

| Parameters | Ratings | Units |
|------------------------|---------|----------------------|
| Blocking Voltage | 350 | V_P |
| Load Current | 100 | mA_{rms} / mA_{DC} |
| On-Resistance (max) | 35 | Ω |
| LED Current to Operate | 1 | mA |

Transient Protection Characteristics

| Peak Pulse Power | V_{WM} |
|------------------|----------|
| 600W | 40.2V |

Features

- Meets Requirements of EN50130-4 (Installation Class 3)
- 3750V_{rms} Input/Output Isolation
- 100% Solid State
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

Applications

- Security
- Sensor Circuitry
- Instrumentation
- Multiplexers
- Data Acquisition
- Electronic Switching
- I/O Subsystems
- Aerospace
- Industrial Controls

Description

The CPC1335 is a single-pole, normally open (1-Form-A) solid state relay with bi-directional transient voltage suppressor (TVS) relay protection, which is designed to meet the requirements of EN50130-4 (installation class 3).

The relay output is constructed with efficient MOSFET switches that use IXYS Integrated Circuits Division's patented OptoMOS architecture. The input, a highly efficient GaAlAs infrared LED, controls the optically coupled output.

The CPC1335 is available in an 8-pin, space-saving surface-mount package.

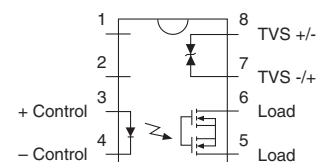
Approvals

- UL Certified Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component: TUV Certificate B 10 05 49410 006

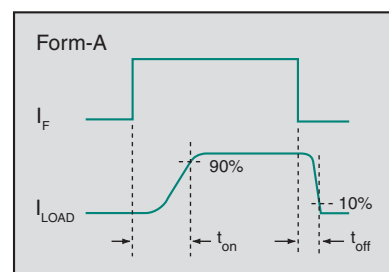
Ordering Information

| Part # | Description |
|------------|----------------------------|
| CPC1335P | 8-Pin Flatpack (50/Tube) |
| CPC1335PTR | 8-Pin Flatpack (1000/Reel) |

Pin Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25°C

| Parameter | Ratings | Units |
|---|-------------|------------------|
| SSR Output Blocking Voltage | 350 | V _p |
| TVS Working Voltage, Maximum (V _{WM}) | 40.2 | V |
| Reverse Input Voltage | 5 | V |
| Input Control Current | 50 | mA |
| Peak (10ms) | 1 | A |
| Input Power Dissipation ¹ | 150 | mW |
| SSR Output Power Dissipation ² | 400 | mW |
| TVS Peak Pulse Power (P _{PP}) (I _{PP} =9.3A, 10/1000µs pulse) | 600 | W |
| Isolation Voltage, Input to Output | 3750 | V _{rms} |
| Operating 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.

¹ Derate linearly 1.33 mW / °C

² Derate linearly 6.67 mW / °C

Electrical Characteristics @ 25°C

| Parameters | Conditions | Symbol | Min | Typ | Max | Units |
|--|--|-------------------|-----|-----|------|--------------------------------------|
| Output Characteristics | | | | | | |
| Load Current | | | | | | |
| Continuous ¹ | I _F =2mA | I _L | - | - | 100 | mA _{rms} / mA _{DC} |
| Peak | t=10ms | I _{LPK} | - | - | ±350 | mA _p |
| On-resistance ² | I _L =100mA | R _{ON} | - | 25 | 35 | Ω |
| Off-State Leakage Current | V _L =350V _p | I _{LEAK} | - | - | 1 | µA |
| Switching Speeds | | | | | | |
| Turn-On | I _F =2mA, V _L =10V | t _{on} | - | - | 10 | ms |
| Turn-Off | | t _{off} | - | - | 10 | |
| Output Capacitance | V _L =50V, f=1MHz | C _{OUT} | - | 40 | - | pF |
| Input Characteristics | | | | | | |
| Input Control Current to Activate ³ | I _L =100mA | I _F | - | - | 1 | mA |
| 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 Load current derates linearly from 100mA @ 25°C to 70mA @ 85°C

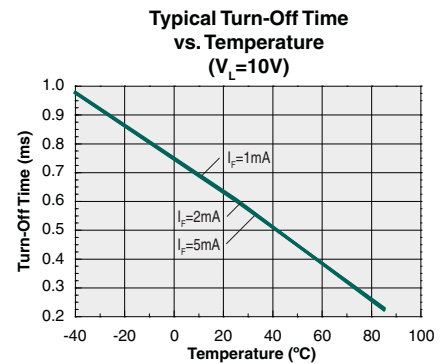
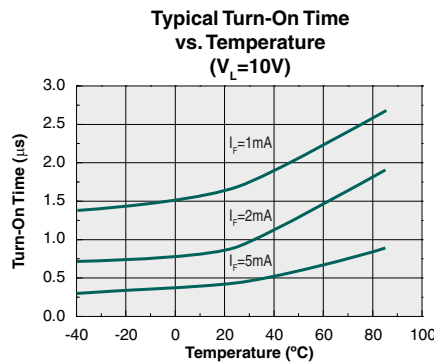
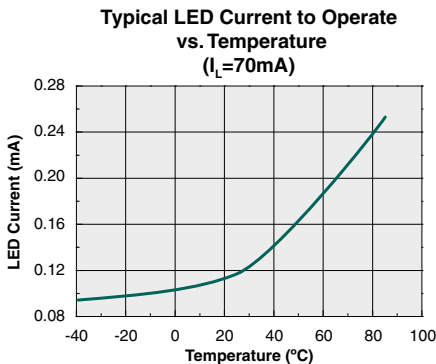
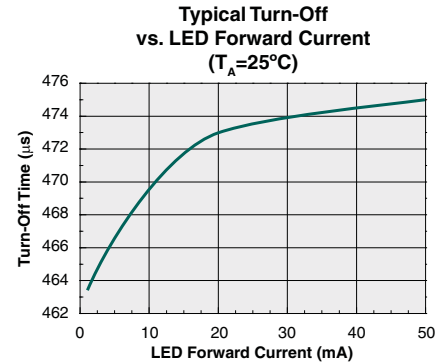
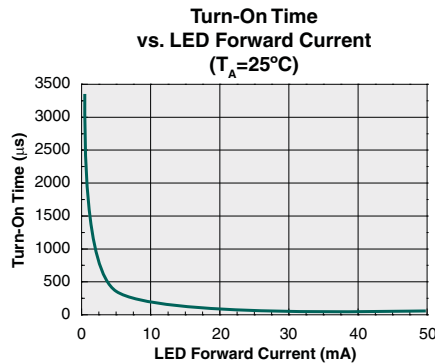
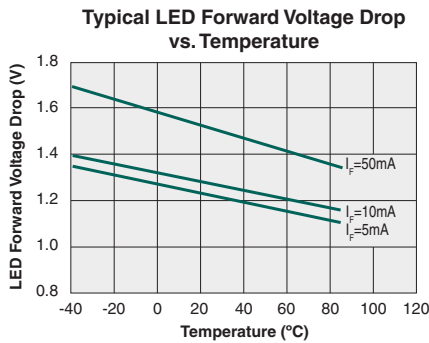
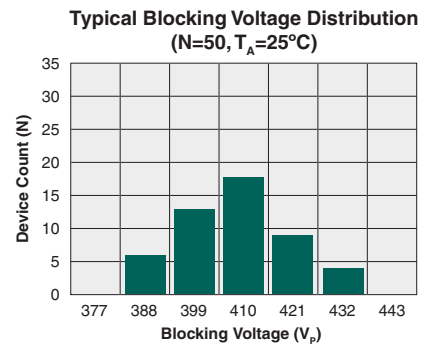
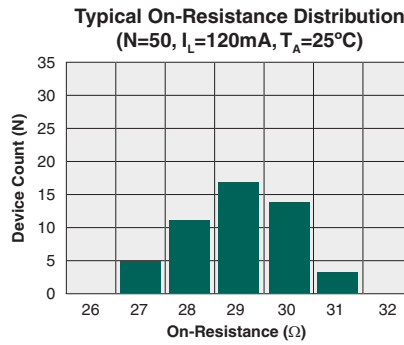
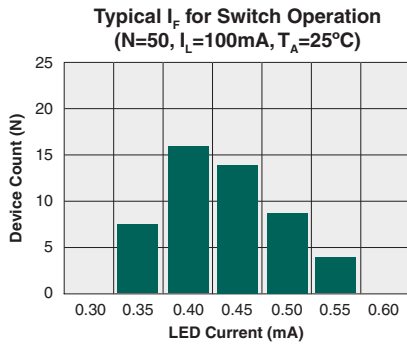
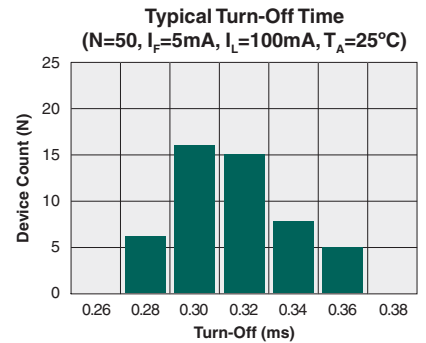
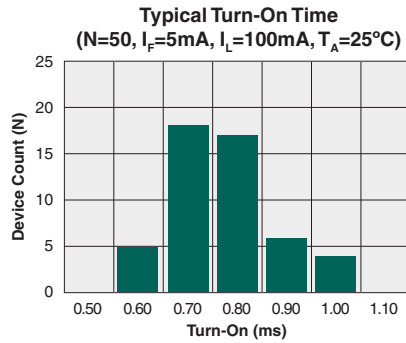
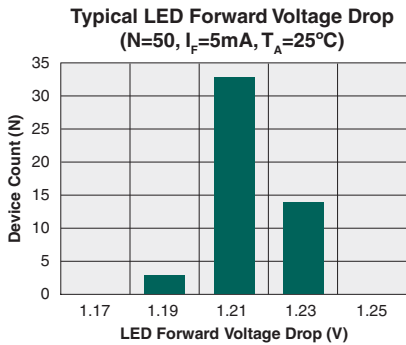
² Measurement taken within 1 second of on-time

³ For applications requiring high temperature operation (greater than 60°C) a minimum LED drive current of 3mA is recommended.

Electrical Characteristics: TVS

| Parameters | Conditions | Symbol | Min | Typ | Max | Units |
|--------------------------------------|------------------------|-----------------|------|-----|------|-------|
| Output Characteristics @ 25°C | | | | | | |
| Clamping Voltage | I _{PP} =9.3A | V _C | - | - | 66.5 | V |
| Reverse Breakdown Voltage | I=1mA | V _{BR} | 44.4 | - | - | V |
| Reverse Leakage Current | V _{WM} =40.2V | I _L | - | - | 5 | µA |

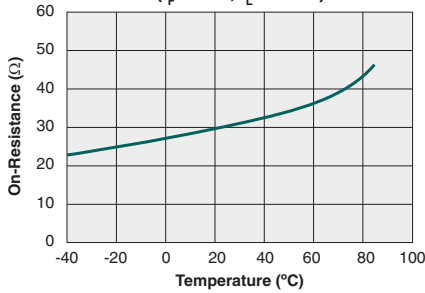
PERFORMANCE DATA*



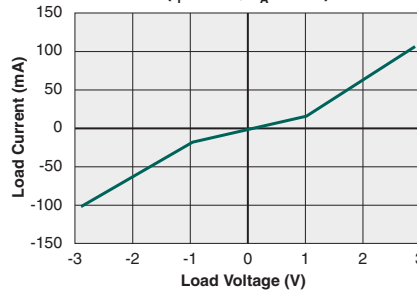
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

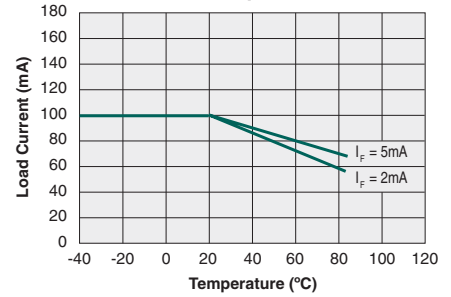
Typical On-Resistance vs. Temperature
($I_F=3mA, I_L=50mA$)



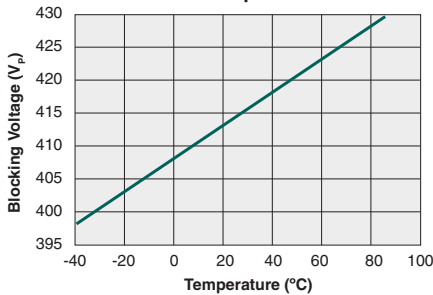
Typical Load Current vs. Load Voltage
($I_F=5mA, T_A=25°C$)



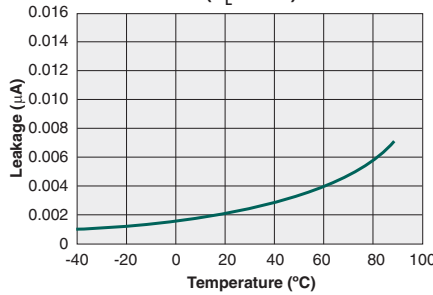
Maximum Load Current vs. Temperature



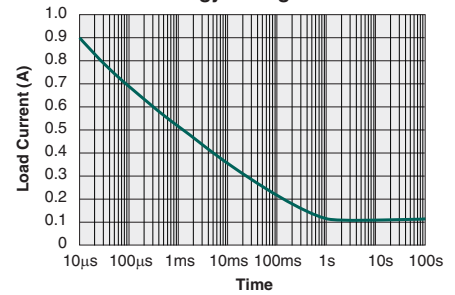
Typical Blocking Voltage vs. Temperature



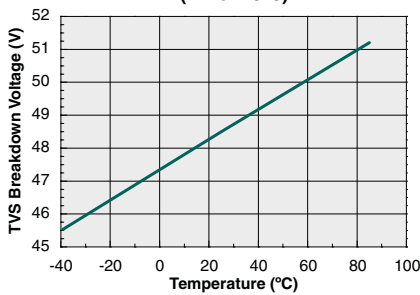
Typical Leakage vs. Temperature Measured Across Pins 5 & 6
($V_L=350V$)



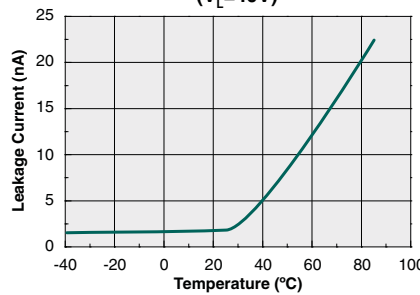
Energy Rating Curve



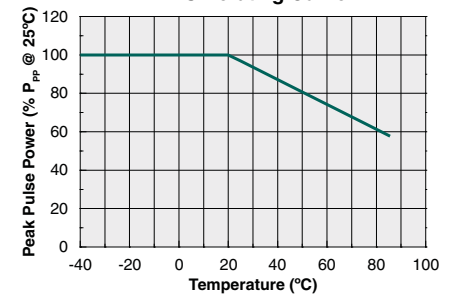
TVS Diode Breakdown Voltage vs. Temperature
(Pins 7 & 8)



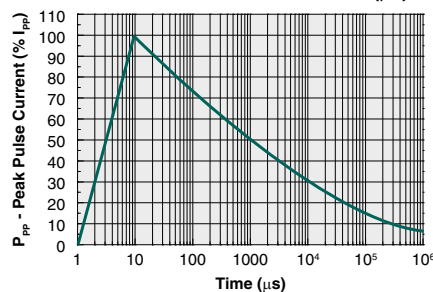
TVS Diode Leakage vs. Temperature
(Pins 7 & 8)
($V_L=40V$)



TVS Derating Curve



TVS Pulse Waveform 10/1000 (μs)



*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 |
|----------|---|
| CPC1335P | 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 |
|----------|----------------------------|
| CPC1335P | 260°C for 30 seconds |

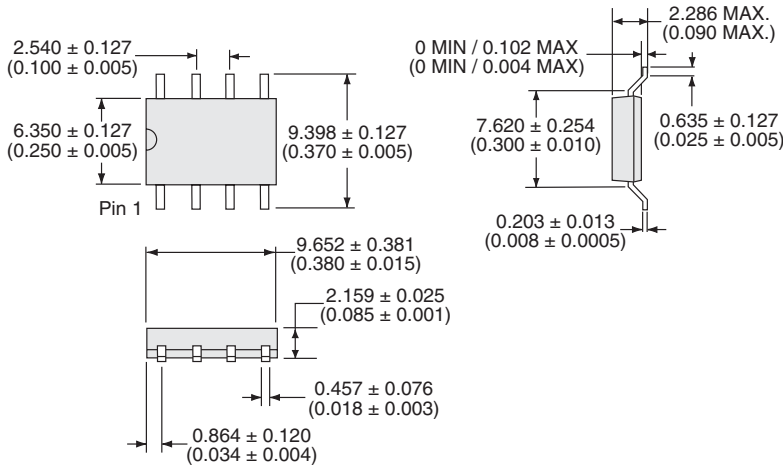
Board Wash

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.

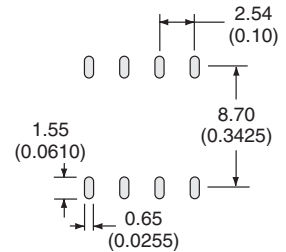


MECHANICAL DIMENSIONS

CPC1335P

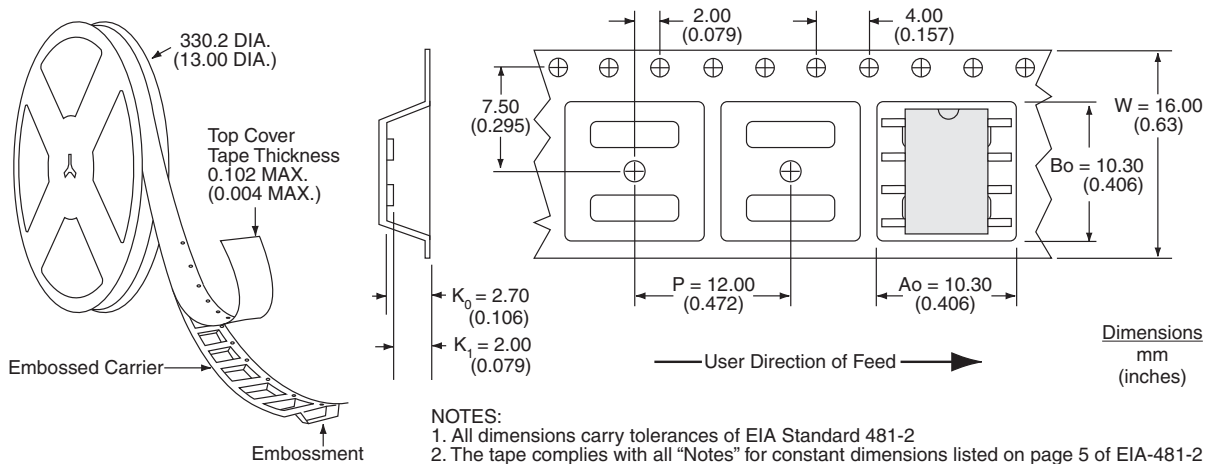


PCB Land Pattern



Dimensions
mm
(inches)

CPC1335PTR Tape & Reel



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