IXYS
INTEGRATED CIRCUITS DIVISION

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

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Load Current	2.2	A_{rms} / A_{DC}
On-Resistance (max)	0.15	Ω

Features
- 3750V_{rms} Input/Output Isolation
- Low Drive Power Requirements
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 6-Pin Package
- Flammability Rating UL 94 V-0
- 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. It uses optically coupled MOSFET technology to provide 3750V_{rms} of input to output isolation, and features an ultra-low on-resistance for high-current operation.

Its optically coupled outputs, which use the patented OptoMOS architecture, are controlled by a highly efficient infrared LED.

Offering the superior reliability associated with semiconductor devices, the LCA715 can be used to replace mechanical relays. Because it has no moving parts, it can offer faster, bounce-free switching in a more compact surface mount or thru-hole package.

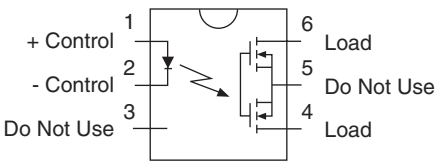
Approvals
- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component: Certificate available on our website

Ordering Information

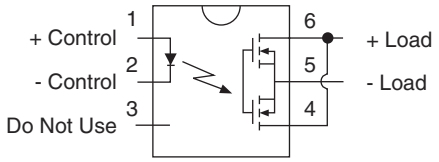
Part #	Description
LCA715	6 Pin DIP (50/Tube)
LCA715S	6 Pin Surface Mount (50/Tube)
LCA715STR	6 Pin Surface Mount (1000/Reel)

Pin Configuration

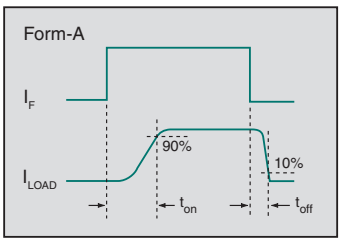
AC/DC Configuration



DC Only Configuration



Switching Characteristics of Normally Open Devices



ПРОМЭЛЕКТРОНИКА / sales@prom-elec.com

Absolute Maximum Ratings @ 25°C

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.

Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

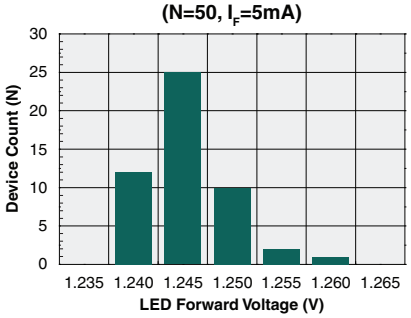
Electrical Characteristcs @ 25°C

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous, AC/DC Configuration	Continuous, Free Air	I_L	-	-	2.2	A_{rms} / A_{DC}
Continuous, DC Configuration			-	-	4	A_{DC}
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 to Activate	I_L=1A	I_F	-	0.9	5	mA
Input Control Current to Deactivate	-	I_F	0.4	-	-	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.5	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Input to Output Capacitance	V_{IO}=0V, f=1MHz	C_{IO}	-	3	-	pF

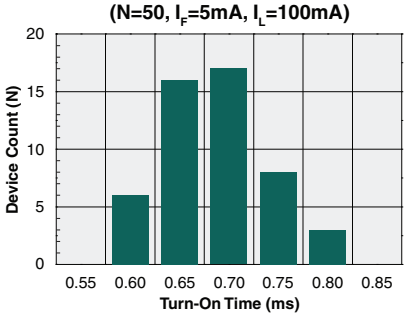
[1] Measurement taken within 1 second of on-time.

PERFORMANCE DATA*

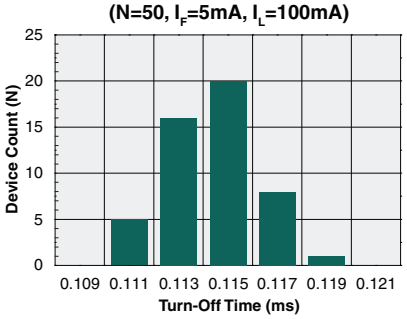
Typical LED Forward Voltage Drop (N=50, I_F=5mA)



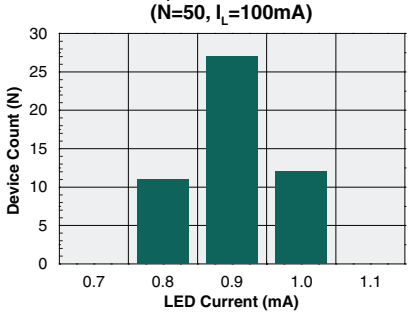
Typical Turn-On Time Distribution (N=50, I_F=5mA, I_L=100mA)



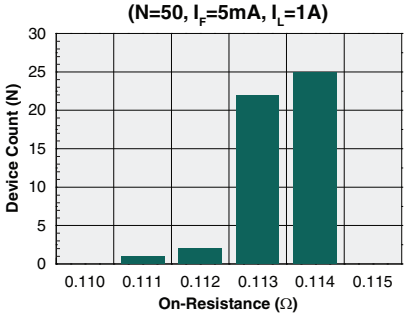
Typical Turn-Off Time Distribution (N=50, I_F=5mA, I_L=100mA)



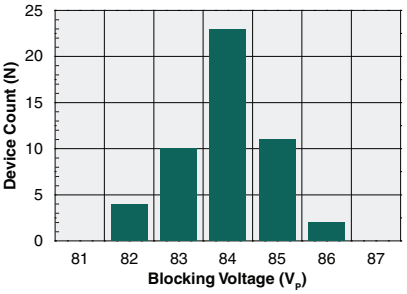
Typical I_F for Switch Operation (N=50, I_L=100mA)



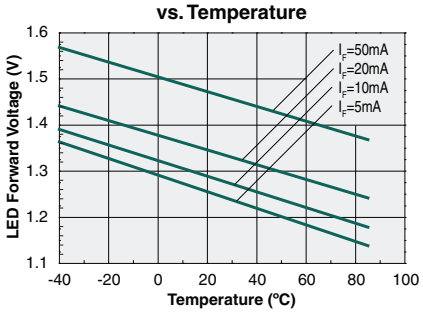
Typical On-Resistance Distribution (N=50, I_F=5mA, I_L=1A)



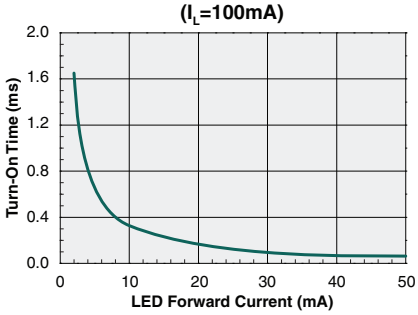
Typical Blocking Voltage Distribution (N=50)



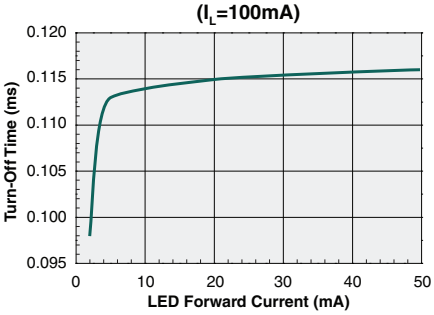
Typical LED Forward Voltage vs. Temperature



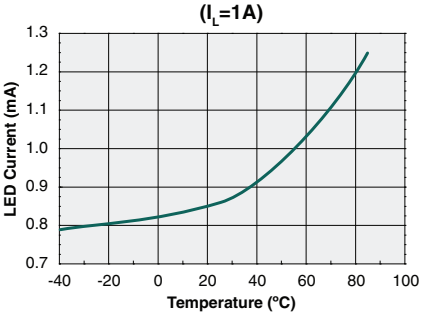
Typical Turn-On Time vs. LED Forward Current (I_L=100mA)



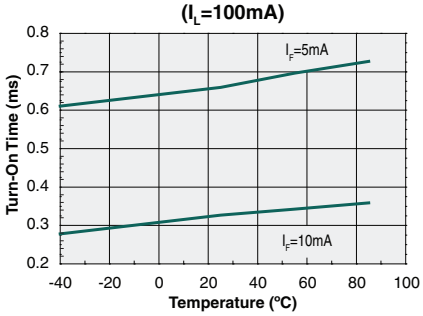
Typical Turn-Off Time vs. LED Forward Current (I_L=100mA)



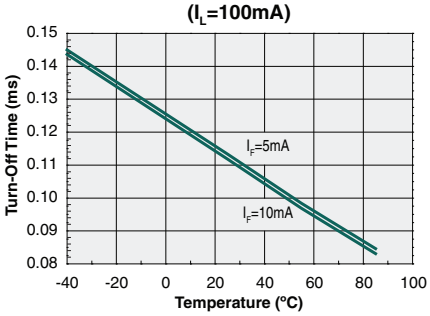
LED Current to Operate vs. Temperature (I_L=1A)



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

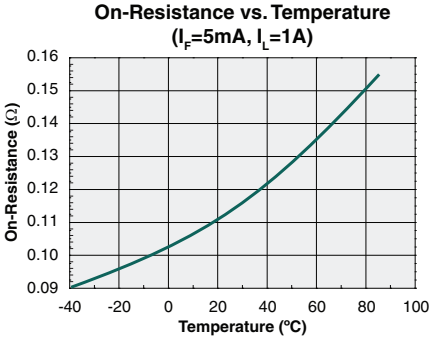


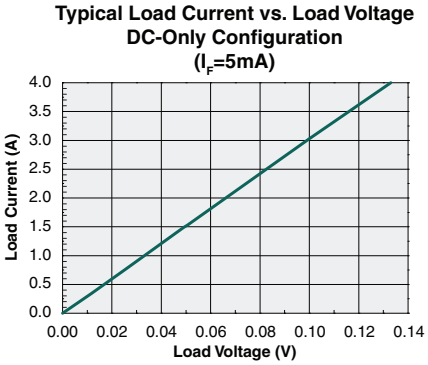
Turn-Off Time vs. Temperature (I_L=100mA)

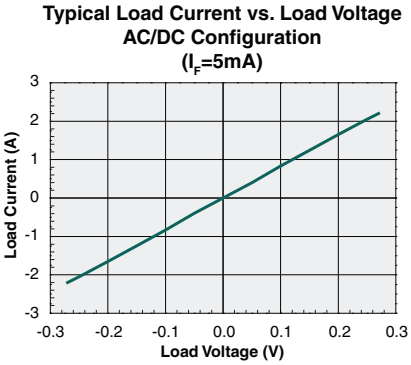


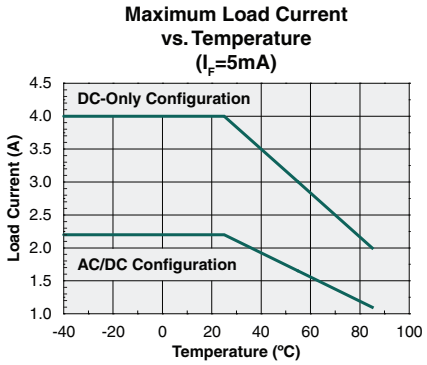
*Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.
For guaranteed parameters not indicated in the written specifications, please contact our application department.

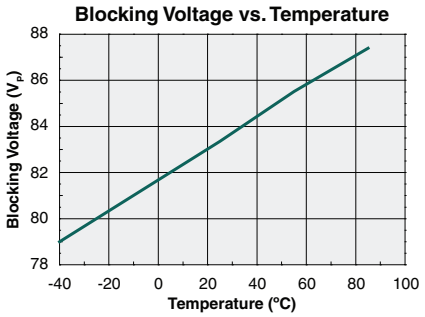
PERFORMANCE DATA*

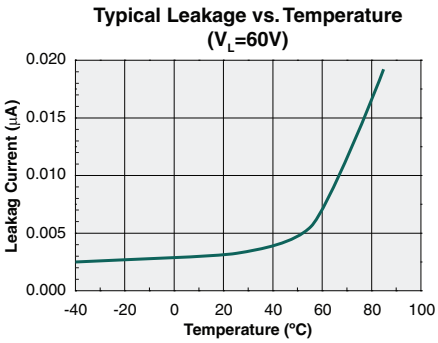


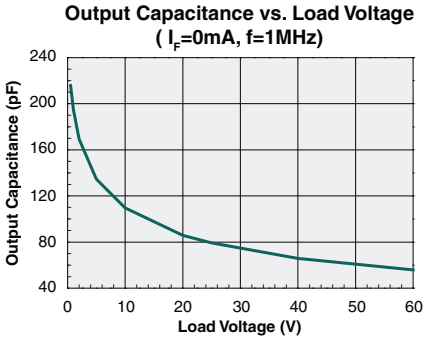


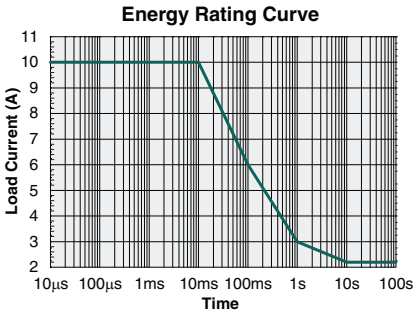












*Unless otherwise noted, data presented in these graphs is typical of device operation at 25ºC.
For guaranteed parameters not indicated in the written specifications, please contact our application department.

Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. IXYS Integrated Circuits classifies 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) classification 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) Classification
LCA715 / LCA715S	MSL 1

ESD Sensitivity

This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Soldering Profile

Provided in the table below is the Classification Temperature (T_C) of this product and the maximum dwell time the body temperature of this device may be (T_C - 5)°C or greater. The classification temperature sets the Maximum Body Temperature allowed for this device during lead-free reflow processes. For through-hole devices, and any other processes, the guidelines of **J-STD-020** must be observed.

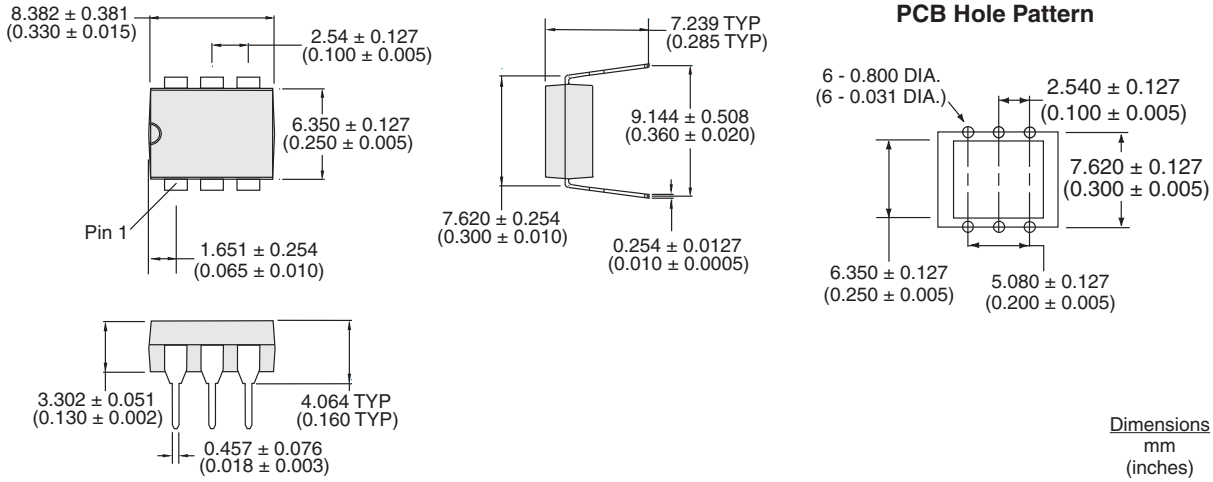
Device	Classification Temperature (T_c)	Dwell Time (t_p)	Max Reflow Cycles
LCA715	250°C	30 seconds	1
LCA715S	250°C	30 seconds	3

Board Wash

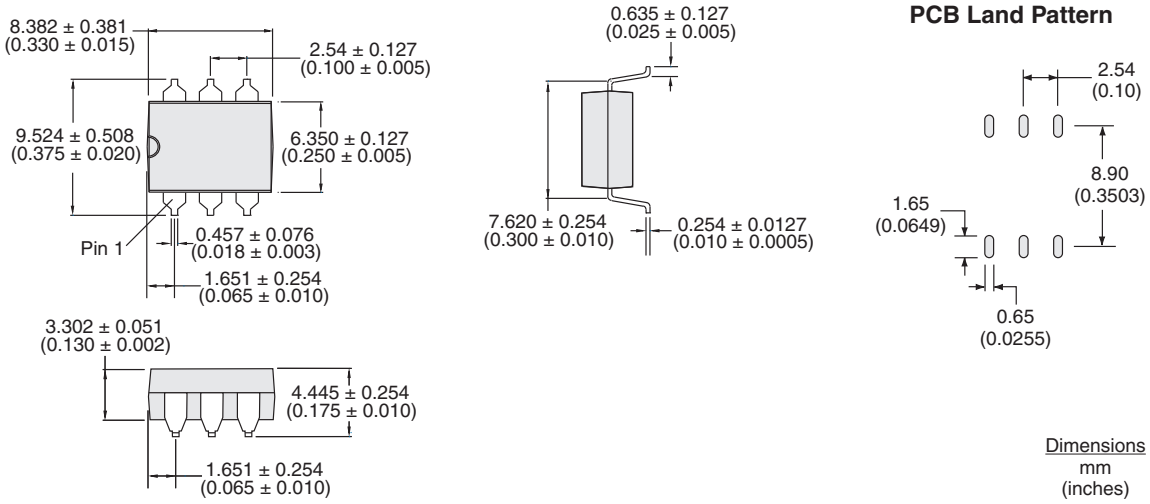
IXYS Integrated Circuits recommends the use of no-clean flux formulations. Board washing to reduce or remove flux residue following the solder reflow process is acceptable provided proper precautions are taken to prevent damage to the device. These precautions include, but are not limited to: using a low pressure wash and providing a follow up bake cycle sufficient to remove any moisture trapped within the device due to the washing process. Due to the variability of the wash parameters used to clean the board, determination of the bake temperature and duration necessary to remove the moisture trapped within the package is the responsibility of the user (assembler). Cleaning or drying methods that employ ultrasonic energy may damage the device and should not be used. Additionally, the device must not be exposed to flux or solvents that are Chlorine- or Fluorine-based.

MECHANICAL DIMENSIONS

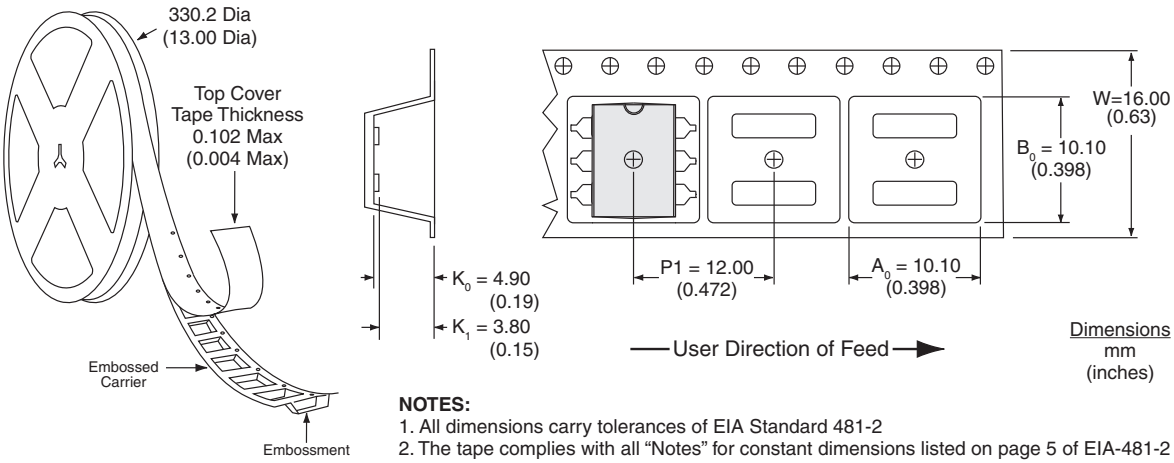
LCA715



LCA715S



LCA715STR 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.ixysic.com

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