



Parameter	Ratings	Units
Blocking Voltage	350	V _p
Load Current	120	mA
Max R _{ON}	35	Ω

Features

- Built-in Current Limiting
- Small 6 Pin Surface Mount and DIP Packages
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V_{rms} Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Flammability Classification Rating: V-0
- Surface Mount, Tape & Reel Version Available

Applications

- Telecommunications
 - Telecom Switching
 - Tip/Ring Circuits
 - Modem Switching (Laptop, Notebook, Pocket Size)
 - Hookswitch
 - 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 LCA110L is a 1-Form-A solid state relay which uses optically coupled MOSFET technology to provide 3750V_{rms} of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture. The optically-coupled output is controlled by a highly efficient GaAlAs infrared LED. The LCA110L 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.

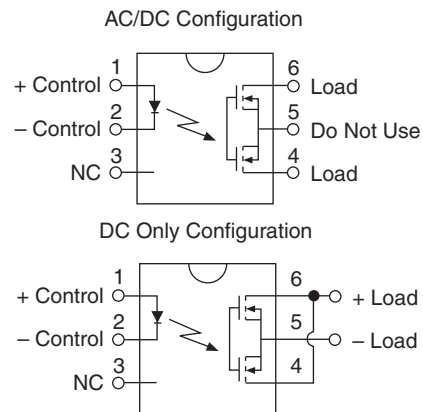
Approvals

- UL Recognized Component: File # E76270
- CSA Certified Component: Certificate # 1175739
- EN/IEC 60950 Compliant

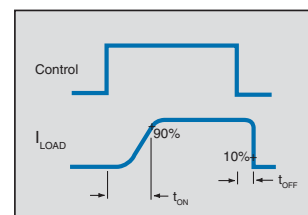
Ordering Information

Part #	Description
LCA110L	6 Pin DIP (50/Tube)
LCA110LS	6 Pin Surface Mount (50/Tube)
LCA110LSTR	6 Pin Surface Mount (1000/Reel)

Pin Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Blocking Voltage	350	V _P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation ¹	150	mW
Total Power Dissipation ²	800	mW
Isolation Voltage, Input to Output	3750	V _{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate Linearly 1.33 mW/°C

² 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.

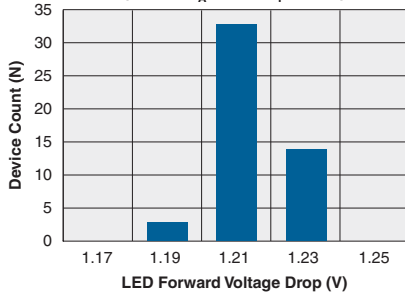
Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current, Continuous						
AC/DC Configuration	-	I _L	-	-	120	mA
DC Configuration					200	
Load Current Limiting, AC/DC Configuration	I _F =2mA, V _L =8V	I _{CL}	130	170	210	mA
On-Resistance ¹						
AC/DC Configuration	I _L =120mA	R _{ON}	-	19	35	Ω
DC Configuration	I _L =200mA			7	10	
Off-State Leakage Current	V _L =350V _P	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	t _{ON}	-	-	3	ms
Turn-Off		t _{OFF}	-	-	3	
Output Capacitance	50V; f=1MHz	C _{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current	I _L =120mA	I _F	-	1.1	2	mA
Input Dropout Current	-	I _F	0.4	1.0	-	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 @ 25°C						
Input to Output Capacitance	-	C _{I/O}	-	3	-	pF

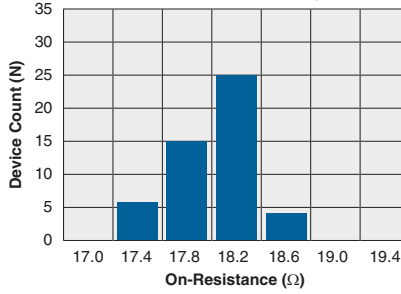
¹ Measurement taken within 1 second of on-time.

PERFORMANCE DATA*

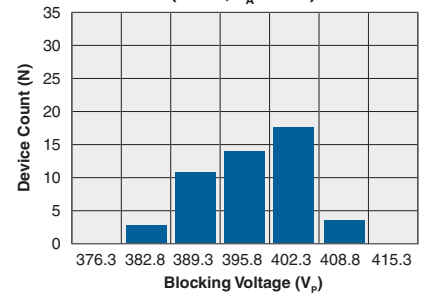
Typical LED Forward Voltage Drop
(N=50, $T_A=25^\circ\text{C}$, $I_F=5\text{mA}$)



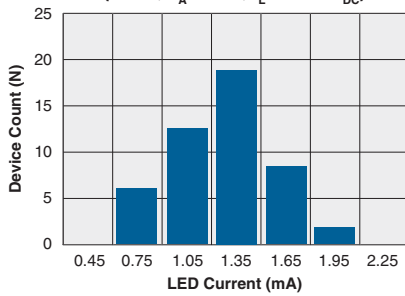
Typical On-Resistance Distribution
(N=50, $T_A=25^\circ\text{C}$, $I_L=120\text{mA}_{\text{DC}}$, $I_F=2\text{mA}$)



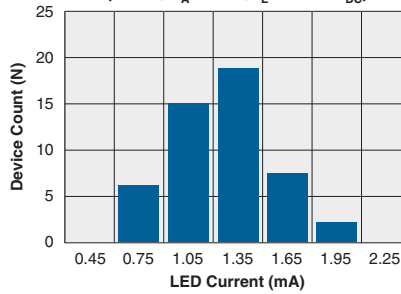
Typical Blocking Voltage Distribution
(N=50, $T_A=25^\circ\text{C}$)



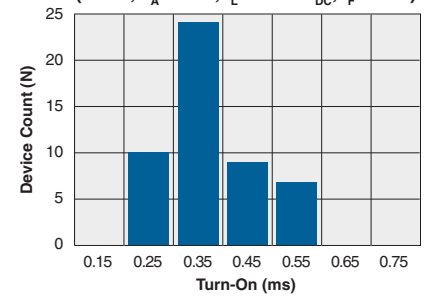
Typical I_F for Switch Operation
(N=50, $T_A=25^\circ\text{C}$, $I_L=120\text{mA}_{\text{DC}}$)



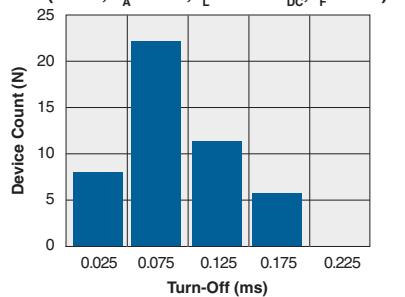
Typical I_F for Switch Dropout
(N=50, $T_A=25^\circ\text{C}$, $I_L=120\text{mA}_{\text{DC}}$)



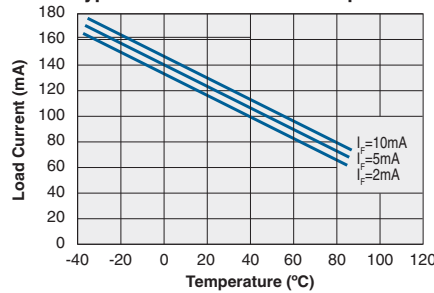
Typical Turn-On Time
(N=50, $T_A=25^\circ\text{C}$, $I_L=120\text{mA}_{\text{DC}}$, $I_F=5\text{mA}$)



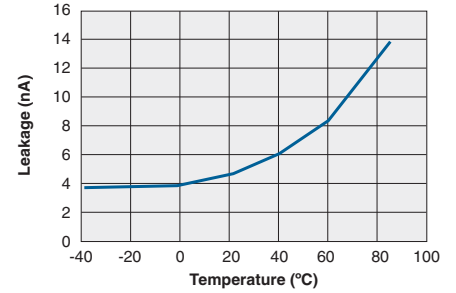
Typical Turn-Off Time
(N=50, $T_A=25^\circ\text{C}$, $I_L=120\text{mA}_{\text{DC}}$, $I_F=5\text{mA}$)



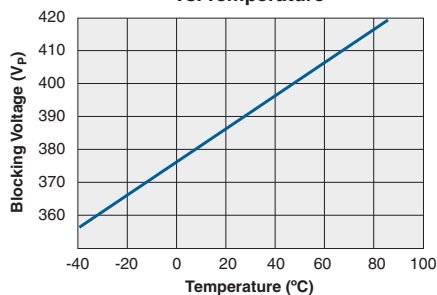
Typical Load Current vs. Temperature



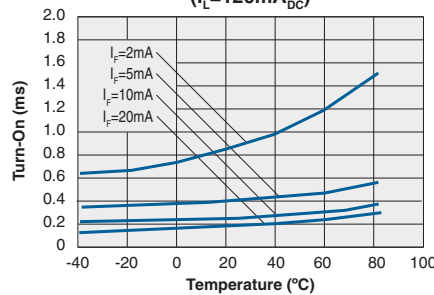
Typical Leakage vs. Temperature
Measured across Pins 4 & 6



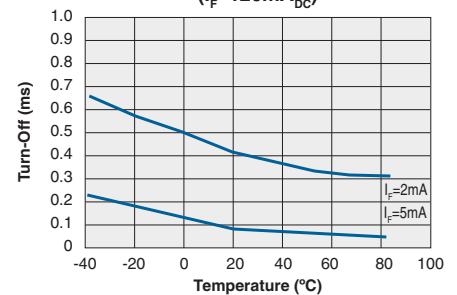
Typical Blocking Voltage vs. Temperature



Typical Turn-On vs. Temperature
($I_L=120\text{mA}_{\text{DC}}$)

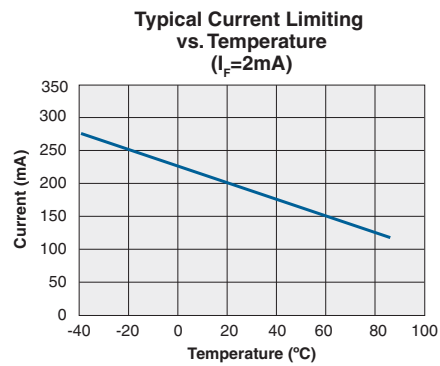
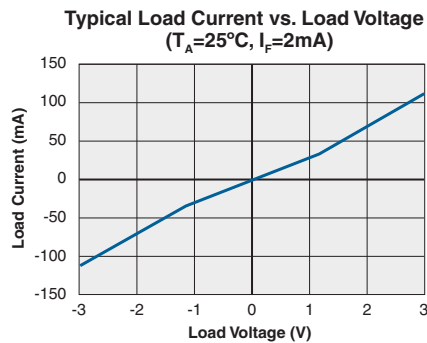
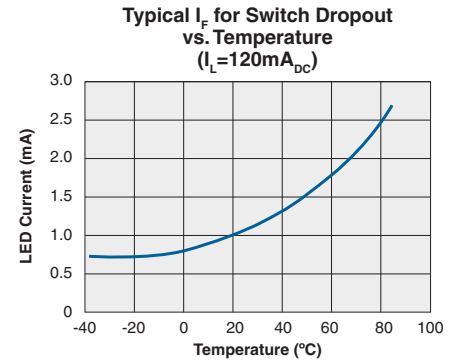
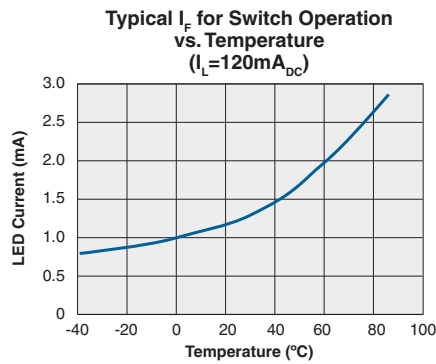
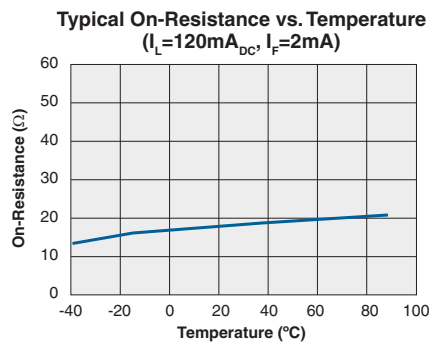
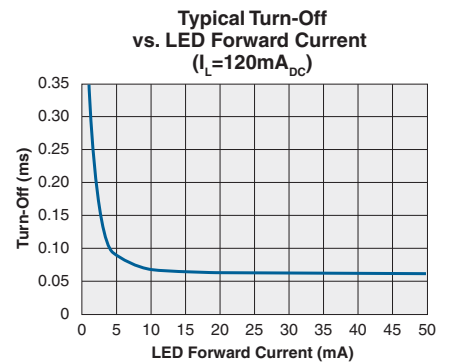
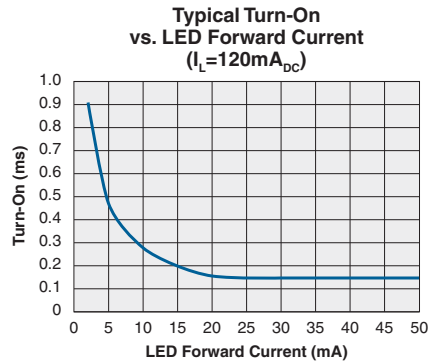
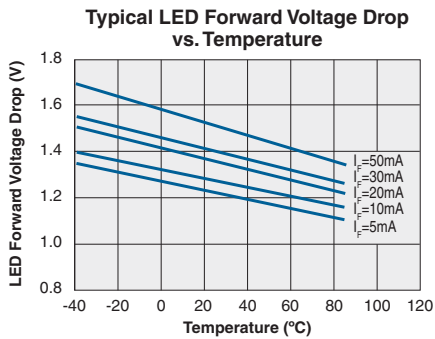


Typical Turn-Off vs. Temperature
($I_F=120\text{mA}_{\text{DC}}$)



*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*



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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.

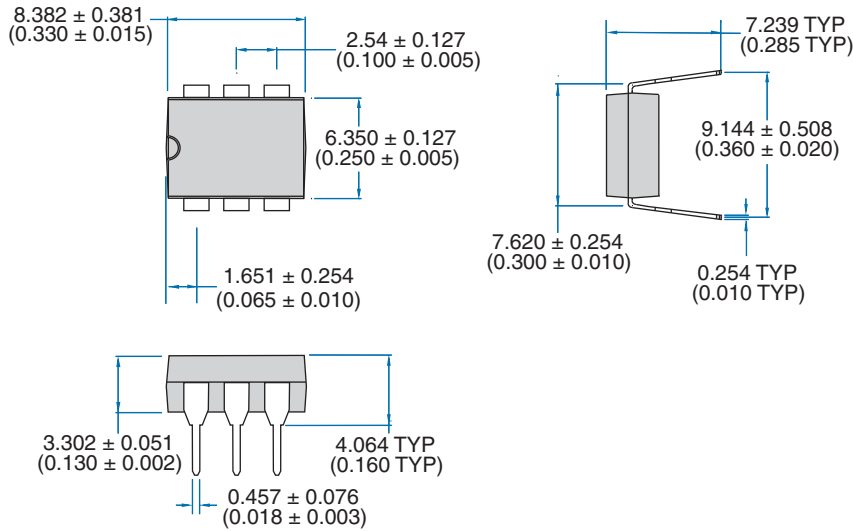
Washing

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

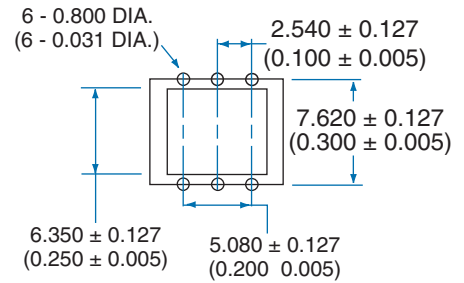


MECHANICAL DIMENSIONS

6-Pin DIP Thru-Hole Package

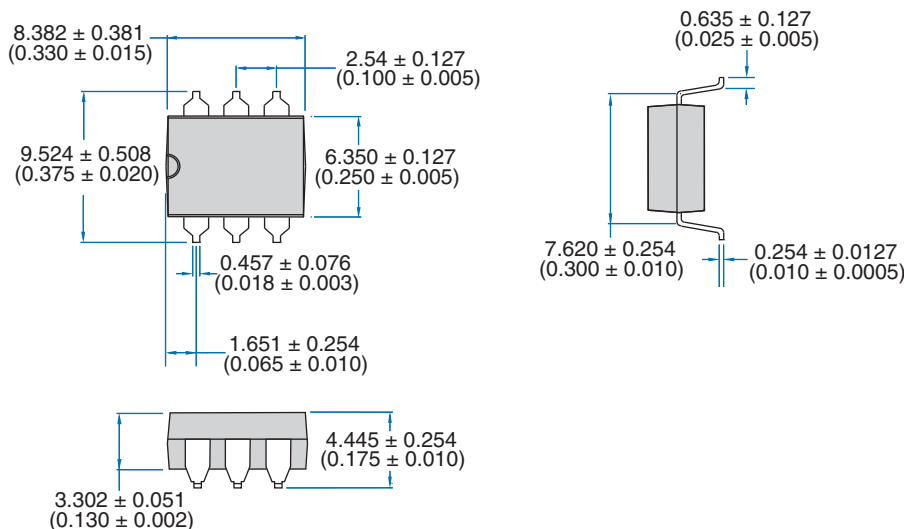


PC Board Pattern

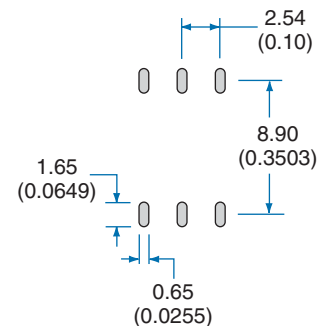


Dimensions
mm
(inches)

6-Pin Surface Mount Package ("S" Suffix)



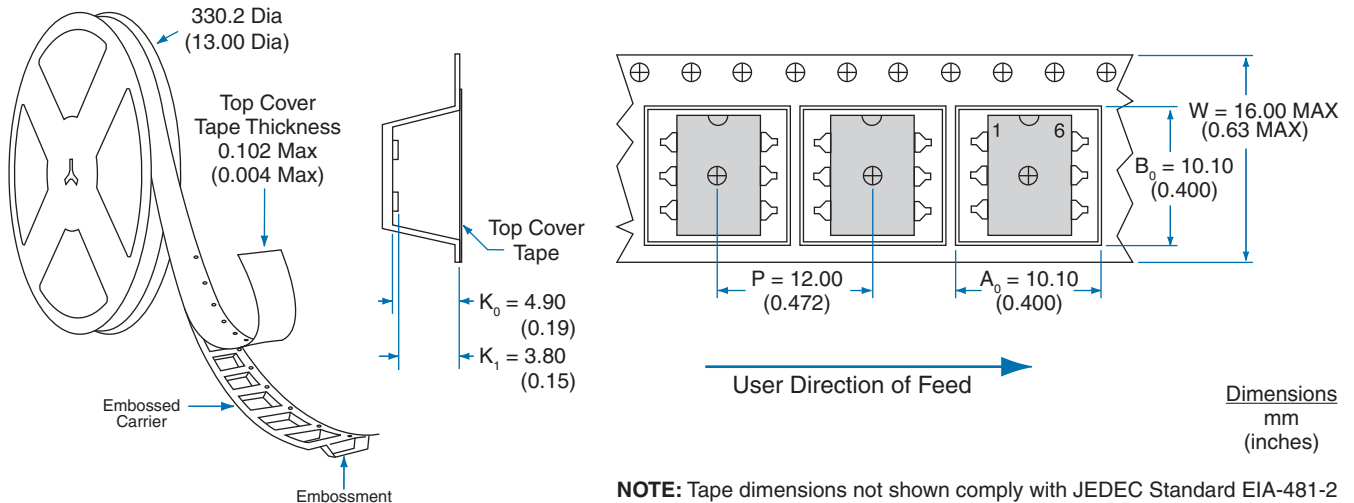
Recommended PCB Land Pattern



Dimensions
mm
(inches)

MECHANICAL DIMENSIONS (Cont.)

Tape and Reel Packaging for 6-Pin "S" Suffix Parts



NOTE: Tape dimensions not shown comply with JEDEC Standard EIA-481-2

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