IXYS
INTEGRATED CIRCUITS DIVISION

CPC1215

Voltage-Controlled, Single-Pole, Normally Open OptoMOS® Relay

Parameter	Rating	Units
Blocking Voltage	400	V_P
Load Current	500	mA_{rms} / mA_{DC}
On-Resistance (max)	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). IXYS Integrated Circuits Division'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.

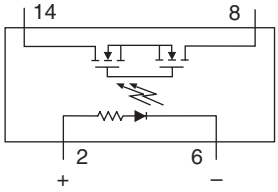
Approvals

- 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

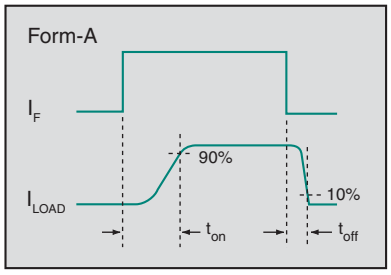
Ordering Information

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

Pin Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25ºC

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 / ºC

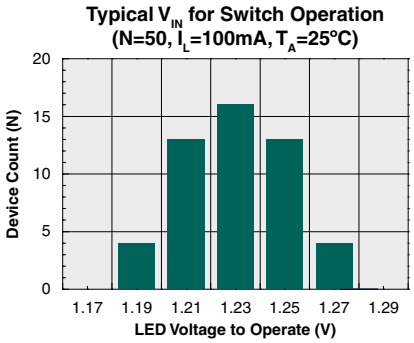
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

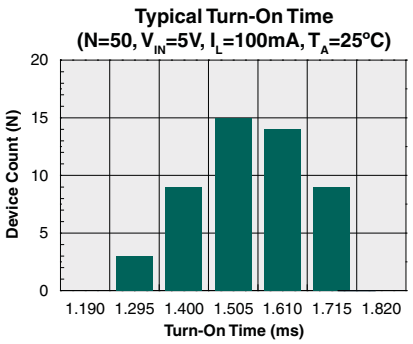
Electrical Characteristics @ 25ºC

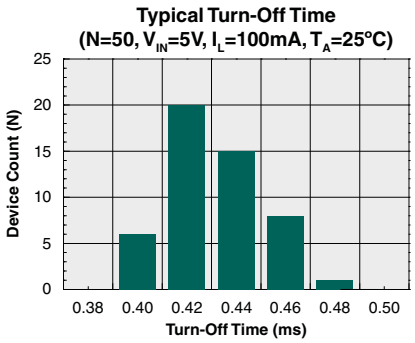
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous	V_{IN}=5V	I_L	-	-	500	mA_{rms} / mA_{DC}
Peak	t=10ms	I_{LPK}	-	-	±1.5	A_P
On-Resistance [1]	I_L=500mA	R_{ON}	-	4.15	6	Ω
Off-State Leakage Current	V_L=400V_P	I_{LEAK}	-	0.009	1	µA
Switching Speeds						
Turn-On (Output Closed)	V_{IN}=5V, V_L=10V	t_{on}	-	1.55	5	ms
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						
Recommended Operating Range	I_L=500mA	V_{IN}	5	-	12	V
Output Closed			-	-	3.75	
Output Open			1	-	-	
Reverse Input Current	V_{IN}=-5V	I_R	-	-	10	µA
Input Resistor	-	-	900	1000	1100	Ω
Common Characteristics						
Capacitance, Input to Output	-	-	-	1	-	pF

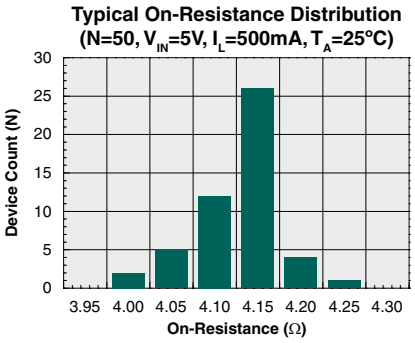
[1] Measurement taken within 1 second of on-time.

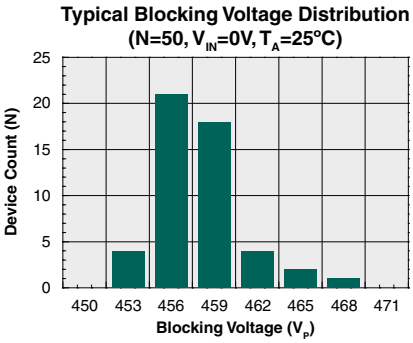
PERFORMANCE DATA*

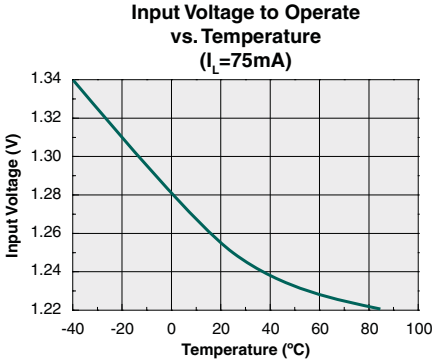


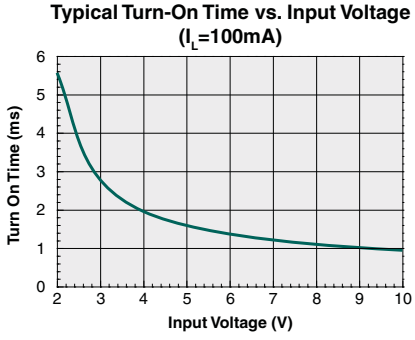


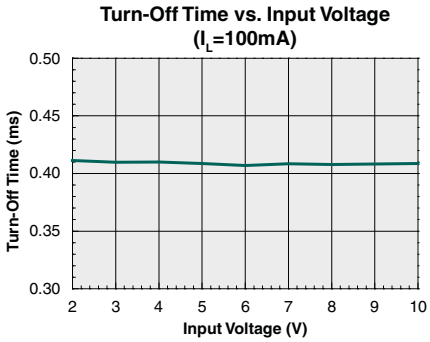


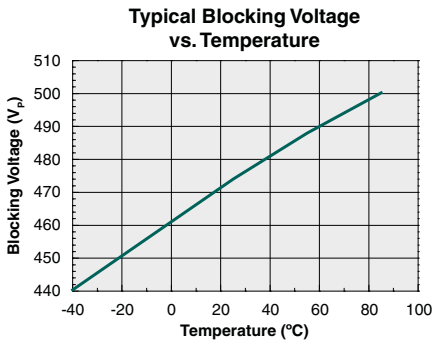


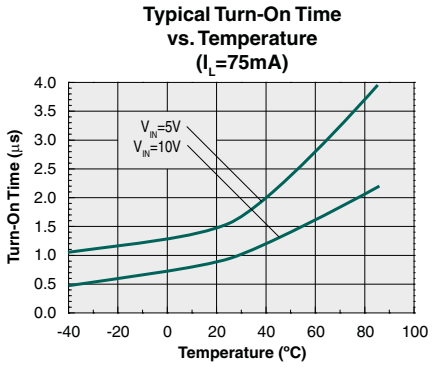


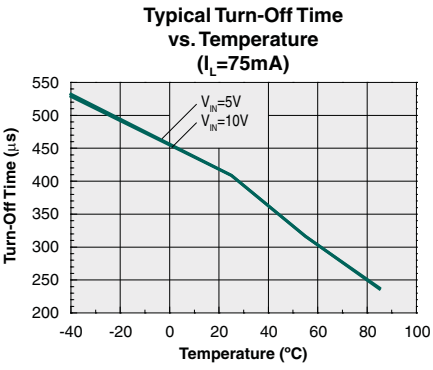








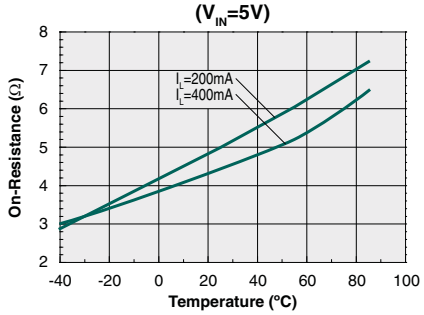




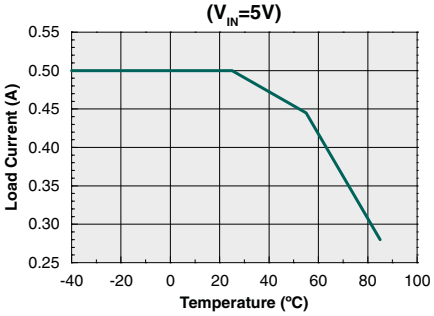
*The Performance Data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

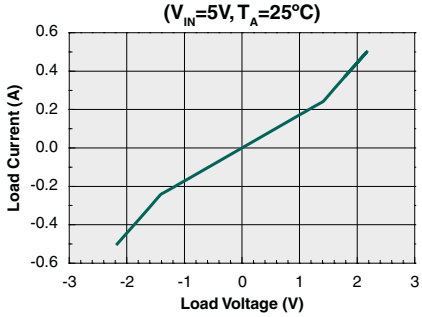
Typical On-Resistance vs. Temperature (V_{IN}=5V)



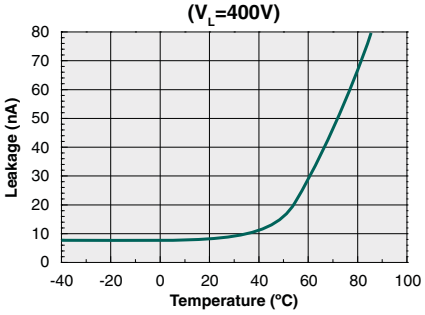
Load Current vs. Temperature (V_{IN}=5V)



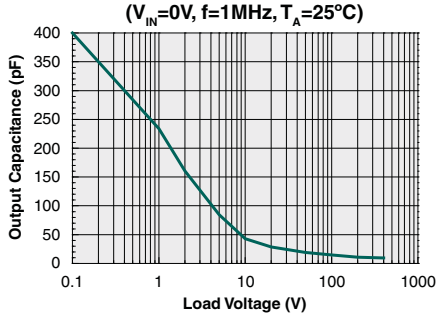
Typical Load Current vs. Load Voltage (V_{IN}=5V, T_A=25°C)



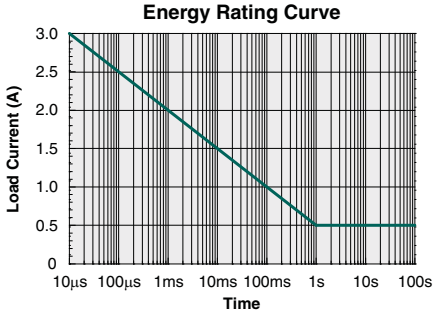
Typical Leakage vs. Temperature Measured Across Pins 14 & 8 (V_L=400V)



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



Energy Rating Curve



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Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. IXYS Integrated Circuits Division 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.

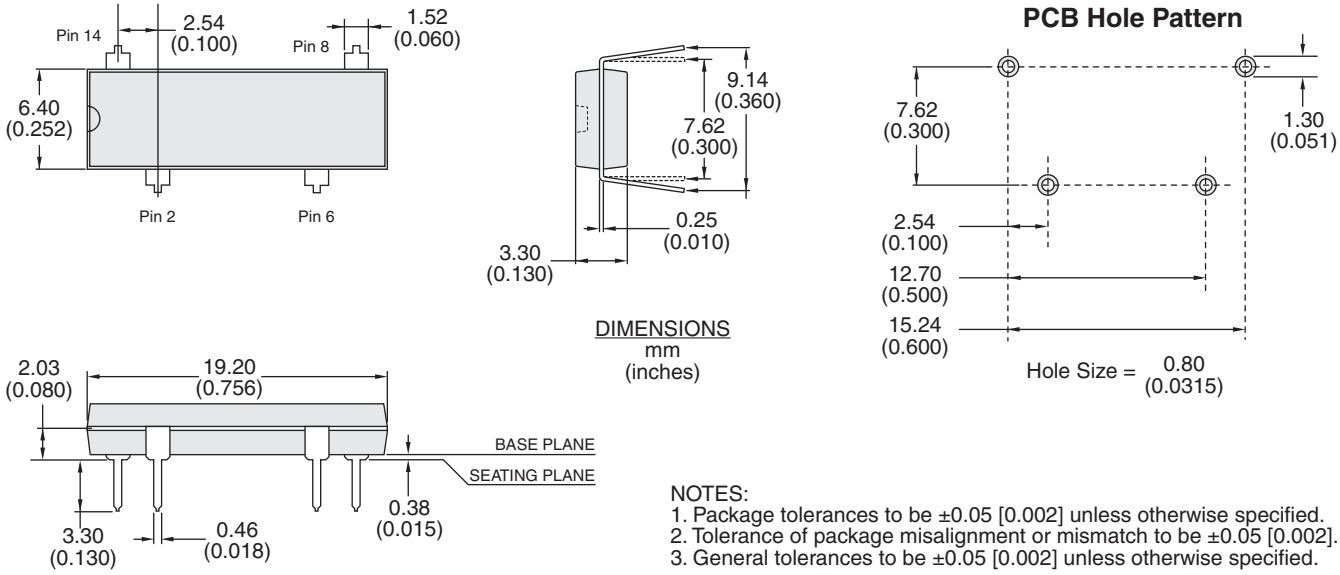
Device	Maximum Temperature x Time
CPC1215G	245°C for 30 seconds

Board Wash

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



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.

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

Specification: DS-CPC1215-R02

12/14/2012

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