IXYS
INTEGRATED CIRCUITS DIVISION

CPC1966YX6
Rapid Turn-On AC Power Switch

Parameter	Rating	Units
AC Operating Voltage	20 - 240	V_{rms}
Load Current	3	A_{rms}
On-State Voltage Drop	1.1	V_P (at $I_L = 2A_P$)
Blocking Voltage	600	V_P

Features

- Load Current up to $3A_{rms}$
- $600V_P$ Blocking Voltage
- High Surge Current: 30A
- 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

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

Description

CPC1966YX6 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 CPC1966YX6 is well suited for industrial environments where electromagnetic interference would disrupt the operation of plant facility communication and control systems.

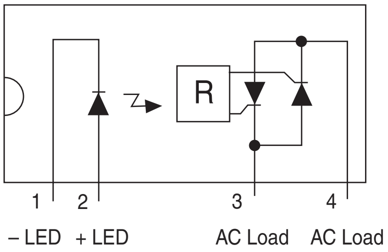
Approvals

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

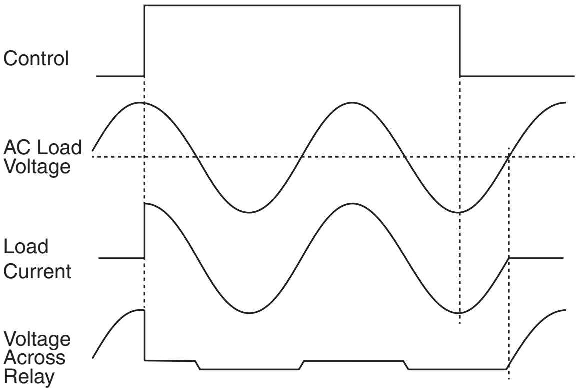
Ordering Information

Part #	Description
CPC1966YX6	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)	1	A
di/dt Critical Rate of Rise of On-State Current	75	A/µs
Input Power Dissipation [1]	150	mW
Total Power Dissipation [2]	2400	mW
ESD, Human Body Model	4	kV
i^2t Fusing Current (1/2 Sine Wave, 60Hz)	8	A^2s
Isolation Voltage, Input to Output	3750	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate linearly 1.33 mW / °C

[2] Derate linearly 20 mW / °C

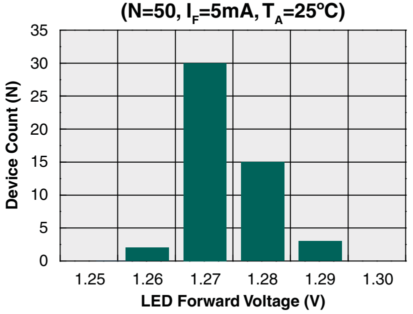
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

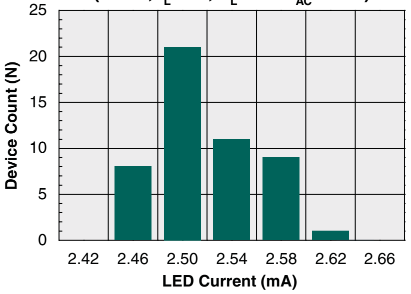
Electrical Characteristics @ 25°C

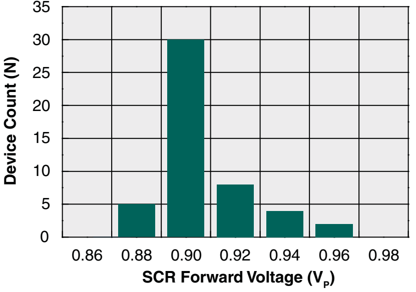
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current, Continuous	V_L=20-240V_{rms}	I_L	0.1	-	3	A_{rms}
Maximum Surge Current	t ≤ 16ms	I_P	-	-	30	A
Off State Leakage Current	V_{DRM}	I_{LEAK}	-	-	100	µA_P
On-State Voltage Drop	I_L=2A_P	-	-	0.88	1.1	V_P
Off-State dV/dt	-	dV/dt	1000	-	-	V/µs
Switching Speeds Turn-on	I_F = 5 mA, Resistive, V_L=20V, 60Hz	t_{on}	-	20	500	µs
Turn-off		t_{off}	-	-	0.5	cycles
Holding Current	-	I_H	-	44	50	mA
Latching Current	-	I_L	-	48	75	mA
Operating Frequency	-		20	-	500	Hz
Input Characteristics						
Input Control Current to Activate [1]	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	µA
Common Characteristics						
Input to Output Capacitance	-	$C_{I/O}$	-	-	3	pF

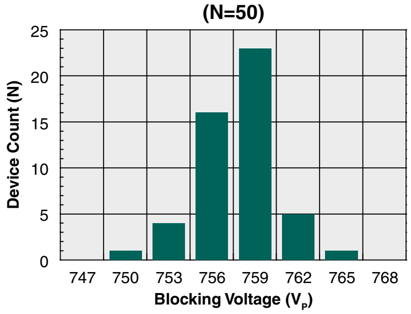
[1] For high-noise environments, or for high-frequency operation, use $I_F \geq$ 10mA.

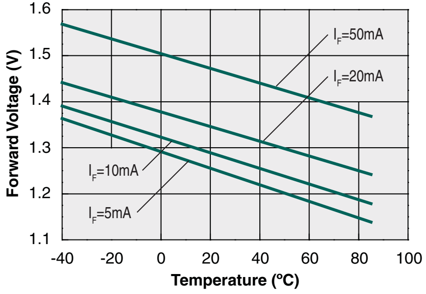
PERFORMANCE DATA @25ºC (Unless Otherwise Noted)*

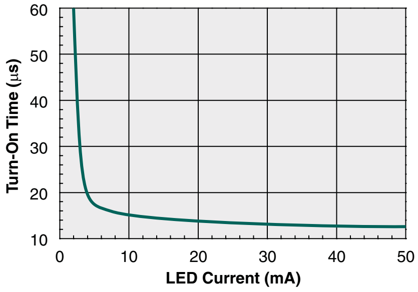

LED Forward Voltage Distribution
($N=50, I_F=5mA, T_A=25ºC$)

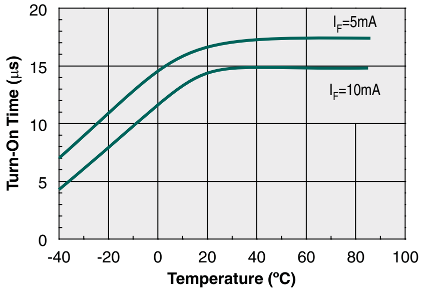

Typical I_F for Switch Operation
Resistive Load
($N=50, I_L=2A, V_L=120V_{AC}$ 60Hz)

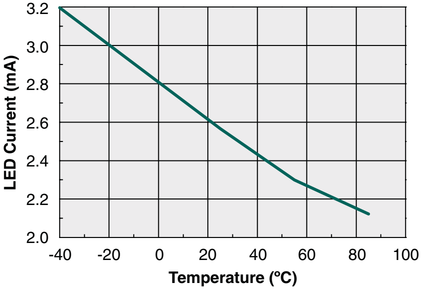

Typical SCR Forward Voltage Distribution
($N=50, I_F=5mA, I_L=2A_P, T_A=25ºC$)


Typical Blocking Voltage Distribution
(N=50)


LED Forward Voltage vs. Temperature


Typical Turn-On Time
vs. LED Forward Current

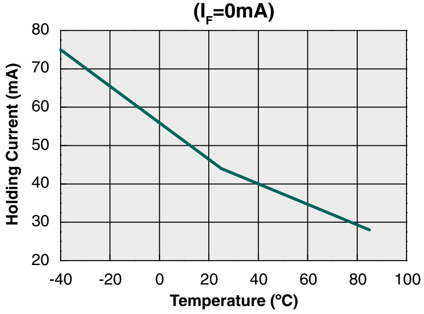

Typical Turn-On Time
vs. Temperature


Typical I_F for Switch Operation
vs. Temperature
(I_L=350mA, 60Hz)

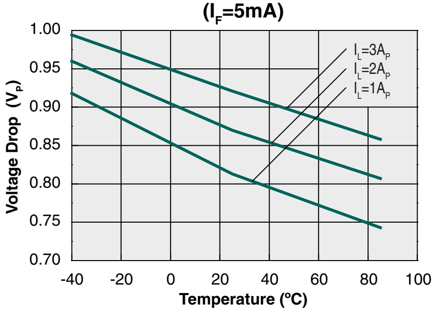
* The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA @25ºC (Unless Otherwise Noted)*

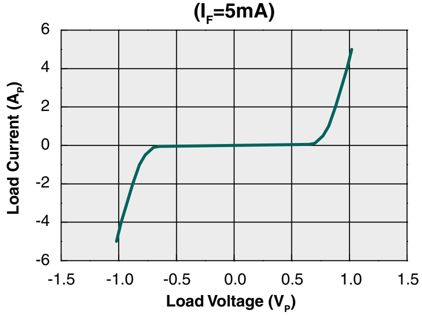
Holding Current vs. Temperature (I_F=0mA)



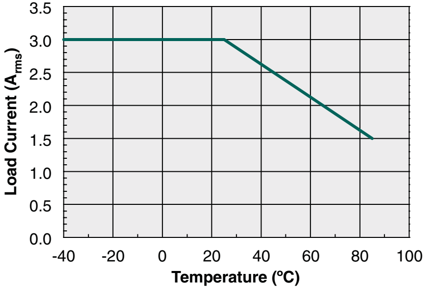
Voltage Drop vs. Temperature (I_F=5mA)



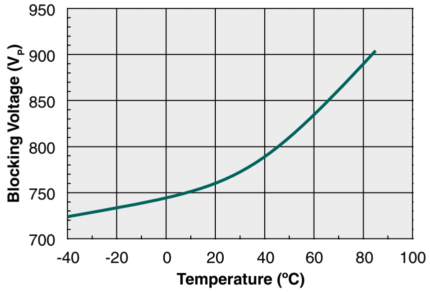
Typical Load Voltage vs. Load Current (I_F=5mA)



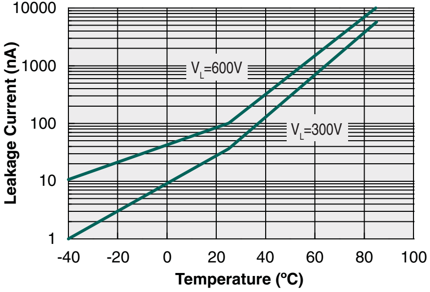
Maximum Load Current vs. Temperature (I_F=5mA)



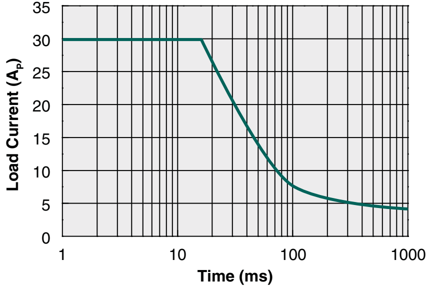
Blocking Voltage vs. Temperature



Leakage Current vs. Temperature



Maximum Surge Current (Non-Repetitive) (Values Apply to T_J=50ºC Before Surge)



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Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. 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
CPC1966YX6	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.

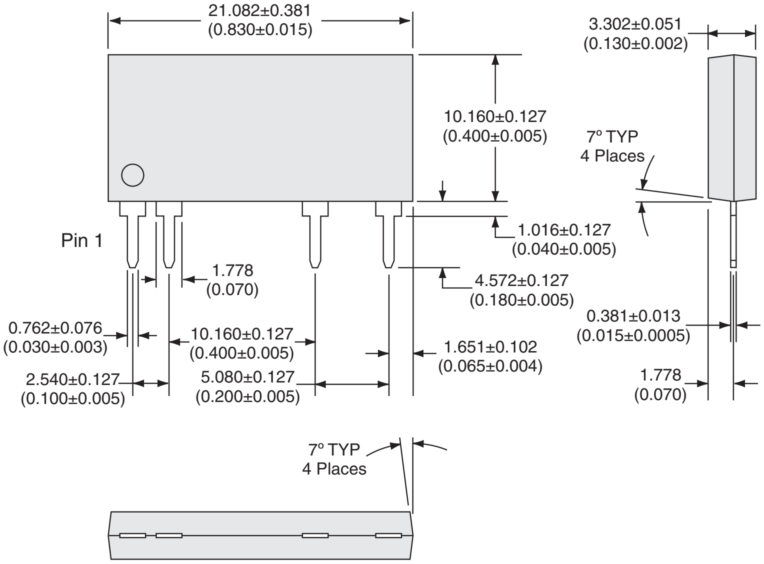
Device	Maximum Temperature x Time
CPC1966YX6	245°C for 30 seconds

Board Wash

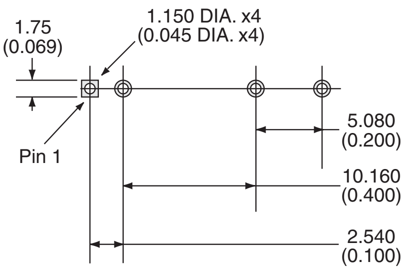
IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a 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

CPC1966YX6



PCB Hole Pattern



Dimensions
mm
(inches)

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

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Specification: DS-CPC1966YX6-R01
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