



	LAA710	Units
Load Voltage	60	V
Load Current	1.0	A
Max R <sub>ON</sub>	0.5	Ω

### Features

- Small 8 Pin 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

### Applications

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

### Description

LAA710 is a Dual 1 Form-A solid state relay that has two independently controlled optically coupled MOSFETs. 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 GaAlAs 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
- BSI Certified:
  - BS EN 60950:1992 (BS7002:1992) Certificate #:7344
  - BS EN 41003:1993 Certificate #:7344

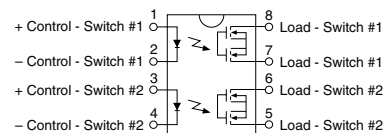
### Ordering Information

Part #	Description
LAA710	8 Pin DIP (50/Tube)
LAA710S	8 Pin Surface Mount (50/Tube)
LAA710STR	8 Pin Surface Mount (1000/Reel)

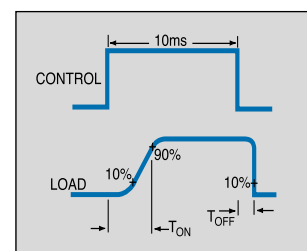
### Pin Configuration

#### LAA710 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
Reverse Input Voltage	-	-	5	V
Blocking Voltage	-	-	60	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 DIP Package	-	-	+260	°C
Flatpack/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.

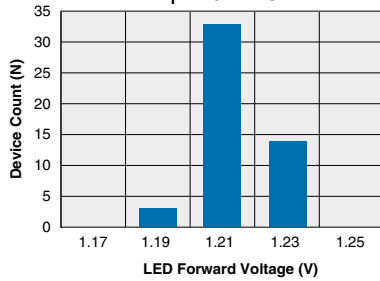
### Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current* (Continuous) AC/DC Configuration	-	I <sub>L</sub>	-	-	1.0	A
Peak Load Current	10ms	I <sub>LPK</sub>	-	-	5.0	A
On-Resistance AC/DC Configuration	I <sub>L</sub> =1.0A	R <sub>ON</sub>	-	-	0.5	Ω
Off-State Leakage Current	V <sub>L</sub> =60V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	2.5	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	0.25	ms
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	220	-	pF
<b>Input Characteristics @ 25°C</b>						
Input Control Current	I <sub>L</sub> =150mA	I <sub>F</sub>	10	-	50	mA
Input Dropout Current	-	I <sub>F</sub>	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

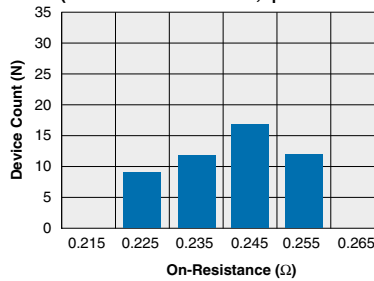
\*NOTE: If both poles operate simultaneously load current must be derated so as not to exceed the package power dissipation value.

**PERFORMANCE DATA\***

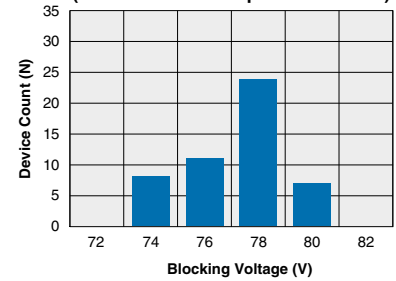
**LAA710**  
Typical LED Forward Voltage Drop  
(N=50 Ambient Temperature = 25°C)  
 $I_F = 10\text{mADC}$



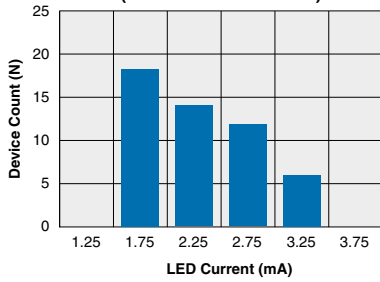
**LAA710**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 1ADC;  $I_F = 10\text{mADC}$ )



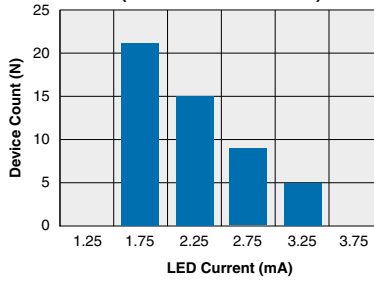
**LAA710**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)



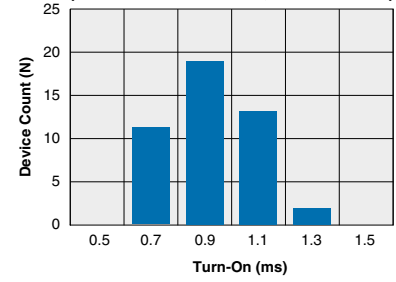
**LAA710**  
Typical  $I_F$  for Switch Operation  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 1ADC)



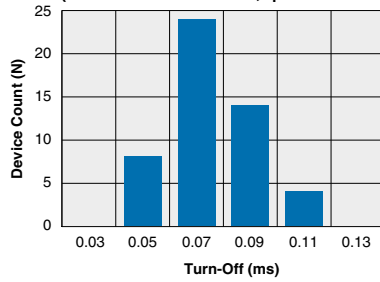
**LAA710**  
Typical  $I_F$  for Switch Dropout  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 1ADC)



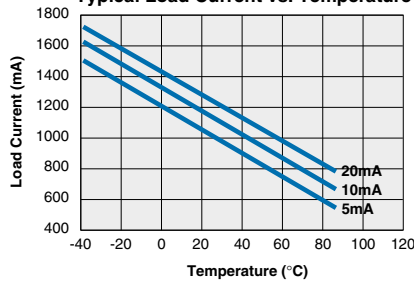
**LAA710**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 1ADC;  $I_F = 10\text{mADC}$ )



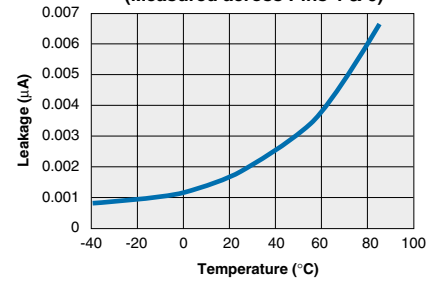
**LAA710**  
Typical Turn-Off Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 1ADC;  $I_F = 10\text{mADC}$ )



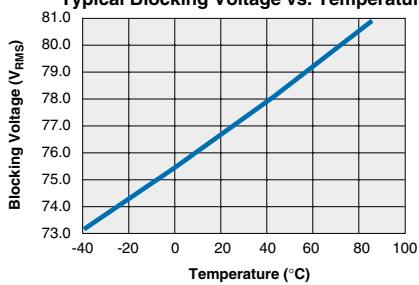
**LAA710**  
Typical Load Current vs. Temperature



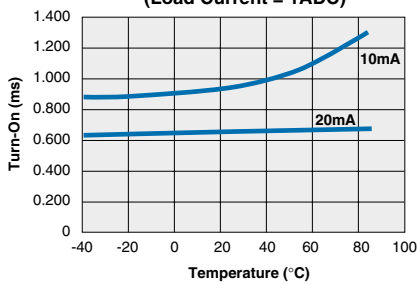
**LAA710**  
Typical Leakage vs. Temperature  
(Measured across Pins 4 & 6)



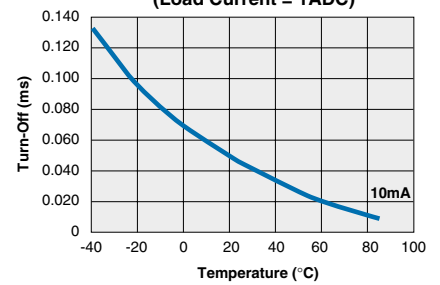
**LAA710**  
Typical Blocking Voltage vs. Temperature



**LAA710**  
Typical Turn-On vs. Temperature  
(Load Current = 1ADC)

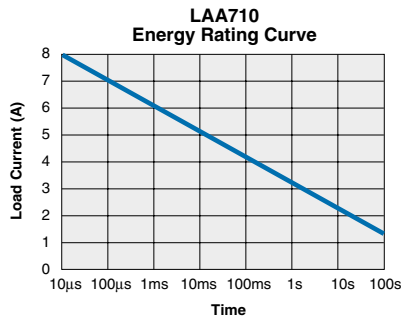
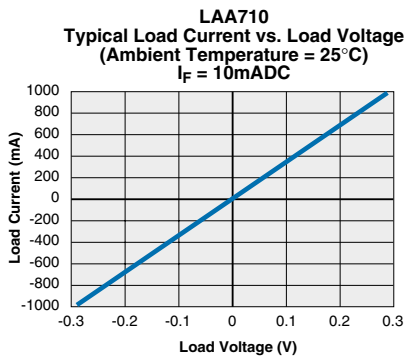
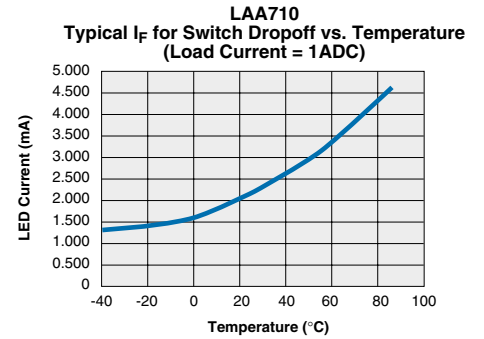
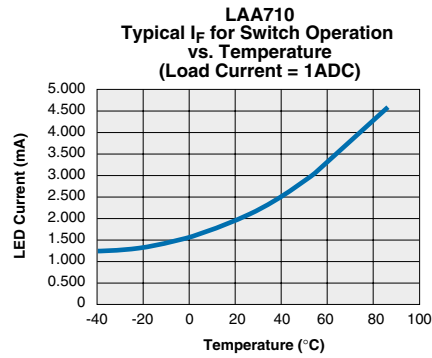
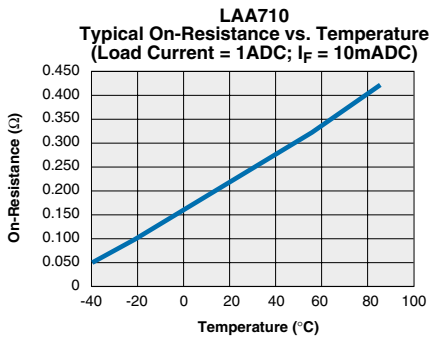
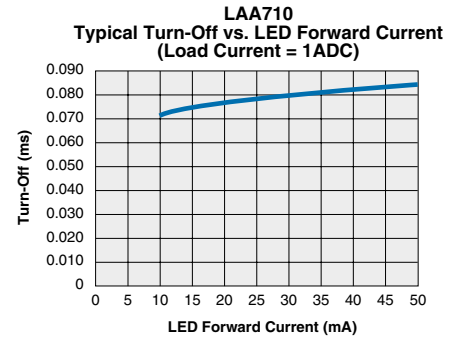
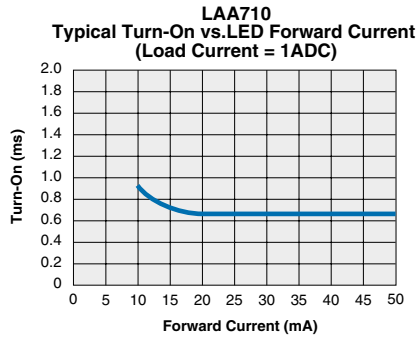
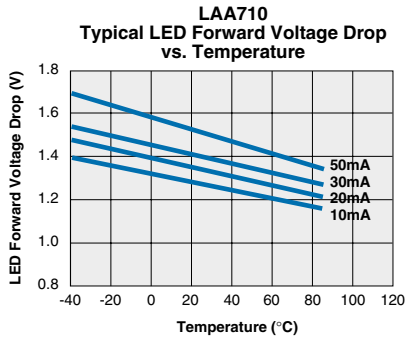


**LAA710**  
Typical Turn-Off vs. Temperature  
(Load Current = 1ADC)



\*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.

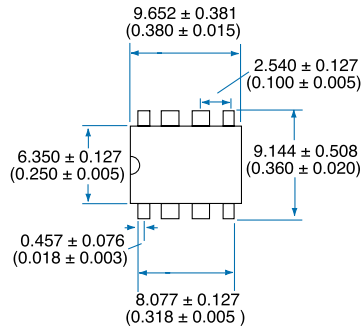
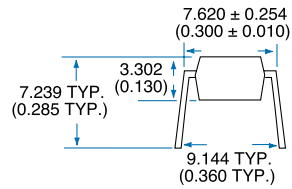
PERFORMANCE DATA\*



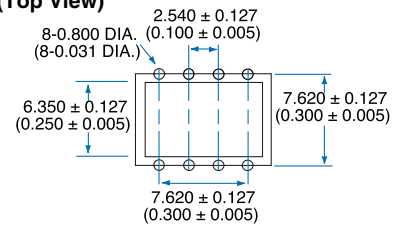
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**MECHANICAL DIMENSIONS**

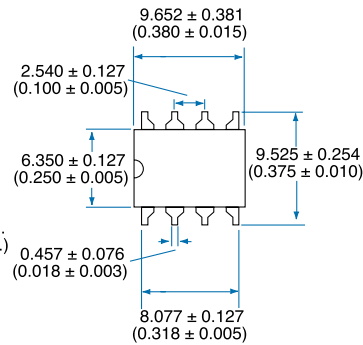
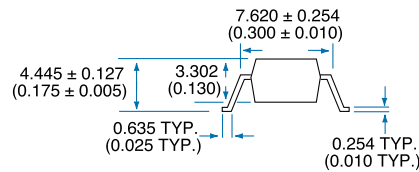
**8 Pin DIP Through Hole (Standard)**



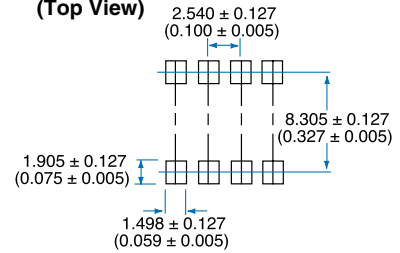
**PC Board Pattern (Top View)**



**8 Pin DIP Surface Mount ("S" Suffix)**



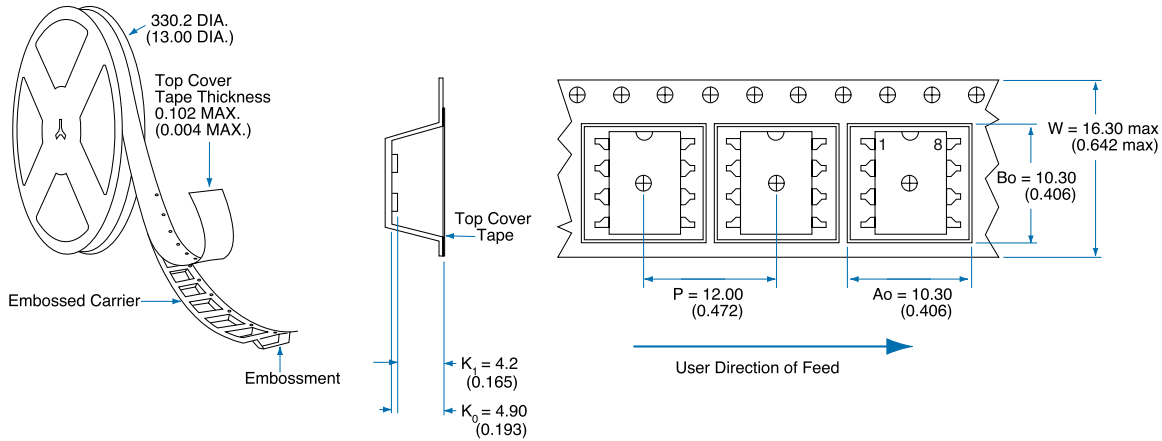
**PC Board Pattern (Top View)**



Dimensions  
mm  
(inches)

## MECHANICAL DIMENSIONS

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



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

Dimensions  
mm  
(inches)

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