

| Parameter         | Rating | Units          |
|-------------------|--------|----------------|
| Blocking Voltage  | 600    | V <sub>P</sub> |
| Load Current      | 90     | mA             |
| Max On-resistance | 50     | Ω              |

## Features

- 5000V<sub>rms</sub> Input/Output Isolation
- 600V<sub>P</sub> Blocking Voltage
- 100% Solid State
- Small 4-Pin Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

## Applications

- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

## Description

The CPC1393G is a single-pole normally-open (1-Form-A) Solid State Relay with an enhanced input to output isolation barrier of 5000V<sub>rms</sub>. Clare's patented OptoMOS architecture makes available the optically coupled technology necessary to activate the output's efficient MOSFET switches. Control of the isolated output is accomplished by means of the highly effective GaAIAs infrared LED at the input.

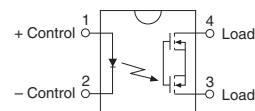
## Approvals

- UL Recognized Component: File # E76270
- EN/IEC 60950 Compliant
- CSA Certified Component: Certificate # 1172007

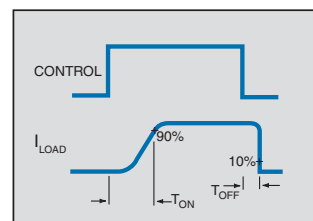
## Ordering Information

| Part Number | Description                     |
|-------------|---------------------------------|
| CPC1393G    | 4-Pin DIP (100/Tube)            |
| CPC1393GV   | 4-Pin DIP V-Bend (100/Tube)     |
| CPC1393GR   | 4-Pin Surface Mount (100/Tube)  |
| CPC1393GRTR | 4-Pin Surface Mount (1000/Reel) |

## Pin Configuration



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



## Absolute Maximum Ratings

| Parameter                              | Ratings     | Units     |
|--|-------------|-----------|
| Peak Blocking Voltage                  | 600         | $V_P$     |
| Reverse Input Voltage                  | 5           | V         |
| Input Control Current                  | 50          | mA        |
| Peak (10ms)                            | 1           | A         |
| Input Power Dissipation <sup>1</sup>   | 100         | mW        |
| Total Package Dissipation <sup>2</sup> | 550         | mW        |
| Isolation Voltage, Input to Output     | 5000        | $V_{rms}$ |
| Operational Temperature                | -40 to +85  | °C        |
| Storage Temperature                    | -40 to +125 | °C        |

<sup>1</sup> Derate Linearly 1.33 mW/°C

<sup>2</sup> Derate Linearly 3.00 mW/°C

Electrical absolute maximum ratings are at 25°C

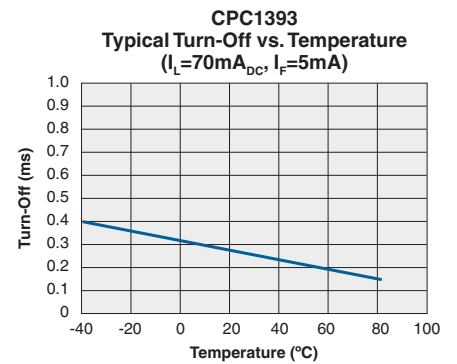
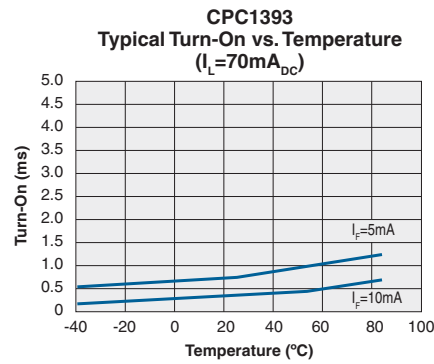
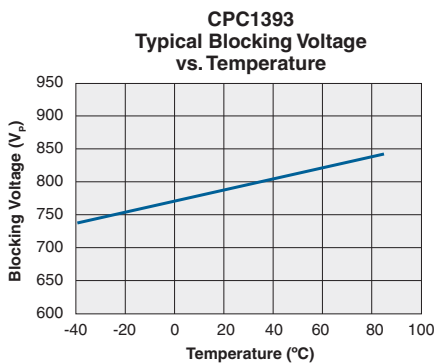
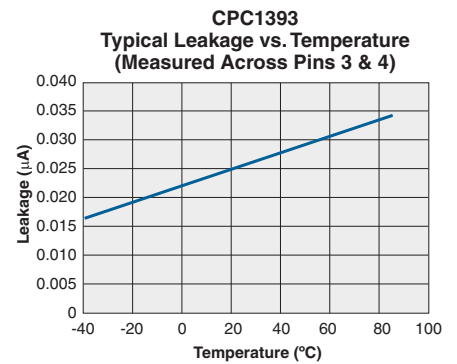
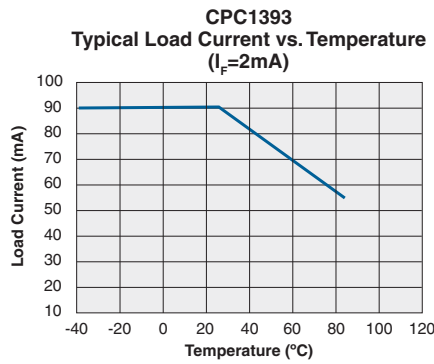
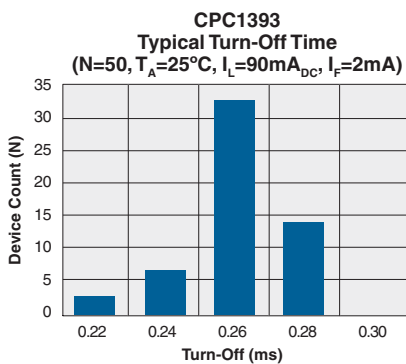
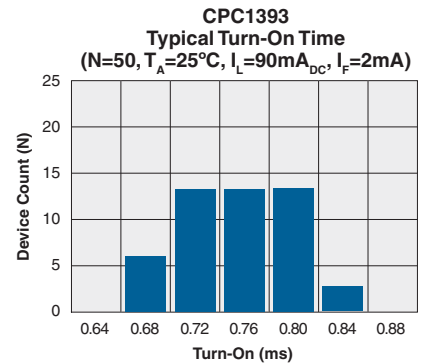
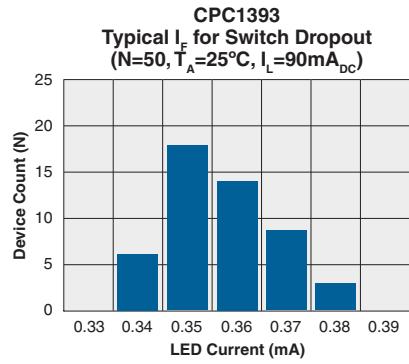
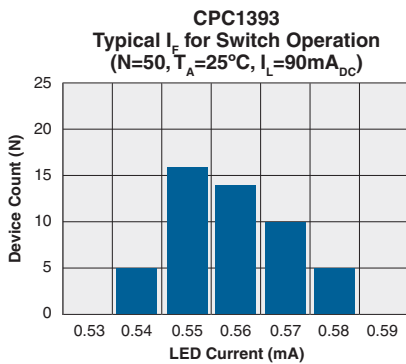
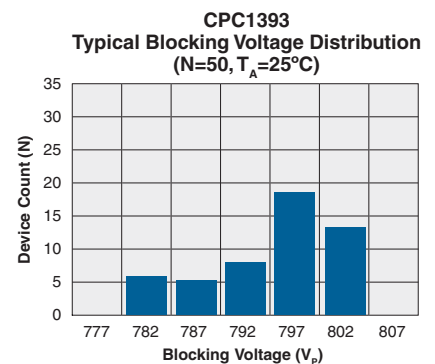
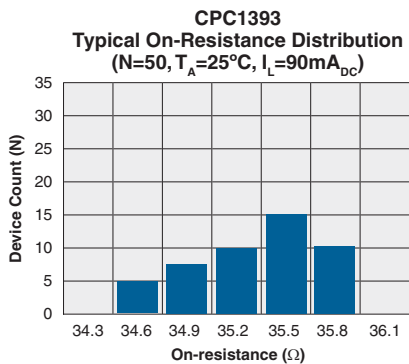
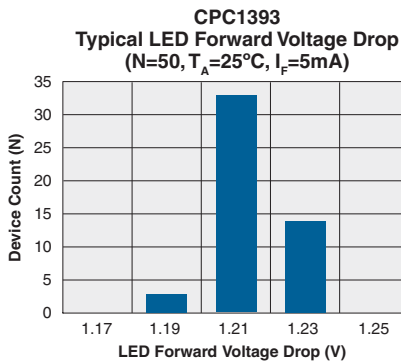
*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.*

## Electrical Characteristics

| Parameters                           | Conditions                 | Symbol     | Min | Typ  | Max | Units    |
|--------------------------------------|----------------------------|------------|-----|------|-----|----------|
| <b>Output Characteristics @ 25°C</b> |                            |            |     |      |     |          |
| Load Current                         |                            |            |     |      |     |          |
| Continuous                           | -                          | $I_L$      | -   | -    | 90  | mA       |
| Peak                                 | t=10ms                     | $I_{LPK}$  | -   | -    | 350 |          |
| On-resistance <sup>1</sup>           | $I_L=90mA$                 | $R_{ON}$   | -   | 35   | 50  | $\Omega$ |
| Off-State Leakage Current            | $V_L=600V$                 | $I_{LEAK}$ | -   | -    | 1   | $\mu A$  |
| Switching Speeds                     |                            |            |     |      |     |          |
| Turn-On                              | $I_F=5mA, V_L=10V$         | $T_{ON}$   | -   | -    | 5   | ms       |
| Turn-Off                             |                            | $T_{OFF}$  | -   | -    | 5   |          |
| Output Capacitance                   | $I_F=0mA, V_L=50V, f=1MHz$ | $C_{OUT}$  | -   | 50   | -   | pF       |
| <b>Input Characteristics @ 25°C</b>  |                            |            |     |      |     |          |
| Input Control Current                | $I_L=90mA$                 | $I_F$      | -   | 0.55 | 2   | mA       |
| Input Dropout Current                | -                          | $I_F$      | 0.2 | -    | -   |          |
| Input Voltage Drop                   | $I_F=5mA$                  | $V_F$      | 0.9 | 1.2  | 1.4 | V        |
| Reverse Input Current                | $V_R=5V$                   | $I_R$      | -   | -    | 10  | $\mu A$  |
| <b>Common Characteristics @ 25°C</b> |                            |            |     |      |     |          |
| Input to Output Capacitance          | -                          | $C_{IO}$   | -   | 3    | -   | pF       |

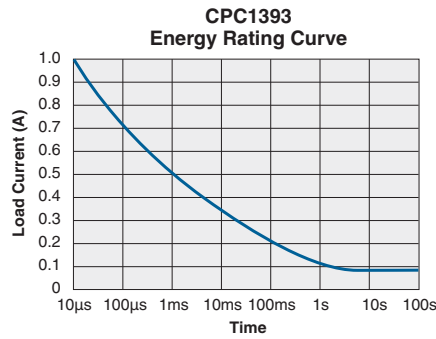
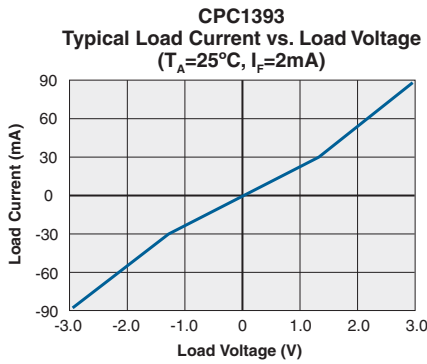
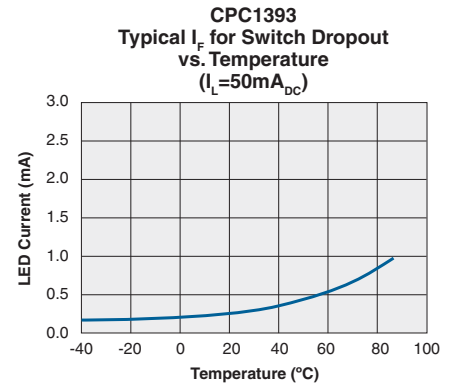
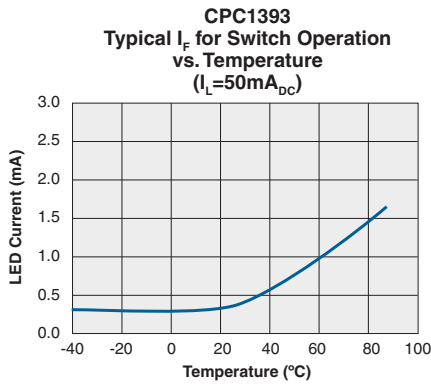
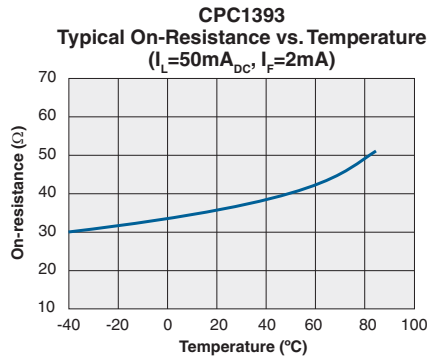
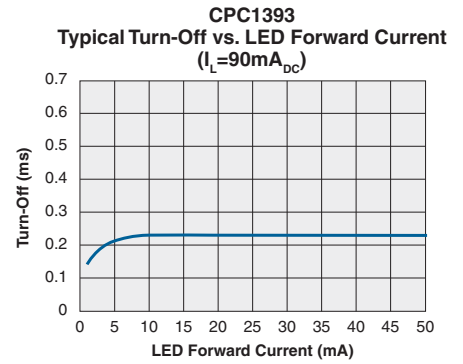
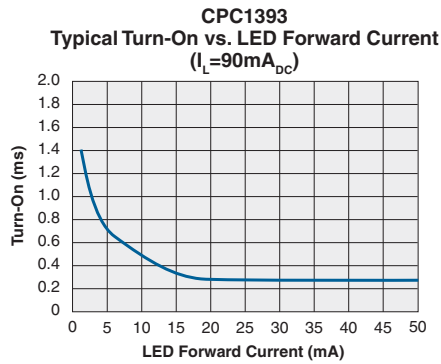
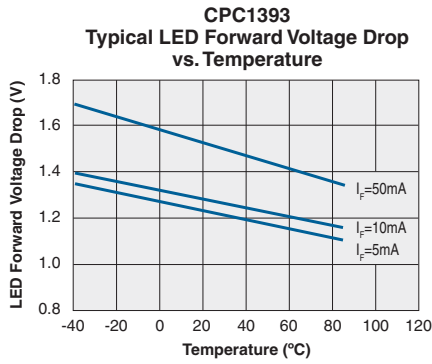
<sup>1</sup> Within 1 second of time.

**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**

**Soldering**

For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

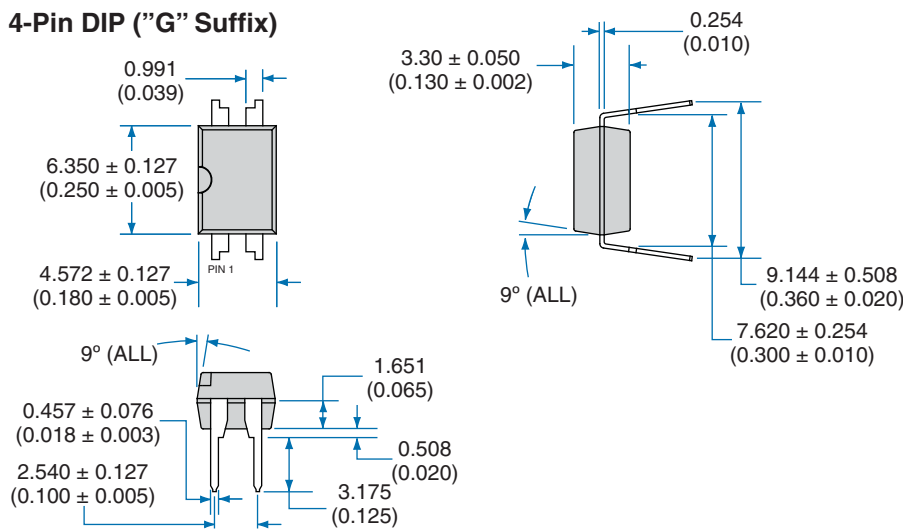
**Washing**

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

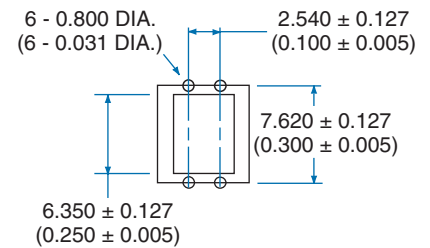


**MECHANICAL DIMENSIONS**

**4-Pin DIP ("G" Suffix)**

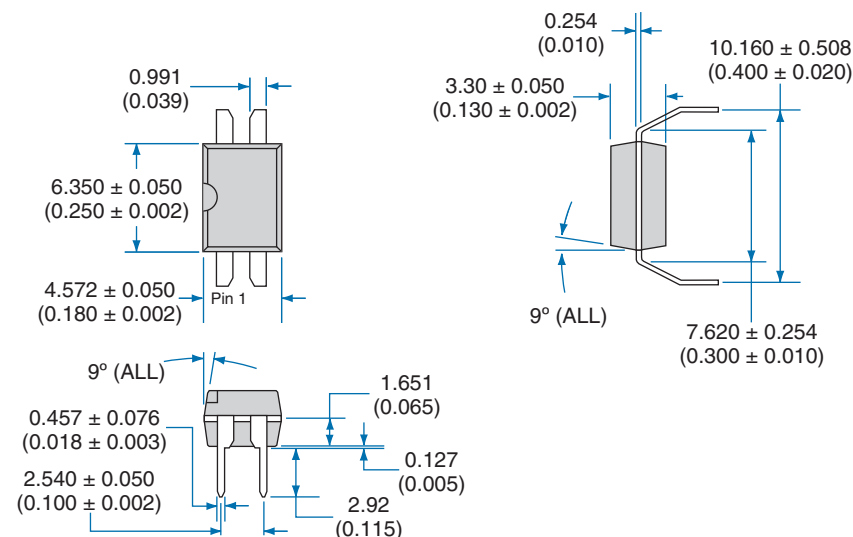


**PC Board Pattern (Top View)**

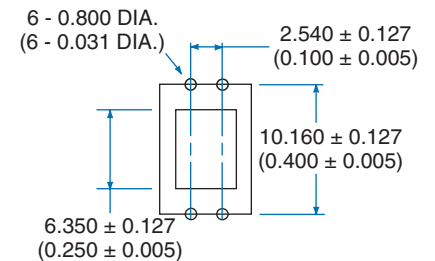


Dimensions  
mm  
(inches)

**4-Pin DIP "V" Package**



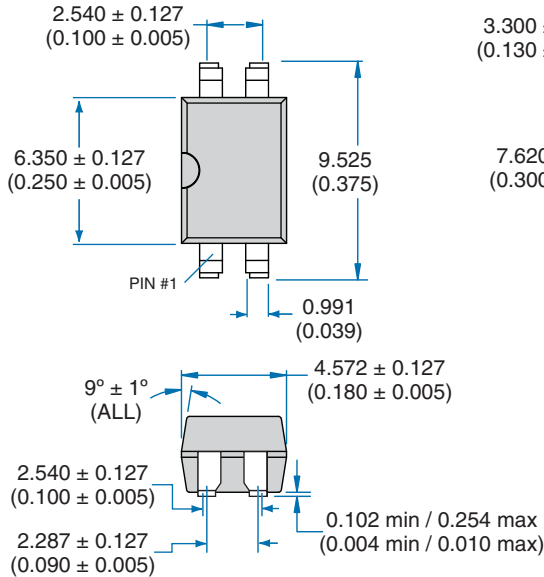
**PC Board Pattern (Top View)**



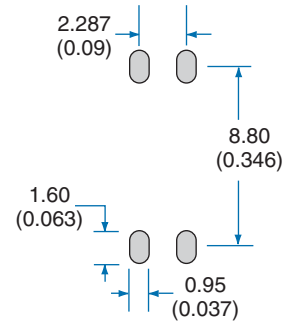
Dimensions  
mm  
(inches)

**MECHANICAL DIMENSIONS**

**4-Pin Surface Mount ("GR" Suffix)**

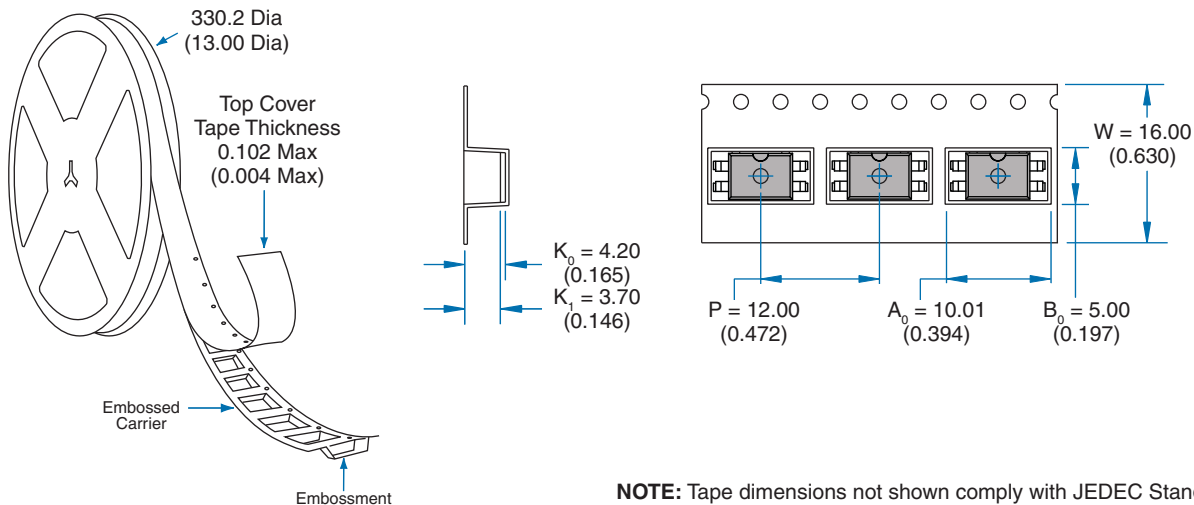


**Recommended PCB Land Pattern**



Dimensions  
mm  
(inches)

**Tape and Reel Packaging for 4-Pin Surface Mount Package**



Dimensions  
mm  
(inches)

**NOTE:** Tape dimensions not shown comply with JEDEC Standard EIA-481-2

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