



**THE DATASHEET OF  
CPC1973Y**





	CPC1973Y	Units
Blocking Voltage	400	V <sub>P</sub>
Load Current	0.35	A <sub>rms</sub>
On-Resistance	5	Ω

### Features

- Power SIP Package
- Handle Load Currents Up to 0.5A
- High Reliability
- No Moving Parts
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- 2500V<sub>rms</sub> Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

### 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

Clare 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 that family, the CPC1973Y is a 1-Form-A solid state relay. The CPC1973Y employs optically coupled MOSFET technology to provide 2500V<sub>rms</sub> of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture while the input is controlled by a highly efficient GaAlAs infrared LED. The combination of low on resistance and high load current handling capabilities makes the relay suitable for a variety of high performance switching applications.

### Approvals

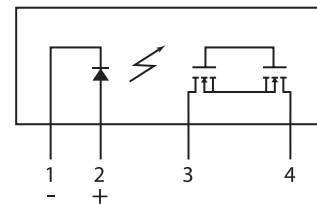
- UL recognized component: File # E69938
- Certified to: UL 508

### Ordering Information

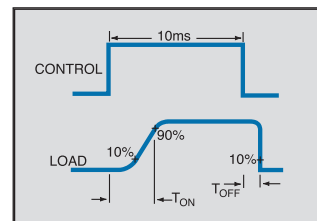
Part #	Description
CPC1973Y	Power SIP Package (25 per tube)

### Pin Configuration

CPC1973Y Pinout



### Switching Characteristics of Normally Open (Form A) Devices



## Absolute Maximum Ratings (@ 25° C)

Parameter	Ratings	Units
Blocking Voltage	400	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
Isolation voltage Input to Output	2500	V <sub>rms</sub>
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

<sup>1</sup> Derate Linearly 3.33 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

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current, Continuous	free air	I <sub>L</sub>	-	-	0.35	A <sub>rms</sub>
Peak Load Current	T=10ms	I <sub>LPK</sub>	-	-	3.5	A <sub>rms</sub>
On-Resistance <sup>1</sup>	I <sub>L</sub> =350mA	R <sub>ON</sub>	-	3.4	5	Ω
Off-State Leakage Current	V <sub>L</sub> =400V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =10mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	5	ms
Turn-Off	I <sub>F</sub> =10mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	3	ms
<b>Input Characteristics @ 25°C</b>						
Input Control Current	I <sub>L</sub> =350mA	I <sub>F</sub>	10	-	-	mA
Input Dropout Current	-	I <sub>F</sub>	-	-	-	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 @ 25°C</b>						
Capacitance Input/Output	f=1MHz	C <sub>I/O</sub>	-	2	-	pF

<sup>1</sup> Load current derates linearly from 600mA @ 25°C to 480mA @80°C.

<sup>2</sup> Measurement taken within 1 second of on time.

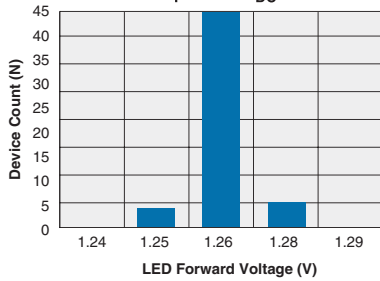
<sup>3</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 3mA is recommended.

## Thermal Characteristics

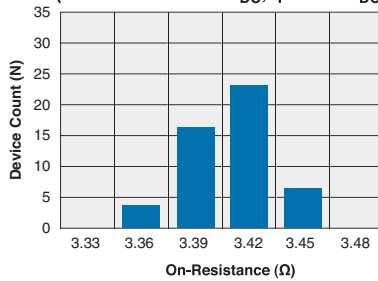
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Thermal Resistance (junction to case)	-	R <sub>θJC</sub>	-	1.5	-	°C/W

**PERFORMANCE DATA\***

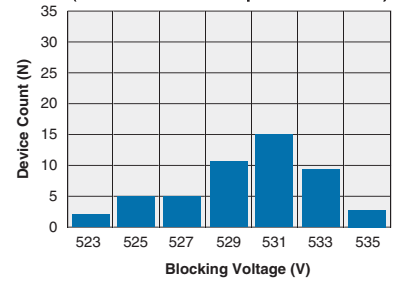
**CPC1973Y**  
Typical LED Forward Voltage Drop  
(N=50 Ambient Temperature = 25°C)  
 $I_F = 10\text{mA}_{DC}$



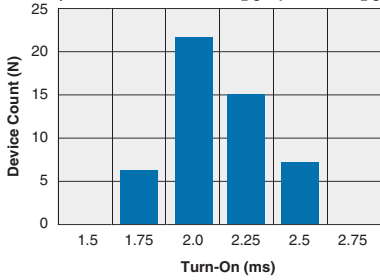
**CPC1973Y**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current =  $0.5A_{DC}$ ;  $I_F = 10\text{mA}_{DC}$ )



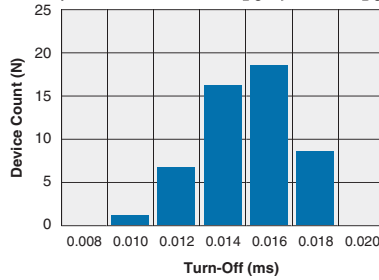
**CPC1973Y**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)



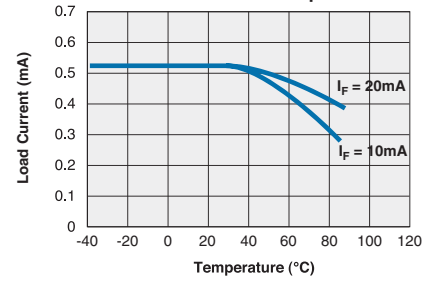
**CPC1973Y**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current =  $0.5A_{DC}$ ;  $I_F = 10\text{mA}_{DC}$ )



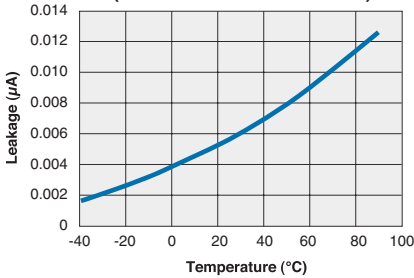
**CPC1973Y**  
Typical Turn-Off Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current =  $0.5A_{DC}$ ;  $I_F = 10\text{mA}_{DC}$ )



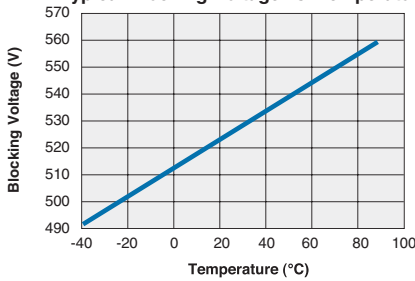
**CPC1973Y**  
Typical Maximum DC  
Load Current vs. Temperature



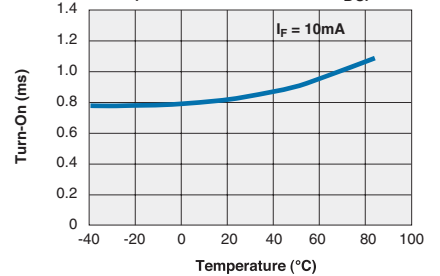
**CPC1973Y**  
Typical Leakage vs. Temperature at  
Maximum Rated Voltage  
(Measured across Pins 3 & 4)



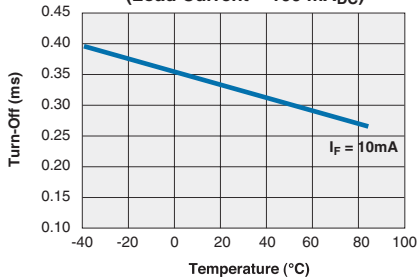
**CPC1973Y**  
Typical Blocking Voltage vs. Temperature



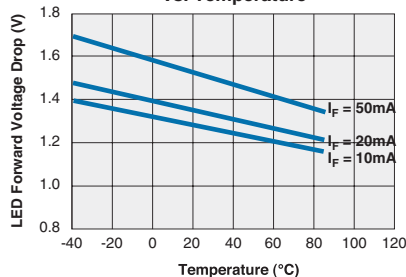
**CPC1973Y**  
Typical Turn-On vs. Temperature  
(Load Current =  $100\text{mA}_{DC}$ )



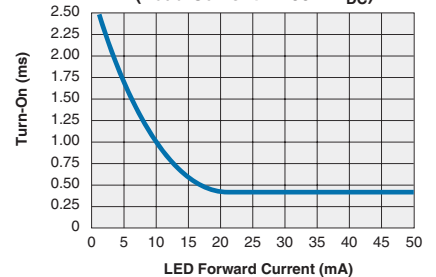
**CPC1973Y**  
Typical Turn-Off vs. Temperature  
(Load Current =  $100\text{mA}_{DC}$ )



**CPC1973Y**  
Typical LED Forward Voltage Drop  
vs. Temperature

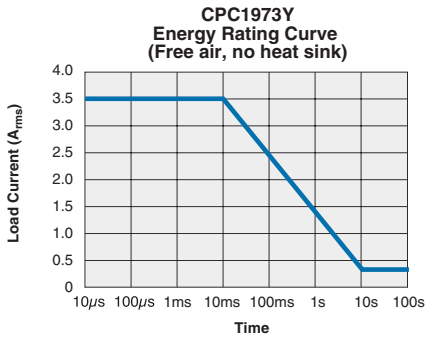
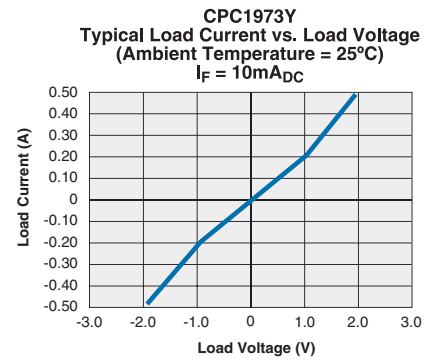
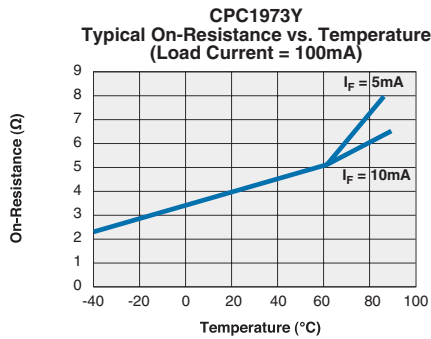
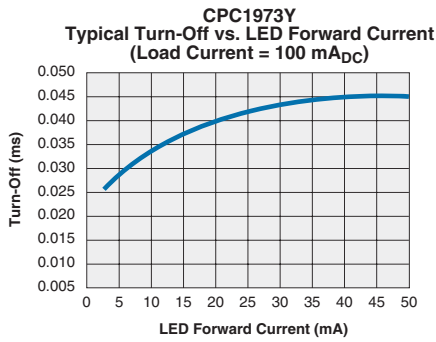


**CPC1973Y**  
Typical Turn-On vs. LED Forward Current  
(Load Current =  $100\text{mA}_{DC}$ )



\*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

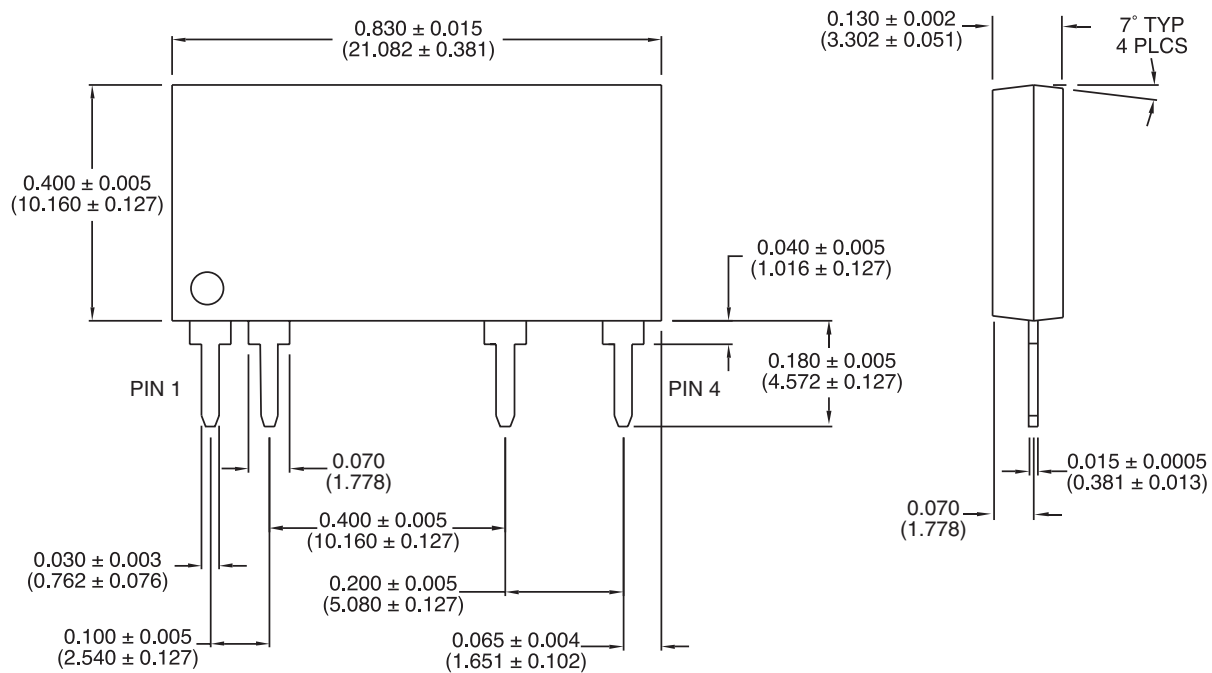
### Soldering

Recommended soldering processes are limited to 245°C component body temperature for 10 seconds.

### Washing

Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

## MECHANICAL DIMENSIONS



NOTE: Pin location tolerances are non-cumulative.

Dimensions:  
inches  
(mm)

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

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