CPC1335P
Single Pole OptoMOS® Relay with Bi-directional Transient Protection

Relay Characteristics

	CPC1335P	Units
Blocking Voltage	350	V
Load Current	100	mA
Max R_{ON}	35	Ω
LED Current to Operate	1.0	mA

Transient Protection Characteristics

Part Number	Peak Pulse Power	V_{WM}
CPC1335P	600W	40.2V

Features
- Small 8 Pin Surface Mount Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V_{RMS} Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Tape & Reel Version Available

Applications
- Security
- Aerospace
- Industrial Controls

Description
CPC1335P is a 1 Form-A solid state relay with Bi-directional TVS relay protection. The efficient MOSFET switches and photovoltaic die that use Clare's patented OptoMOS® architecture to provide 3750 V_{RMS} of input to output isolation. The optically coupled input is controlled by highly efficient GaAlAs infrared LEDs. The device is available in an 8 pin space saving surface mount package. The transient voltage suppressor is designed to meet the requirements of EN50130-4 (installation class 3).

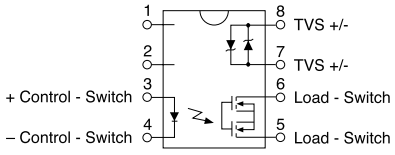
Approvals
- UL pending.

Ordering Information

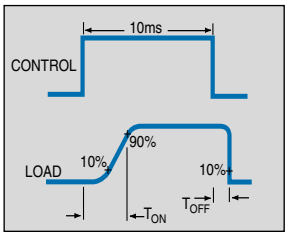
Part #	Description
CPC1335P	8 Pin Flatpack (50/Tube)
CPC1335PTR	8 Pin Flatpack (1000/Reel)

Pin Configuration

CPC1335P Pinout



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings - Relay (@ 25˚ C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150[1]	mW
Input Control Current	-	-	50	mA
Peak (10ms)	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800[2]	mW
Blocking Voltage	-	-	350	V
Isolation Voltage Input to Output	3750	-	-	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature (10 Seconds Max.)	-	-	+220	°C

[1] Derate Linearly 1.33 mw/˚C

[2] Derate Linearly 6.67 mw/˚C

Absolute Maximum Ratings

Absolute Maximum Ratings	Symbol	Max	Units
Peak Pulse Power			
(Ipp=9.3A, 10/1000µs pulse)	P_{PP}	600	W
Max Stand-Off/Working Voltage	V_{WM}	40.2	V

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 these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.

Electrical Characteristics: Relay

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current (Continuous) AC Peak[1]	I_F=2mA	I_L	-	-	100	mA
Peak Load Current	10ms max	I_{LPK}	-	-	350	mA
On-Resistance[2]	I_L=100mA	R_{ON}	-	25	35	Ω
Off-State Leakage Current	V_L=350V	I_{LEAK}	-	-	1	µA
Switching Speeds Turn-On	I_F=2mA, V_L=10V	T_{ON}	-	-	10	ms
Turn-Off	I_F=2mA, V_L=10V	T_{OFF}	-	-	10	ms
Output Capacitance	$50V_{RMS}$; f=1MHz	C_{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current[3]	I_L=100mA	I_F	1	-	50	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
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

[1] Load current derates linearly from 100 mA @ 25˚C to 70ma @ 85˚C

[2] Measurement taken within 1 second of on time

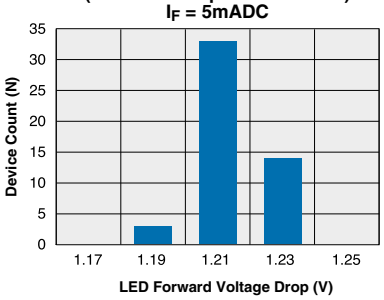
[3] For applications requiring high temp operation (greater than 60˚C) a minimum LED drive current of 3mA is recommended.

Electrical Characteristics: TVS

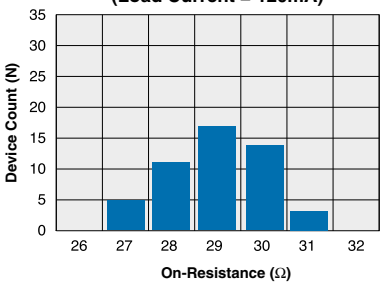
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Clamping Voltage	(Ipp=9.3A)	V_C	-	-	64.8	V
Reverse Breakdown Voltage	(I_{BR}=1000 µA)	V_{BR}	44.4	-	-	V
Reverse Leakage Current	(V_{WM}=40.2 V)	I_D	-	-	5	µA

PERFORMANCE DATA*

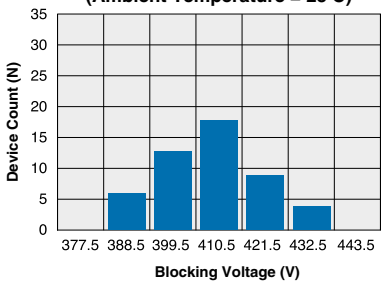
CPC1335P
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
I_F = 5mADC



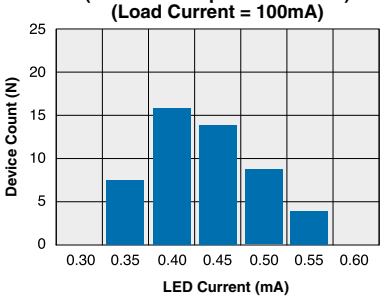
CPC1335P
Typical On-Resistance Distribution
(Ambient Temperature = 25°C)
(Load Current = 120mA)



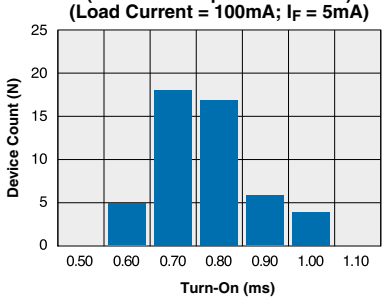
CPC1335P
Typical Blocking Voltage Distribution
(Ambient Temperature = 25°C)



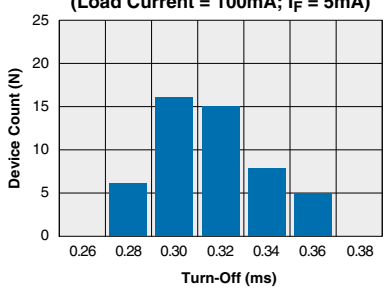
CPC1335P
Typical I_F for Switch Operation
(Ambient Temperature = 25°C)
(Load Current = 100mA)



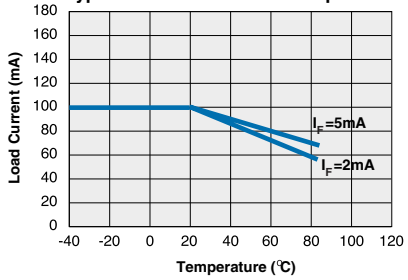
CPC1335P
Typical Turn-On Time
(Ambient Temperature = 25°C)
(Load Current = 100mA; I_F = 5mA)



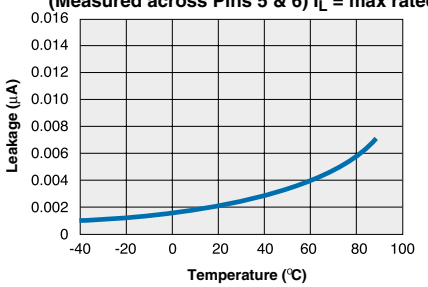
CPC1335P
Typical Turn-Off Time
(Ambient Temperature = 25°C)
(Load Current = 100mA; I_F = 5mA)



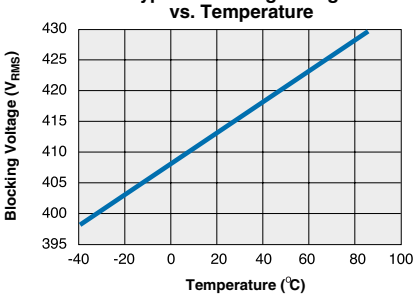
CPC1335P
Typical Load Current vs. Temperature



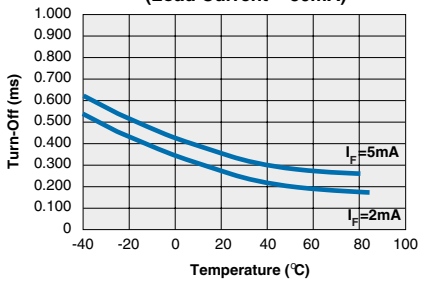
CPC1335P
Typical Leakage vs. Temperature
(Measured across Pins 5 & 6) I_L = max rated



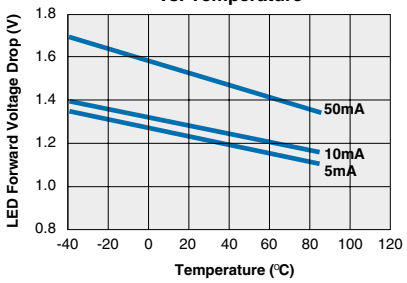
CPC1335P
Typical Blocking Voltage
vs. Temperature



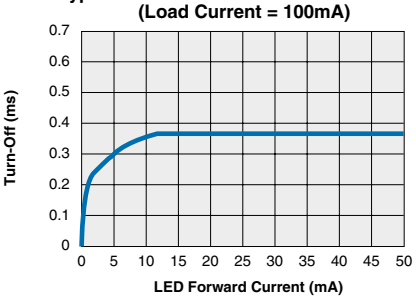
CPC1335P
Typical Turn-Off vs. Temperature
(Load Current = 50mA)



CPC1335P
Typical LED Forward Voltage Drop
vs. Temperature



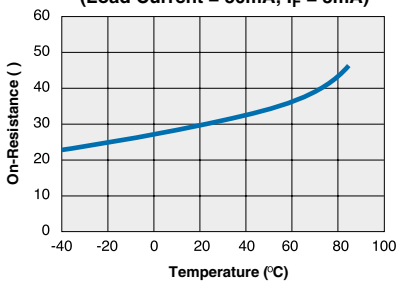
CPC1335P
Typical Turn-Off vs. LED Forward Current
(Load Current = 100mA)



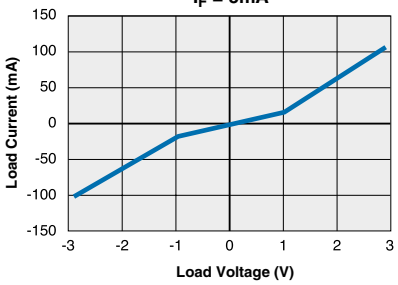
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

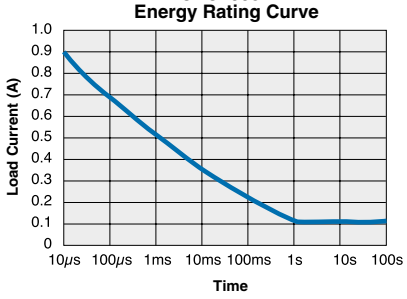
CPC1335P
Typical On-Resistance vs. Temperature
(Load Current = 50mA; I_F = 3mA)



CPC1335P
Typical Load Current vs. Load Voltage
(Ambient Temperature = 25°C)
I_F = 5mA



CPC1335P
Energy Rating Curve



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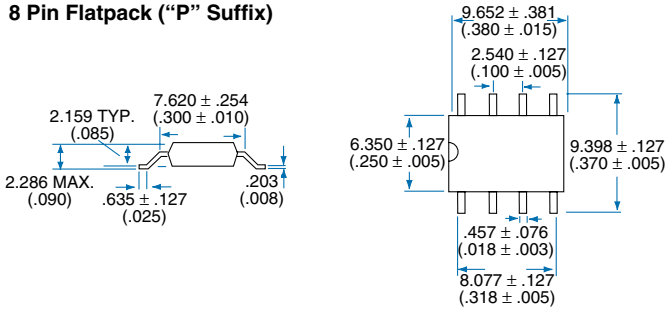
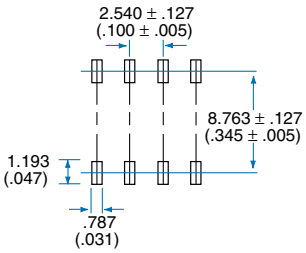
MECHANICAL DIMENSIONS

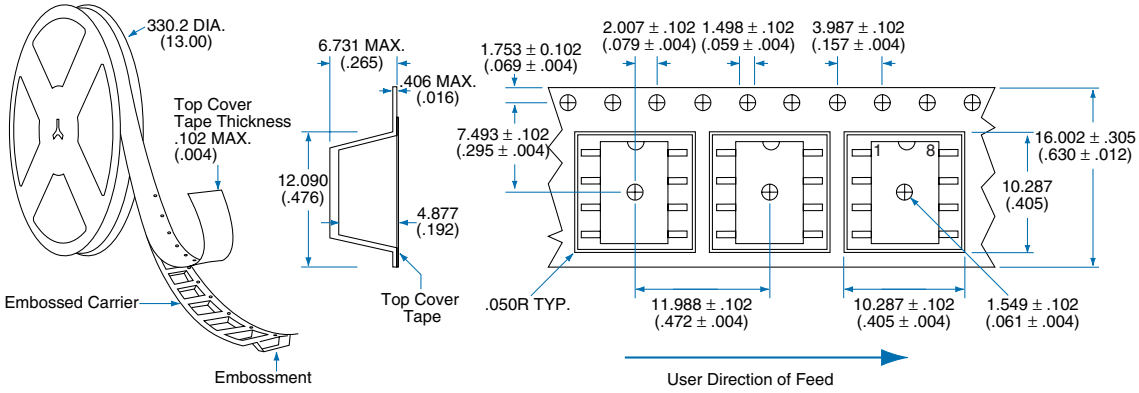
8 Pin Flatpack ("P" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 8 Pin Flatpack Package



Dimensions
mm
(inches)

CLARE

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

Specification: DS-CPC1335P-R2.0

11/19/02