IXYS
INTEGRATED CIRCUITS DIVISION



CPC1972
AC Power Switch

Parameter	Ratings	Units
Blocking Voltage	800	V_P
Load Current	250	mA_{rms}
On State Voltage Drop	3	V_{rms} (at I_L = 250 mA_{rms})
Operating Voltage	550	V_{rms}

Features
- Load Current up to 250mA_{rms}
- 800V_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
- Flammability Classification Rating of V-0

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

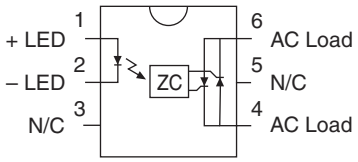
Description
The CPC1972 is an AC Solid State Switch using optical coupling with dual power silicon controlled rectifier (SCR) outputs to produce an alternative to optocoupler and Triac circuits. The CPC1972 switches are robust enough to provide a blocking voltage of up to 800V_P . In addition, tightly controlled zero cross circuitry ensures switching of AC loads without the generation of transients. The input and output circuits are optically coupled to provide 3750V_{rms} of isolation and noise immunity between the control and load circuits. As a result the CPC1972 is well suited for industrial environments where electromagnetic interference could disrupt the operation of electromechanical relays.

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

Ordering Information

Part Number	Description
CPC1972G	6-Pin DIP (50/Tube)
CPC1972GS	6-Pin Surface Mount (50/Tube)
CPC1972GSTR	6-Pin Surface Mount (1000/Reel)

Pin Configuration



Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	800	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation [1]	150	mW
Total Package Dissipation [2]	800	mW
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 6.67 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.

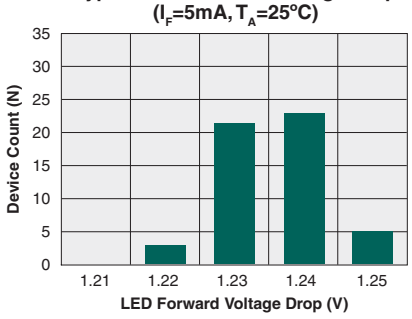
Electrical Characteristics @ 25ºC

Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Operating Voltage Range	-	V_L	5	-	550	V_{rms}
Load Current						
Continuous	-	I_L	5	-	250	mA_{rms}
Peak	t = 10ms	I_{TSM}	-	-	2	A_P
Off State Leakage Current	V_L=800V_P	I_{LEAK}	-	-	1	µA
On-State Voltage Drop	I_L = 250mA_{rms}	V_{ON}	-	-	3	V_{rms}
Critical Rate of Rise	-	dV/dt	500	-	-	V/µs
Holding Current	I_F=5mA	I_H	-	300	-	µA
Switching Speeds						
Turn-on	I_F=5mA	t_{on}	-	-	0.5	cycles
Turn-off		t_{off}	-	-	0.5	
Zero-Cross Turn-On Voltage [1]	1st half-cycle	-	-	5	20	V
	Subsequent half-cycle	-	-	1	-	V
Operating Frequency	-	-	20	-	500	Hz
Load Power Factor for Guaranteed Turn-On [2]	f=60Hz	PF	0.25	-	-	-
Input Characteristics						
Input Control Current to Activate [3]	-	I_F	-	-	5	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Input Drop-out Voltage	-	-	0.8	-	-	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

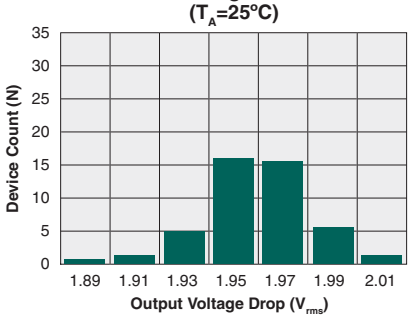
[1] Zero Cross 1st half-cycle @ <100Hz
[2] Snubber circuits may be required at low power factors.
[3] For high noise environment use at least 10mA LED current

PERFORMANCE DATA*

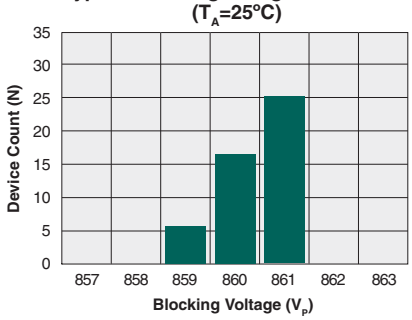
Typical LED Forward Voltage Drop (I_F=5mA, T_A=25°C)



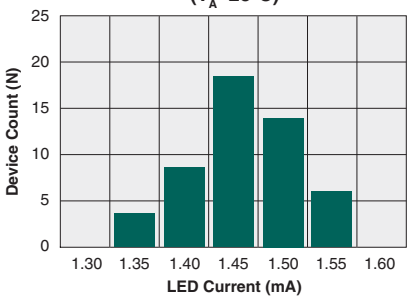
Typical On-State Output Forward Voltage Distribution (T_A=25°C)



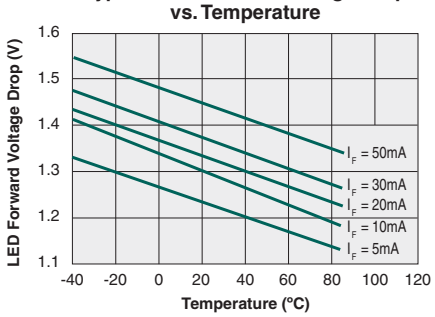
Typical Blocking Voltage Distribution (T_A=25°C)



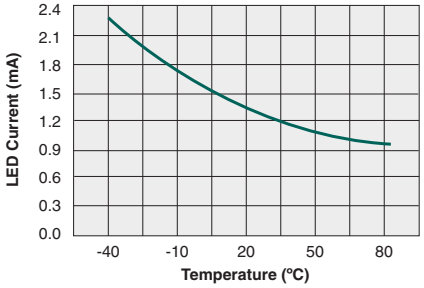
Typical I_F for Switch Operation (T_A=25°C)



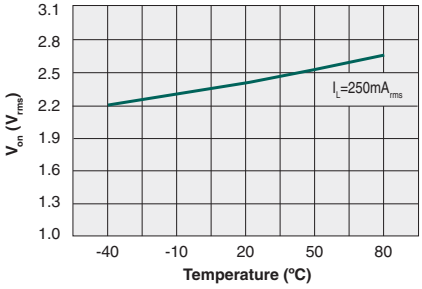
Typical LED Forward Voltage Drop vs. Temperature



Typical I_F for Switch Operation vs. Temperature



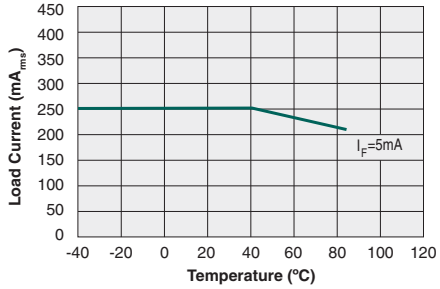
Typical Output Voltage Drop vs. Temperature



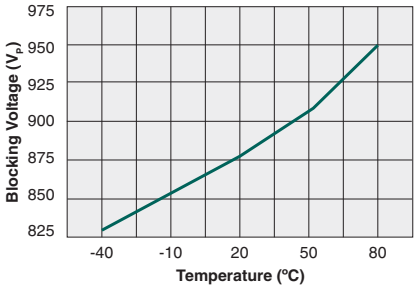
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

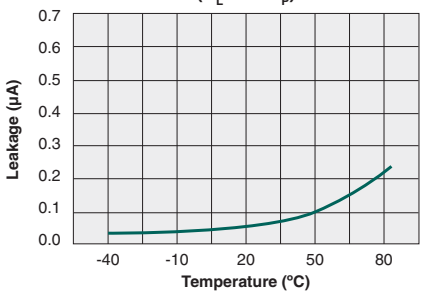
Typical Maximum Load Current vs. Temperature



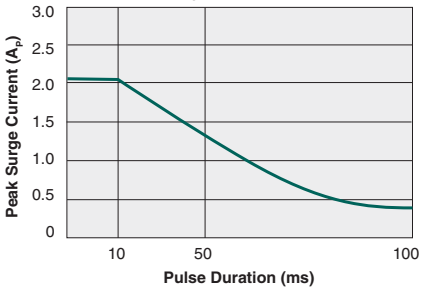
Typical Blocking Voltage vs. Temperature



Typical Leakage vs. Temperature (V_L=800V_P)



Maximum Surge Current (Non-Repetitive) (T_J=50ºC max)



*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 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
CPC1972G / CPC1972GS	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.

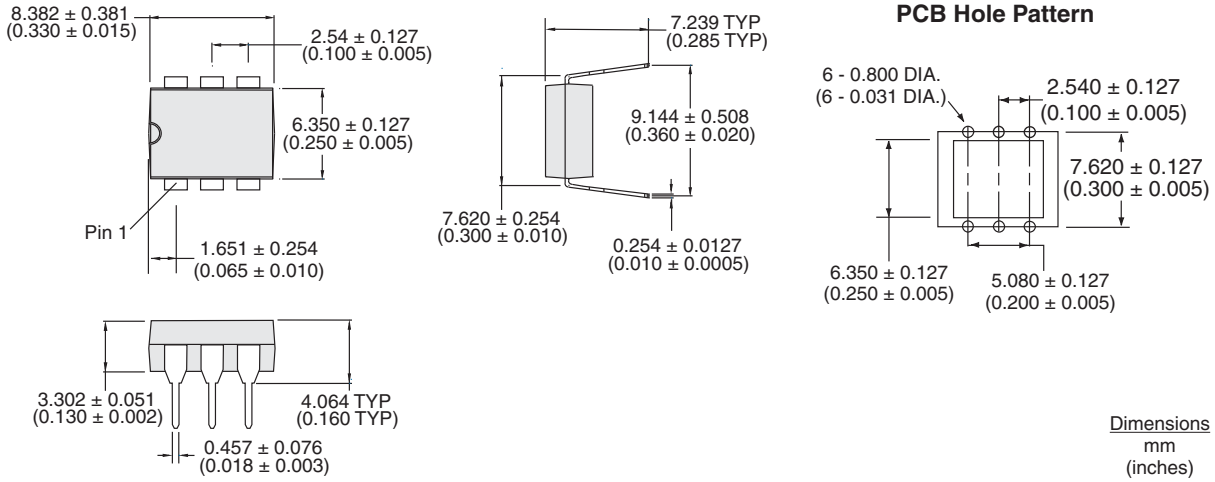
Device	Maximum Temperature x Time
CPC1972G / CPC1972GS	250°C for 30 seconds

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.

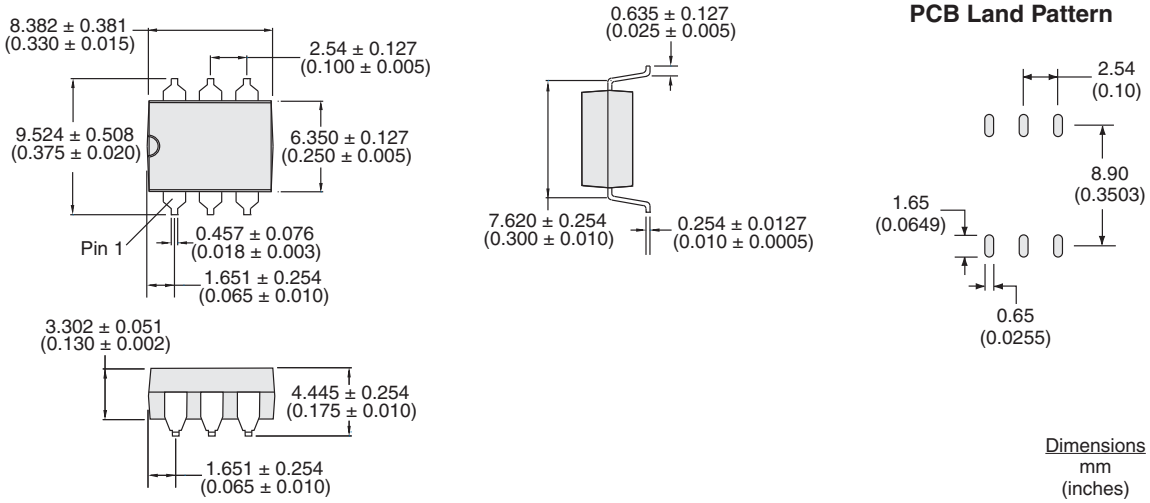
MECHANICAL DIMENSIONS

CPC1972G



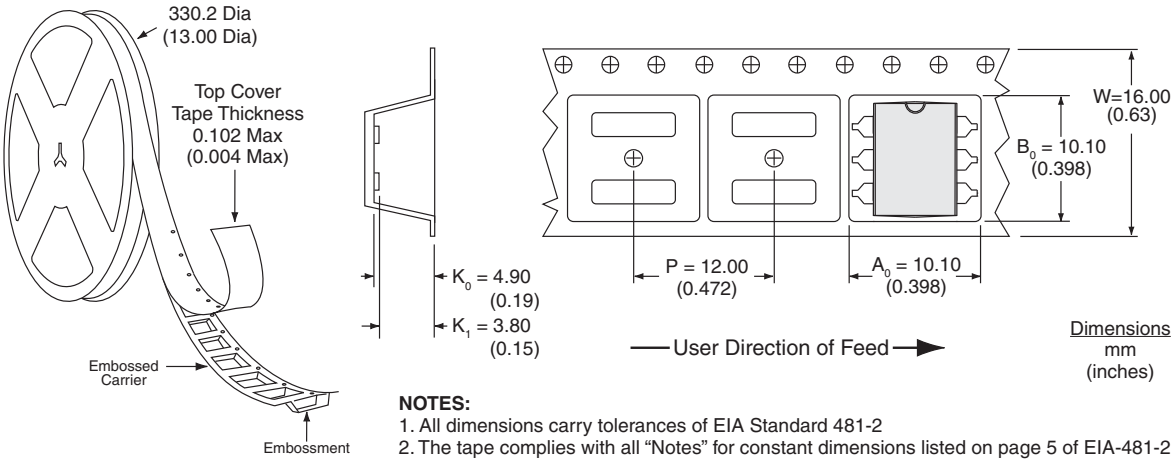
Dimensions
mm
(inches)

CPC1972GS



Dimensions
mm
(inches)

CPC1972GSTR Tape & Reel



NOTES:
1. All dimensions carry tolerances of EIA Standard 481-2
2. The tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

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

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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

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