LCA715
Single-Pole, Normally Open 6-Pin OptoMOS® Relay

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Load Current	2.2	A
Max On-resistance	0.15	Ω

Features
- 3750V_{rms} Input/Output Isolation
- Small 6-Pin Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available

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 LCA715 is a 60V single-pole, normally open (1-Form-A) Solid State Relay. The ultra-low on-resistance of this relay enables high-current operation. Clare's patented OptoMOS architecture makes available the optically coupled technology necessary to activate the output's efficient MOSFET switches, while providing 3750V_{rms} input-to-output isolation. Control of the isolated output is accomplished by means of the highly effective GaAlAs infrared LED at the input.

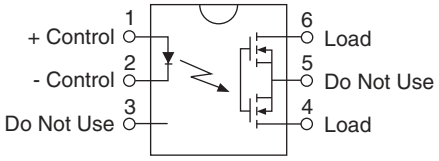
Approvals
- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950:
  TUV Certificate B 09 07 49410 004

Ordering Information

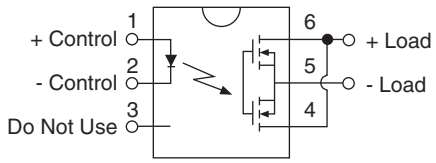
Part #	Description
LCA715	6 Pin DIP (50/Tube)
LCA715S	6 Pin Surface Mount (50/Tube)
LCA715STR	6 Pin Surface Mount (1000/Reel)

Pin Configuration

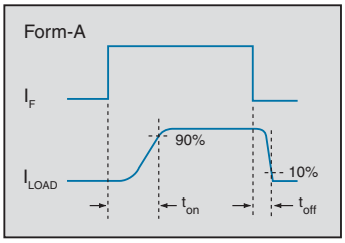
AC/DC Configuration



DC Only Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation [1]	800	mW
ESD, Human Body Model	8	kV
Isolation Voltage, Input to Output	3750	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate linearly 6.67 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.

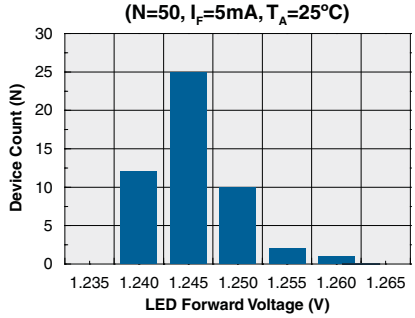
Electrical Characteristcs @ 25ºC

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous, AC/DC Configuration	Continuous, Free Air	I_L	-	-	2.2	A
Continuous, DC Configuration			-	-	4	
Peak	t≤10ms	I_{LPK}	-	-	10	A_P
On-Resistance [1]						
AC/DC Configuration	I_F=5mA, I_L=1A	R_{ON}	-	0.12	0.15	Ω
DC Configuration			-	0.038	0.05	
Off-State Leakage Current	I_F=0mA, V_L=60V_P	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{on}	-	0.7	2.5	ms
Turn-Off		t_{off}	-	0.115	0.25	ms
Output Capacitance	I_F=0mA, f=1MHz					
	V_L=10V	C_{OUT}	-	110	200	pF
	V_L=50V		-	60	-	
Input Characteristics						
Input Control Current	I_L=1A	I_F	-	0.9	5	mA
Input Dropout Current	-	I_F	0.4	-	-	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						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

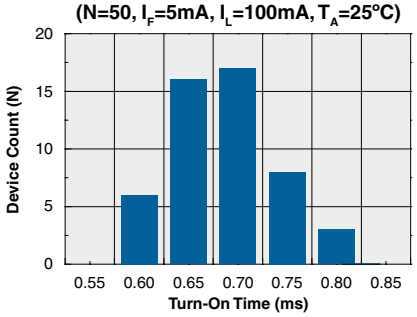
[1] Measurement taken within 1 second of on-time.

PERFORMANCE DATA*

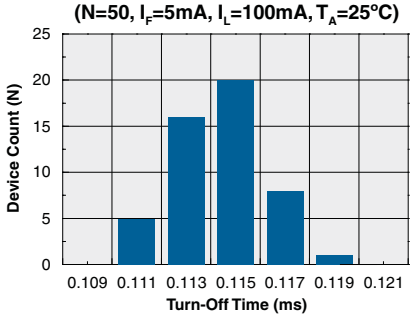
Typical LED Forward Voltage Drop (N=50, I_F=5mA, T_A=25°C)



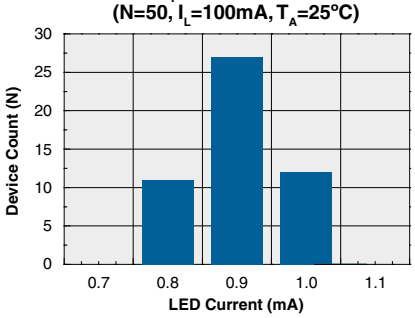
Typical Turn-On Time Distribution (N=50, I_F=5mA, I_L=100mA, T_A=25°C)



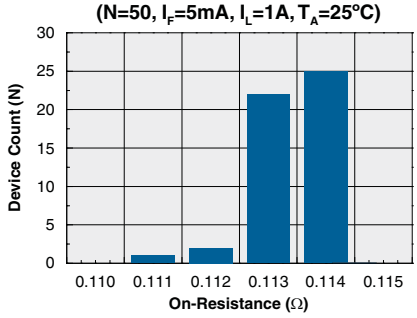
Typical Turn-Off Time Distribution (N=50, I_F=5mA, I_L=100mA, T_A=25°C)



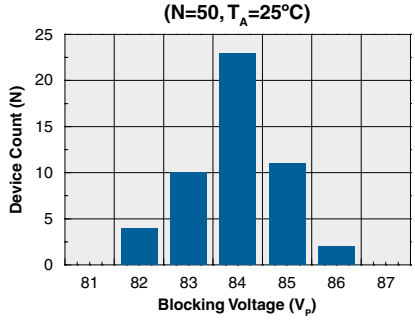
Typical I_F for Switch Operation (N=50, I_L=100mA, T_A=25°C)



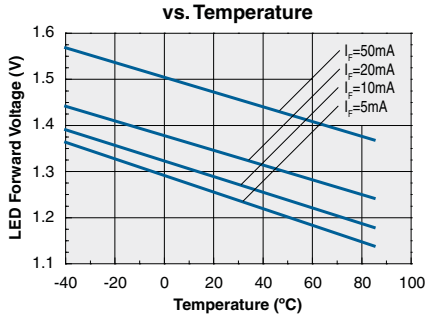
Typical On-Resistance Distribution (N=50, I_F=5mA, I_L=1A, T_A=25°C)



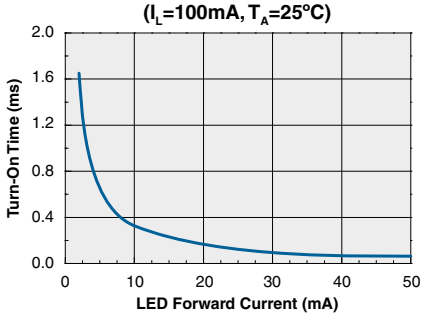
Typical Blocking Voltage Distribution (N=50, T_A=25°C)



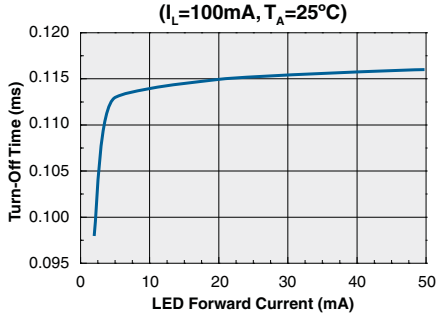
Typical LED Forward Voltage vs. Temperature



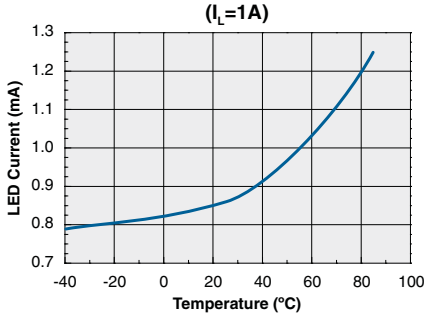
Typical Turn-On Time vs. LED Forward Current (I_L=100mA, T_A=25°C)



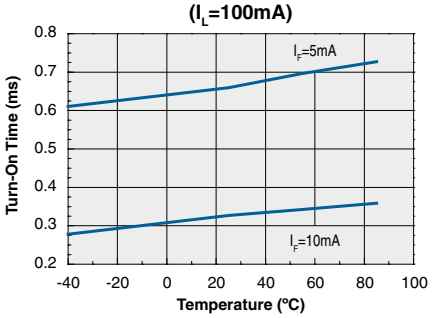
Typical Turn-Off Time vs. LED Forward Current (I_L=100mA, T_A=25°C)



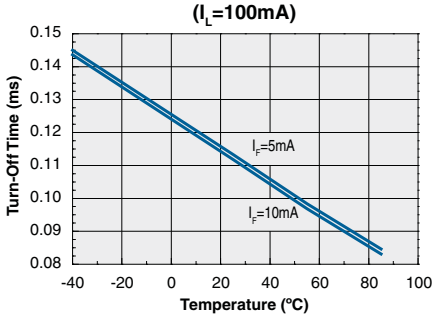
LED Current to Operate vs. Temperature (I_L=1A)



Turn-On Time vs. Temperature (I_L=100mA)



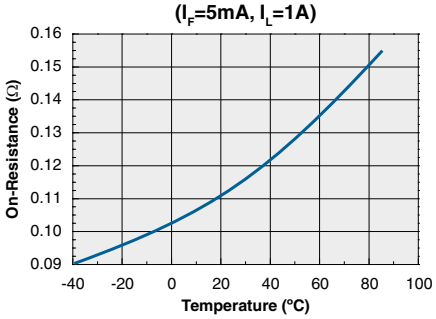
Turn-Off Time vs. Temperature (I_L=100mA)



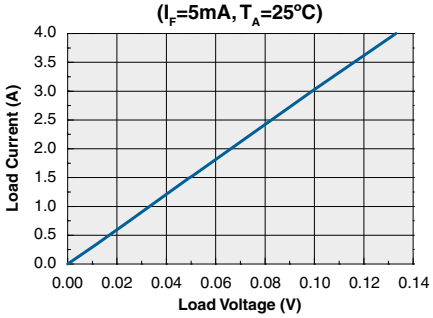
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

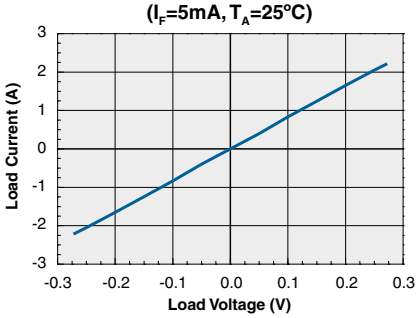
On-Resistance vs. Temperature
(I_F=5mA, I_L=1A)



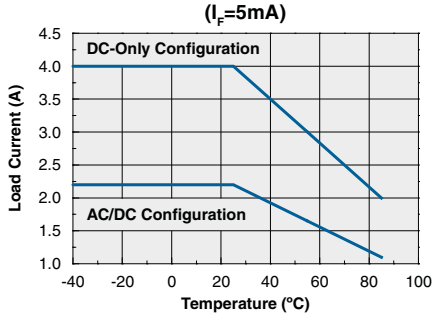
Typical Load Current vs. Load Voltage
DC-Only Configuration
(I_F=5mA, T_A=25°C)



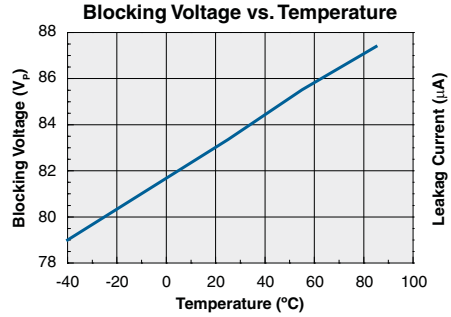
Typical Load Current vs. Load Voltage
AC/DC Configuration
(I_F=5mA, T_A=25°C)



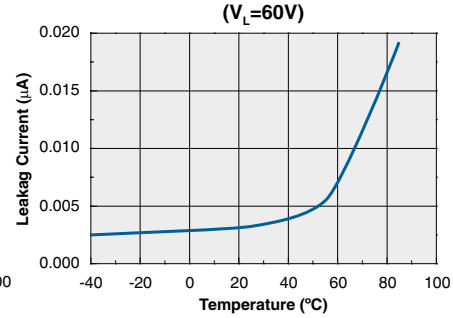
Typical Load Current
vs. Temperature
(I_F=5mA)



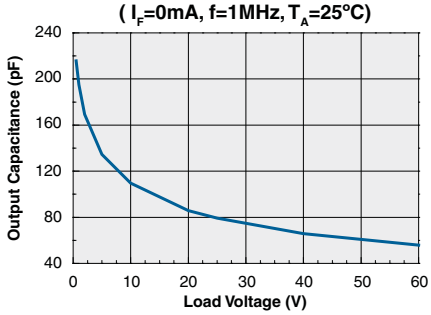
Blocking Voltage vs. Temperature



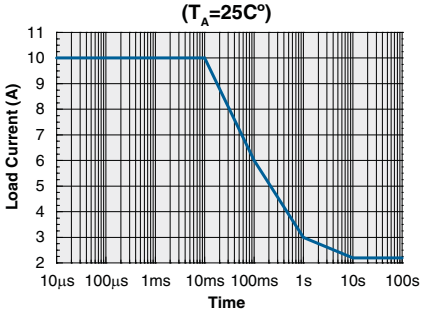
Typical Leakage vs. Temperature
(V_L=60V)



Output Capacitance vs. Load Voltage
(I_F=0mA, f=1MHz, T_A=25°C)



Energy Rating Curve
(T_A=25C°)



*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 ingression. 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
LCA715 / LCA715S	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.

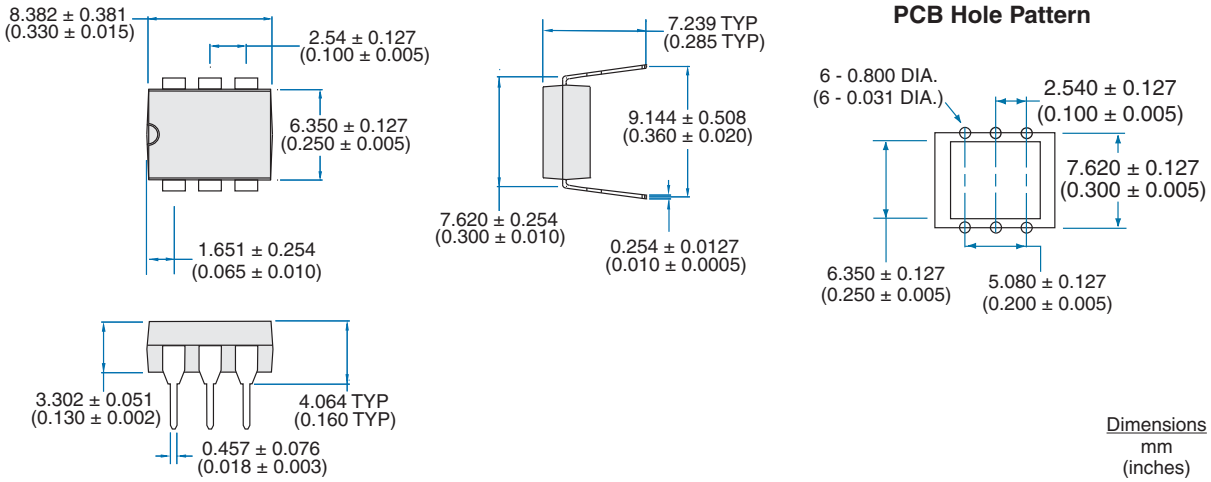
Device	Maximum Temperature x Time
LCA715 / LCA715S	250°C for 30 seconds

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 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.

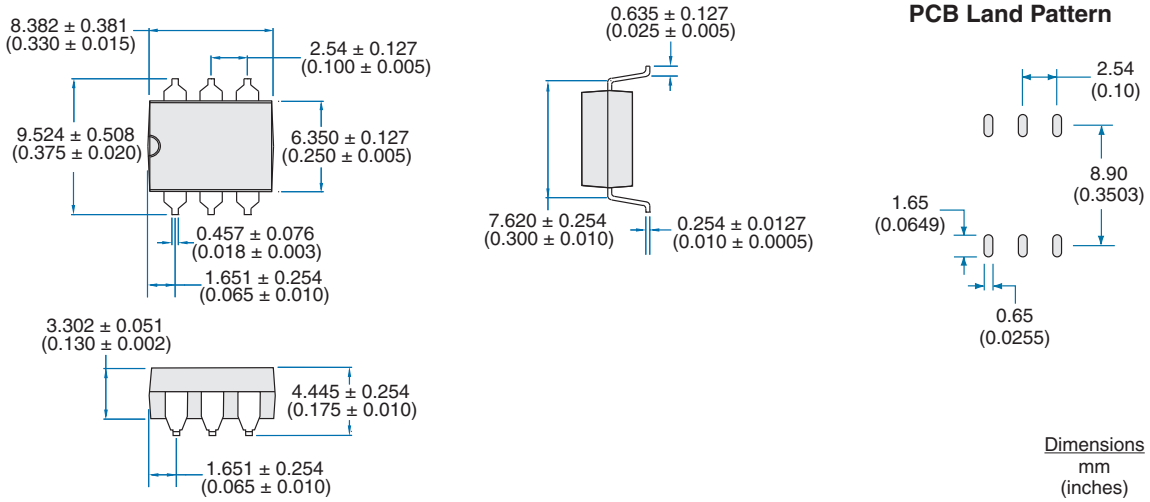
MECHANICAL DIMENSIONS

LCA715



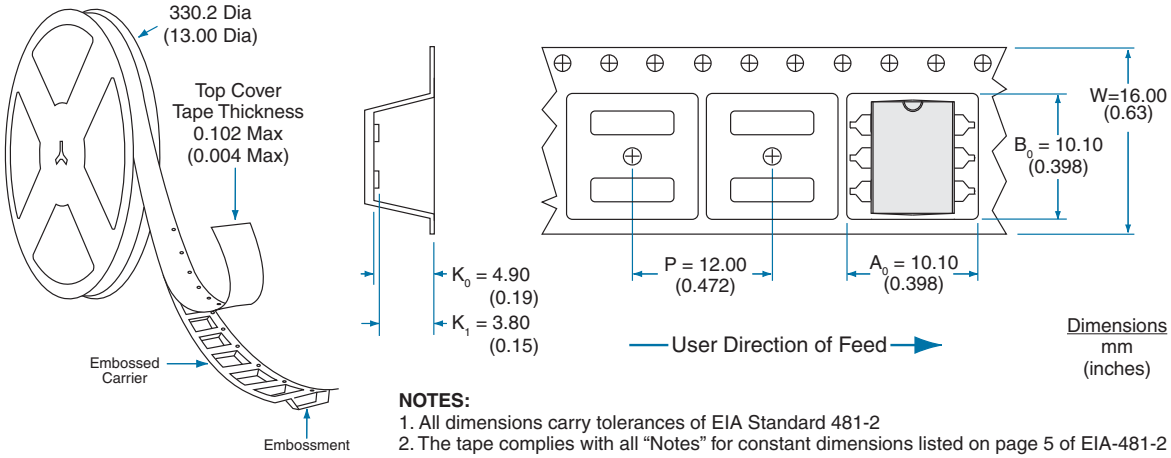
Dimensions
mm
(inches)

LCA715S



Dimensions
mm
(inches)

LCA715S Tape & Reel



NOTES:
1. All dimensions carry tolerances of EIA Standard 481-2
2. The tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

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

Specification: DS-LCA715-R05

11/10/2010