



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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| Parameter           | Rating | Units              |
|---------------------|--------|--------------------|
| Blocking Voltage    | 600    | $V_P$              |
| Load Current        | 0.5    | $A_{DC} / A_{rms}$ |
| On-Resistance (max) | 6      | $\Omega$           |

### Features

- 12.5mm of Creepage (with Appropriate Layout)
- Continuous Load Currents Up to 0.5A
- 600V<sub>P</sub> Blocking Voltage
- 5000V<sub>rms</sub> Input/Output Isolation
- Power SOIC Package
- High Reliability
- No Moving Parts
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable

### Applications

- Industrial Controls
- Motor Control
- Robotics
- Medical Equipment—Patient/Equipment Isolation
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- IC Equipment
- Home Appliances

### Description

IXYS Integrated Circuits Division and IXYS have combined to bring OptoMOS technology, reliability, and compact size to a new family of high-power Solid State Relays.

As part of this family, the CPC1983B single-pole, normally open (1-Form-A) Solid State Power Relay is rated for up to 0.5 A<sub>DC</sub> / A<sub>rms</sub> continuous load current.

The CPC1983B employs optically coupled MOSFET technology to provide 5000V<sub>rms</sub> of input to output isolation. The optically coupled outputs, that use patented OptoMOS architecture, are controlled by a highly efficient GaAlAs infrared LED.

This combination of low on-resistance and high load current handling capability makes this relay suitable for a variety of high performance switching applications.

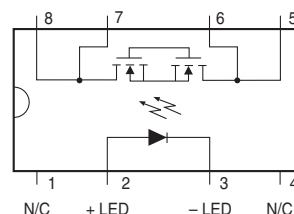
### Approvals

- UL 508 Recognized Component: File E69938

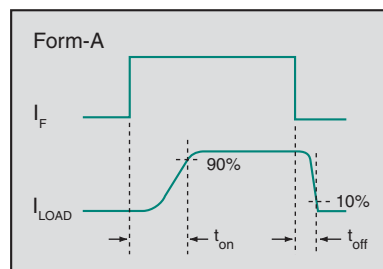
### Ordering Information

| Part #   | Description                      |
|----------|----------------------------------|
| CPC1983B | Power SOIC Package (25 per tube) |

### Pin Configuration



### Switching Characteristics of Normally Open Devices



## Absolute Maximum Ratings @ 25°C

| Parameter                            | Ratings     | Units            |
|--------------------------------------|-------------|------------------|
| Blocking Voltage                     | 600         | V <sub>P</sub>   |
| Reverse Input Voltage                | 5           | V                |
| Input Control Current                | 50          | mA               |
| Peak (10ms)                          | 1           | A                |
| Input Power Dissipation <sup>1</sup> | 150         | mW               |
| Total Power Dissipation <sup>2</sup> | 2400        | mW               |
| Isolation Voltage, Input to Output   | 5000        | V <sub>rms</sub> |
| ESD Rating, Human Body Model         | 8           | kV               |
| Operational Temperature              | -40 to +85  | °C               |
| Storage Temperature                  | -40 to +125 | °C               |

<sup>1</sup> Derate linearly 3.33 mW / °C

<sup>2</sup> 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

| Parameter                           | Conditions   | Symbol            | Min | Typ  | Max | Units                              |
|-------------------------------------|--|-------------------|-----|------|-----|------------------------------------|
| <b>Output Characteristics</b>       |  |                   |     |      |     |                                    |
| Load Current, Continuous            | I <sub>F</sub> =5mA, Free air                          | I <sub>L</sub>    | -   | -    | 0.5 | A <sub>DC</sub> / A <sub>rms</sub> |
| Peak Load Current                   | I <sub>F</sub> =5mA, t <sub>≤</sub> 10ms               | I <sub>LPK</sub>  | -   | -    | ±3  | A                                  |
| On-Resistance <sup>1</sup>          | I <sub>F</sub> =5mA, I <sub>L</sub> =0.5A              | R <sub>ON</sub>   | -   | 3.5  | 6   | Ω                                  |
| Off-State Leakage Current           | I <sub>F</sub> =0mA, V <sub>L</sub> =600V <sub>P</sub> | I <sub>LEAK</sub> | -   | -    | 1   | μA                                 |
| Switching Speeds                    | I <sub>F</sub> =5mA, V <sub>L</sub> =10V               | t <sub>on</sub>   | -   | 2.2  | 5   | ms                                 |
| Turn-On                             |  |                   |     |      |     |                                    |
| Turn-Off                            |  | t <sub>off</sub>  | -   | 0.15 | 2   |                                    |
| Output Capacitance                  | I <sub>F</sub> =0mA, V <sub>L</sub> =50V, f=1MHz       | C <sub>OUT</sub>  | -   | 41   | -   | pF                                 |
| <b>Input Characteristics</b>        |  |                   |     |      |     |                                    |
| Input Control Current to Activate   | I <sub>L</sub> =0.5A                                   | I <sub>F</sub>    | -   | 1.3  | 5   | mA                                 |
| Input Control Current to Deactivate | -  | I <sub>F</sub>    | 0.5 | -    | -   | mA                                 |
| Input Voltage Drop                  | I <sub>F</sub> =5mA                                    | V <sub>F</sub>    | 0.9 | 1.2  | 1.4 | V                                  |
| Reverse Input Current               | V <sub>R</sub> =5V                                     | I <sub>R</sub>    | -   | -    | 10  | μA                                 |
| <b>Input/Output Characteristics</b> |  |                   |     |      |     |                                    |
| Capacitance, Input to Output        | f=1MHz   | C <sub>IO</sub>   | -   | 2    | -   | pF                                 |

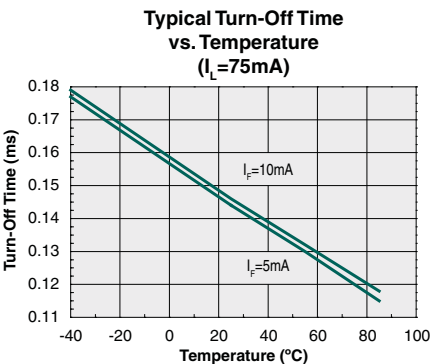
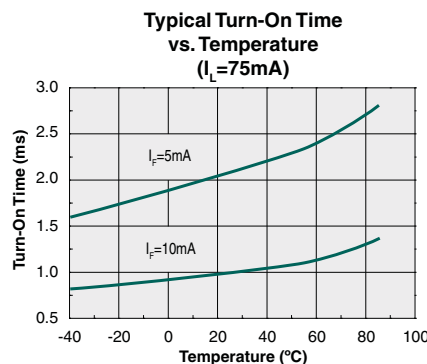
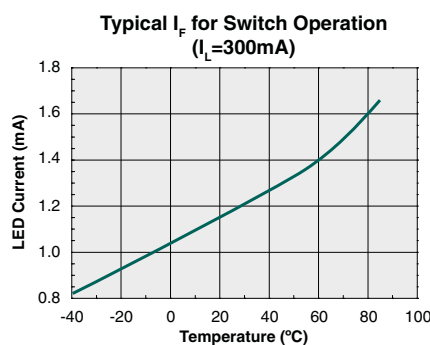
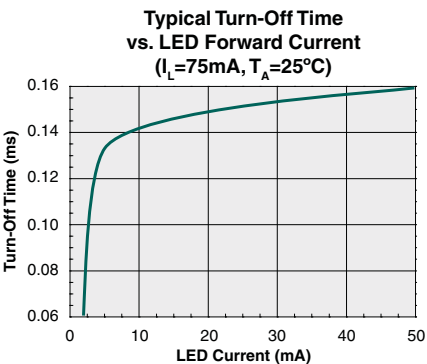
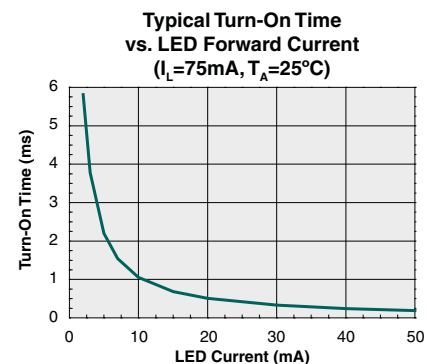
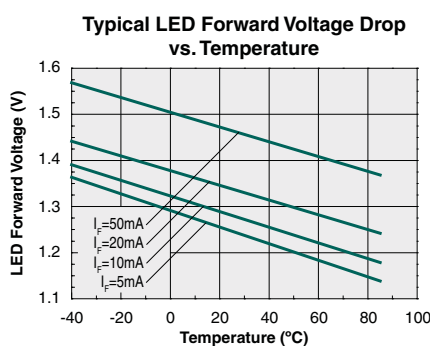
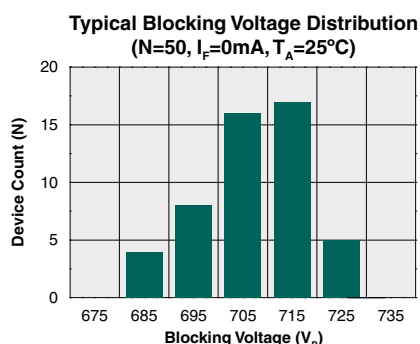
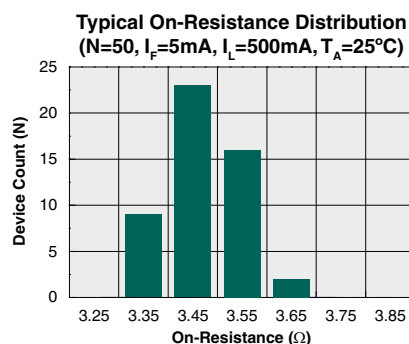
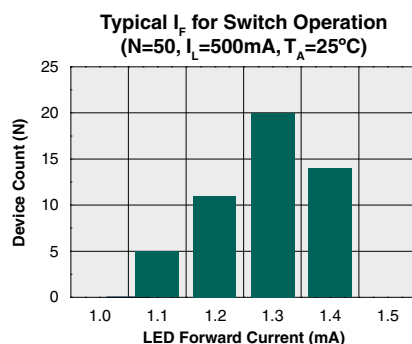
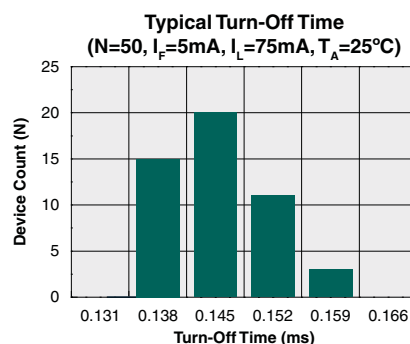
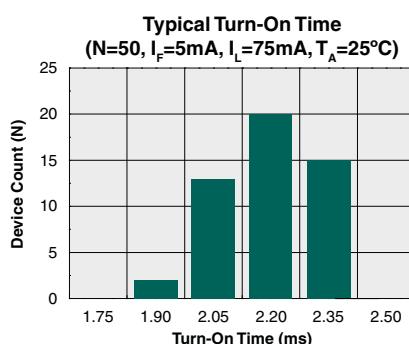
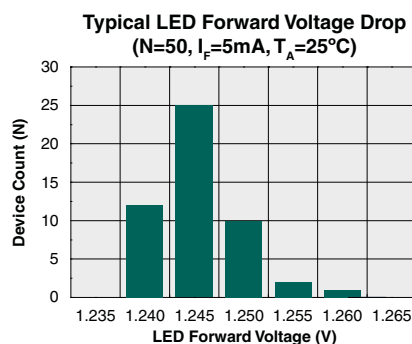
<sup>1</sup> Measurement taken within 1 second of on-time.

## Thermal Characteristics

| Parameter                             | Conditions | Symbol           | Min | Typ | Max | Units |
|---------------------------------------|------------|------------------|-----|-----|-----|-------|
| Thermal Resistance (junction to case) | -          | R <sub>θJC</sub> | -   | 1.5 | -   | °C/W  |

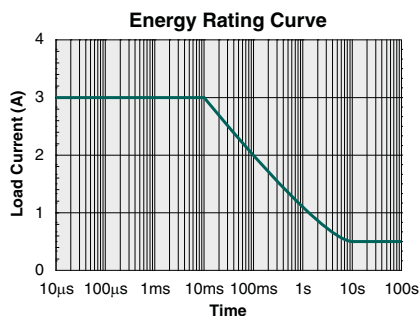
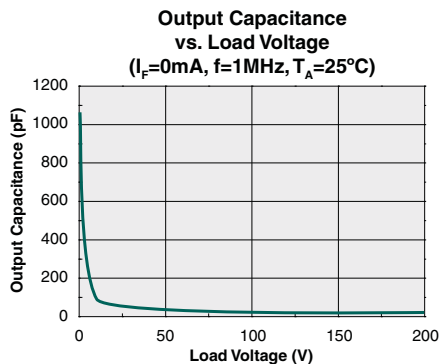
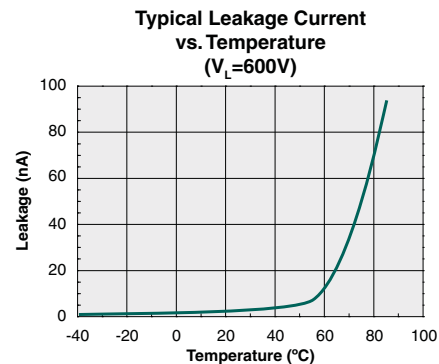
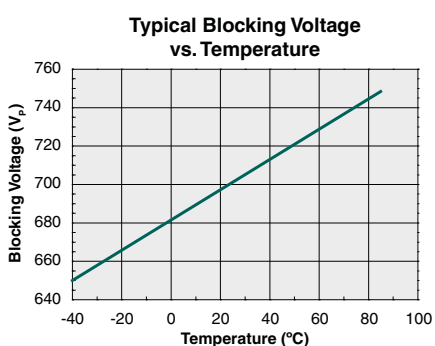
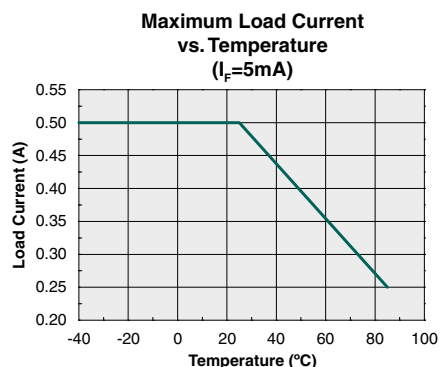
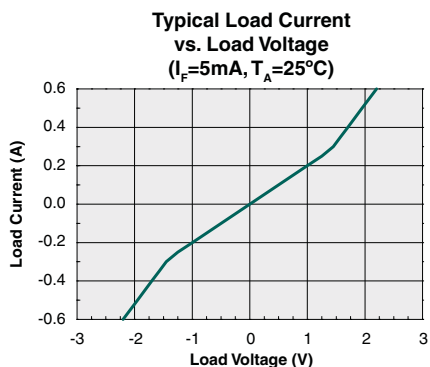
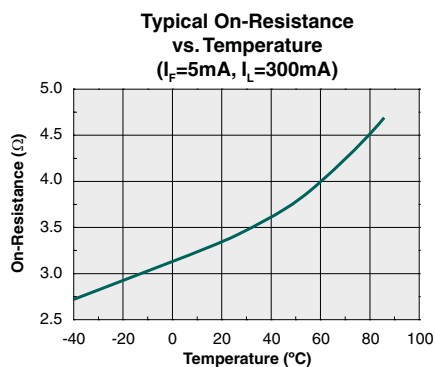


## PERFORMANCE DATA\*



\*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\***



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## 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 |
|----------|---|
| CPC1983B | 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 |
|----------|----------------------------|
| CPC1983B | 245°C for 30 seconds       |

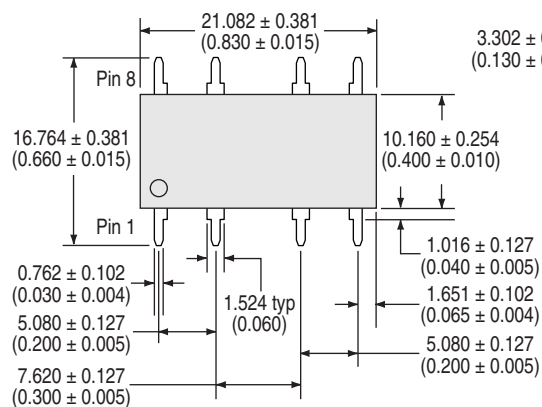
### Board Wash

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.

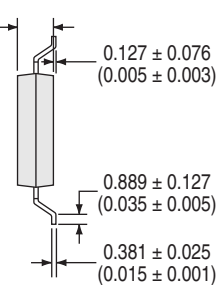


## MECHANICAL DIMENSIONS

### CPC1983B

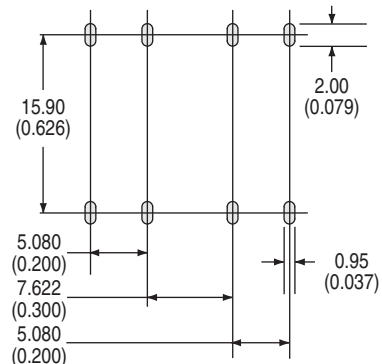


Note: Pin-to-pin tolerances are non-cumulative.



Dimensions  
Unless Otherwise Noted  
mm  
(inches)

### Recommended PCB Pattern



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

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