=1MHz$	$C_{IO}$	-	-	3	pF	

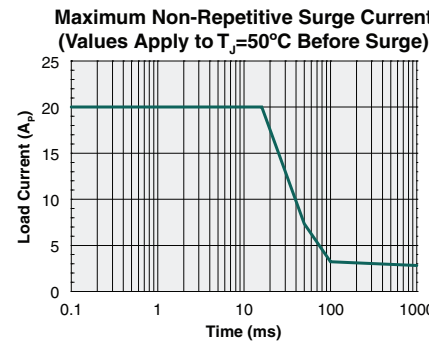
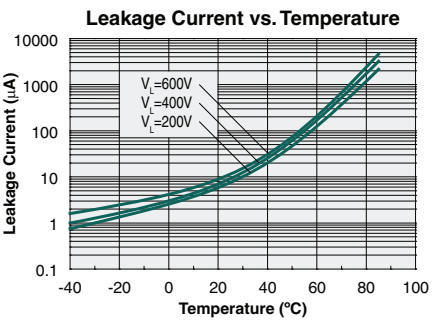
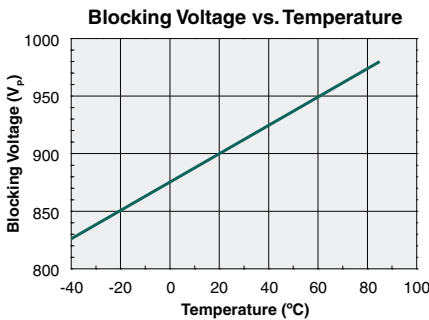
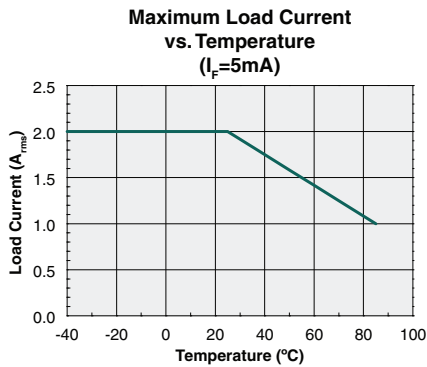
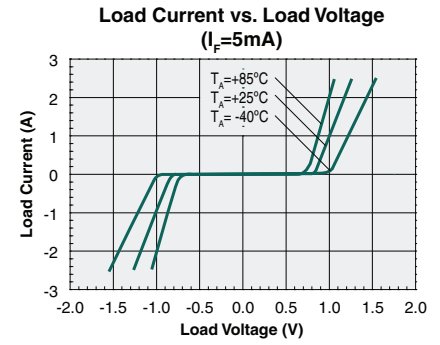
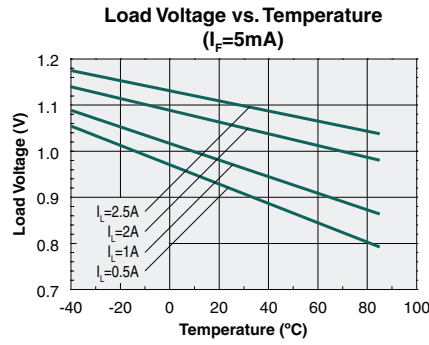
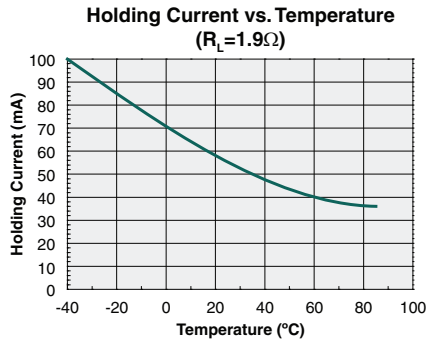
<sup>1</sup> Zero Cross 1st half-cycle @ <100Hz.  
<sup>2</sup> Snubber circuits may be required at low power factors.  
<sup>3</sup> For high-noise environments, or for high-frequency operation, a minimum LED drive current of 10mA is recommended.

**PERFORMANCE DATA\***



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

**PERFORMANCE DATA\***



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## 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
CPC1976Y	260°C	245°C	10 seconds	1

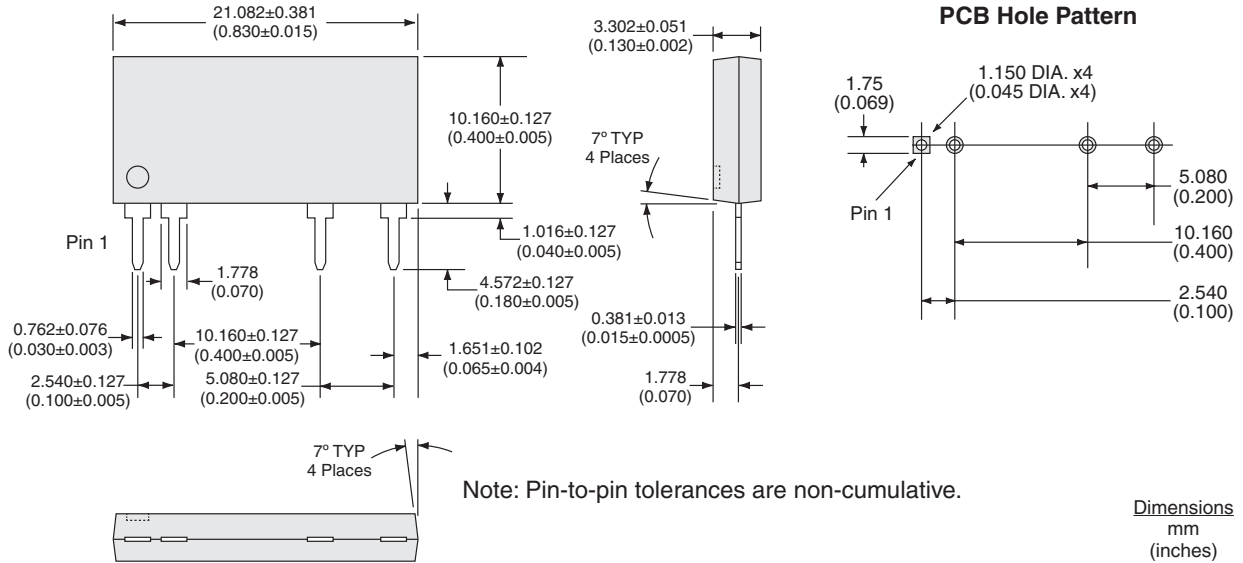
### Board Wash

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**

**CPC1976Y**



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