



| Parameter | Rating | Units |
|-------------------|--------|----------|
| Blocking Voltage | 350 | V_P |
| Load Current | 100 | mA |
| Max On-resistance | 35 | Ω |

Features

- 3750V_{rms} Input/Output Isolation
- Three Functions in One Package
- Bidirectional Current Sensing
- Bidirectional Current Switching
- FCC Compatible
- No EMI/RFI Generation
- Small 16-Pin SOIC Package (PCMCIA Compatible)
- Machine Insertable, Wave Solderable
- 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

The IAA110P Multifunction Telecom switch combines two 350V normally open (1-Form-A) relays and one optocoupler in a single package. The relays use optically coupled MOSFET technology to provide 3750V_{rms} of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture while the inputs' highly efficient GaAIAs infrared LEDs control the outputs. The IAA110P allows telecom circuit designers to combine three discrete functions in a single component that occupies less space than traditional discrete component solutions.

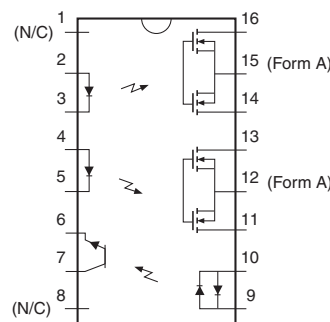
Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1305490
- EN/IEC 60950-1 Certified Component:
TUV Certificate: B 09 07 49410 006

Ordering Information

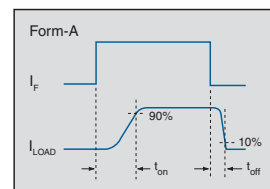
| Part # | Description |
|-----------|-------------------------|
| IAA110P | 16-Pin SOIC (50/Tube) |
| IAA110PTR | 16-Pin SOIC (1000/Reel) |

Pin Configuration



1. (N/C)
2. + LED - Form A Relay #1
3. - LED - Form A Relay #1
4. + LED - Form A Relay #2
5. - LED - Form A Relay #2
6. Emitter - Phototransistor
7. Collector - Phototransistor
8. (N/C)
9. LED - Phototransistor +/-
10. LED - Phototransistor +/-
11. Output - Form A Relay #2
12. Common Source Relay #2
13. Output - Form A Relay #2
14. Output - Form A Relay #1
15. Common Source Relay #1
16. Output - Form A Relay #1

Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25°C

| Parameter | Ratings | Units |
|--|-------------|------------------|
| Input Control Current, Relay | 50 | mA |
| Total Package Dissipation ¹ | 1 | W |
| Isolation Voltage, Input to Output | 3750 | V _{rms} |
| Operational Temperature | -40 to +85 | °C |
| Storage Temperature | -40 to +125 | °C |

¹ Derate linearly 1.67 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.

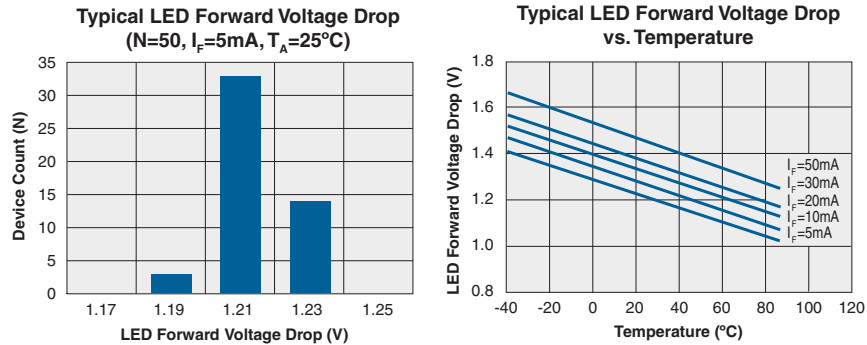
Electrical Characteristics @25°C: Relay Section

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|-------------------------------|--|-------------------|-----|-----|-----|----------------|
| Output Characteristics | | | | | | |
| Blocking Voltage (Peak) | I _L =1μA | V _L | - | - | 350 | V _P |
| Load Current | | | | | | |
| Continuous | - | I _L | - | - | 100 | mA |
| Peak | t=10ms | I _{LPK} | - | - | 350 | mA |
| On-Resistance | I _L =100mA | R _{ON} | - | - | 35 | Ω |
| Off-State Leakage Current | V _L =350V, T _J =25°C | I _{LEAK} | - | - | 1 | μA |
| Switching Speeds | | | | | | |
| Turn-On | I _F =5mA, V _L =10V | t _{on} | - | - | 3 | ms |
| Turn-Off | | t _{off} | - | - | 3 | ms |
| Output Capacitance | V _L =50V, f=1MHz | C _{OUT} | - | 25 | - | pF |
| Input Characteristics | | | | | | |
| Input Control Current | I _L =100mA | I _F | - | - | 5 | mA |
| Input Dropout Current | I _L =1mA | I _F | 0.4 | - | - | mA |
| Input Voltage Drop | I _F =5mA | V _F | 0.9 | 1.2 | 1.4 | V |
| Reverse Input Voltage | - | V _R | - | - | 5 | V |
| Reverse Input Current | V _R =5V | I _R | - | - | 10 | μA |

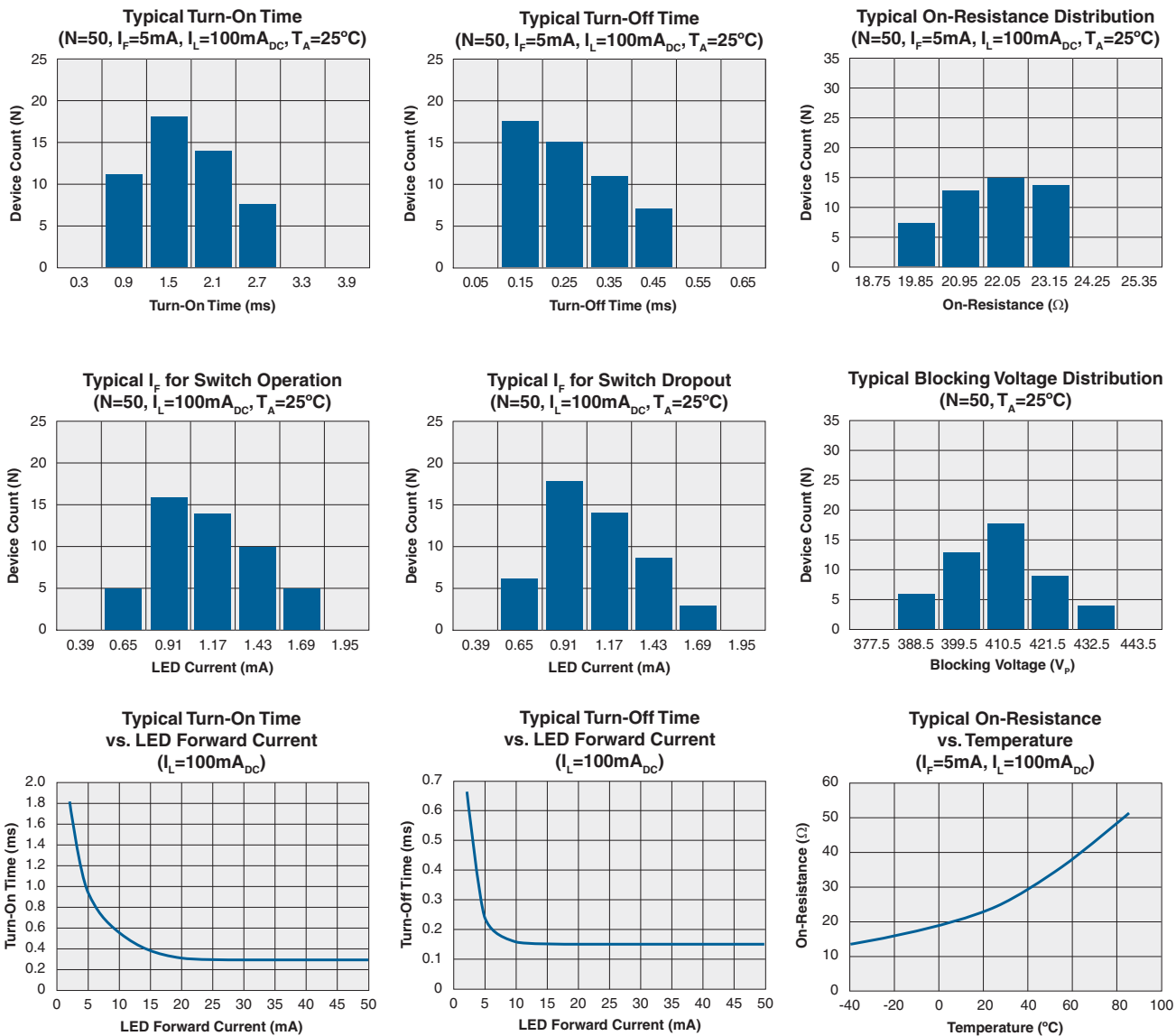
Electrical Characteristics @25°C: Detector Section

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|--------------------------------------|--|-------------------|------|-----|-----|------------------|
| Output Characteristics | | | | | | |
| Phototransistor Blocking Voltage | I _C =10μA | BV _{CEO} | 20 | 50 | - | V |
| Phototransistor Dark Current | V _{CE} =5V, I _F =0mA | I _{CEO} | - | 50 | 500 | nA |
| Saturation Voltage | I _C =2mA, I _F =16mA | V _{SAT} | - | 0.3 | 0.5 | V |
| Current Transfer Ratio | I _F =6mA, V _{CE} =0.5V | CTR | 33 | - | - | % |
| Input Characteristics | | | | | | |
| Input Control Current | I _C =2mA, V _{CE} =0.5V | I _F | - | 2 | 6 | mA |
| Input Voltage Drop | I _F =5mA | V _F | 0.9 | 1.2 | 1.4 | V |
| Input Current (Detector Must be Off) | I _C =1μA, V _{CE} =5V | - | 5 | 25 | - | μA |
| Capacitance, Input to Output | V _L =50V, f=1MHz | C _{I/O} | - | 3 | - | pF |
| Isolation, Input to Output | - | V _{I/O} | 3750 | - | - | V _{rms} |

COMMON PERFORMANCE DATA*

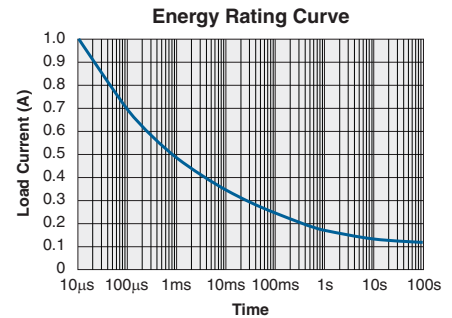
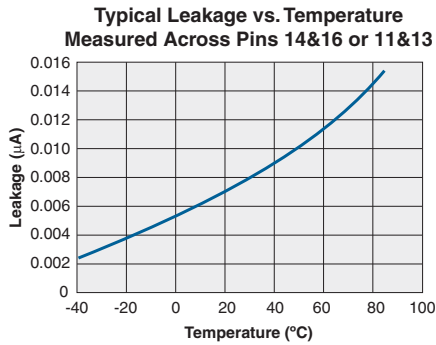
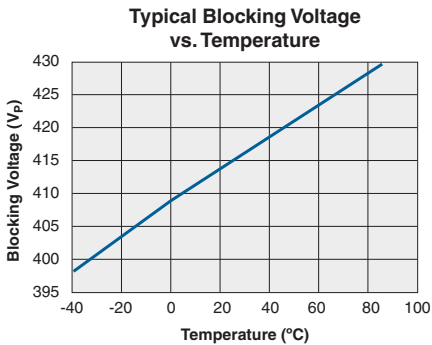
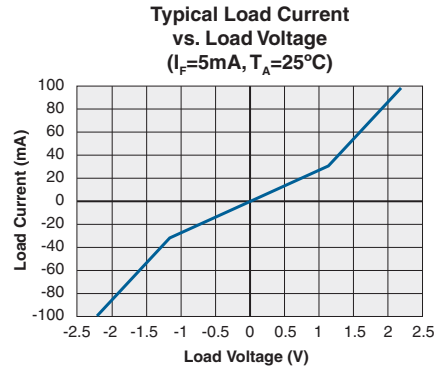
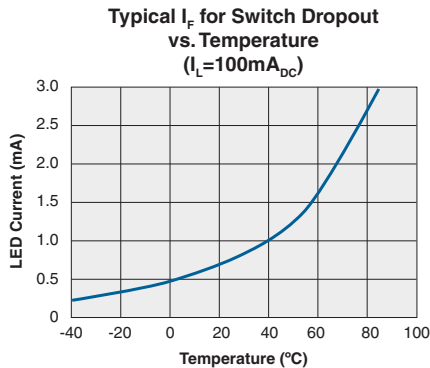
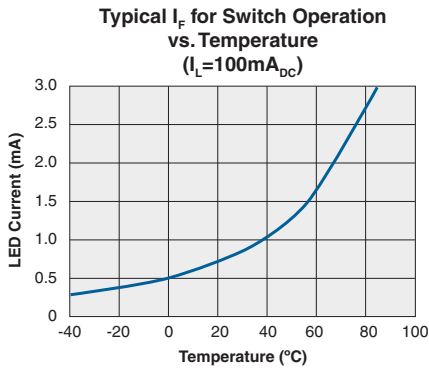
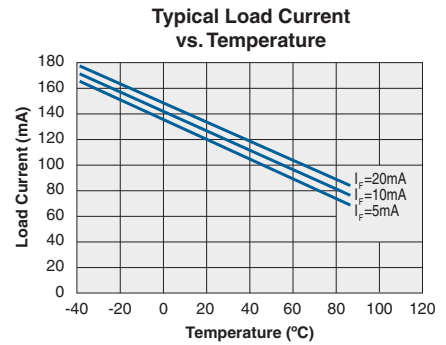
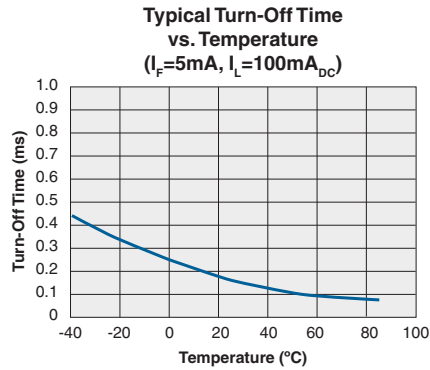
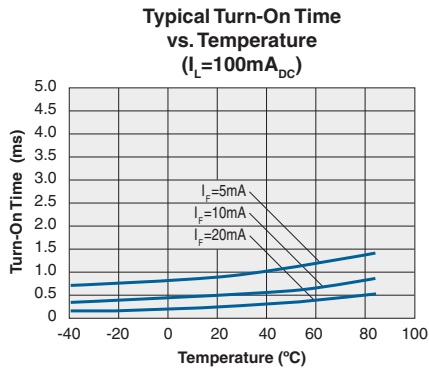


RELAY PERFORMANCE DATA*

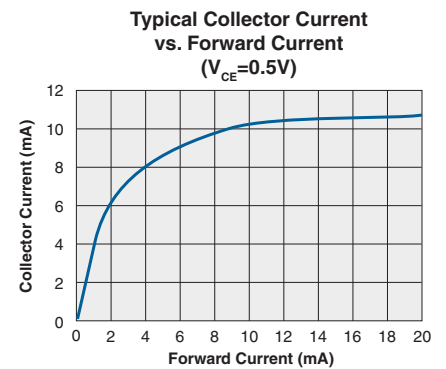
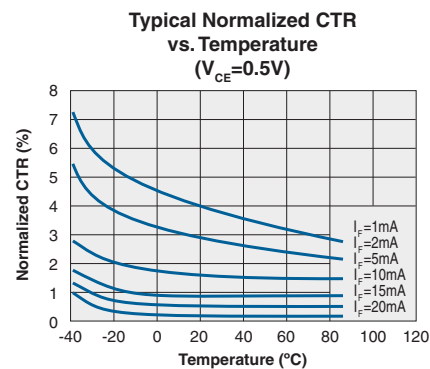
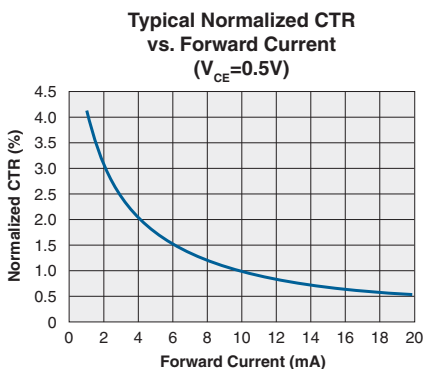


* The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

RELAY PERFORMANCE DATA (cont.)*



DETECTOR 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.

Manufacturing Information

Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. Clare 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 |
|---------|---|
| IAA110P | 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 |
|---------|----------------------------|
| IAA110P | 260°C for 30 seconds |

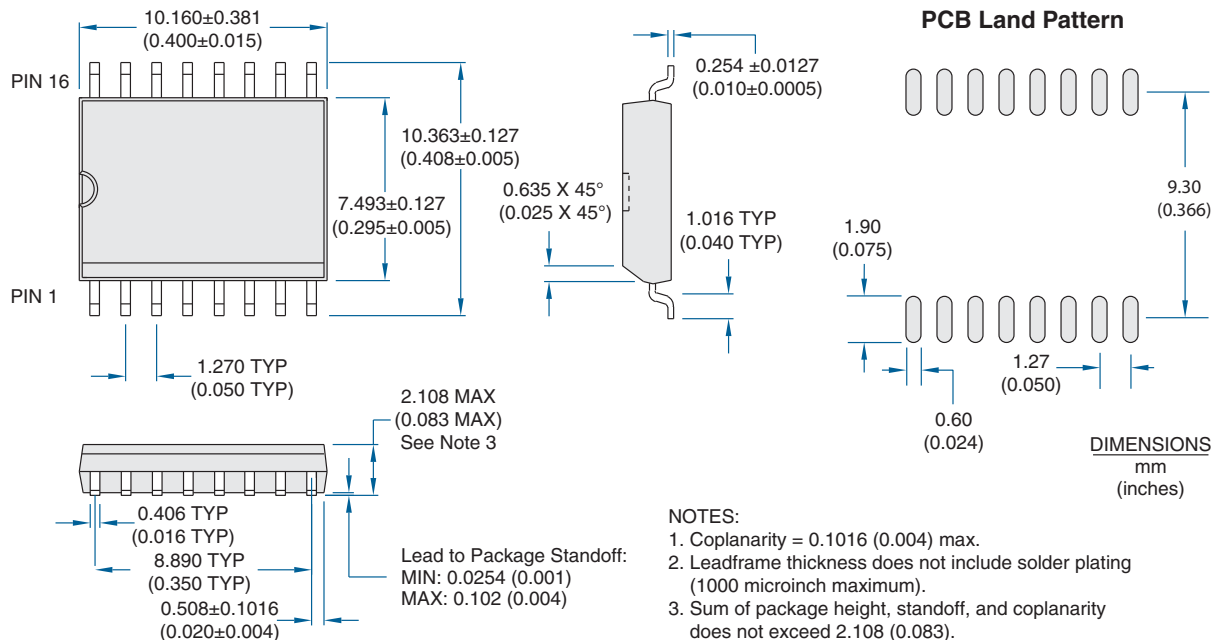
Board Wash

Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare 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.

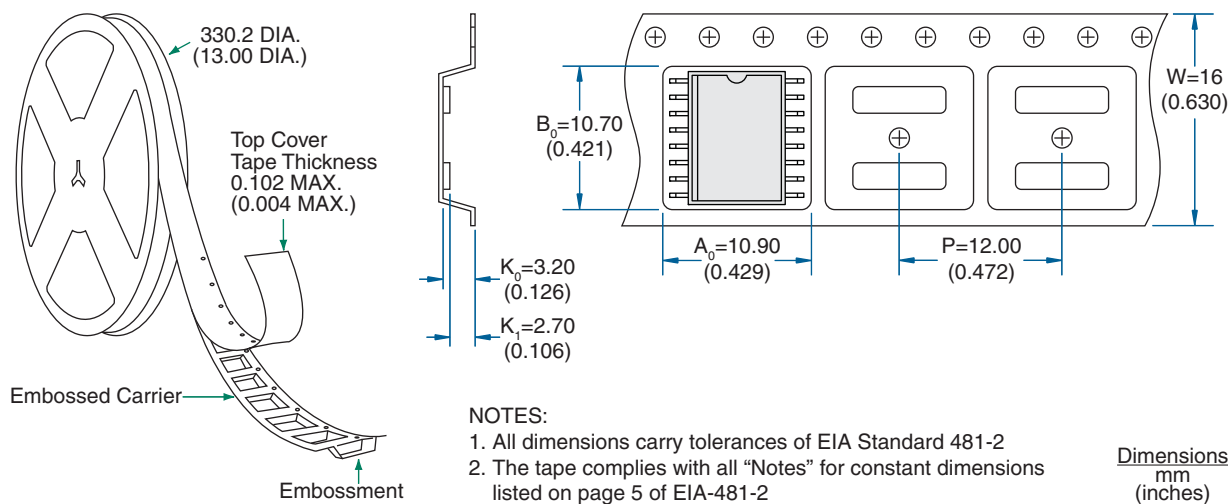


MECHANICAL DIMENSIONS

IAA110P



IAA110P Tape & Reel



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