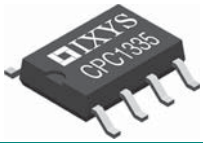
IXYS
INTEGRATED CIRCUITS DIVISION



CPC1335
Single Pole OptoMOS® Relay with Bi-directional Transient Protection

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.

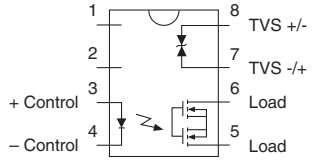
The CPC1335 is available in an 8-pin, space-saving surface-mount package.

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

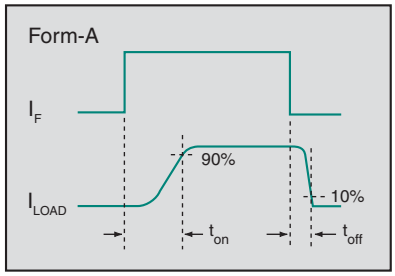
Ordering Information

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

Pin Configuration



Switching Characteristics of Normally Open Devices



Pb RoHS e3

Absolute Maximum Ratings @ 25ºC

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

[1] Derate linearly 1.33 mW / ºC
[2] Derate linearly 6.67 mW / ºC

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						
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

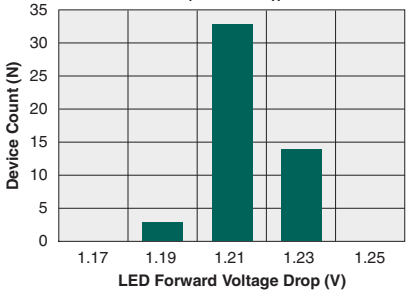
[1] Load current derates linearly from 100mA @ 25°C to 70ma @ 85°C
[2] Measurement taken within 1 second of on-time
[3] For applications requiring high temperature operation (greater than 60°C) a minimum LED drive current of 3mA is recommended.

Electrical Characteristics: TVS

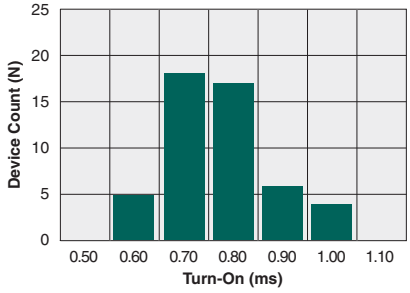
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Clamping Voltage	I_{PP}=9.3A	V_C	-	-	66.5	V
Reverse Breakdown Voltage	I=1mA	V_{BR}	44.4	-	-	V
Reverse Leakage Current	V_{WM}=40.2V	I_L	-	-	5	µA

PERFORMANCE DATA*

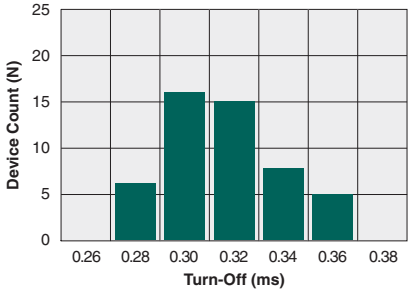
Typical LED Forward Voltage Drop
(N=50, I_F=5mA, T_A=25°C)



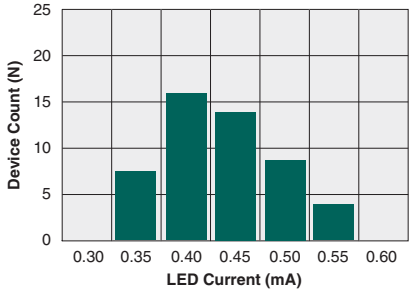
Typical Turn-On Time
(N=50, I_F=5mA, I_L=100mA, T_A=25°C)



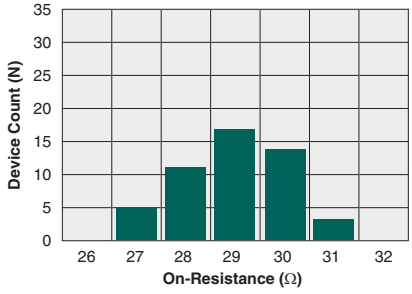
Typical Turn-Off Time
(N=50, I_F=5mA, I_L=100mA, T_A=25°C)



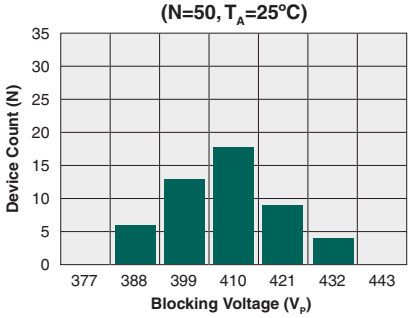
Typical I_F for Switch Operation
(N=50, I_L=100mA, T_A=25°C)



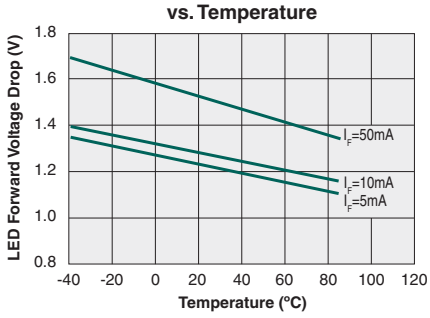
Typical On-Resistance Distribution
(N=50, I_L=120mA, T_A=25°C)



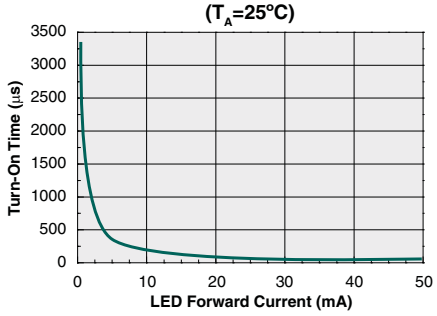
Typical Blocking Voltage Distribution
(N=50, T_A=25°C)



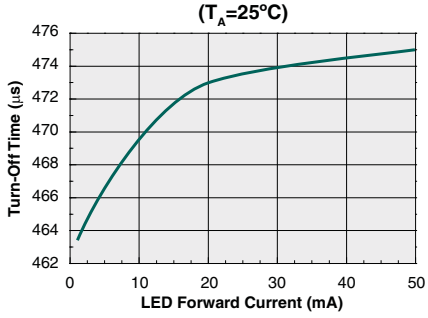
Typical LED Forward Voltage Drop
vs. Temperature



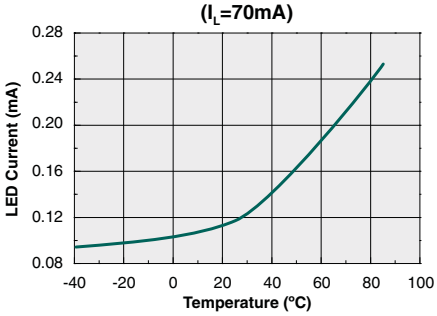
Turn-On Time
vs. LED Forward Current
(T_A=25°C)



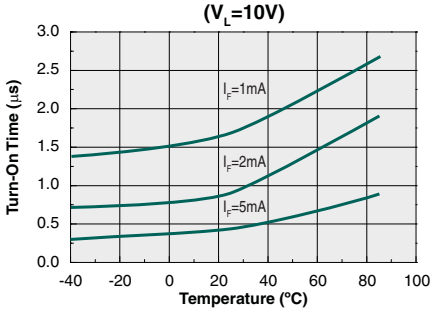
Typical Turn-Off
vs. LED Forward Current
(T_A=25°C)



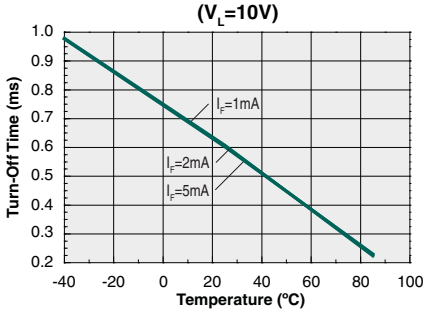
Typical LED Current to Operate
vs. Temperature
(I_L=70mA)



Typical Turn-On Time
vs. Temperature
(V_L=10V)



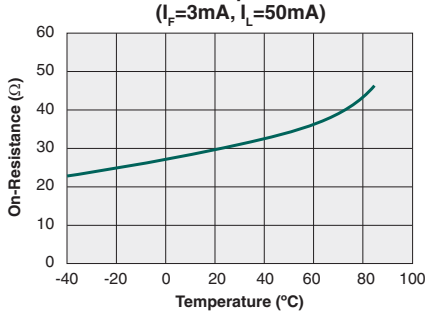
Typical Turn-Off Time
vs. Temperature
(V_L=10V)



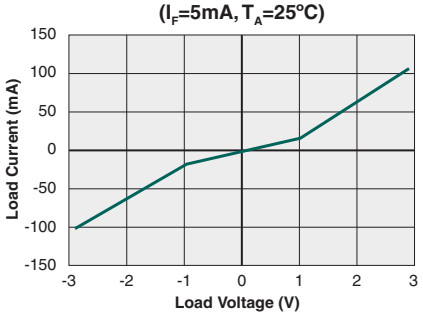
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

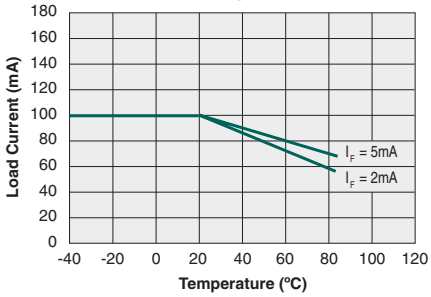
Typical On-Resistance vs. Temperature (I_F=3mA, I_L=50mA)



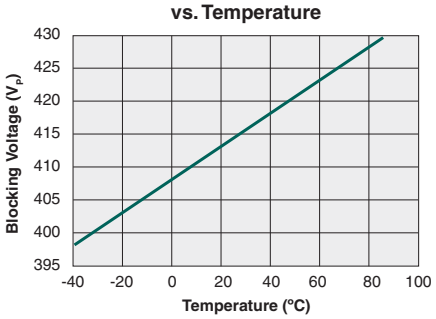
Typical Load Current vs. Load Voltage (I_F=5mA, T_A=25°C)



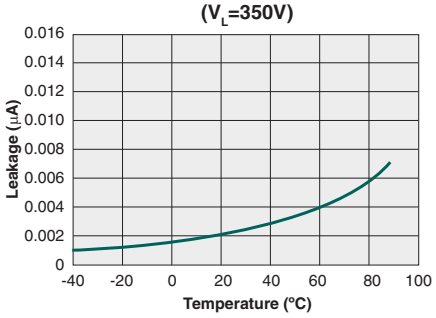
Maximum Load Current vs. Temperature



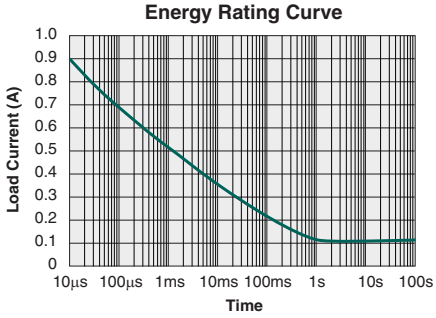
Typical Blocking Voltage vs. Temperature



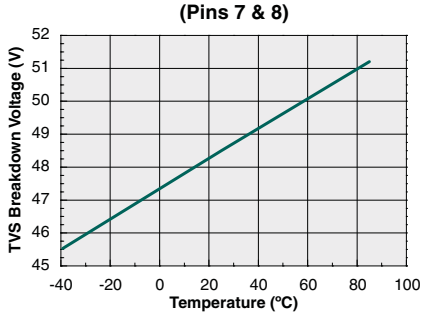
Typical Leakage vs. Temperature Measured Across Pins 5 & 6 (V_L=350V)



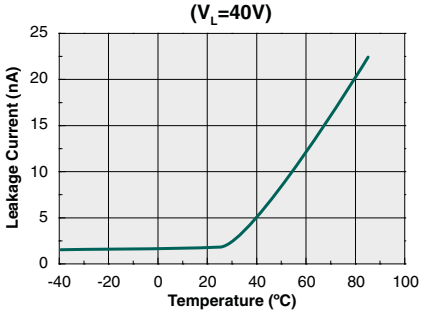
Energy Rating Curve



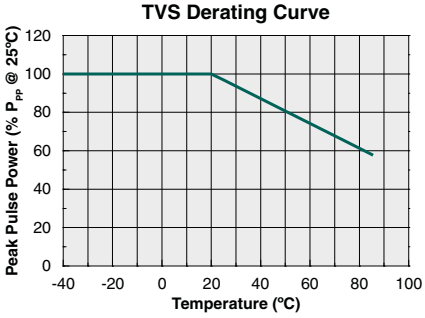
TVS Diode Breakdown Voltage vs. Temperature (Pins 7 & 8)



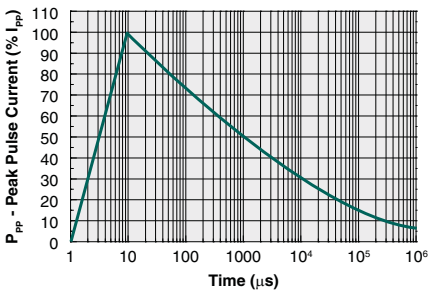
TVS Diode Leakage vs. Temperature (Pins 7 & 8) (V_L=40V)



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 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
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.

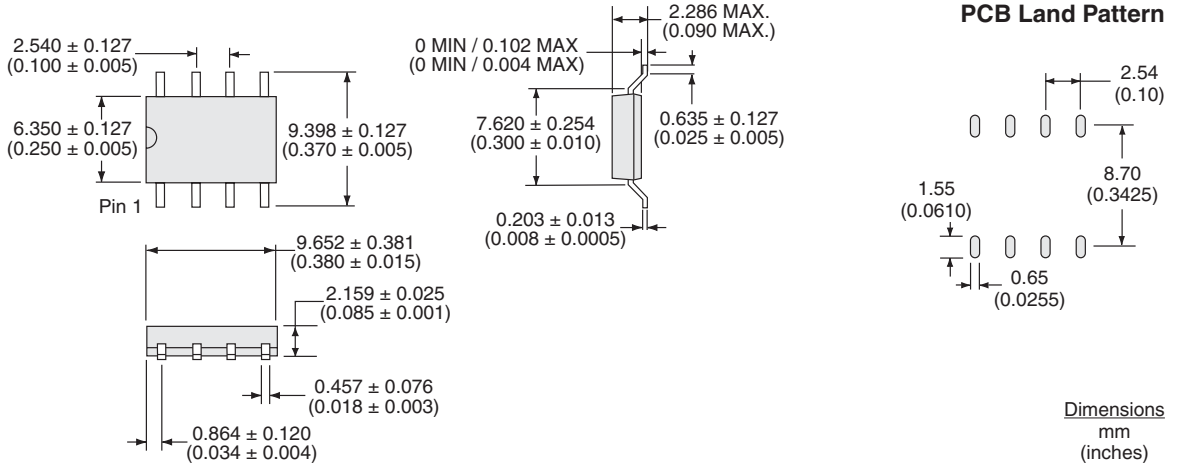
Device	Maximum Temperature x Time
CPC1335P	260°C for 30 seconds

Board Wash

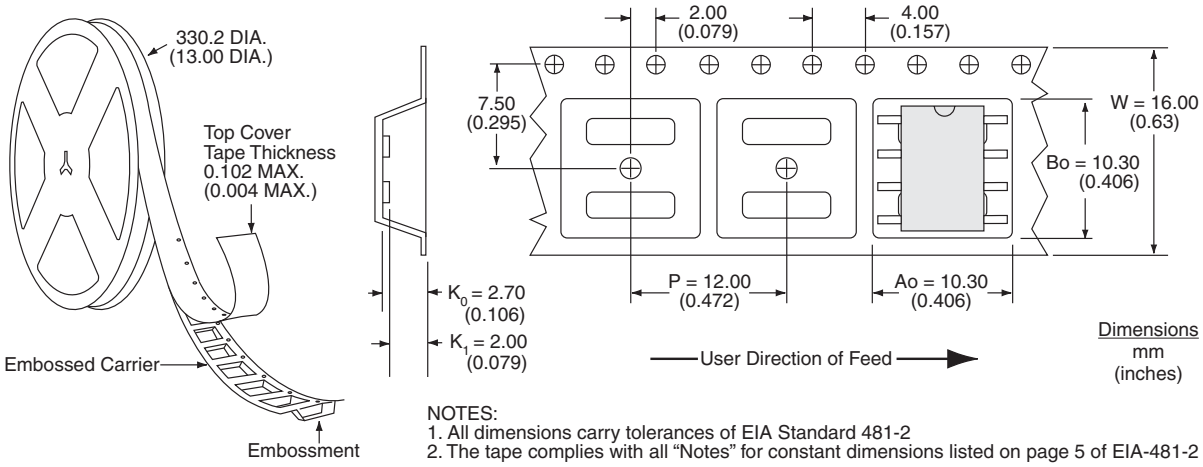
IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a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



CPC1335PTR 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

Specification: DS-CPC1335-R07

12/16/2012

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