



	LCA110	Units
Load Voltage	350	V
Load Current	120	mA
Max R <sub>ON</sub>	35	Ω

### Features

- Small 6 Pin Surface Mount and DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V<sub>RMS</sub> Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available
- Flammability classification rating of V-0

### Applications

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
    - Hook Switch
    - Dial Pulsing
    - Ground Start
    - Ringing Injection
- 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 LCA110 is a 1-Form-A solid state relay which uses optically coupled MOSFET technology to provide 3750V<sub>RMS</sub> of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED. The LCA110 can be used to replace mechanical relays and offers the superior reliability associated with semiconductor devices. Because they have no moving parts, they can offer faster, bounce-free switching in a more compact surface mount or through hole package.

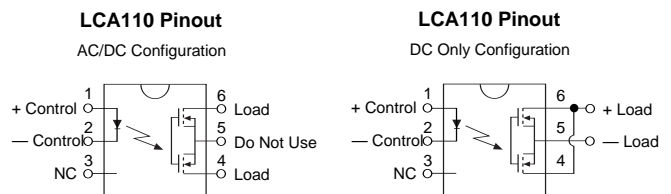
### Regulatory Information

- UL Recognized: E76270
- CSA Certified: LR 43639-10
- Certified to: EN 60950, EN 41003

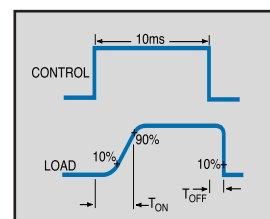
### Ordering Information

Part #	Description
LCA110	6 Pin DIP (50/Tube)
LCA110S	6 Pin Surface Mount (50/Tube)
LCA110STR	6 Pin Surface Mount (1000/Reel)

### Pin Configuration



### Switching Characteristics of Normally Open (Form A) Devices



### Absolute Maximum Ratings (@ 25° C)

Parameter	Ratings	Units
Input Power Dissipation	150 <sup>1</sup>	mW
Input Control Current	50	mA
Peak (10ms)	1	A
Reverse Input Voltage	5	V
Blocking Voltage	350	V
Total Power Dissipation	800 <sup>2</sup>	mW
Isolation Voltage Input to Output	3750	V <sub>RMS</sub>
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C
Soldering Temperature DIP Package	+260	°C
Surface Mount Package (10 Seconds Max.)	+220	°C

<sup>1</sup> Derate Linearly 1.33 mW/°C

<sup>2</sup> Derate Linearly 6.67 mW/°C

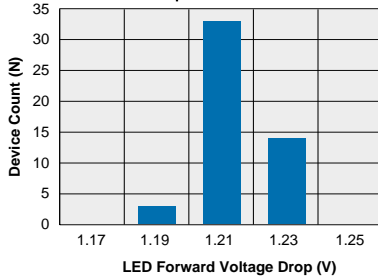
*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.*

### Electrical Characteristics

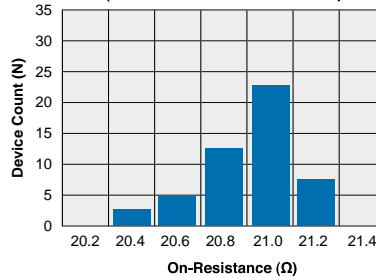
Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current (Continuous) AC/DC Configuration	-	$I_L$	-	-	120	mA
DC Configuration	-	$I_L$	-	-	200	mA
Peak Load Current	10ms	$I_{LPK}$	-	-	350	mA
On-Resistance AC/DC Configuration	$I_L=120\text{mA}$	$R_{ON}$	-	23	35	$\Omega$
DC Configuration	$I_L=200\text{mA}$	$R_{ON}$	-	7	10	$\Omega$
Off-State Leakage Current	$V_L=350\text{V}$	$I_{LEAK}$	-	-	1	$\mu\text{A}$
Switching Speeds						
Turn-On	$I_F=5\text{mA}, V_L=10\text{V}$	$T_{ON}$	-	-	3	ms
Turn-Off	$I_F=5\text{mA}, V_L=10\text{V}$	$T_{OFF}$	-	-	3	ms
Output Capacitance	50V; f=1MHz	$C_{OUT}$	-	25	-	pF
<b>Input Characteristics @ 25°C</b>						
Input Control Current	$I_L=120\text{mA}$	$I_F$	2	-	-	mA
Input Dropout Current	-	$I_F$	0.4	0.7	-	mA
Input Voltage Drop	$I_F=5\text{mA}$	$V_F$	0.9	1.2	1.4	V
Reverse Input Current	$V_R=5\text{V}$	$I_R$	-	-	10	$\mu\text{A}$
<b>Common Characteristics @ 25°C</b>						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

**PERFORMANCE DATA\***

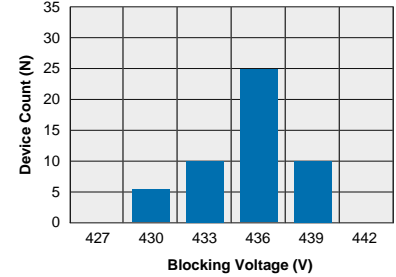
**LCA110**  
Typical LED Forward Voltage Drop  
(N=50 Ambient Temperature = 25°C)  
 $I_F = 5\text{mADC}$



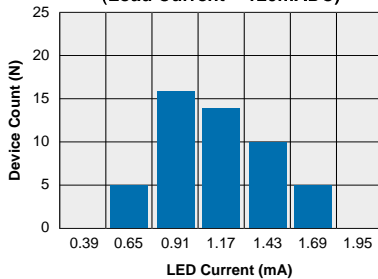
**LCA110**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



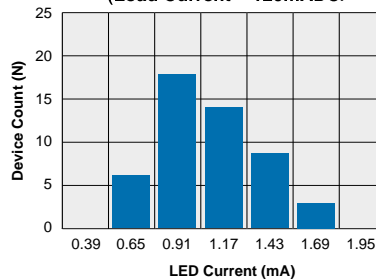
**LCA110**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)



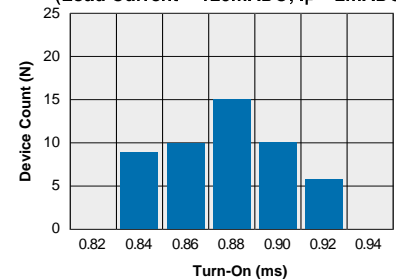
**LCA110**  
Typical  $I_F$  for Switch Operation  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



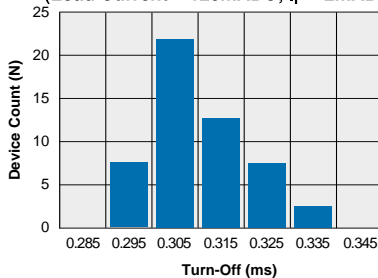
**LCA110**  
Typical  $I_F$  for Switch Dropout  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



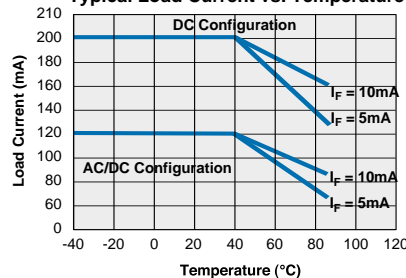
**LCA110**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC;  $I_F = 2\text{mADC}$ )



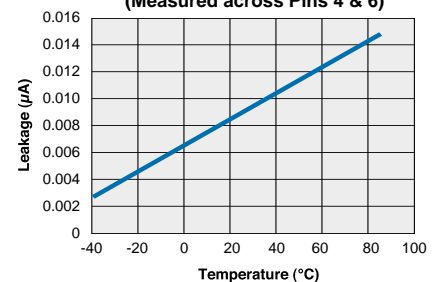
**LCA110**  
Typical Turn-Off Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC;  $I_F = 2\text{mADC}$ )



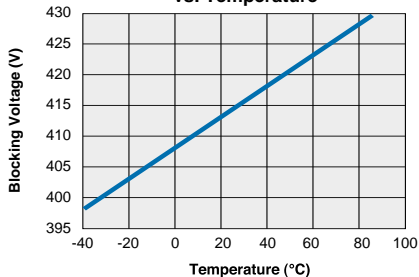
**LCA110**  
Typical Load Current vs. Temperature



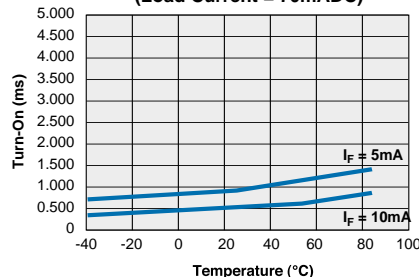
**LCA110**  
Typical Leakage vs. Temperature  
(Measured across Pins 4 & 6)



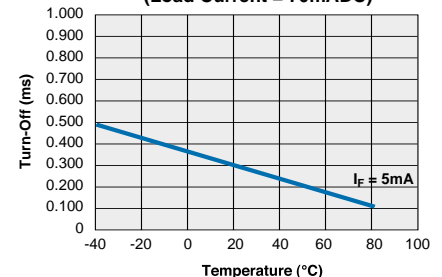
**LCA110**  
Typical Blocking Voltage vs. Temperature



**LCA110**  
Typical Turn-On vs. Temperature  
(Load Current = 70mADC)

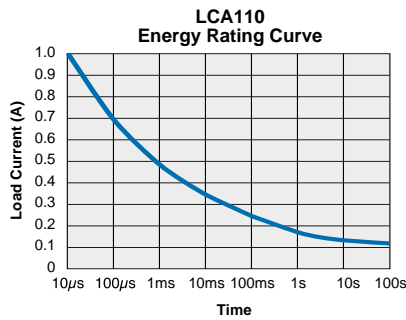
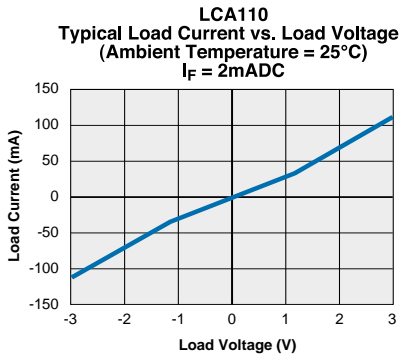
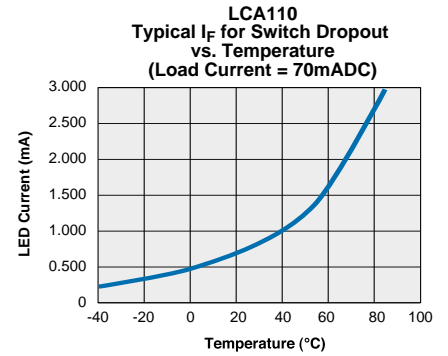
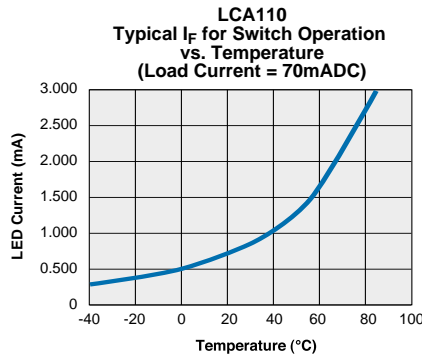
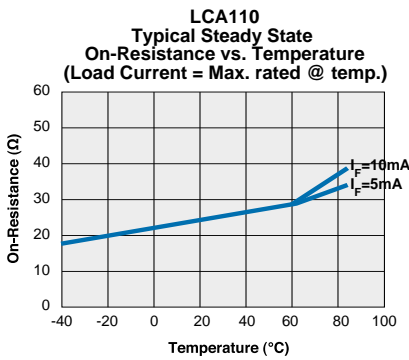
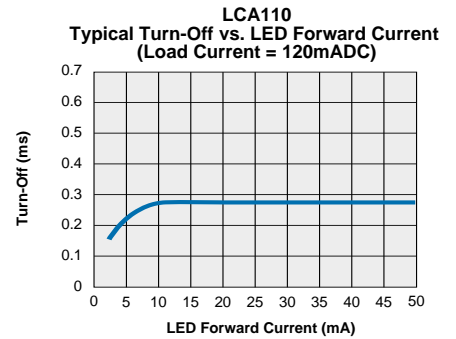
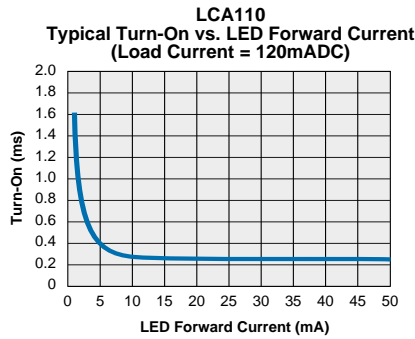
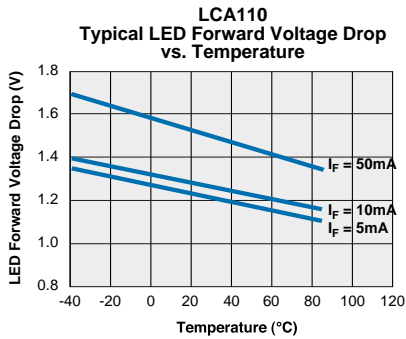


**LCA110**  
Typical Turn-Off vs. Temperature  
(Load Current = 70mADC)



\*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.

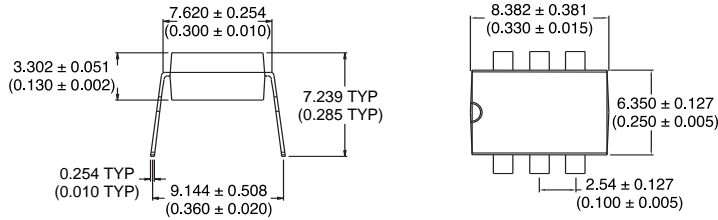
PERFORMANCE DATA\*



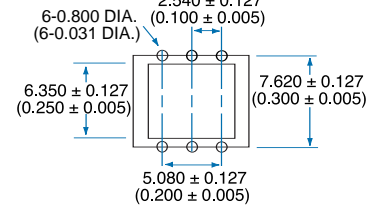
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

**MECHANICAL DIMENSIONS**

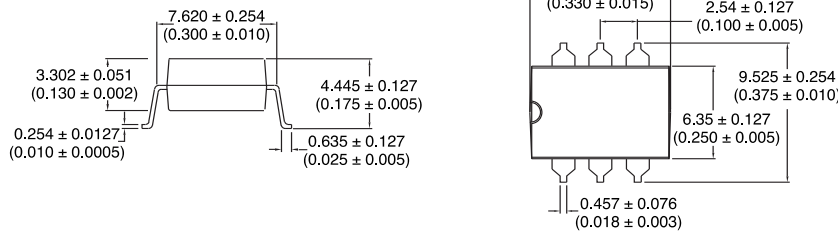
**6Pin DIP Through Hole (Standard)**



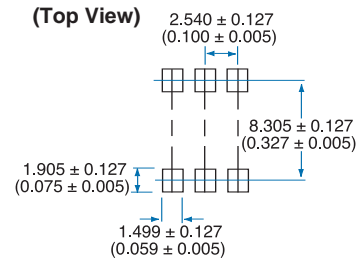
**PC Board Pattern (Top View)**



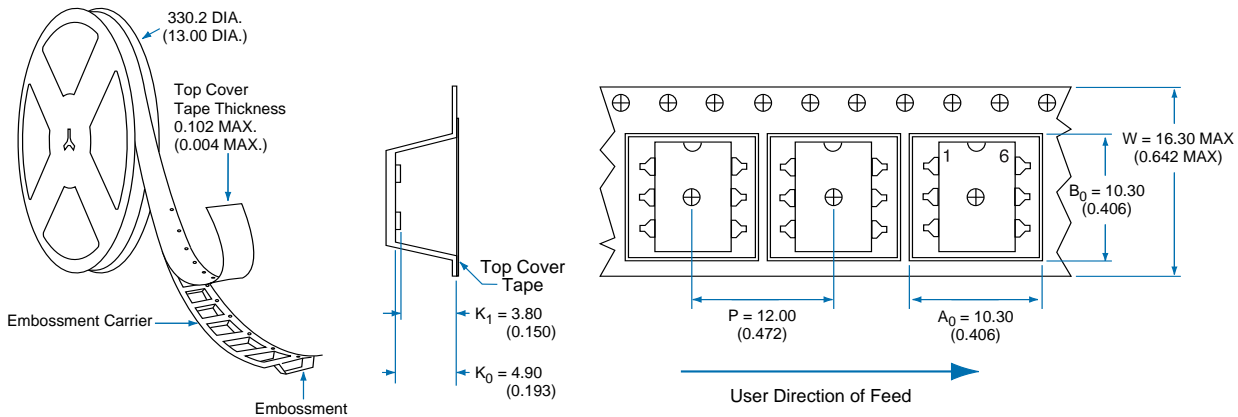
**6Pin Surface Mount ("S" Suffix)**



**PC Board Pattern (Top View)**



**Tape and Reel Packaging for 6 Pin Surface Mount Package**



Dimensions  
mm  
(inches)

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