



|                     | <b>PAA110L</b> | <b>Units</b> |
|---------------------|----------------|--------------|
| Load Voltage        | 400            | V            |
| Load Current        | 150            | mA           |
| Max R <sub>ON</sub> | 22             | Ω            |

### Description

PAA110 is a 400V, 150mA, 22Ω 2-Form-A relay. This performance leader provides high peak load voltage handling capability and improved peak load current handling. Current limiting version is available ("L" suffix, see specification for variations in performance).

### 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
- VDE Compatible
- FCC Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Current Limiting, Surface Mount and Tape & Reel Versions Available

### 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

### Applications

- Telecommunications
  - 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

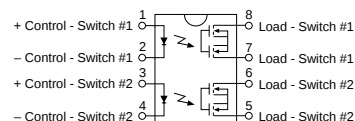
### Ordering Information

| <b>Part #</b> | <b>Description</b>              |
|---------------|---------------------------------|
| PAA110L       | 8 Pin DIP (50/Tube)             |
| PAA110LP      | 8 Pin Flatpack (50/Tube)        |
| PAA110LPTR    | 8 Pin Flatpack (1000/Reel)      |
| PAA110LS      | 8 Pin Surface Mount (50/Tube)   |
| PAA110LSTR    | 8 Pin Surface Mount (1000/Reel) |

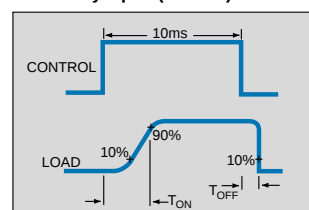
### Pin Configuration

#### PAA110L 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<br>Peak (10ms)                   | -    | -   | 50<br>1          | mA<br>A          |
| Reverse Input Voltage                                  | -    | -   | 5                | V                |
| Total Power Dissipation                                | -    | -   | 800 <sup>2</sup> | mW               |
| Isolation Voltage<br>Input to Output                   | 3750 | -   | -                | V <sub>RMS</sub> |
| Operational Temperature                                | -40  | -   | +85              | °C               |
| Storage Temperature                                    | -40  | -   | +125             | °C               |
| Soldering Temperature<br>DIP Package                   | -    | -   | +260             | °C               |
| Flatpack/Surface Mount<br>Package<br>(10 Seconds Max.) | -    | -   | +220             | °C               |

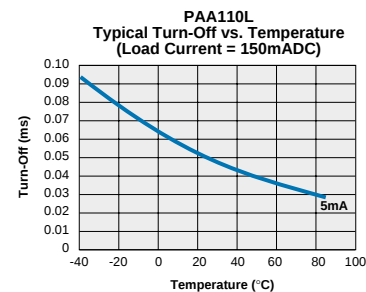
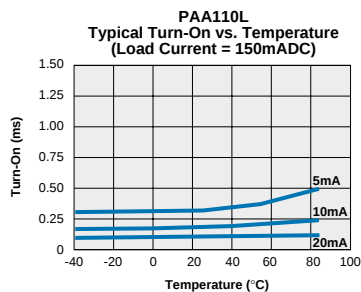
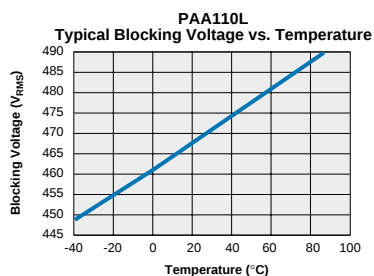
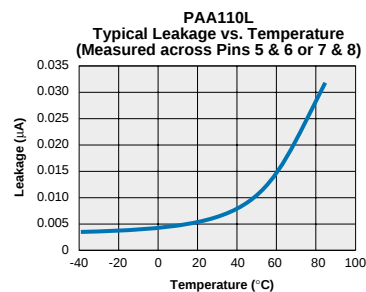
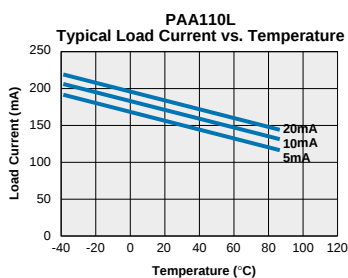
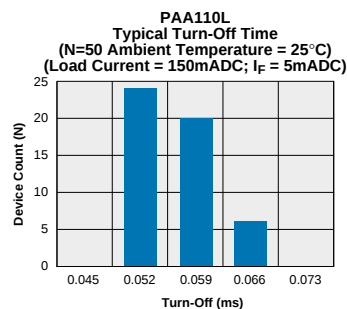
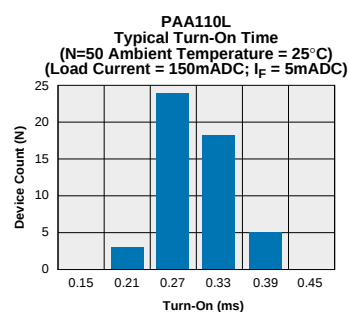
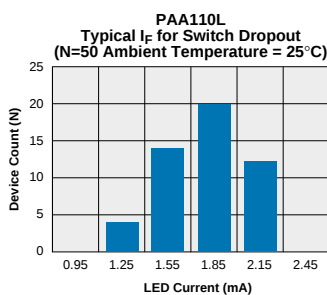
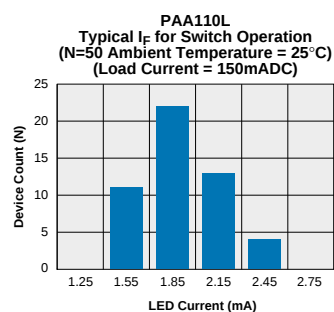
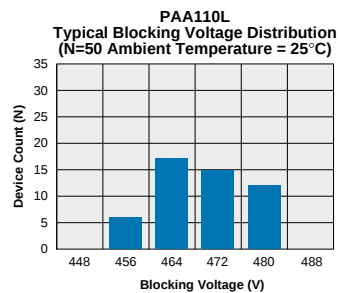
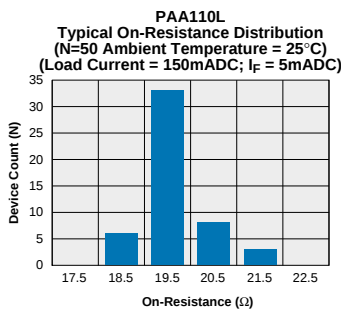
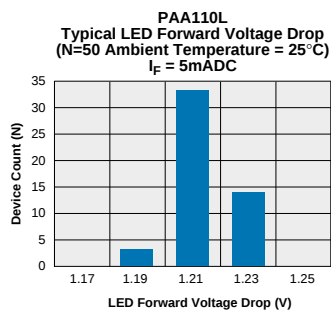
<sup>1</sup> Derate Linearly 1.33 mW/°C<sup>2</sup> Derate Linearly 6.67 mW/°C

*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 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**

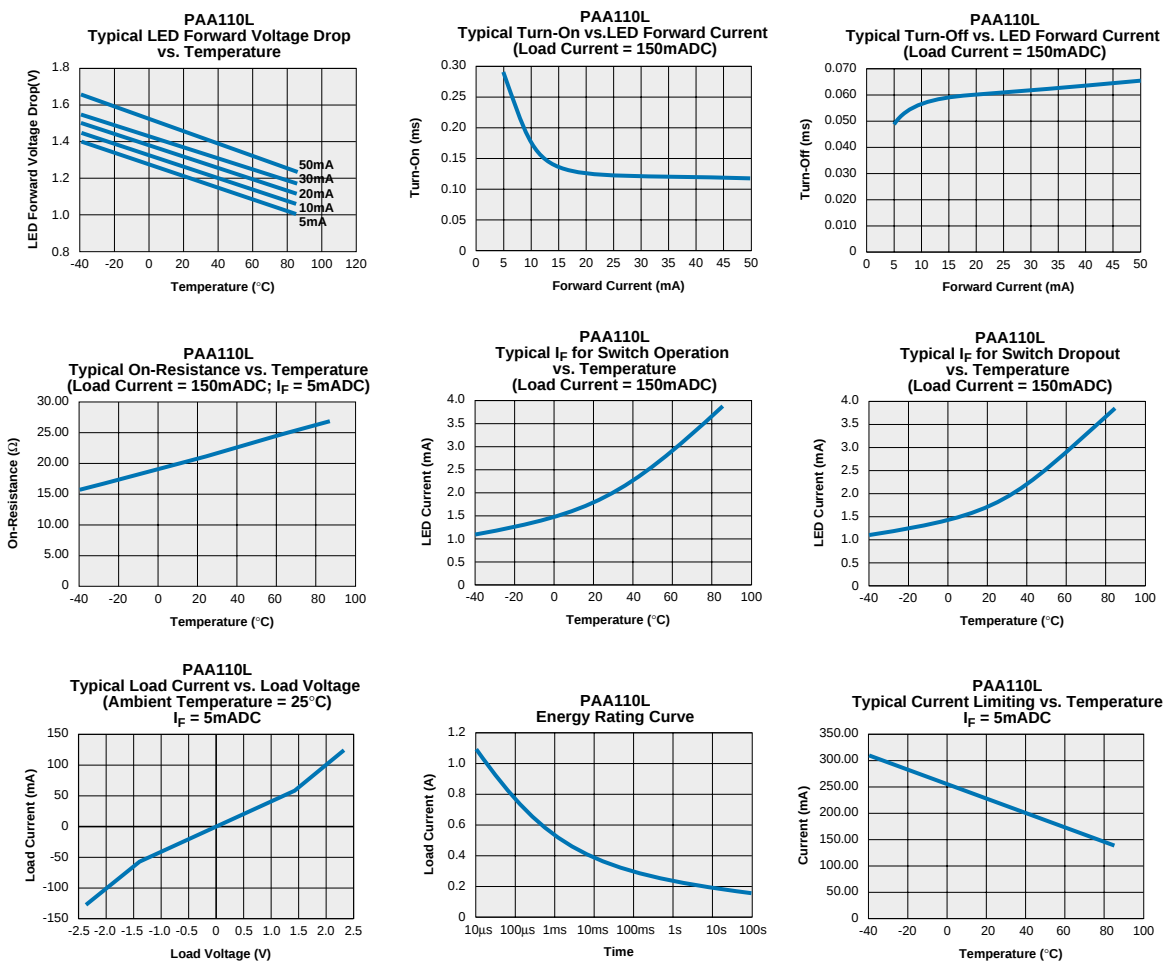
| Parameter                                         | Conditions                                                                                          | Symbol            | Min  | Typ | Max  | Units            |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------|------|-----|------|------------------|
| Output Characteristics @ 25°C                     |                                                                                                     |                   |      |     |      |                  |
| Load Voltage (Peak)                               | -                                                                                                   | V <sub>L</sub>    | -    | -   | 250  | V                |
| Load Voltage (Peak)                               | -                                                                                                   | V <sub>L</sub>    | -    | -   | 400  | V                |
| Load Current* (Continuous)<br>AC/DC Configuration | -                                                                                                   | I <sub>L</sub>    | -    | -   | 150  | mA               |
| Peak Load Current                                 | 10ms                                                                                                | I <sub>LPK</sub>  | -    | -   | -    | mA               |
| On-Resistance<br>AC/DC Configuration              | I <sub>L</sub> =150mA                                                                               | R <sub>ON</sub>   | -    | 18  | 25   | Ω                |
| Off-State Leakage Current                         | V <sub>L</sub> =400V                                                                                | I <sub>LEAK</sub> | -    | -   | 1    | μA               |
| Switching Speeds                                  | I <sub>F</sub> =5mA, V <sub>L</sub> =10V<br>I <sub>F</sub> =5mA, V <sub>L</sub> =10V<br>50V; f=1MHz | T <sub>ON</sub>   | -    | -   | 1    | ms               |
| Turn-On                                           |                                                                                                     | T <sub>OFF</sub>  | -    | -   | 0.25 | ms               |
| Turn-Off                                          |                                                                                                     | C <sub>OUT</sub>  | -    | 25  | -    | pF               |
| Output Capacitance                                |                                                                                                     | I <sub>CL</sub>   | 190  | 235 | 280  | mA               |
| Load Current Limiting                             |                                                                                                     |                   |      |     |      |                  |
| Capacitance<br>Input to Output                    | -                                                                                                   | -                 | -    | 3   | -    | pF               |
| Input Characteristics @ 25°C                      |                                                                                                     |                   |      |     |      |                  |
| Input Control Current                             | I <sub>L</sub> =150mA                                                                               | I <sub>F</sub>    | 5    | -   | 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               |
| Input to Output Isolation                         | -                                                                                                   | V <sub>I/O</sub>  | 3750 | -   | -    | V <sub>RMS</sub> |

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

**PERFORMANCE DATA\***


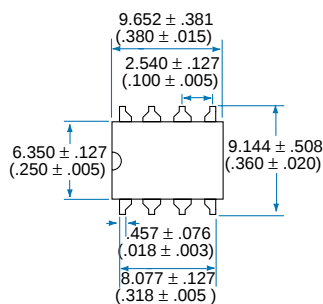
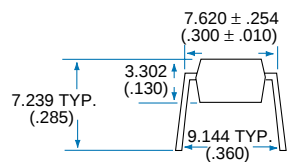
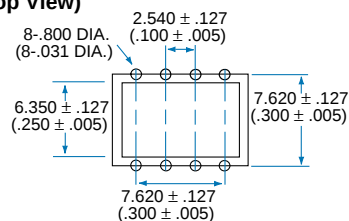
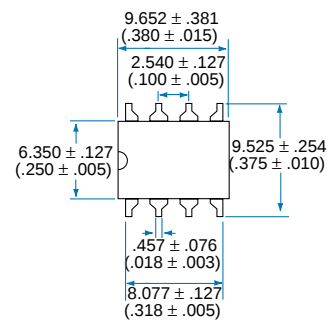
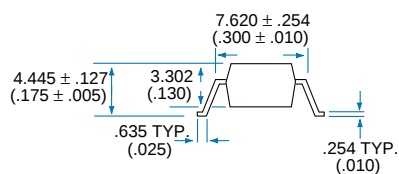
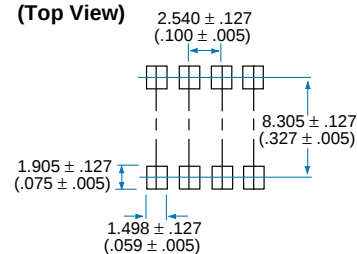
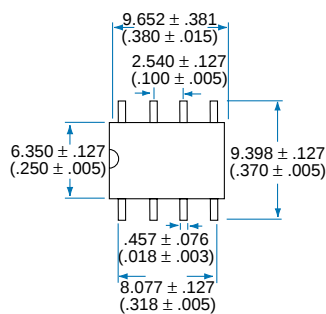
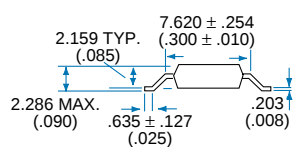
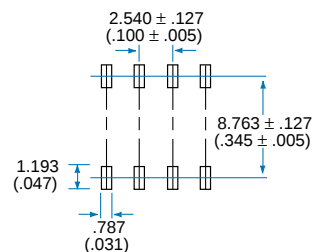
The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## PERFORMANCE DATA\*



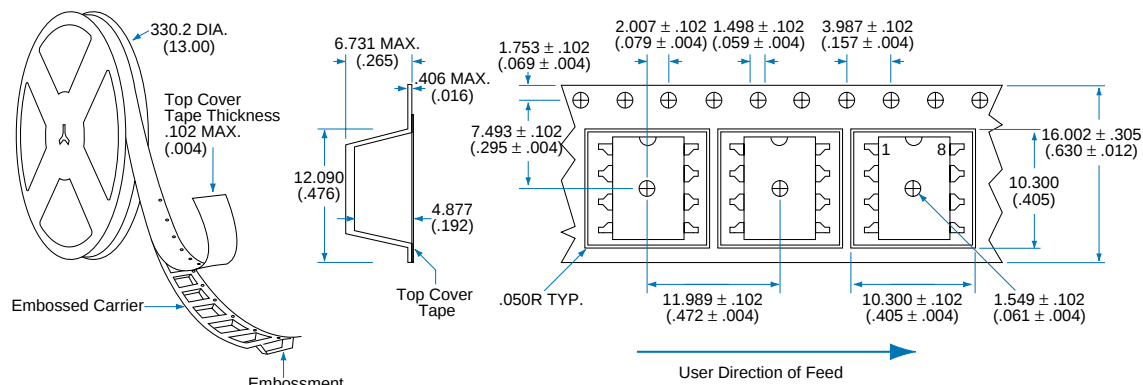
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## Mechanical Dimensions

**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)

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



**6**

## CLARE LOCATIONS

Clare Headquarters  
78 Cherry Hill Drive  
Beverly, MA 01915  
Tel: 1-978-524-6700  
Fax: 1-978-524-4900  
Toll Free: 1-800-27-CLARE

Clare Micronix Division  
145 Columbia  
Aliso Viejo, CA 92656-1490  
Tel: 1-949-831-4622  
Fax: 1-949-831-4628

## SALES OFFICES

### AMERICAS

**Americas Headquarters**  
Clare  
78 Cherry Hill Drive  
Beverly, MA 01915  
Tel: 1-978-524-6700  
Fax: 1-978-524-4900  
Toll Free: 1-800-27-CLARE

**Eastern Region**  
Clare  
P.O. Box 856  
Mahwah, NJ 07430  
Tel: 1-201-236-0101  
Fax: 1-201-236-8685  
Toll Free: 1-800-27-CLARE

**Central Region**  
Clare Canada Ltd.  
3425 Harvester Road, Suite 202  
Burlington, Ontario L7N 3N1  
Tel: 1-905-333-9066  
Fax: 1-905-333-1824

**Western Region**  
Clare  
1852 West 11th Street, #348  
Tracy, CA 95376  
Tel: 1-209-832-4367  
Fax: 1-209-832-4732  
Toll Free: 1-800-27-CLARE

**Canada**  
Clare Canada Ltd.  
3425 Harvester Road, Suite 202  
Burlington, Ontario L7N 3N1  
Tel: 1-905-333-9066  
Fax: 1-905-333-1824

## EUROPE

**European Headquarters**  
CP Clare nv  
Bampslaan 17  
B-3500 Hasselt (Belgium)  
Tel: 32-11-300868  
Fax: 32-11-300890

**France**  
Clare France Sales  
Lead Rep  
99 route de Versailles  
91160 Champlan  
France  
Tel: 33 1 69 79 93 50  
Fax: 33 1 69 79 93 59

**Germany**  
Clare Germany Sales  
ActiveComp Electronic GmbH  
Mitterstrasse 12  
85077 Manching  
Germany  
Tel: 49 8459 3214 10  
Fax: 49 8459 3214 29

**Italy**  
C.L.A.R.E.s.a.s.  
Via C. Colombo 10/A  
I-20066 Melzo (Milano)  
Tel: 39-02-95737160  
Fax: 39-02-95738829

**Sweden**  
Clare Sales  
Comptronic AB  
Box 167  
S-16329 Spånga  
Tel: 46-862-10370  
Fax: 46-862-10371

**United Kingdom**  
Clare UK Sales  
Marco Polo House  
Cook Way  
Bindon Road  
Taunton  
UK-Somerset TA2 6BG  
Tel: 44-1-823 352541  
Fax: 44-1-823 352797

## ASIA/PACIFIC

**Asian Headquarters**  
Clare  
Room N1016, Chia-Hsin, Bldg II,  
10F, No. 96, Sec. 2  
Chung Shan North Road  
Taipei, Taiwan R.O.C.  
Tel: 886-2-2523-6368  
Fax: 886-2-2523-6369

<http://www.clare.com>

Clare cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in this Clare product. No circuit patent licenses nor indemnity are expressed or implied. Clare reserves the right to change the specification and circuitry, without notice at any time. The products described in this document are not intended for use in medical implantation or other direct life support applications where malfunction may result in direct physical harm, injury or death to a person.