



Parameter	Rating	Units
AC Operating Voltage	20 - 240	$V_{rms}$
Load Current	2	$A_{rms}$
On-State Voltage Drop	1.25	$V_P$ (at $I_L = 2A_P$ )
Blocking Voltage	600	$V_P$

### Features

- Load Current up to  $2A_{rms}$
- $600V_P$  Blocking Voltage
- High Surge Current: 20A
- Rapid Turn-On (Non-Zero-Cross Turn-On)
- 5mA Sensitivity
- Creepage Distance: 0.125" on Output Pins
- DC Control, AC Output
- Optically Isolated
- TTL and CMOS Compatible
- Low EMI and RFI Generation
- High Noise Immunity
- Machine Insertable, Wave Solderable

### Applications

- HVAC Control (Heating, Ventilation, Air Conditioning)
- Lighting
- Programmable Control
- Process Control
- Power Control Panels
- Remote Switching
- Gas Pump Electronics
- Contactors
- Large Relays
- Solenoids
- Motors
- Heaters

### Description

CPC1976YX6 is an AC Solid State Switch utilizing dual power SCR outputs. This device features Rapid Turn-On (non-zero-cross) control of the output SCRs, which makes it ideal for precisely switching AC loads independent of the load voltage phase.

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 CPC1976YX6 is well suited for industrial environments where electromagnetic interference would disrupt the operation of plant facility communication and control systems.

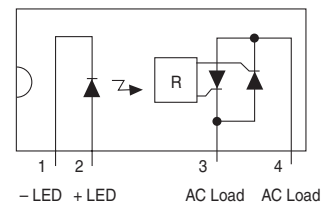
### Approvals

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

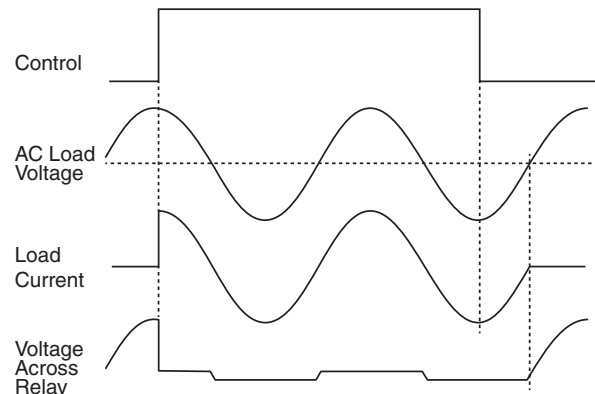
### Ordering Information

Part #	Description
CPC1976YX6	4-Pin (8-Pin Body) SIP (25/Tube)

### Pin Configuration



### Rapid Turn-On (Non-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)	A
di/dt Critical Rate of Rise of On-State Current	40	A/ $\mu$ s
Input Power Dissipation <sup>1</sup>	150	mW
Total Power Dissipation <sup>2</sup>	2400	mW
ESD, Human Body Model	4	kV
$i^2t$ for Fusing (1/2 Sine Wave, 60Hz)	3.5	A <sup>2</sup> s
Isolation Voltage, Input to Output	3750	$V_{rms}$
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°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.

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

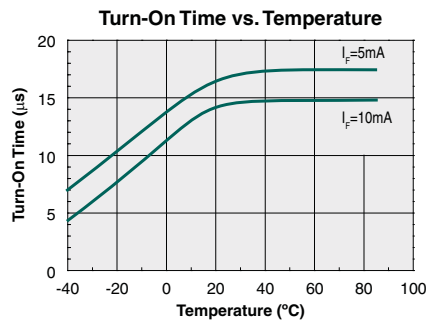
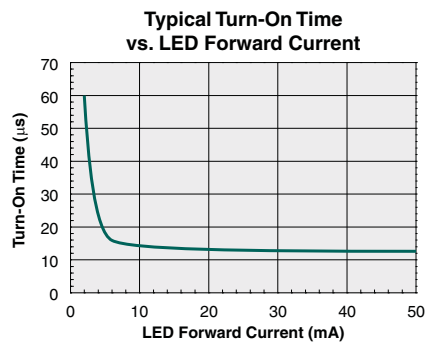
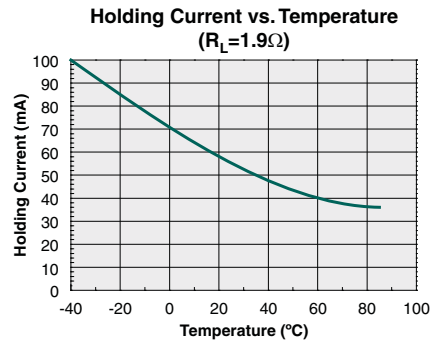
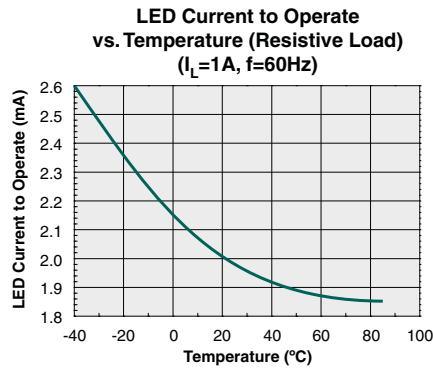
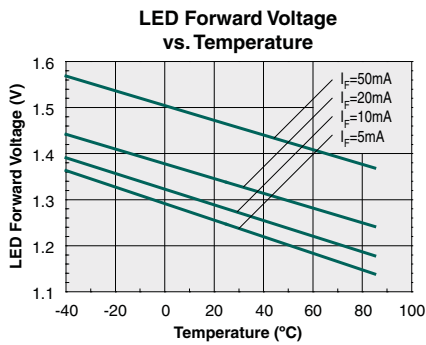
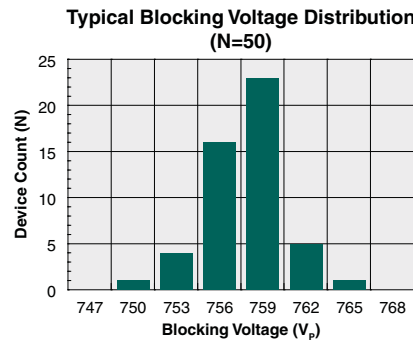
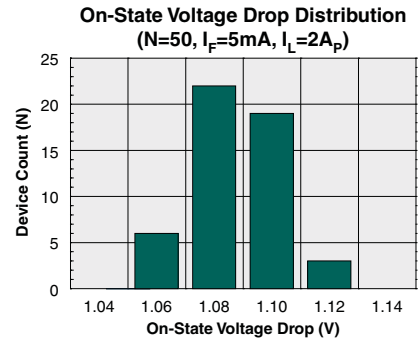
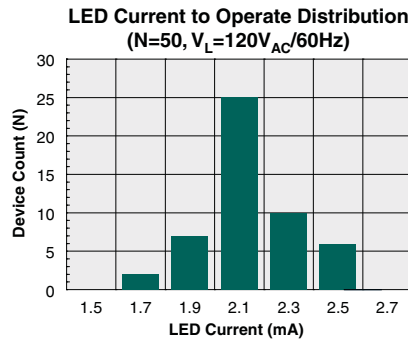
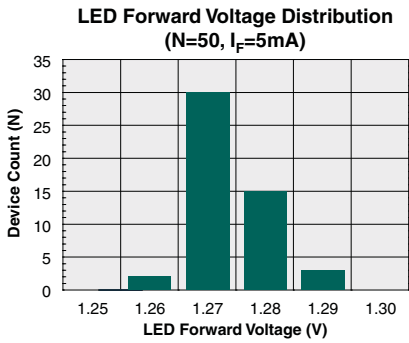
<sup>2</sup> Derate linearly 20 mW / °C

### Electrical Characteristics @ 25°C

Parameters	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics</b>						
Load Current, Continuous	$V_L=20-240V_{rms}$	$I_L$	0.070	-	2	$A_{rms}$
Maximum Surge Current	$t \leq 16ms$	$I_{PK}$	-	-	20	A
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	$I_F = 5 \text{ mA, Resistive}$ $V_L=20V, 60Hz$	$t_{on}$	-	20	500	$\mu$ s
Turn-on		$t_{off}$	-	-	0.5	cycle
Turn-off						
Holding Current	-	$I_H$	-	-	75	mA
Latching Current	-	$I_L$	-	-	100	mA
Operating Frequency	-		20	-	500	Hz
<b>Input Characteristics</b>						
Input Control Current to Activate <sup>1</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	$V_B=5V$	$I_B$	-	-	10	$\mu$ A
<b>Common Characteristics</b>						
Input to Output Capacitance	-	$C_{IO}$	-	-	3	pF

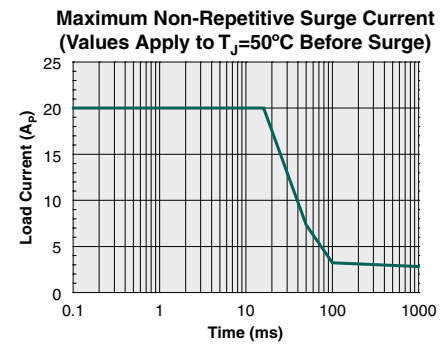
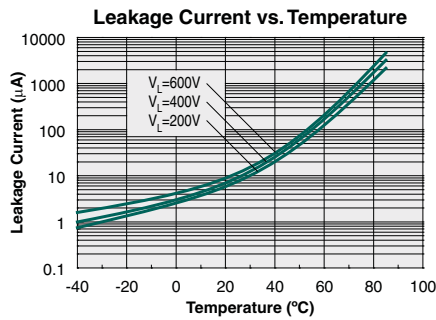
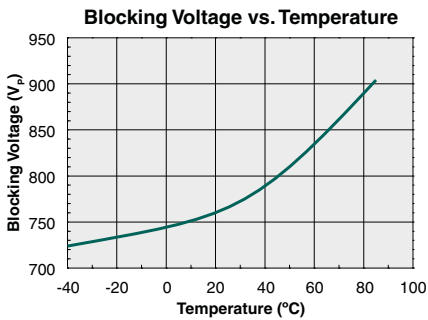
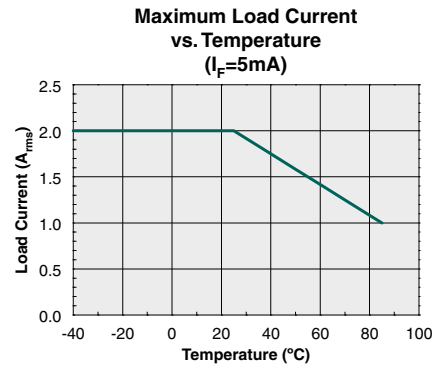
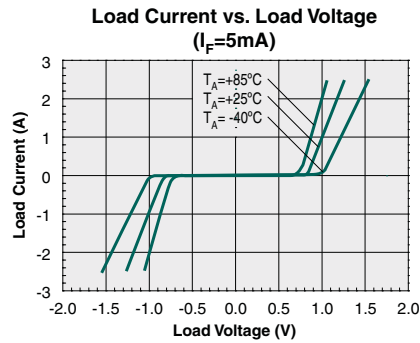
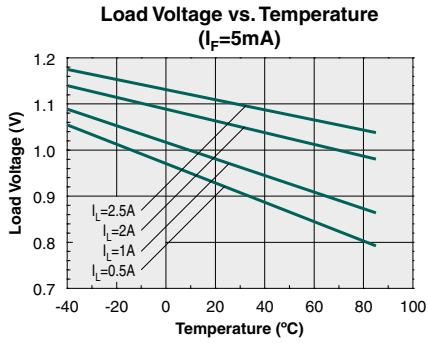
<sup>1</sup> For high-noise environments, or for high-frequency operation, use  $I_F \geq 10mA$ .

**PERFORMANCE DATA @ 25°C (Unless Otherwise Noted)\***



\* 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 @ 25°C (Unless Otherwise Noted)\*



\* 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. 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
CPC1976YX6	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
CPC1976YX6	245°C for 30 seconds

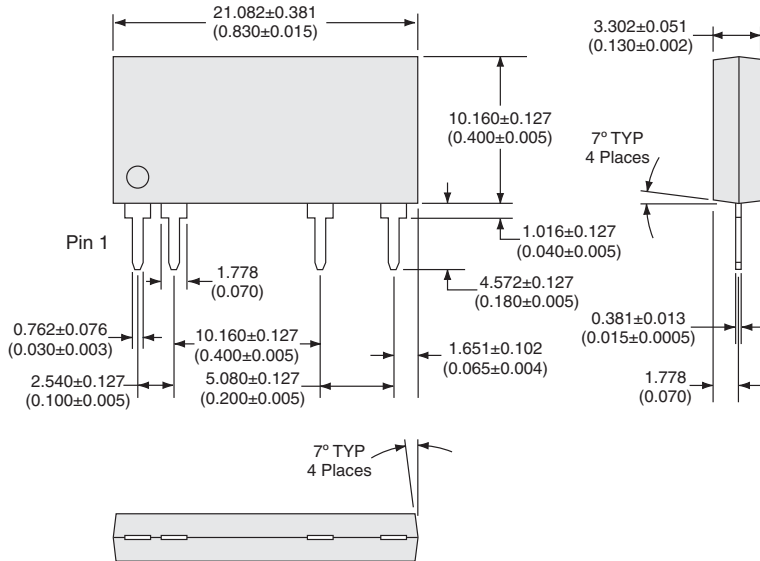
### Board Wash

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.

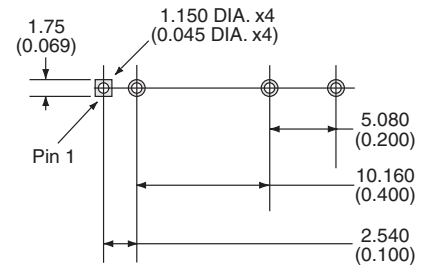


**MECHANICAL DIMENSIONS**

**CPC1976YX6**



**PCB Hole Pattern**



Dimensions  
mm  
(inches)

**For additional information please visit our website at: [www.ixysic.com](http://www.ixysic.com)**

IXYS Integrated Circuits Division 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 IXYS Integrated Circuits Division's Standard Terms and Conditions of Sale, IXYS Integrated Circuits Division 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 IXYS Integrated Circuits Division's product may result in direct physical harm, injury, or death to a person or severe property or environmental damage. IXYS Integrated Circuits Division reserves the right to discontinue or make changes to its products at any time without notice.

The information below supercedes any previously presented material.

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



---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).