



Parameter	Rating	Units
Blocking Voltage	400	V _P
Load Current	500	mA
Max R _{ON}	6	Ω
Input Voltage to operate	5-12	V

Features

- Voltage-Controlled Operation
- Matches Popular Reed Relay Pin-Out
- 3750V_{rms} Input/Output Isolation
- 100% Solid State
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Immune to Radiated EM Fields
- 4-Pin DIP Package
- Auto Pick & Place, Wave Solderable

Applications

- Security
 - Passive Infrared Detectors (PIR)
 - Data Signalling
 - Sensor Circuitry
- Telecommunications
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
- Energy Meters
- Medical Equipment—Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Description

The CPC1215 is a voltage-controlled, single-pole, normally open (1-Form-A), optically coupled solid state relay in a 4-pin Dual In-line Package (DIP). Clare's patented OptoMOS architecture makes available the optically coupled technology necessary to activate the output's efficient MOSFET switches while providing a 3750V_{rms} input-to-output isolation barrier. Control of the isolated output is accomplished by means of a highly effective GaAlAs infrared LED at the input while the internal resistor in series with the LED enables the input's voltage-controlled operation.

Because the input is solid state there is no need for snubbers or "catch" diodes to suppress the inductive flyback transient voltage normally associated with EMR coils.

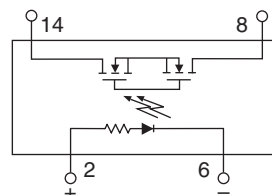
Approvals

- UL 1577 Approved Component: Pending
- CSA Certified Component: Certificate 1172007
- Certified to:
 - IEC 60950-1: 2005
 - EN 60950-1: 2006
 - TUV Certificate: B 09 07 49410 004

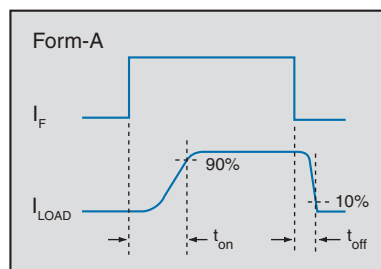
Ordering Information

Part #	Description
CPC1215G	4-Pin DIP (14-Pin Body) (25/tube)

Pin Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage	400	V _P
Reverse Input Voltage	5	V
Input Control Voltage	15	V
Input Power Dissipation	225	mW
Total Power Dissipation ¹	1600	mW
Isolation Voltage, Input to Output	3750	V _{rms}
ESD, Human Body Model	8	kV
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate linearly 16.6 mW / °C

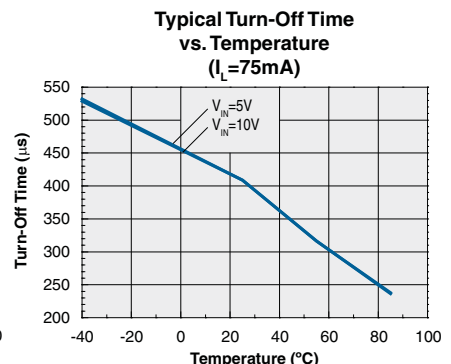
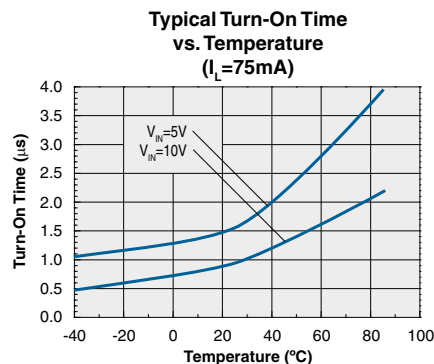
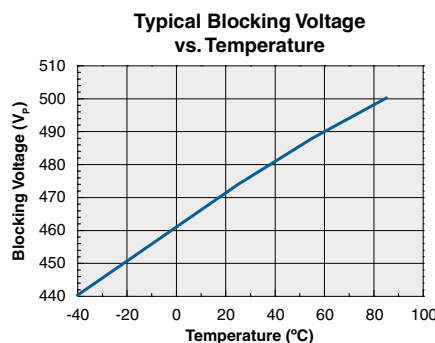
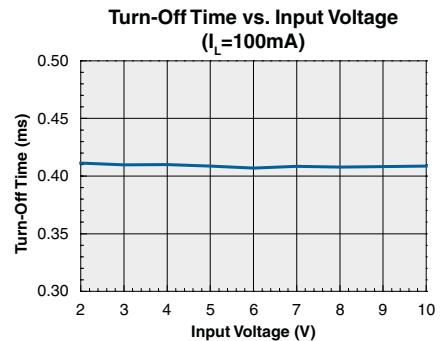
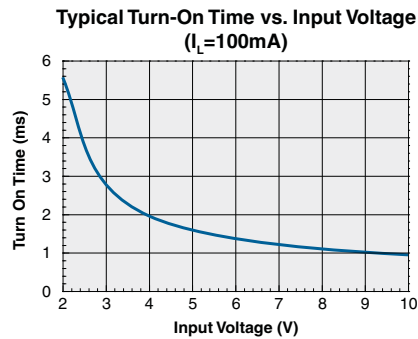
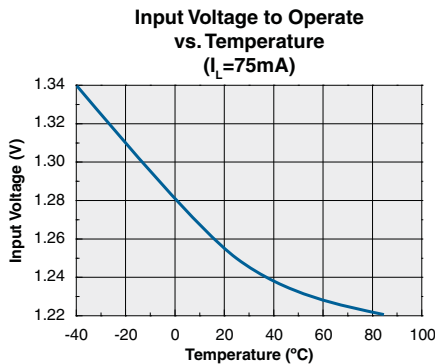
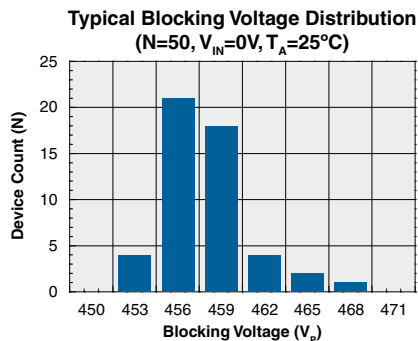
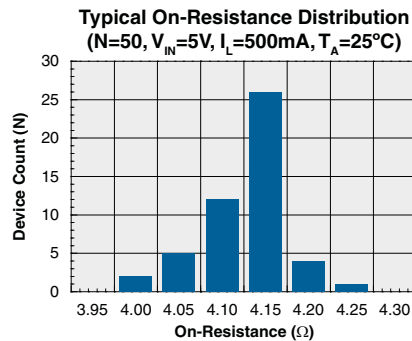
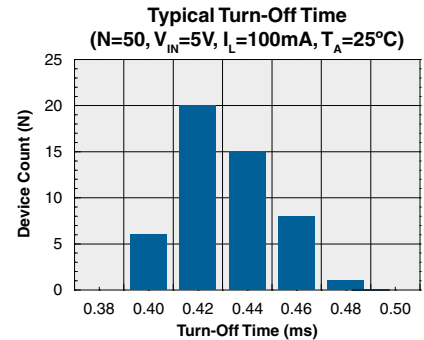
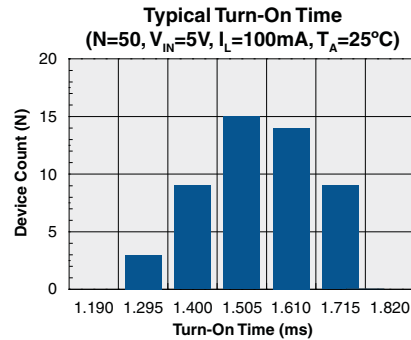
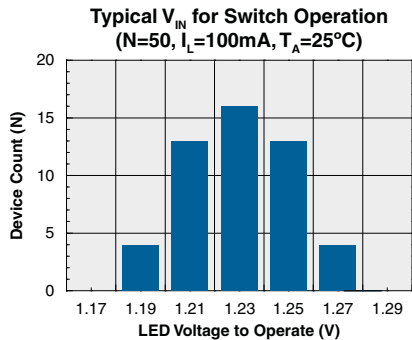
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics @ 25°C

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current	V _{IN} =5V	I _L	-	-	±500	mA
Continuous						
Peak	t=10ms	I _{LPK}	-	-	±1.5	A
On-Resistance ¹	I _L =500mA	R _{ON}	-	4.15	6	Ω
Off-State Leakage Current	V _L =400V _P	I _{LEAK}	-	0.009	1	μA
Switching Speeds	V _{IN} =5V, V _L =10V	t _{on}	-	1.55	5	ms
Turn-On (Output Closed)						
Turn-Off (Output Open)		t _{off}	-	0.42	3	
Output Capacitance	V _{IN} =0V, V _L =50V, f=1MHz	C _{OUT}	-	18	-	pF
Input Characteristics						
Input Control Voltage	I _L =500mA	V _{IN}	5	-	12	V
Recommended Operating Range			-	-	3.75	
Output Closed			1	-	-	
Output Open						
Reverse Input Current	V _{IN} =-5V	I _R	-	-	10	μA
Input Resistor	-	-	900	1000	1100	Ω
Common Characteristics						
Capacitance, Input to Output	-	-	-	1	-	pF

¹ Measurement taken within 1 second of on-time.

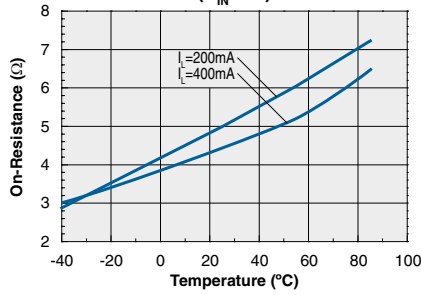
PERFORMANCE DATA*



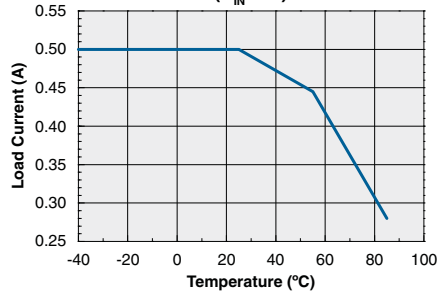
*The Performance Data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

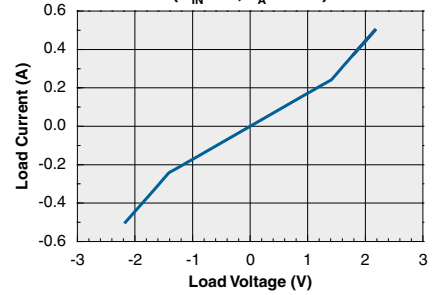
Typical On-Resistance vs. Temperature
($V_{IN}=5V$)



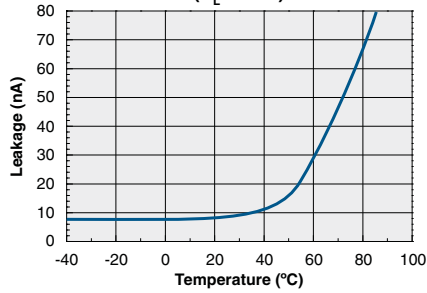
Load Current vs. Temperature
($V_{IN}=5V$)



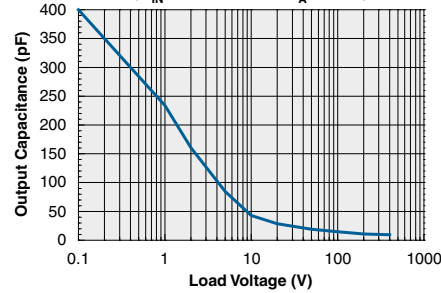
Typical Load Current vs. Load Voltage
($V_{IN}=5V, T_A=25^\circ C$)



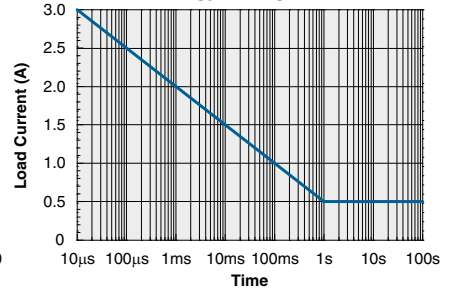
Typical Leakage vs. Temperature
Measured Across Pins 14 & 8
($V_L=400V$)



Output Capacitance vs. Load Voltage
($V_{IN}=0V, f=1MHz, T_A=25^\circ C$)



Energy Rating Curve



*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 ingress. Clare 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
CPC1215G	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
CPC1215G	245°C for 30 seconds

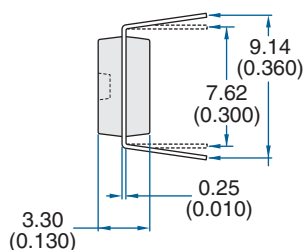
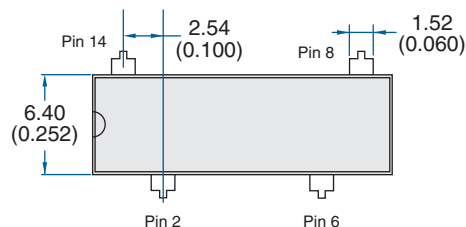
Board Wash

Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake may 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.

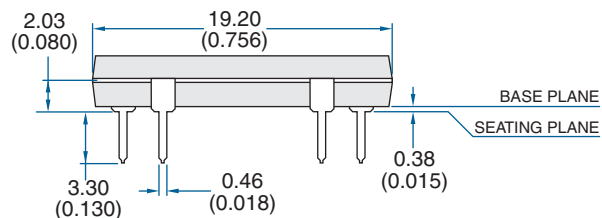


MECHANICAL DIMENSIONS

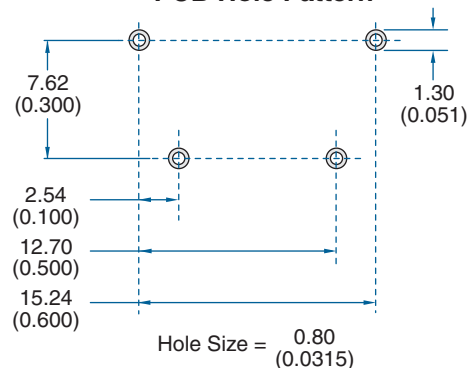
CPC1215G



DIMENSIONS
mm
(inches)



PCB Hole Pattern



NOTES:

1. Package tolerances to be ± 0.05 [0.002] unless otherwise specified.
2. Tolerance of package misalignment or mismatch to be ± 0.05 [0.002].
3. General tolerances to be ± 0.05 [0.002] unless otherwise specified.

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Specification: DS-CPC1215-R01
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