

# LCA110 Single Pole OptoMOS<sup>®</sup> Relays



Parameter	Rating	Units
Blocking Voltage	350	V <sub>P</sub>
Load Current	120	mA
Max On-resistance	35	Ω

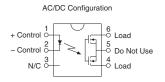
#### **Features**

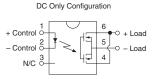
- 100% Solid State
- Small 6-Pin Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- · High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V<sub>rms</sub> Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount Tape & Reel Version Available
- Flammability classification rating of V-0

#### **Applications**

- Instrumentation
  - Multiplexers
  - Data Acquisition
  - · Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

## Pin Configuration





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efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS<sup>®</sup> architecture. The optically coupled output is controlled by a highly efficient GaAIAs 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 though hole package.

The LCA110 is a 1-Form-A Solid State Relay which uses optically coupled MOSFET technology to provide  $3750V_{rms}$  of input to output isolation. The

#### **Approvals**

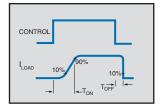
Description

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- EN/IEC 60950-1:2001 Compliant

## **Ordering Information**

Part Number	Description
LCA110	6-Pin DIP (50/Tube)
LCA110S	6-Pin Surface Mount (50/Tube)
LCA110STR	6-Pin Surface Mount (1,000/Reel)

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







## **Absolute Maximum Ratings**

Parameter	Ratings	Units	
Blocking Voltage	350	V <sub>P</sub>	
Reverse Input Voltage	5	V	
Input Control Current	50	mA	
Peak (10ms)	1	А	
Input Power Dissipation <sup>1</sup>	150	mW	
Total Power Dissipation <sup>2</sup>	800	mW	
Isolation Voltage, Input to Output	3750	V <sub>rms</sub>	
Operational Temperature	-40 to +85	°C	
Storage Temperature	-40 to +125	°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.

<sup>1</sup> Derate Linearly 1.33 mW/°C <sup>2</sup> Derate Linearly 6.67 mW/°C

Electrical absolute maximum ratings are at 25°C

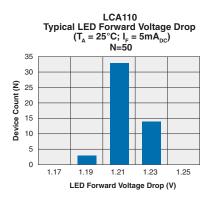
### **Electrical Characteristics**

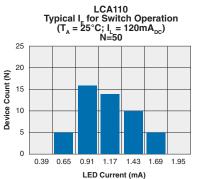
Parameter	Conditions	Symbol	Min	Тур	Max	Units
Output Characteristics @ 25°C						
Load Current (Continuous)						
AC/DC Configuration			-	-	120	
DC Configuration	-		-	-	200	mA
Peak Load Current	t=10ms	I <sub>LPK</sub>	-	-	350	mA
On-resistance						
AC/DC Configuration	I <sub>L</sub> =120mA	Р	-	23	35	Ω
DC Configuration	I <sub>L</sub> =200mA	R <sub>ON</sub>	-	7	10	
Off-State Leakage Current	V <sub>L</sub> =350V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On		T <sub>ON</sub>			3	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-		
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current	I <sub>L</sub> =120mA	I <sub>F</sub>	-	-	2	mA
Input Dropout Current	-	I <sub>F</sub>	0.4	-	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA
Common Characteristics @ 25°C						
Input to Output Capacitance	-	C <sub>I/O</sub>	-	3	-	pF

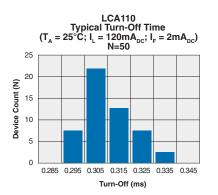


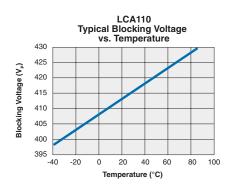


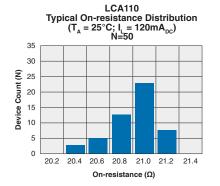
## **PERFORMANCE DATA\***

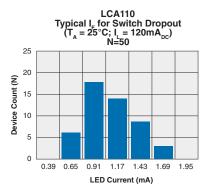












LCA110

Typical Load Current vs. Temperature

**DC** Configuration

AC/DC Configuration

10m/

 $I_{r} = 5mA$ 

l<sub>F</sub> = 10mA

I<sub>F</sub> = 5mA

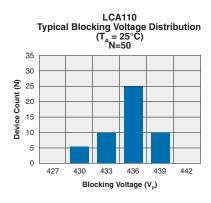
210

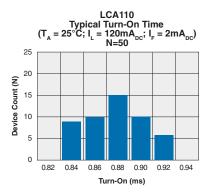
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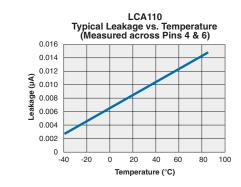
60

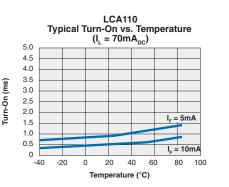
0

-40 -20 0 20 40 60 80 100 120

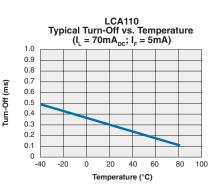








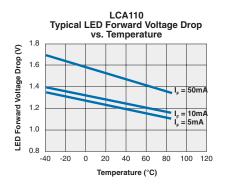
Temperature (°C)

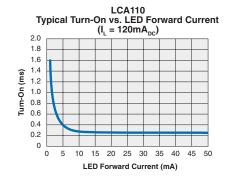


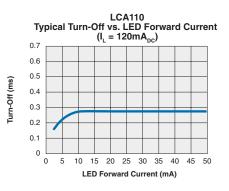
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

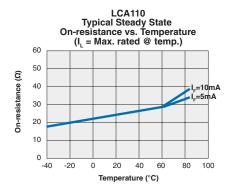


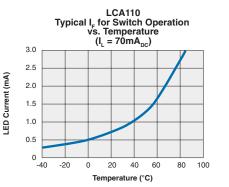
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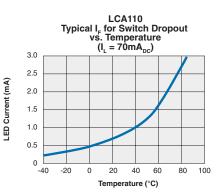


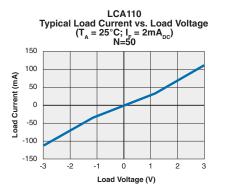


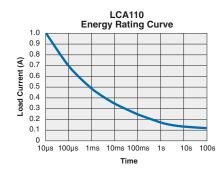












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## **Manufacturing Information**

#### Soldering

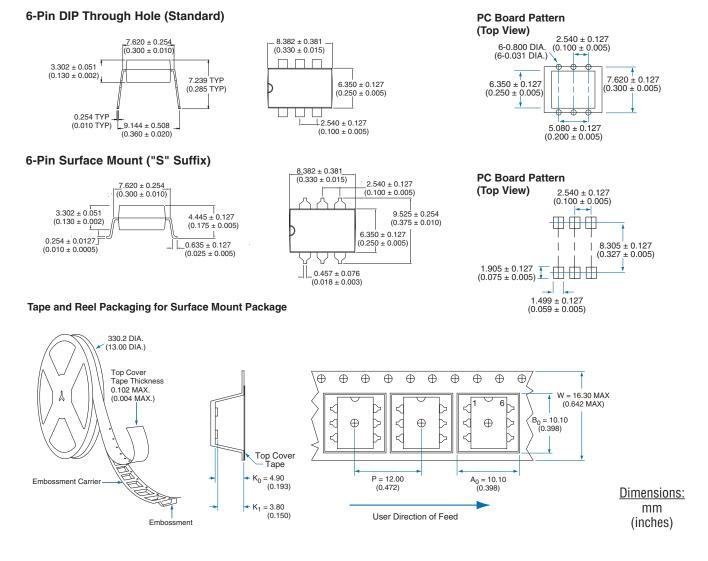
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Recommended soldering processes are limited to 260°C component body temperature for 10 seconds.

#### Washing

Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.





#### **MECHANICAL DIMENSIONS**



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