PAA110L

Dual Single-Pole OptoMOS® Relays

Parameters	Ratings	Units
Load Voltage	400	V_P
Load Current	150	mA
Max R_{ON}	25	Ω

Features

- Small 8-Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- 100% Solid State
- Arc-Free With No Snubbing Circuits
- 3750V_{rms} Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Current Limiting
- Surface Mount and Tape Reel Version Available.

Applications

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hook Switch
  - 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

PAA110L is a 400V, 150mA, 25Ω dual 1-Form-A (normally open) relay. This performance leader provides high peak load voltage handling capability and improved peak load current handling. Integrated current-limiting circuitry limits current to 280mA at room temperature.

Approvals

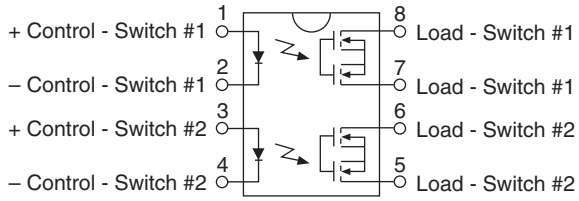
- UL Recognized Component: File # E76270
- CSA Certified Component: File # 1175739
- EN/IEC 60950-1 Compliant

Ordering Information

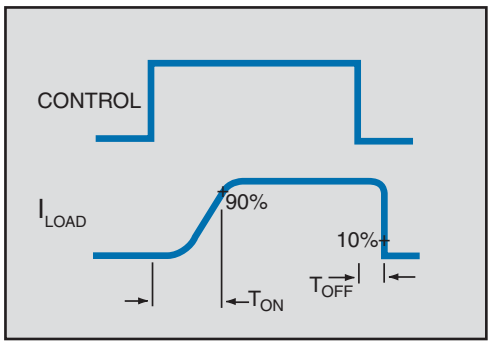
Part #	Description
PAA110L	8-Pin DIP (50/Tube)
PAA110PL	8-Pin Flatpack (50/Tube)
PAA110PLTR	8-Pin Flatpack (1000/Reel)
PAA110LS	8-Pin Surface Mount (50/Tube)
PAA110LSTR	8-Pin Surface Mount (1000/Reel)

Pin Configuration

AC/DC Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings

Parameter	Ratings	Units
Blocking Voltage	400	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

Electrical absolute maximum ratings are at 25°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.

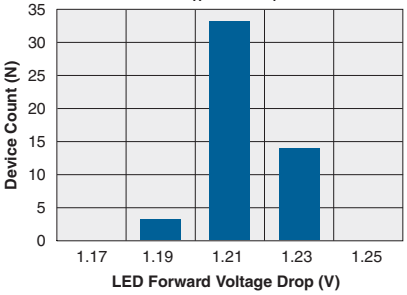
Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current, Continuous	-	I_L	-	-	150	mA
On-Resistance	I_L=150mA	R_{ON}	-	18	25	Ω
Off-State Leakage Current	V_L=400V	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{ON}	-	0.3	1	ms
Turn-Off		t_{OFF}	-	0.058	0.5	
Output Capacitance	50V; f=1MHz	C_{OUT}	-	25	-	pF
Load Current Limiting	-	I_{CL}	190	235	280	mA
Capacitance Input to Output	-	-	-	3	-	pF
Input Characteristics @ 25°C						
Input Control Current	I_L=150mA	I_F	-	-	5	mA
Input Dropout Current	-	I_F	0.4	-	-	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

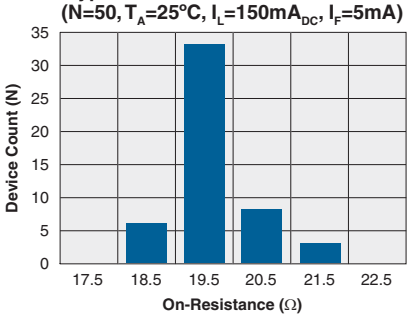
*NOTE: If both poles operate simultaneously load current must be derated so as not to exceed the package power dissipation value.

PERFORMANCE DATA*

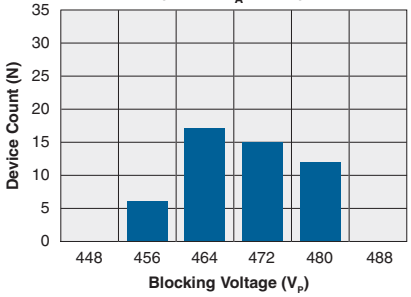
PAA110L
Typical LED Forward Voltage Drop
(N=50, T_A=25°C, I_F=5mA)



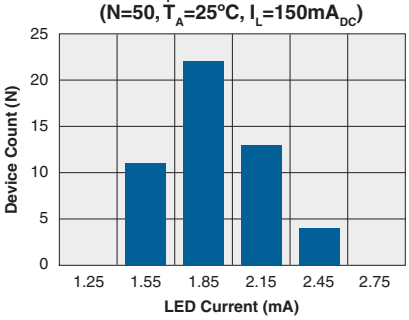
PAA110L
Typical On-Resistance Distribution
(N=50, T_A=25°C, I_L=150mA$_{DC}$, I_F=5mA)



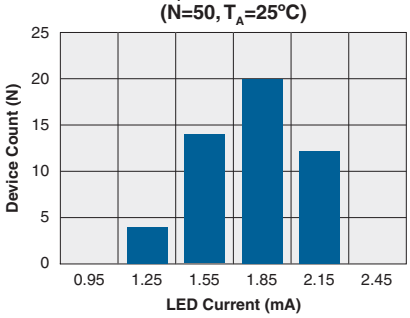
PAA110L
Typical Blocking Voltage Distribution
(N=50, T_A=25°C)



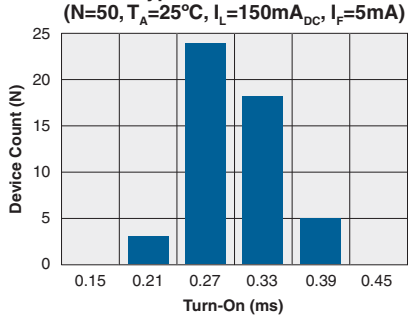
PAA110L
Typical I_F for Switch Operation
(N=50, T_A=25°C, I_L=150mA$_{DC}$)



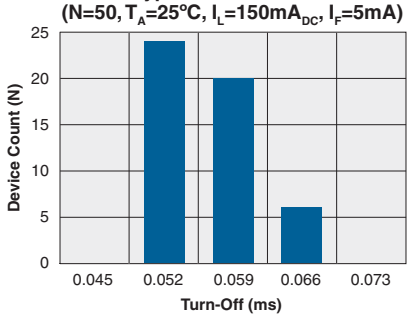
PAA110L
Typical I_F for Switch Dropout
(N=50, T_A=25°C)



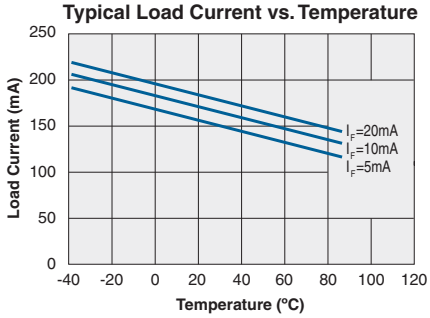
PAA110L
Typical Turn-On Time
(N=50, T_A=25°C, I_L=150mA$_{DC}$, I_F=5mA)



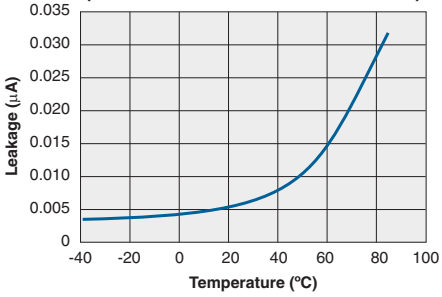
PAA110L
Typical Turn-Off Time
(N=50, T_A=25°C, I_L=150mA$_{DC}$, I_F=5mA)



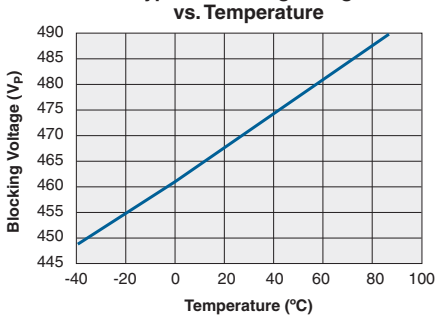
PAA110L
Typical Load Current vs. Temperature



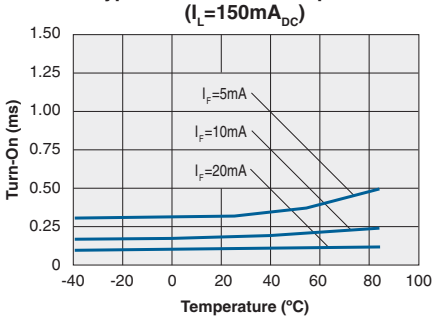
PAA110L
Typical Leakage vs. Temperature
(Measured Across Pins 5&6 or 7&8)



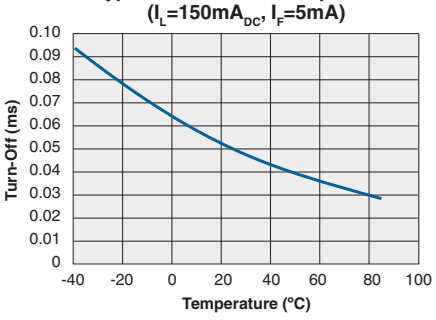
PAA110L
Typical Blocking Voltage
vs. Temperature



PAA110L
Typical Turn-On vs. Temperature
(I_L=150mA$_{DC}$)



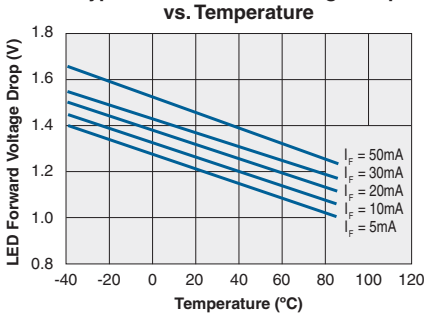
PAA110L
Typical Turn-Off vs. Temperature
(I_L=150mA$_{DC}$, I_F=5mA)



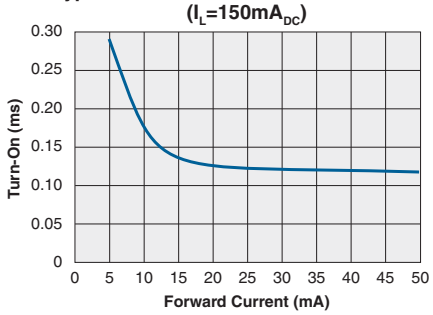
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

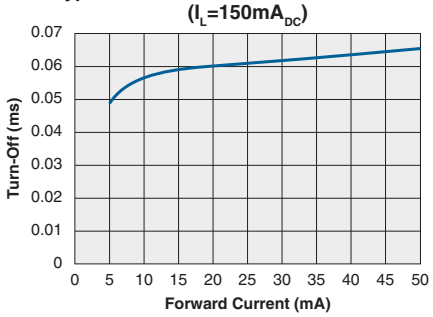
PAA110L
Typical LED Forward Voltage Drop vs. Temperature



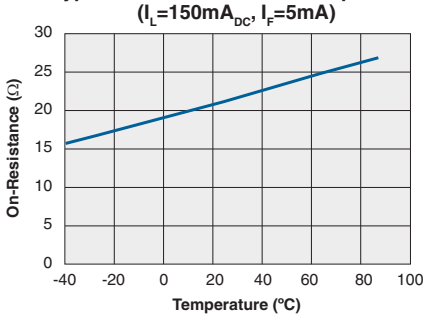
PAA110L
Typical Turn-On vs. LED Forward Current (I_L=150mA$_{DC}$)



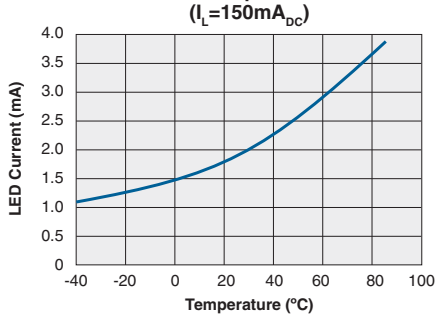
PAA110L
Typical Turn-Off vs. LED Forward Current (I_L=150mA$_{DC}$)



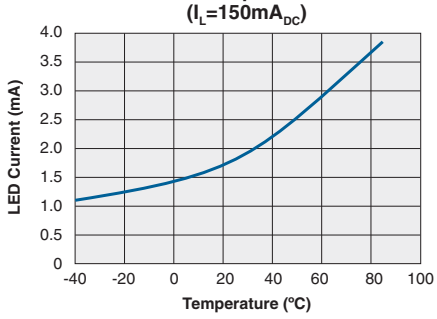
PAA110L
Typical On-Resistance vs. Temperature (I_L=150mA$_{DC}$, I_F=5mA)



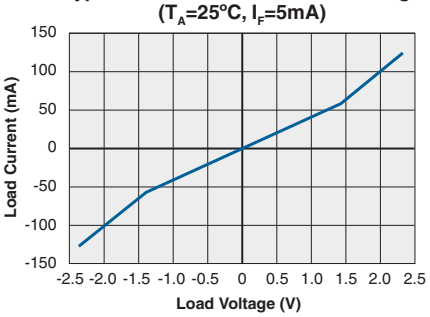
PAA110L
Typical I_F for Switch Operation vs. Temperature (I_L=150mA$_{DC}$)



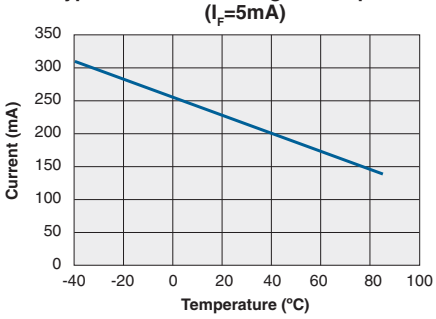
PAA110L
Typical I_F for Switch Dropout vs. Temperature (I_L=150mA$_{DC}$)



PAA110L
Typical Load Current vs. Load Voltage (T_A=25°C, I_F=5mA)



PAA110L
Typical Current Limiting vs. Temperature (I_F=5mA)



*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.

Manufacturing Information

Soldering

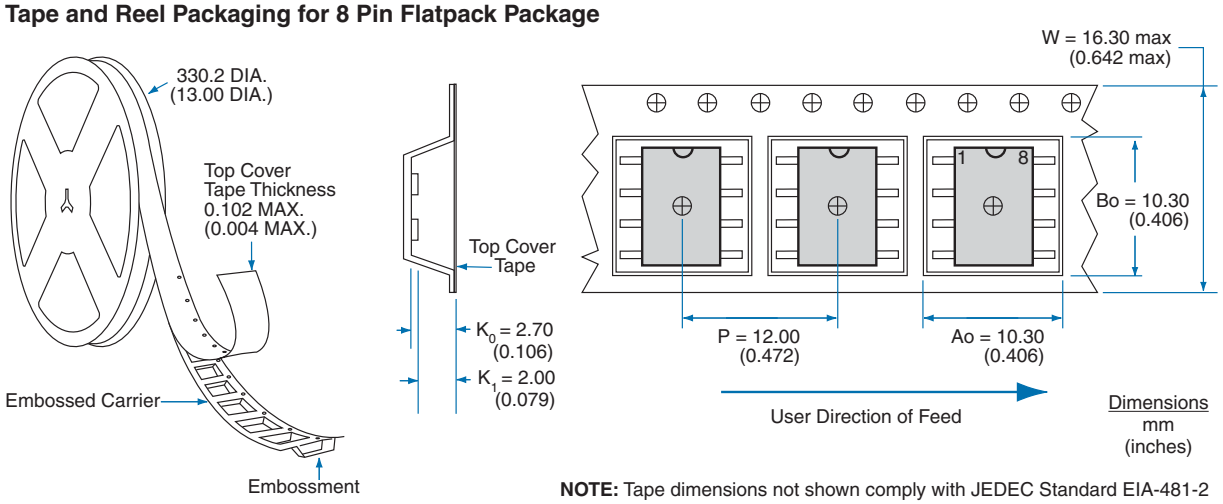
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

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

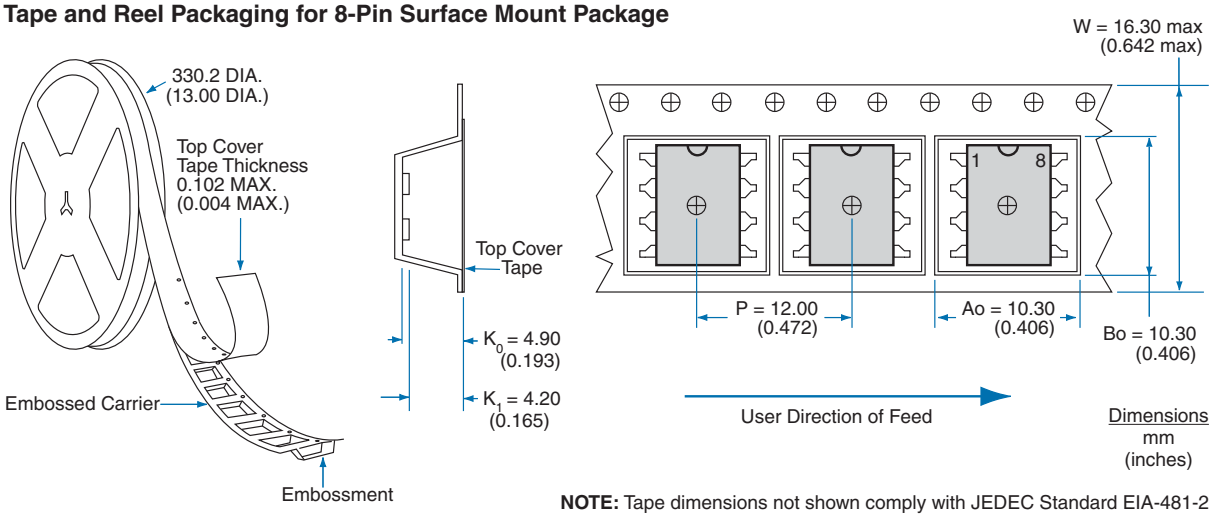
MECHANICAL DIMENSIONS

Tape and Reel Packaging for 8 Pin Flatpack Package



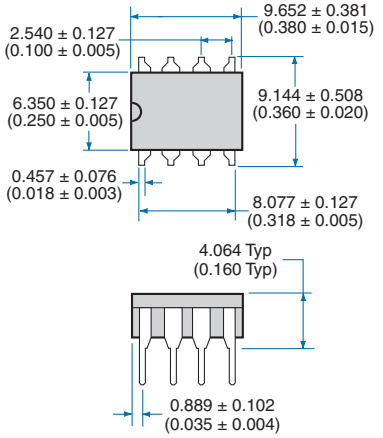
NOTE: Tape dimensions not shown comply with JEDEC Standard EIA-481-2

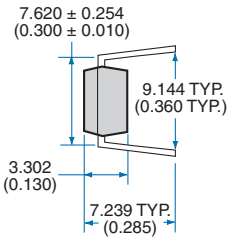
Tape and Reel Packaging for 8-Pin Surface Mount Package



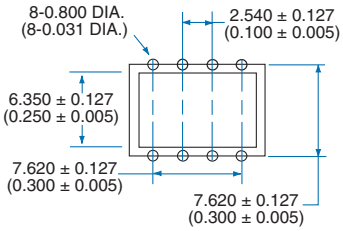
NOTE: Tape dimensions not shown comply with JEDEC Standard EIA-481-2

8-Pin DIP Through-Hole Package



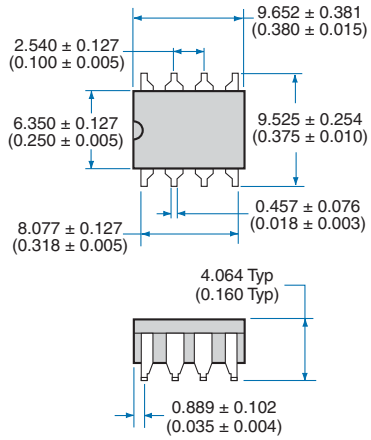


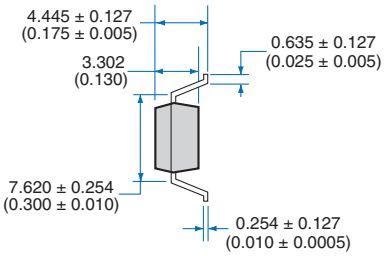
PC Board Pattern



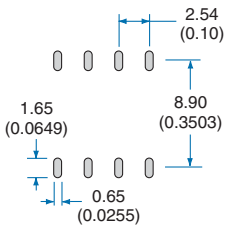
Dimensions
mm
(inches)

8-Pin Surface Mount Package



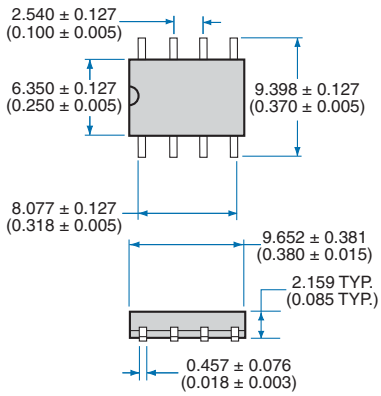


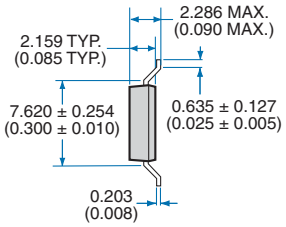
Recommended PCB Land Pattern



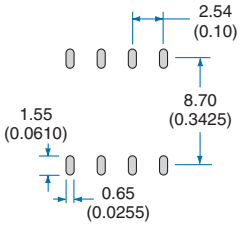
Dimensions
mm
(inches)

8 Pin Flatpack Package





Recommended PCB Land Pattern



Dimensions
mm
(inches)

For additional information please visit our website at: www.clare.com

Specification: DS-PAA110L-R05

7/23/08