



Parameters	Ratings	Units
Load Voltage	400	$V_P$
Load Current	150	$mA_{rms} / mA_{DC}$
On-Resistance (max)	25	$\Omega$

### Features

- Current Limiting
- 3750V<sub>rms</sub> Input/Output Isolation
- Low Drive Power Requirements (TTL/CMOS Compatible)
- 100% Solid State
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 8-Pin DIP Package
- Machine Insertable, Wave Solderable
- 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 dual 400V, 150mA, 25 $\Omega$  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.

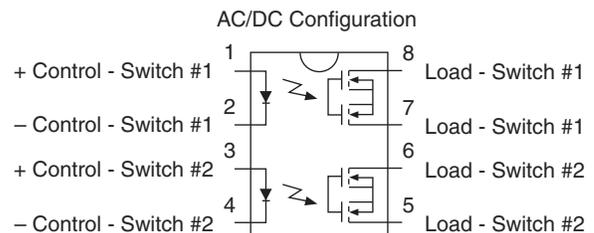
### Approvals

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

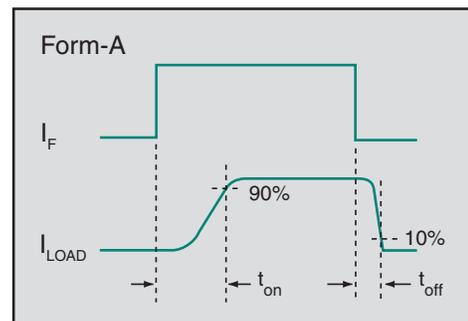
### Ordering Information

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



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



### Absolute Maximum Ratings @25°C

Parameter	Ratings	Units
Blocking Voltage	400	V <sub>P</sub>
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation <sup>1</sup>	150	mW
Total Power Dissipation <sup>2</sup>	800	mW
Isolation Voltage Input to Output	3750	V <sub>rms</sub>
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

<sup>1</sup> Derate linearly 1.33 mW / °C

<sup>2</sup> Derate linearly 6.67 mW / °C

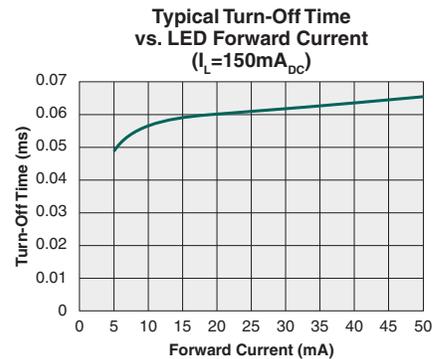
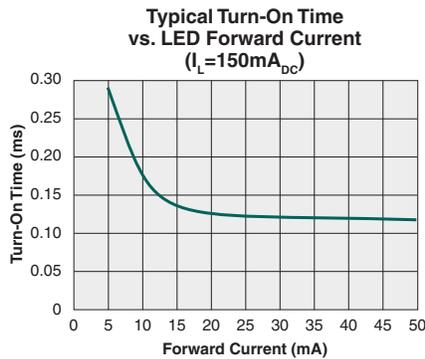
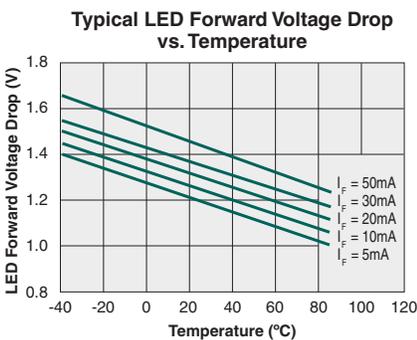
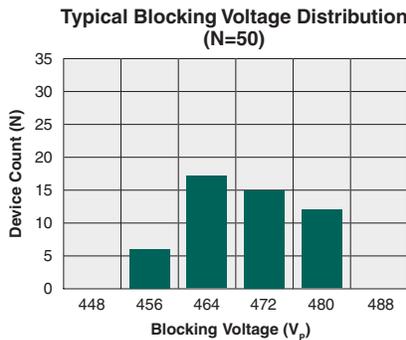
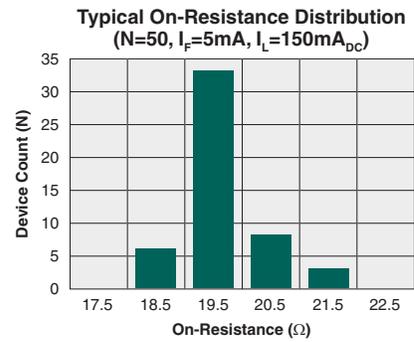
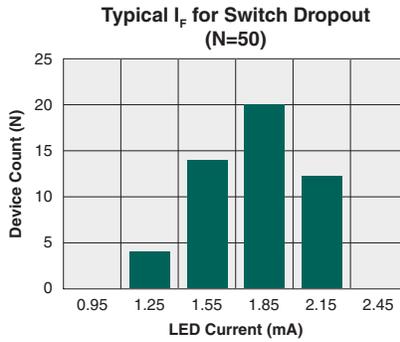
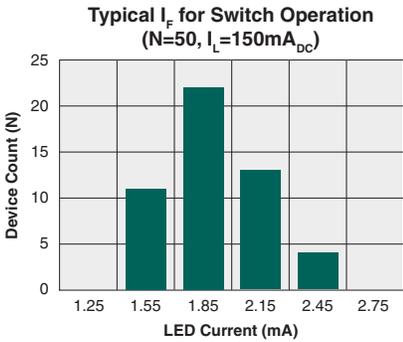
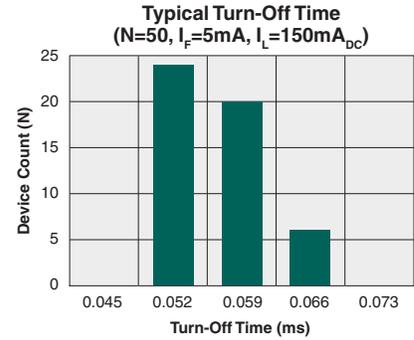
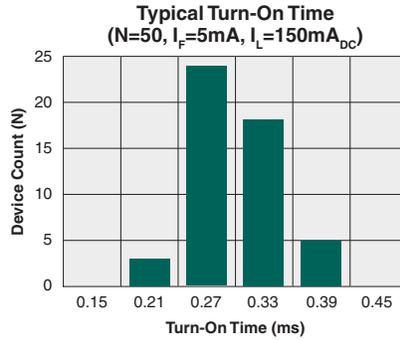
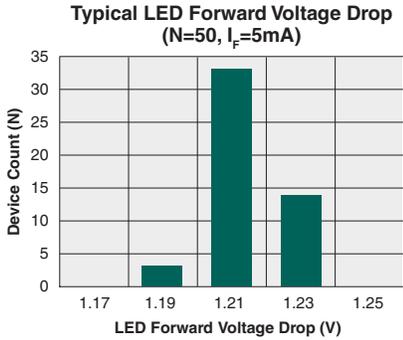
*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.*

### Electrical Characteristics @25°C

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics</b>						
Load Current, Continuous	-	I <sub>L</sub>	-	-	150	mA <sub>rms</sub> / mA <sub>DC</sub>
On-Resistance	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
<b>Switching Speeds</b>						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	t <sub>on</sub>	-	0.3	1	ms
Turn-Off		t <sub>off</sub>	-	0.058	0.5	
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
Load Current Limiting	-	I <sub>CL</sub>	190	235	280	mA <sub>rms</sub> / mA <sub>DC</sub>
Capacitance Input to Output	-	-	-	3	-	pF
<b>Input Characteristics</b>						
Input Control Current to Activate	I <sub>L</sub> =150mA	I <sub>F</sub>	-	-	5	mA
Input Control Current to Deactivate	-	I <sub>F</sub>	0.4	-	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA
<b>Common Characteristics</b>						
Input to Output Capacitance	-	C <sub>IO</sub>	-	3	-	pF

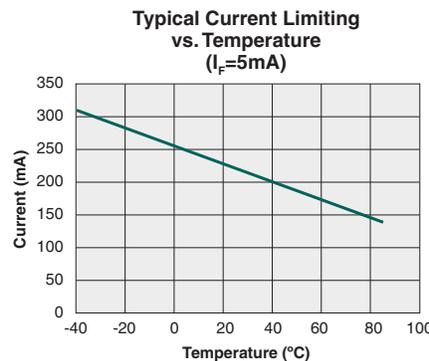
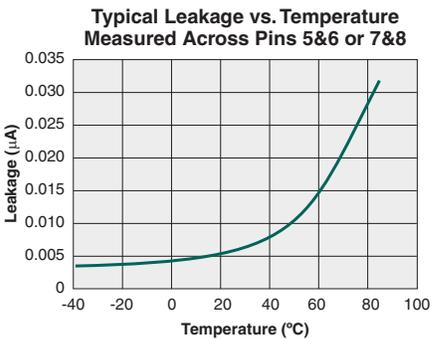
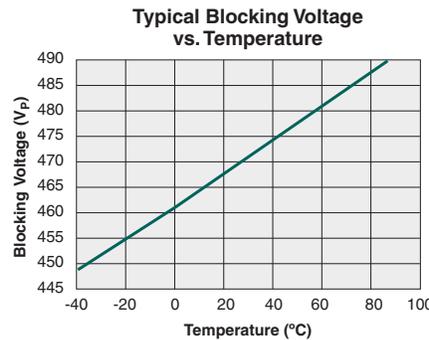
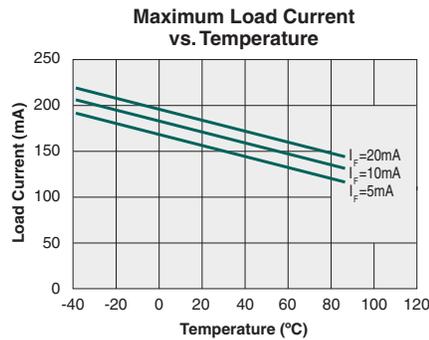
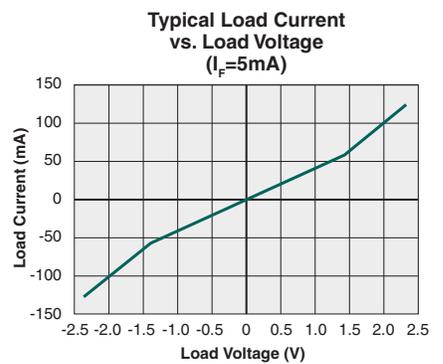
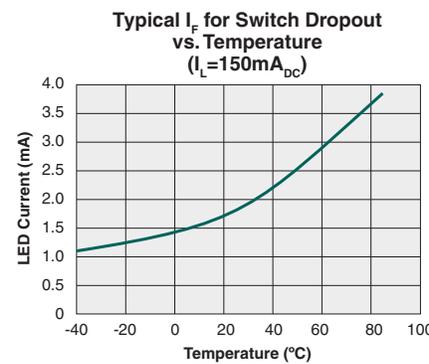
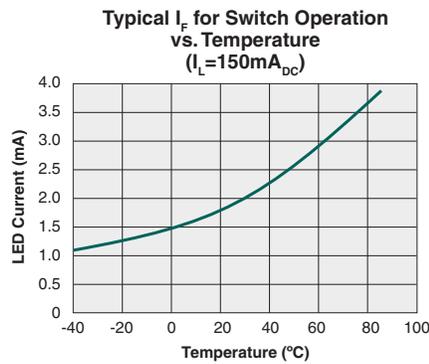
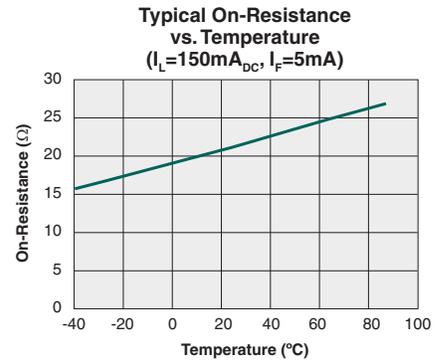
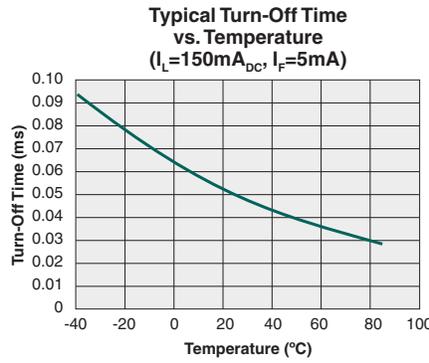
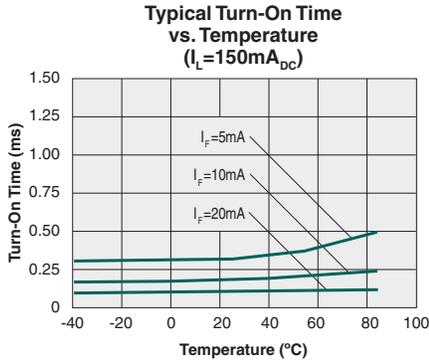
\*NOTE: If both poles operate simultaneously load current must be derated in order not to exceed the package power dissipation value.

**PERFORMANCE DATA @25°C (Unless Otherwise Noted)\***



\*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.

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\*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

### Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. IXYS Integrated Circuits Division classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Rating
PAA110L / PAA110PL / PAA110LS	MSL 1

### ESD Sensitivity



This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

### Reflow Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

Device	Maximum Temperature x Time
PAA110L / PAA110LS	250°C for 30 seconds
PAA110PL	260°C for 30 seconds

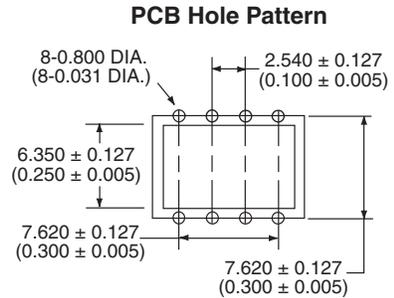
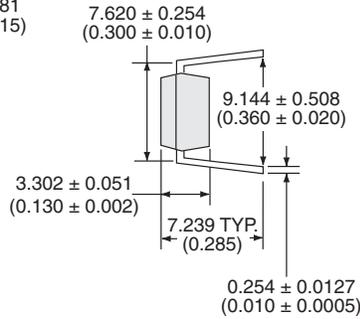
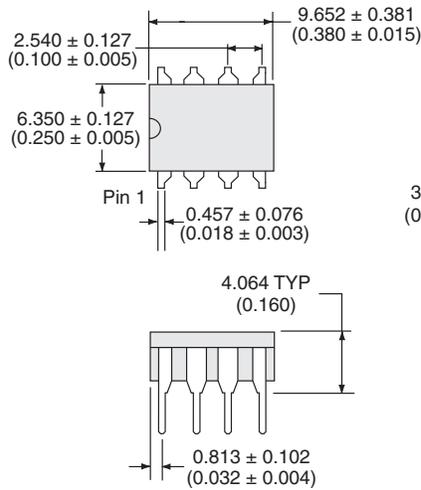
### Board Wash

IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake could be necessary if a wash is used after solder reflow processes. Chlorine- or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.



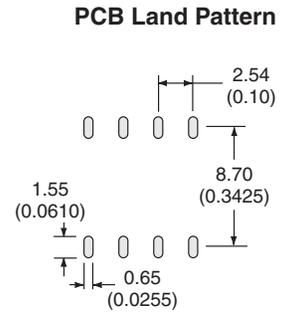
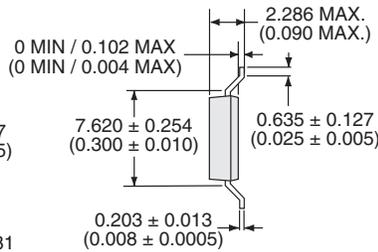
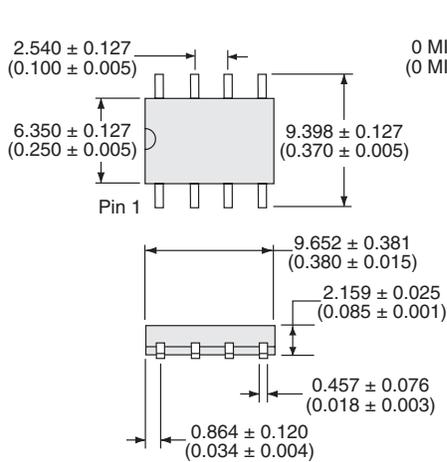
**Mechanical Dimensions**

**PAA110L**



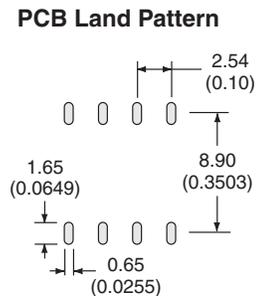
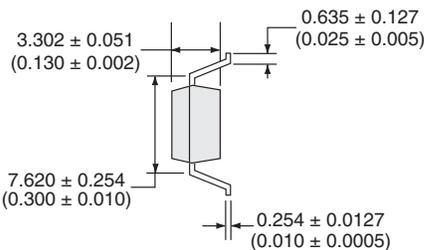
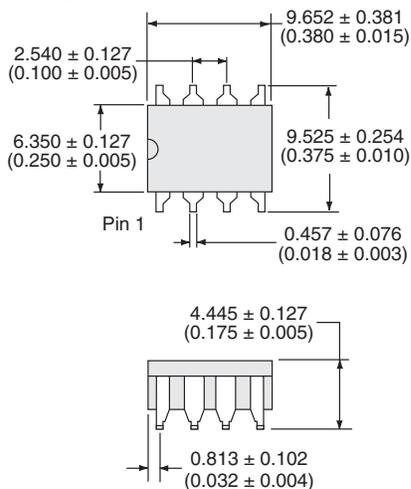
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mm  
(inches)

**PAA110PL**



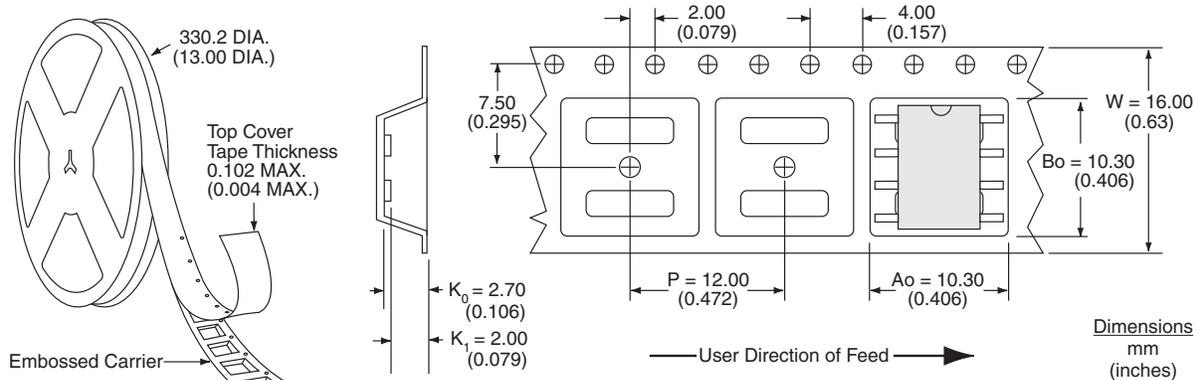
Dimensions  
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(inches)

**PAA110LS**



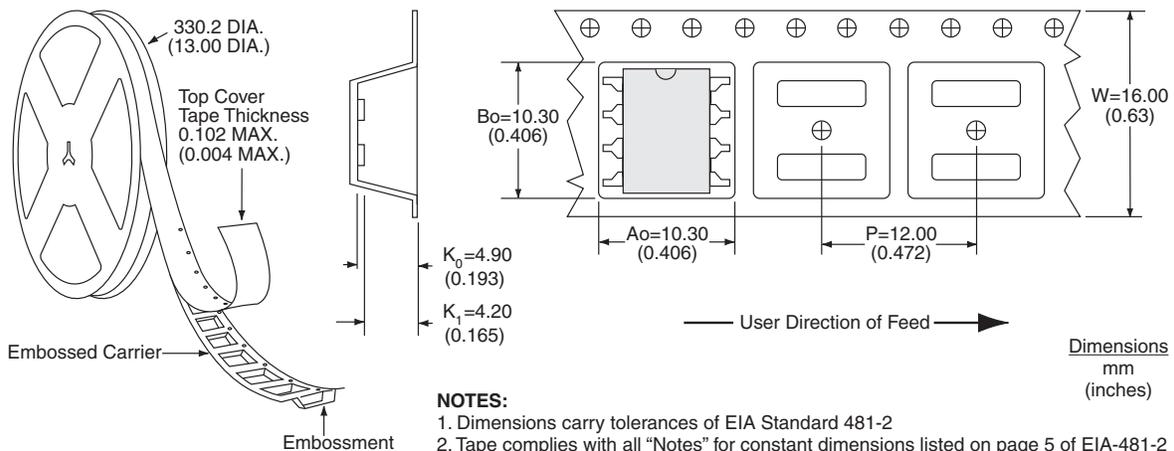
Dimensions  
mm  
(inches)

### PAA110PLTR Tape & Reel



- NOTES:  
 1. All dimensions carry tolerances of EIA Standard 481-2  
 2. The tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

### PAA110LSTR Tape & Reel



- NOTES:  
 1. Dimensions carry tolerances of EIA Standard 481-2  
 2. Tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

For additional information please visit our website at: [www.ixysic.com](http://www.ixysic.com)

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