



# CLARE

# LAA110L Dual Pole OptoMOS® Relays



	LAA110L	Units
Blocking Voltage	350	V
Load Current	120	mA
Max R <sub>ON</sub>	35	Ω

### Features

- Small 8 Pin DIP Package
- Current Limit
- 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

### Applications

- Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringer 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

LAA110L is a Dual 1 Form-A solid state relay that has two independently controlled optically coupled MOSFETs with an additional current limiting circuit. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture to provide 3750 V<sub>RMS</sub> of input to output isolation. The optically coupled inputs are controlled by highly efficient GaAIAs infrared LEDs. Dual pole OptoMOS relays provide a more compact design solution than discrete single pole relays in a variety of applications. The dual pole relays save board space by incorporating both relays in a single 8-pin package.

### Approvals

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- Certified to:
  - EN 60950
  - EN 41003
  - IEC950
  - AS/NZS3260

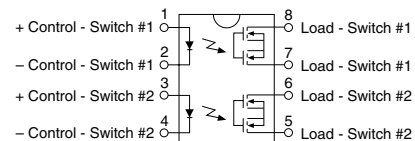
### Ordering Information

Part #	Description
LAA110L	8 Pin DIP (50/Tube)
LAA110PL	8 Pin Flatpack (50/Tube)
LAA110PLTR	8 Pin Flatpack (1000/Reel)
LAA110LS	8 Pin Surface Mount (50/Tube)
LAA110LSTR	8 Pin Surface Mount (1000/Reel)

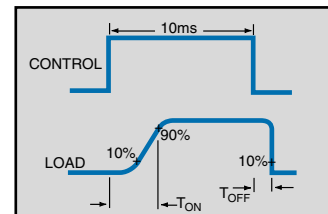
### Pin Configuration

#### LAA110L Pinout

AC/DC Configuration



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



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

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

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

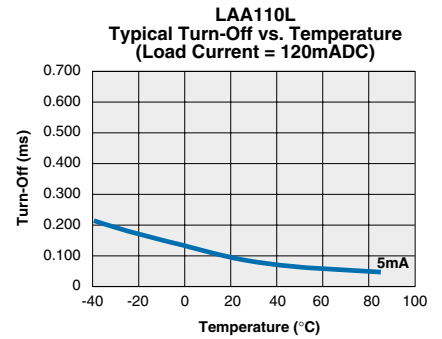
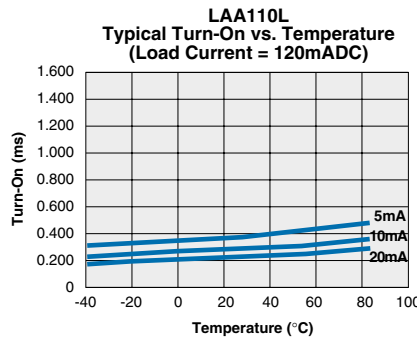
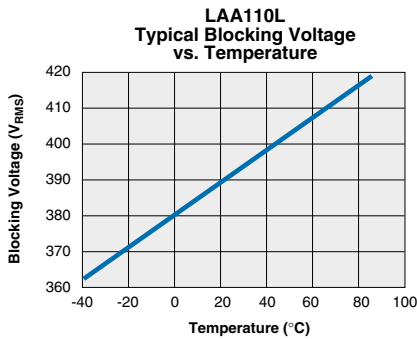
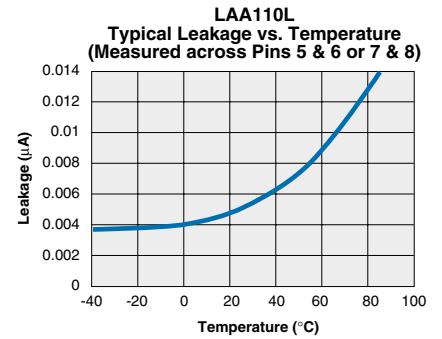
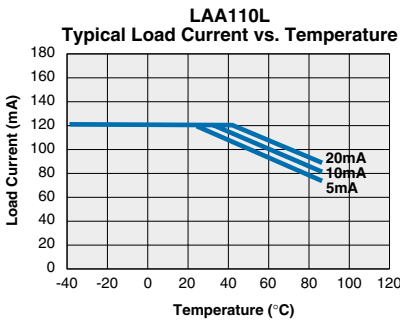
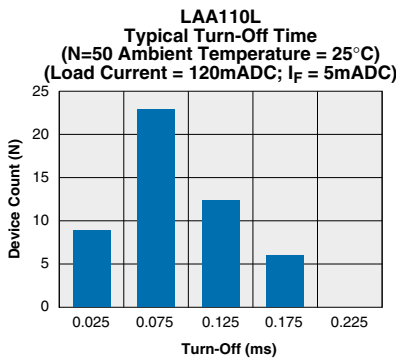
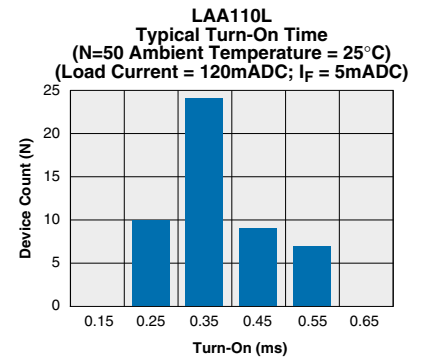
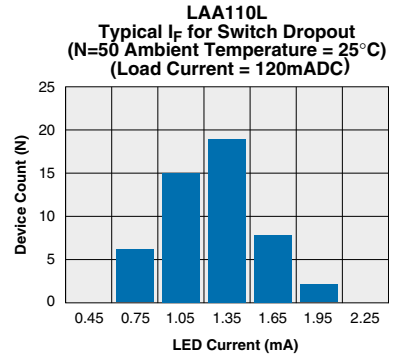
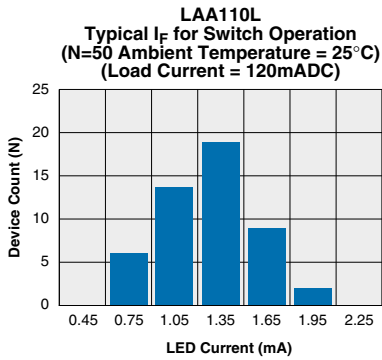
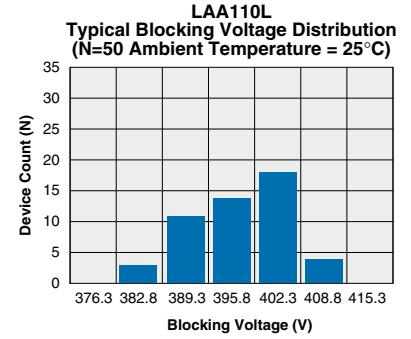
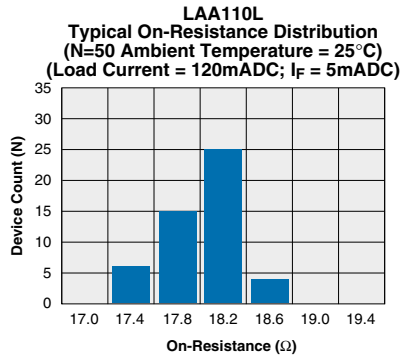
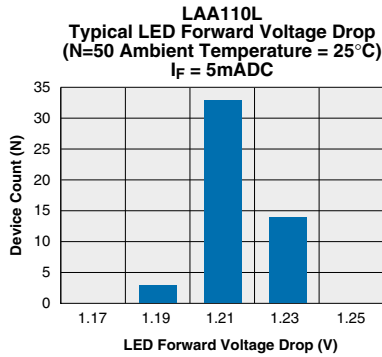
*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.*

**Electrical Characteristics**

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current (Continuous)*	-	I <sub>L</sub>	-	-	120	mA
Peak Load Current	10ms max	I <sub>LPK</sub>	-	-	350	mA
On-Resistance	I <sub>L</sub> =120mA	R <sub>ON</sub>	-	30	35	Ω
Off-State Leakage Current	V <sub>L</sub> =350V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	3	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	3	ms
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
Load Current Limiting	-	I <sub>CL</sub>	130	170	210	mA
<b>Input Characteristics @ 25°C</b>						
Input Control Current	I <sub>L</sub> =120mA	I <sub>F</sub>	5	-	50	mA
Input Dropout Current	-	-	0.4	0.7	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Voltage	-	V <sub>R</sub>	-	-	5	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA
Input to Output Capacitance	-	C <sub>I/O</sub>	-	3	-	pF

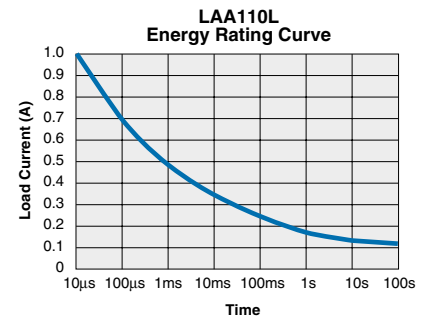
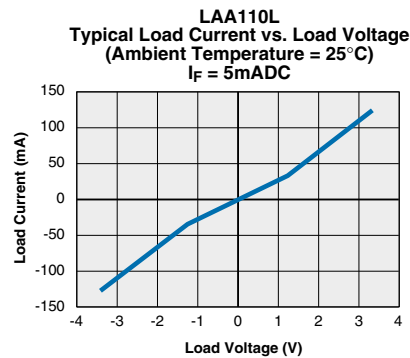
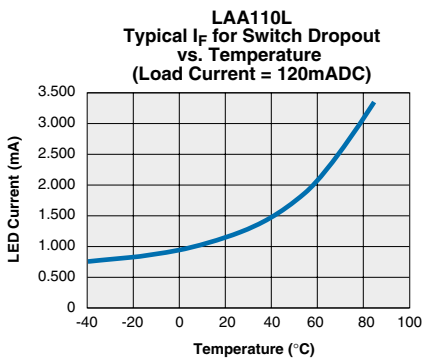
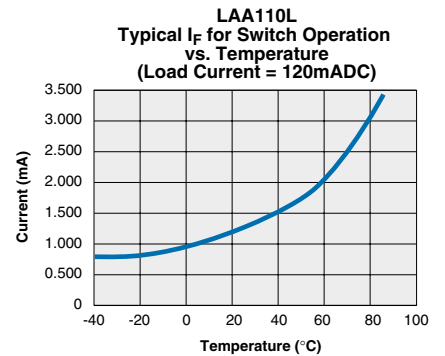
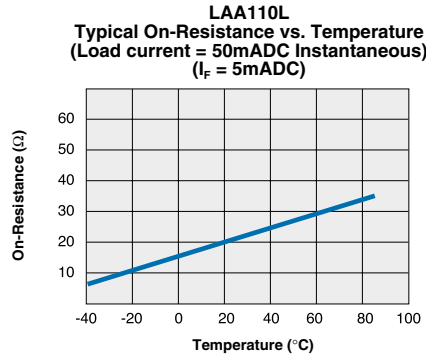
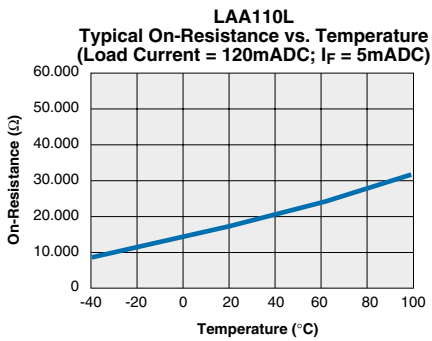
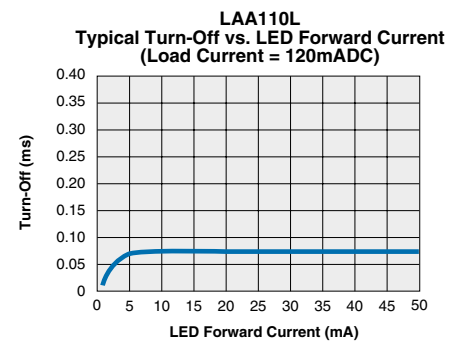
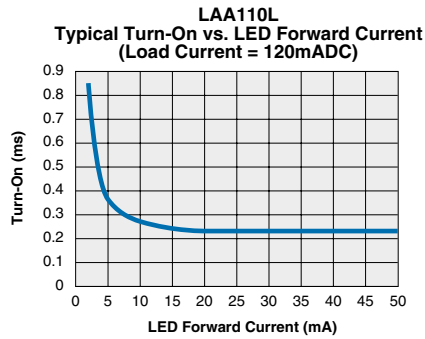
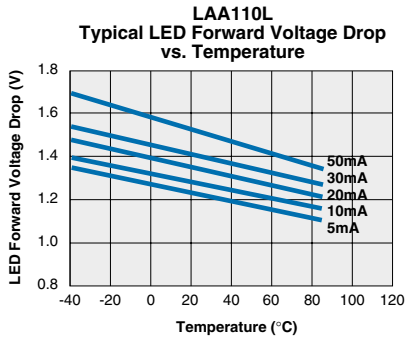
\*Note: If both poles operate load current must be derated so as not to exceed the package power dissipation value.

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.

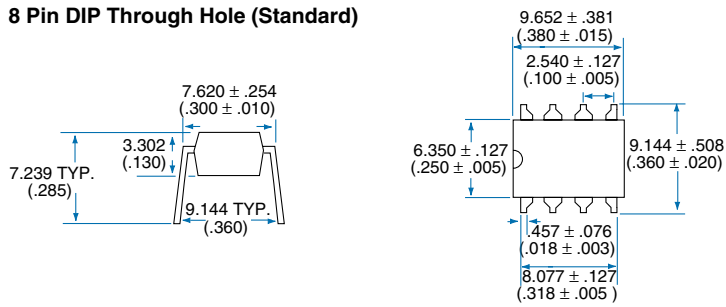
PERFORMANCE DATA\*



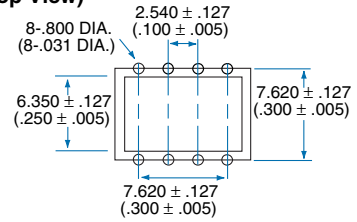
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MECHANICAL DIMENSIONS

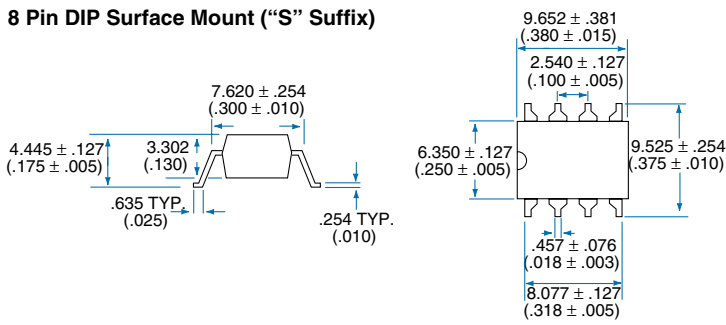
8 Pin DIP Through Hole (Standard)



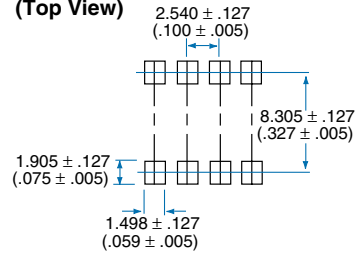
PC Board Pattern (Top View)



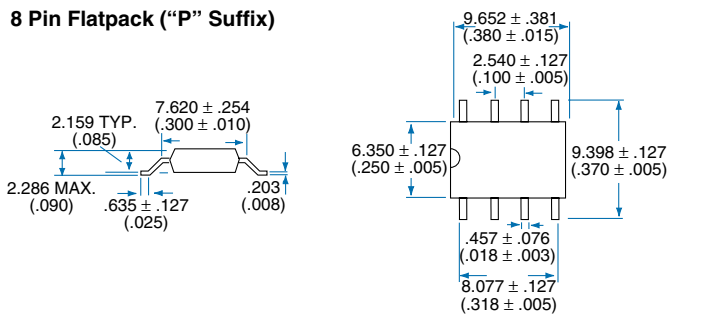
8 Pin DIP Surface Mount ("S" Suffix)



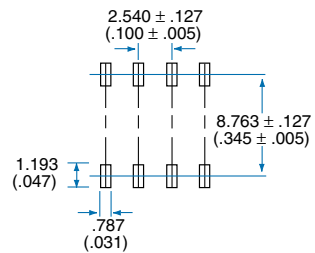
PC Board Pattern (Top View)



8 Pin Flatpack ("P" Suffix)



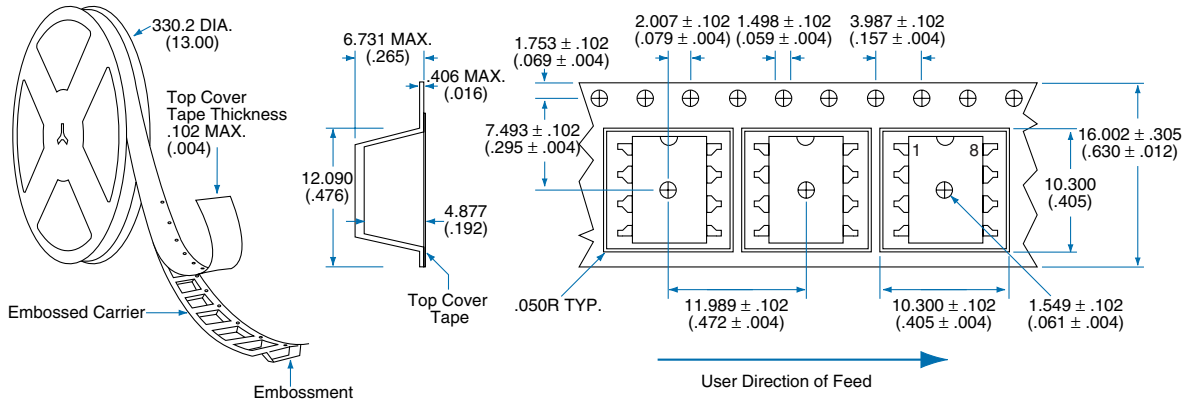
PC Board Pattern (Top View)



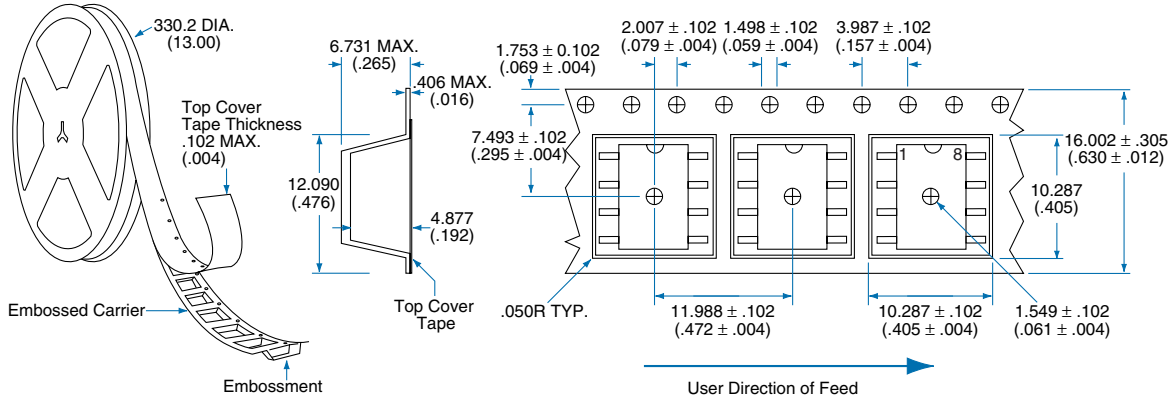
Dimensions  
 mm  
 (inches)

**MECHANICAL DIMENSIONS**

**Tape and Reel Packaging for 8 Pin Surface Mount Package**



**Tape and Reel Packaging for 8 Pin Flatpack Package**



Dimensions  
mm  
(inches)



# CLARE

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