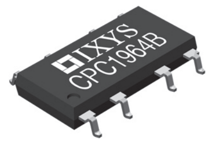
INTEGRATED CIRCUITS DIVISION



CPC1964B
AC Power Switch

Parameter	Rating	Units
AC Operating Voltage	20 - 280	V_{rms}
Load Current	1.5	A_{rms}
On-State Voltage Drop	1.4	V_P (at I_L = 1.5A_P)
Blocking Voltage	800	V_P

Features

- Load Current up to 1.5A_{rms}
- 800V_P Blocking Voltage
- 5mA Sensitivity
- 5000V_{rms} Input to Output Isolation
- Off-State dV/dt: 1000V/μs Minimum
- 12.5mm External Creepage Distance with Appropriate Layout
- Zero-Cross Switching
- 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
- Meters

Description

CPC1964B 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 800V_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 5000V_{rms} of isolation between the control and load circuits. As a result, the CPC1964B is well suited for industrial environments where electromagnetic interference would disrupt the operation of plant facility communication and control systems.

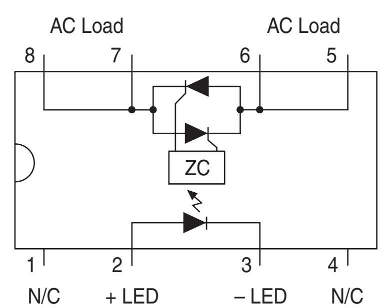
Approvals

- UL 508 Certified Component: File E69938
- CSA Industrial Control Switches Approval: Pending

Ordering Information

Part #	Description
CPC1964B	8-Pin Power SOIC (25/Tube)

Pin Configuration



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage (V_{DRM})	800	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation [1]	150	mW
Total Power Dissipation [2]	2400	mW
Isolation Voltage Input to Output	5000	V_{rms}
ESD, Human Body Model	4	kV
i^2t for Fusing (1/2 Sine Wave, 50Hz)	1.6	A^2s
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.

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.

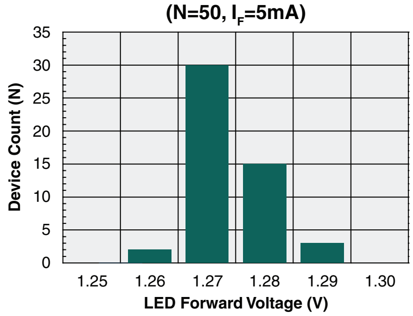
Electrical Characteristics @ 25°C

Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current, Continuous	V_L=120-280V_{rms}	I_L	0.1	-	1.5	A_{rms}
Maximum Surge Current	t ≤ 20ms	I_P	-	-	16	A_P
Off State Leakage Current	I_F=0mA, V_L=V_{DRM}	I_{LEAK}	-	-	100	μA_P
On-State Voltage Drop [1]	I_F=5mA, I_L=1.5A_P	-	-	1.21	1.4	V_P
Off-State dV/dt	I_F=0mA	dV/dt	1000	-	-	V/µs
Switching Speeds						
Turn-on	I_F = 5 mA	t_{on}	-	-	0.5	cycles
Turn-off		t_{off}	-	-	0.5	cycles
Zero-Cross Turn-On Voltage [2]	1st half cycle	-	-	5	20	V
	Subsequent half cycle	-	-	-	5	V
Holding Current	-	I_H	-	-	75	mA
Latching Current	-	I_L	-	-	75	mA
Operating Frequency	-		20	-	500	Hz
Load Power Factor for Guaranteed Turn-On [3]	f=60Hz	PF	0.25	-	-	-
Input Characteristics						
Input Control Current to Activate [4]	f=60Hz, I_L=1A Resistive	I_F	-	-	5	mA
Input Drop-out Voltage to Deactivate	-	-	0.8	-	-	V
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.5	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Input to Output Capacitance	V_{IO}=0V, f=1MHz	C_{IO}	-	-	3	pF

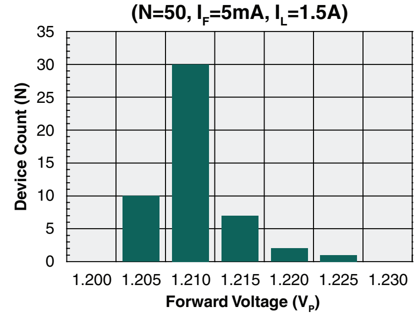
[1] Tested at a peak value equivalent.
[2] Zero Cross 1st half cycle @ <100Hz.
[3] Snubber circuits may be required at low power factors.
[4] For high-noise environments, or for high-frequency operation, use $I_F \geq$ 10mA.

PERFORMANCE DATA*

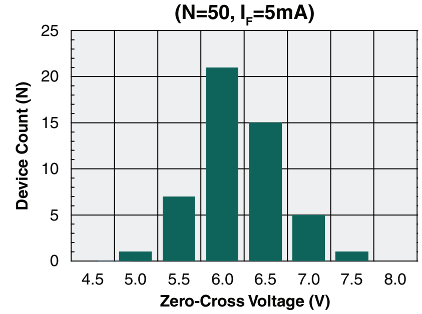
Typical LED Forward Voltage Drop (N=50, I_F=5mA)



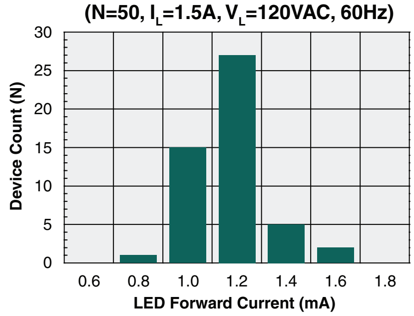
On-State Forward Voltage Drop (N=50, I_F=5mA, I_L=1.5A)



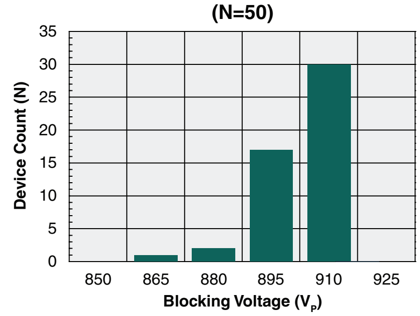
First Zero-Cross Turn-On Voltage Distribution (N=50, I_F=5mA)



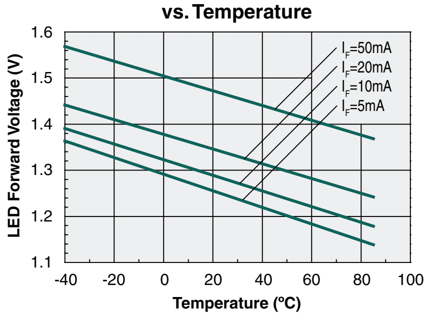
Typical I_F for Switch Operation Resistive Load (N=50, I_L=1.5A, V_L=120VAC, 60Hz)



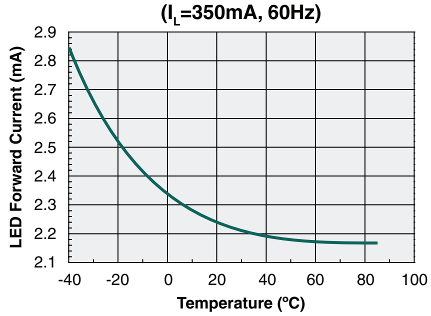
Typical Blocking Voltage Distribution (N=50)



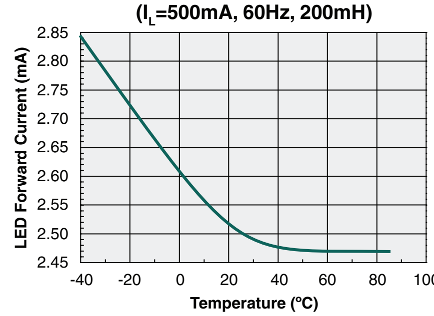
Typical LED Forward Voltage Drop vs. Temperature



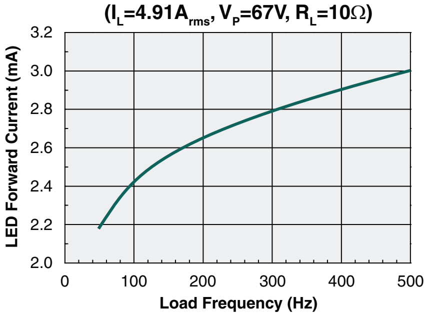
Typical I_F for Switch Operation Resistive Load (I_L=350mA, 60Hz)



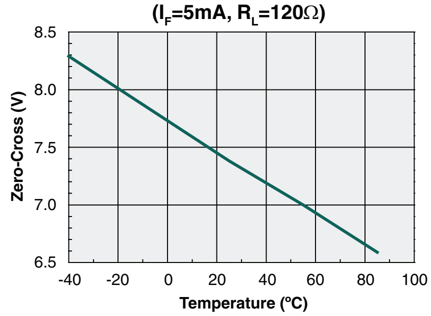
Typical I_F for Switch Operation Inductive Load (I_L=500mA, 60Hz, 200mH)



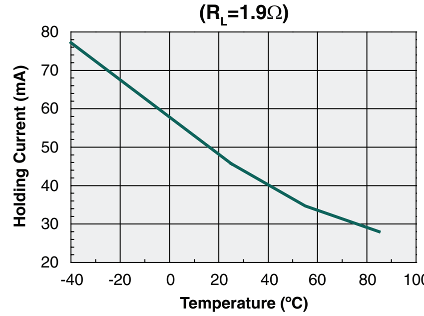
Typical I_F for Switch Operation vs. Load Frequency (Resistive) (I_L=4.91A_{rms}, V_P=67V, R_L=10Ω)



First Zero-Cross Turn-On Voltage (I_F=5mA, R_L=120Ω)



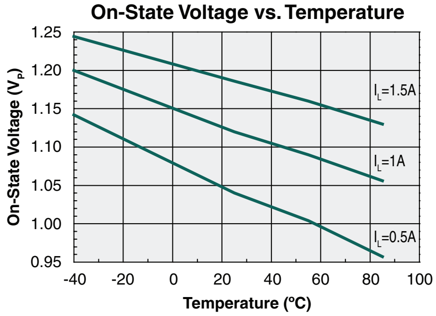
Holding Current (R_L=1.9Ω)



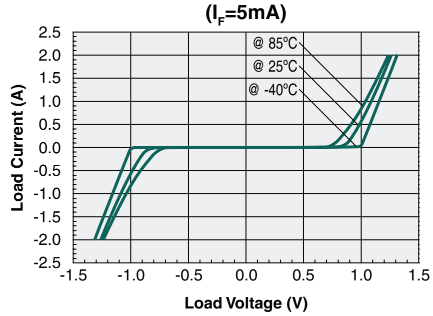
*Unless otherwise noted, data presented in these graphs is typical of device operation at 25ºC.
For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

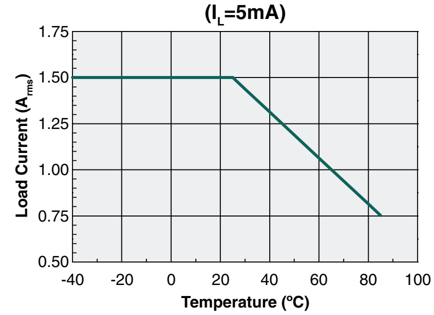
On-State Voltage vs. Temperature



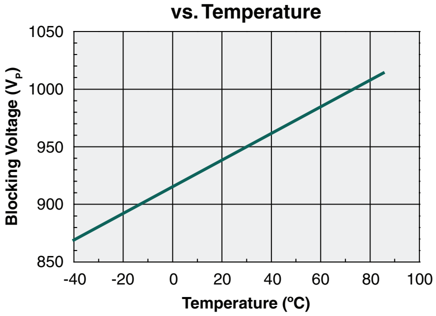
Typical Load Current vs. Load Voltage (I_F=5mA)



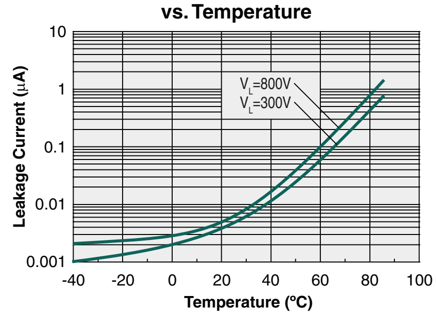
Maximum Load Current vs. Temperature (I_L=5mA)



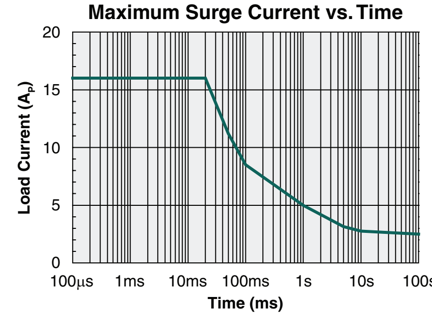
Typical Blocking Voltage vs. Temperature



Typical Leakage Current vs. Temperature



Maximum Surge Current vs. Time



*Unless otherwise noted, data presented in these graphs is typical of device operation at 25ºC.
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 classifies 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) classification 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) Classification
CPC1964B	MSL 1

ESD Sensitivity

This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Soldering Profile

Provided in the table below is the Classification Temperature (T_C) of this product and the maximum dwell time the body temperature of this device may be (T_C - 5)°C or greater. The classification temperature sets the Maximum Body Temperature allowed for this device during lead-free reflow processes. For through-hole devices, and any other processes, the guidelines of **J-STD-020** must be observed.

Device	Classification Temperature (T_c)	Dwell Time (t_p)	Max Reflow Cycles
CPC1964B	245°C	30 seconds	3

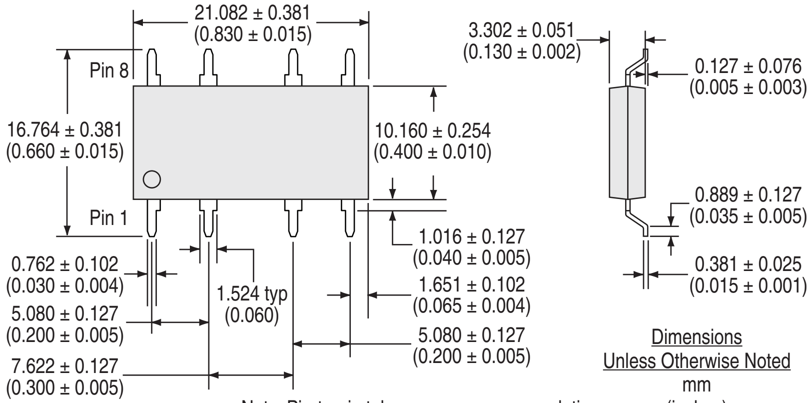
Board Wash

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 flux or solvents that are Chlorine- or Fluorine-based.

Pb RoHS e3

Mechanical Dimensions

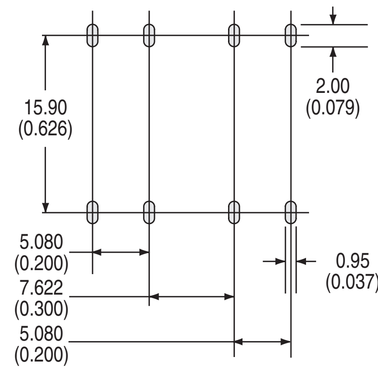
CPC1964B



Note: Pin-to-pin tolerances are non-cumulative.

Dimensions
Unless Otherwise Noted
mm
(inches)

Recommended PCB Pattern



Specification: DS-CPC1964B-R04

6/20/2018

The information below supercedes any previously presented material.

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

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