



Parameter	Rating	Units
Peak Blocking Voltage	400	V _P
Load Current	140	mA
Max On-resistance	22	Ω

Features

- 5000V_{rms} Input/Output Isolation
- 400V_P 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 CPC1390G is a single-pole normally-open (1-Form-A) Solid State Relay with an enhanced input to output isolation barrier of 5000V_{rms}. 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.

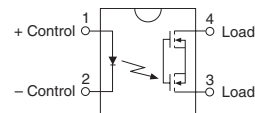
Approvals

- UL - File # E76270
- EN60950 - Pending

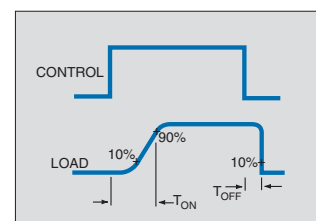
Ordering Information

Part Number	Description
CPC1390G	4-Pin DIP (100/Tube)
CPC1390GV	4-Pin DIP V-Bend (100/Tube)
CPC1390GR	4-Pin Surface Mount (100/Tube)
CPC1390GRTR	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	400	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation ¹	100	mW
Total Package Dissipation ²	550	mW
Isolation Voltage, Input to Output	5000	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate Linearly 1.33 mW/°C

² Derate Linearly 3.00 mW/°C

Electrical absolute maximum ratings are at 25°C

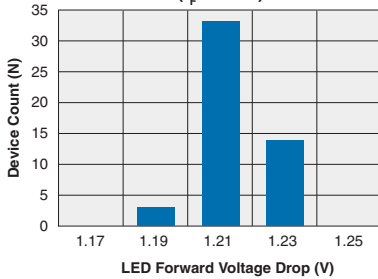
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics

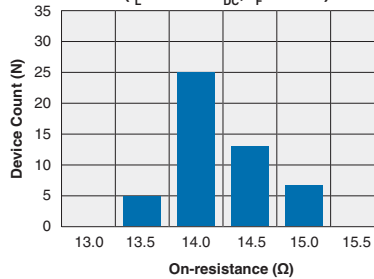
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current						
Continuous	-	I_L	-	-	140	mA
Peak	t≤10ms	I_{LPK}	-	-	400	
On-Resistance	$I_L=140mA$	R_{ON}	-	14	22	Ω
Off-State Leakage Current	$V_L=400V$	I_{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	$I_F=5mA, V_L=10V$	T_{ON}	-	-	1	ms
Turn-Off		T_{OFF}	-	-	0.5	
Output Capacitance	$I_F=0mA, V_L=50V, f=1MHz$	C_{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current	$I_L=140mA$	I_F	-	0.7	2	mA
Input Dropout Current	-	I_F	0.2	0.65	-	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 @ 25°C						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

PERFORMANCE DATA*

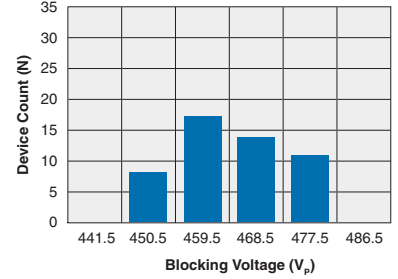
CPC1390
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
($I_F = 5\text{mA}$)



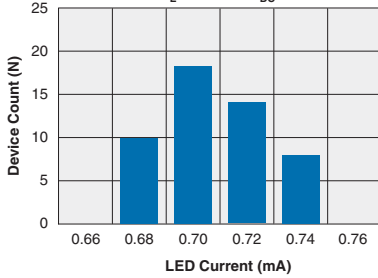
CPC1390
Typical On-resistance Distribution
(N=50 Ambient Temperature = 25°C)
($I_L = 140\text{mA}_{DC}$; $I_F = 5\text{mA}$)



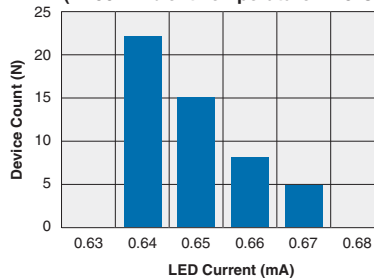
CPC1390
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



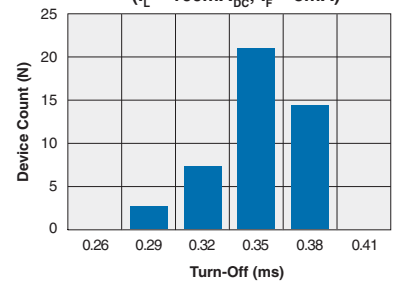
CPC1390
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
($I_L = 140\text{mA}_{DC}$)



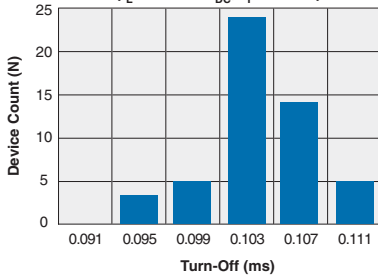
CPC1390
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)



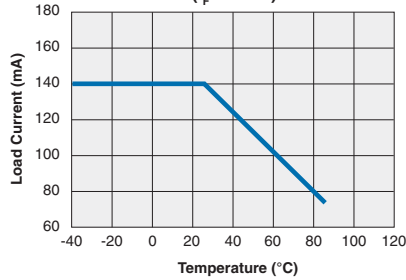
CPC1390
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
($I_L = 100\text{mA}_{DC}$; $I_F = 5\text{mA}$)



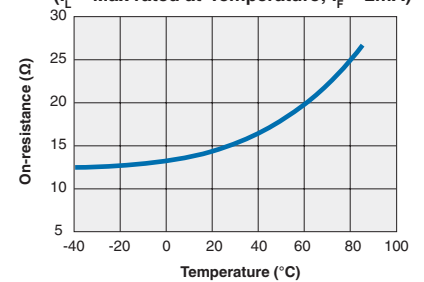
CPC1390
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
($I_L = 100\text{mA}_{DC}$; $I_F = 5\text{mA}$)



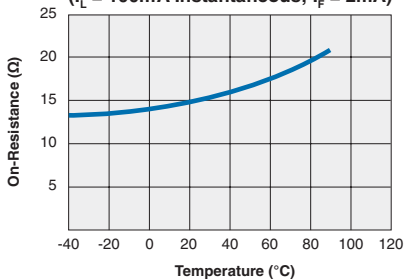
CPC1390
Typical Load Current vs. Temperature
($I_F = 2\text{mA}$)



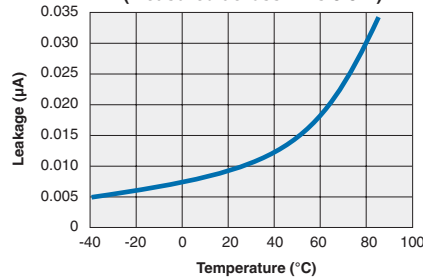
CPC1390
Typical On-resistance vs. Temperature
($I_L = \text{Max rated at Temperature}$; $I_F = 2\text{mA}$)



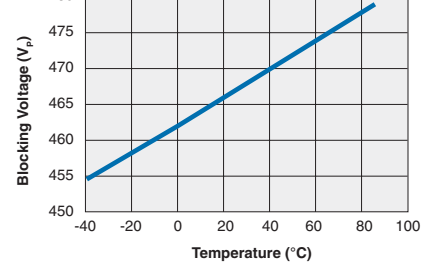
CPC1390
Typical On-resistance vs. Temperature
($I_L = 100\text{mA}$ Instantaneous; $I_F = 2\text{mA}$)



CPC1390
Typical Leakage vs. Temperature
(Measured across Pins 3 & 4)

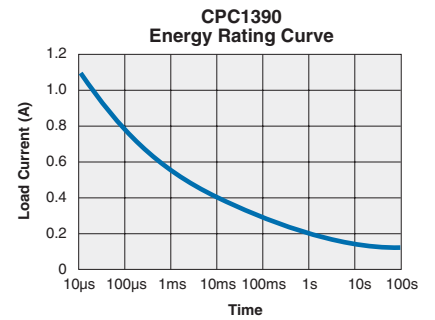
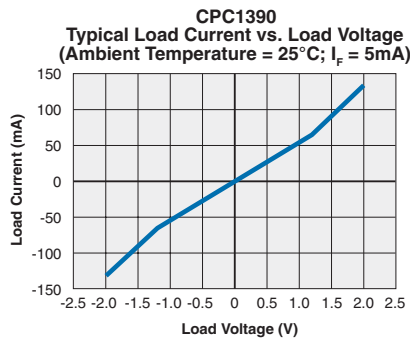
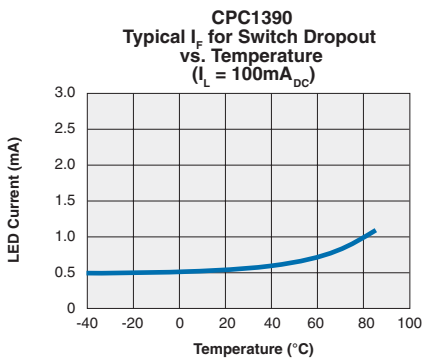
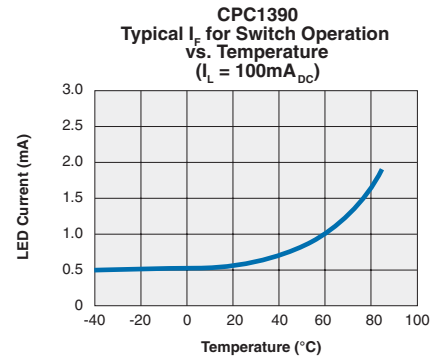
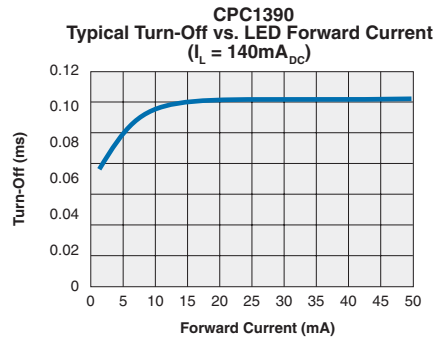
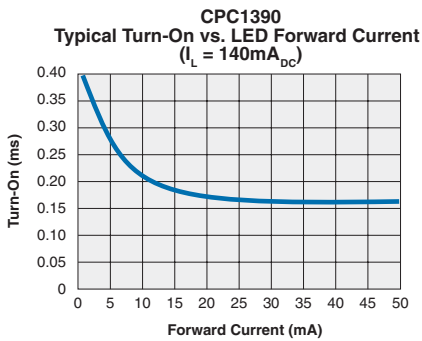
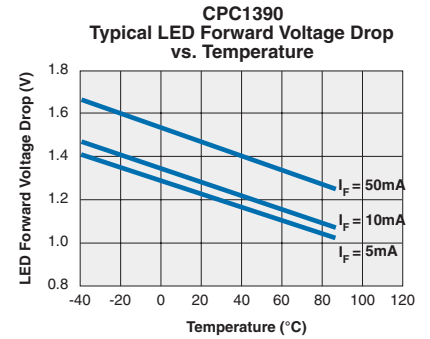
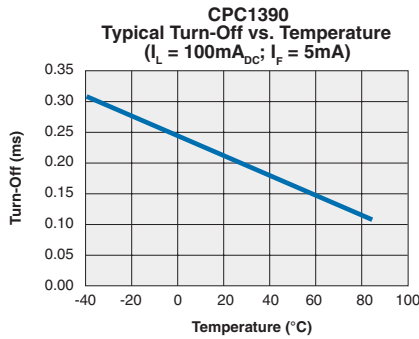
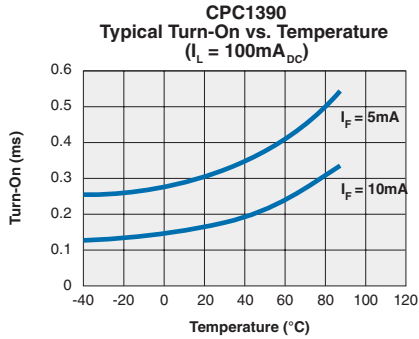


CPC1390
Typical Blocking Voltage vs. Temperature



*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*



*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

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.

Recommended soldering processes are limited to 260°C component body temperature for 10 seconds.

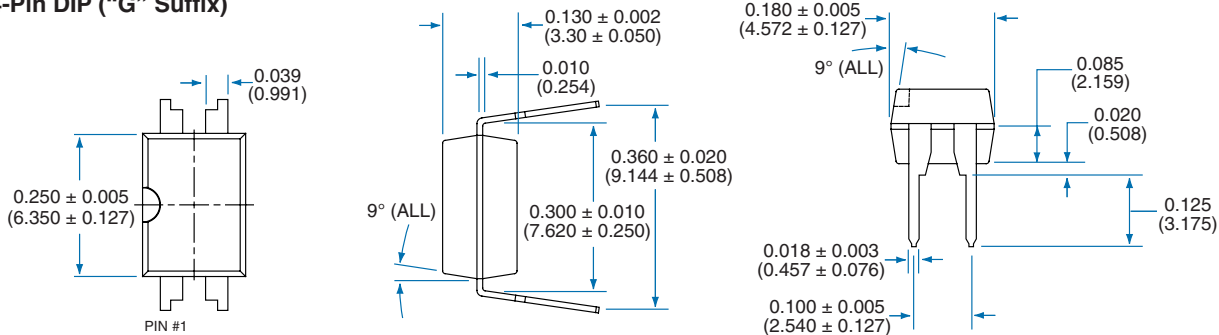
Washing

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



MECHANICAL DIMENSIONS

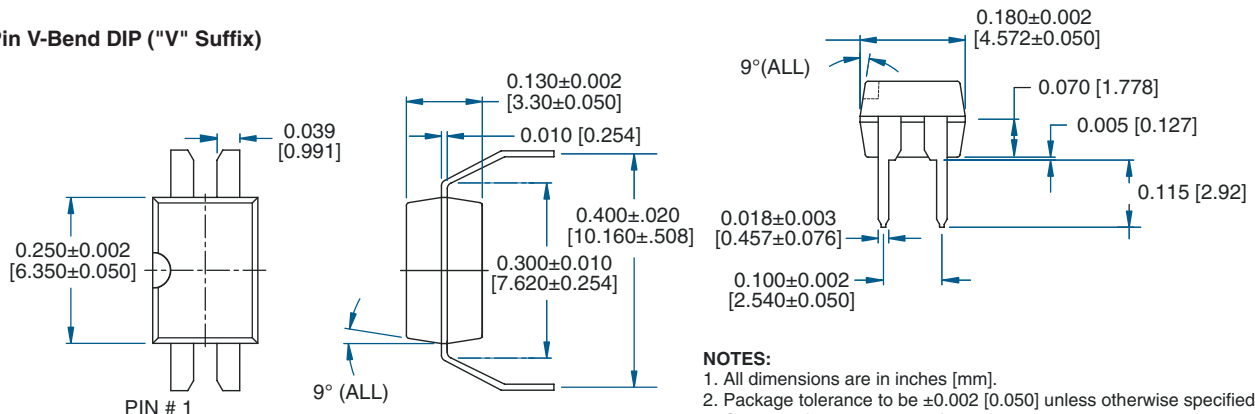
4-Pin DIP ("G" Suffix)



NOTES:

1. All dimensions are in inches (mm).
2. Package tolerance to be ± 0.002 (0.05) unless otherwise specified.
3. Cavity surface to be matte finish, 21 - 24 inches charmill gauge.
4. Tolerance of package misalignment or mismatch to be ± 0.002 (0.05).
5. General tolerances ± 0.002 (0.05) unless otherwise specified.

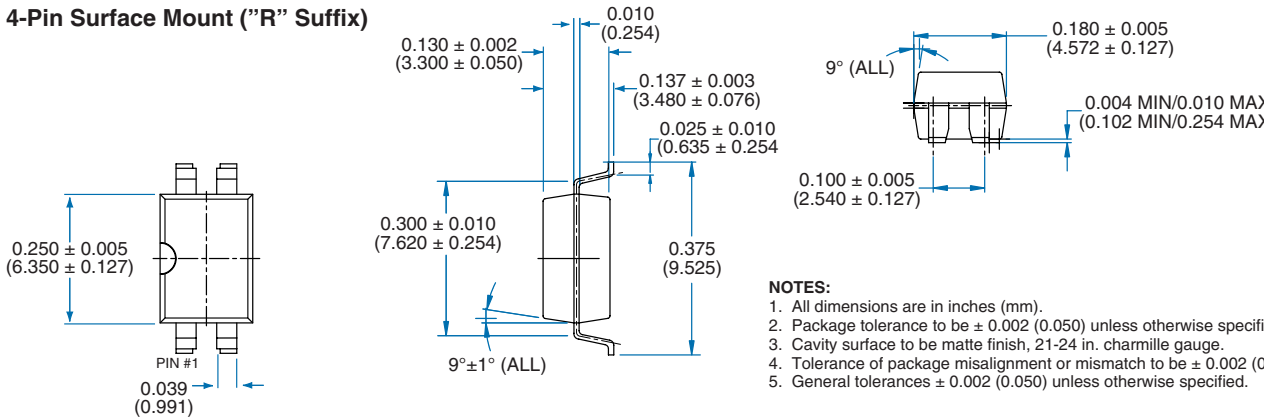
4-Pin V-Bend DIP ("V" Suffix)



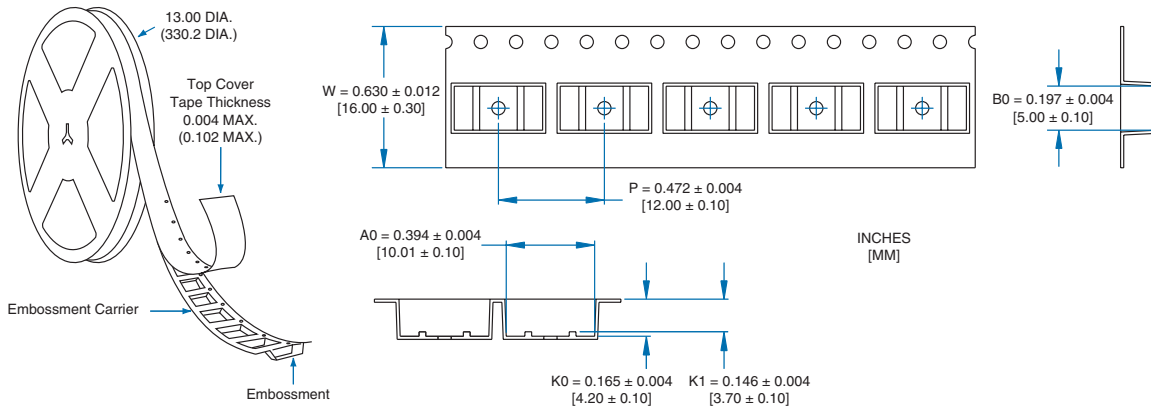
NOTES:

1. All dimensions are in inches [mm].
2. Package tolerance to be ± 0.002 [0.050] unless otherwise specified.
3. Cavity surface to be matte finish, 21-24 in charmill gauge.
4. Tolerances of package misalignment or mismatch to be ± 0.002 [0.050].
5. General tolerances ± 0.002 [0.050] unless otherwise specified.

4-Pin Surface Mount ("R" Suffix)



Tape and Reel Packaging for Surface Mount Package



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