



| Parameter | Ratings | Units |
|---------------------|---------|----------------------|
| Blocking Voltage | 250 | V_p |
| Load Current | 170 | mA_{rms} / mA_{DC} |
| On-Resistance (max) | 20 | Ω |

Features

- 3750V_{rms} Input/Output Isolation
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- FCC Compatible
- VDE Compatible
- No EMI/RFI Generation
- Small 8-Pin Package
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions 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

LAA120 is a dual normally open (1-Form-A) Solid State Relay that has two independently controlled, optically coupled MOSFET switches. The MOSFET switches and photovoltaic die use optically coupled MOSFET technology to provide 3750V_{rms} of input to output isolation.

The optically coupled outputs, which use the patented OptoMOS architecture, are controlled by a highly efficient GaAIAs infrared LED.

This dual switch OptoMOS relay provides a more compact design solution than discrete single-pole relays in a variety of applications, and saves board space by incorporating both switches in a single 8-Pin package.

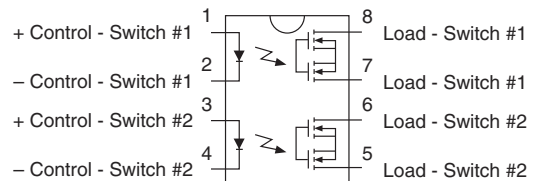
Approvals

- UL Certified Component: File E76270
- CSA Certified Component: Certificate 1175739
- EN/IEC 60950-1 Certified Component: TUV Certificate B 10 05 49410 006

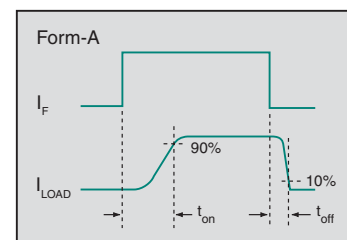
Ordering Information

| Part # | Description |
|-----------|----------------------------------|
| LAA120 | 8-Pin DIP (50/Tube) |
| LAA120S | 8-Pin Surface Mount (50/Tube) |
| LAA120STR | 8-Pin Surface Mount (1,000/Reel) |
| LAA120P | 8-Pin Flat Pack (50/Tube) |
| LAA120PTR | 8-Pin Flat Pack (1,000/Reel) |

Pin Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings @ 25°C

| Parameter | Ratings | Units |
|--------------------------------------|-------------|------------------|
| Blocking Voltage | 250 | 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

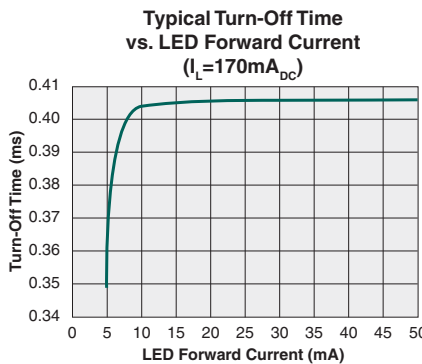
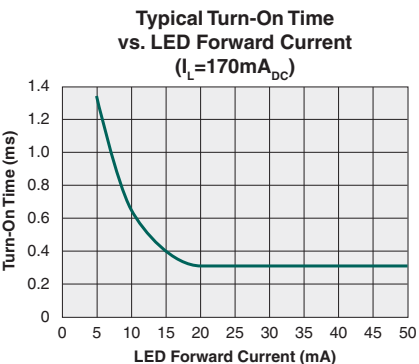
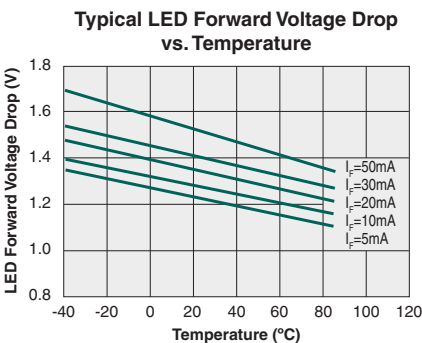
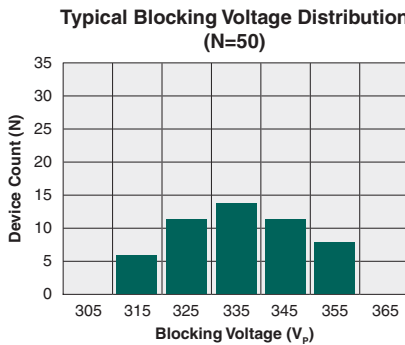
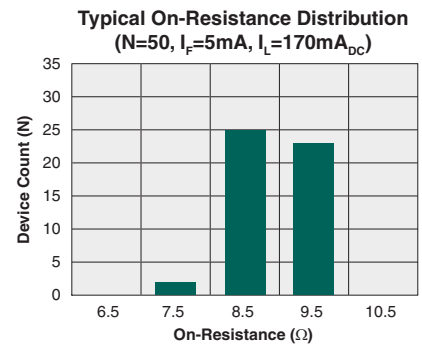
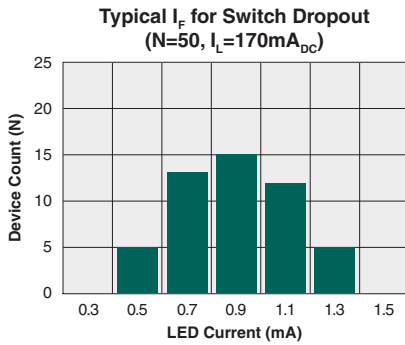
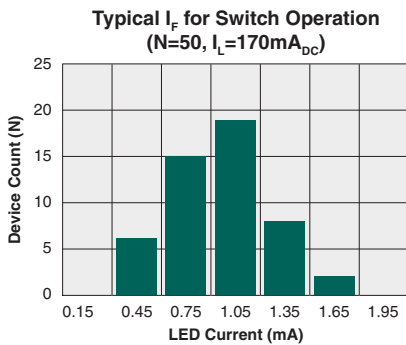
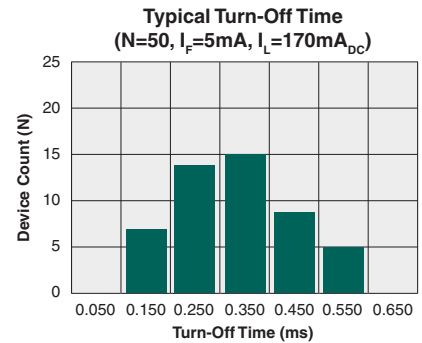
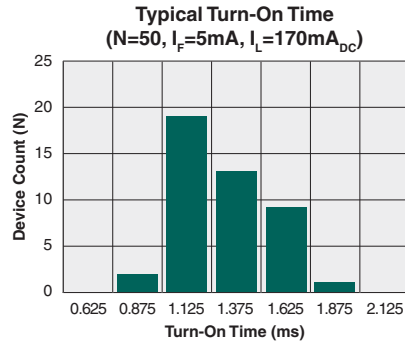
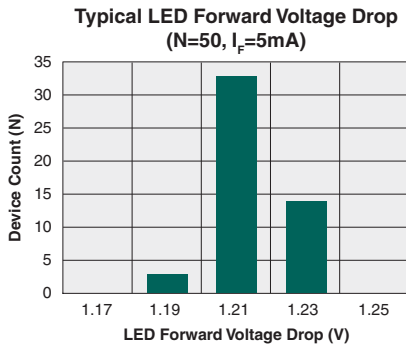
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics @ 25°C

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|-------------------------------------|--|-------------------|-----|-----|------|--------------------------------------|
| Output Characteristics | | | | | | |
| Load Current | | | | | | |
| Continuous ¹ | - | I _L | - | - | 170 | mA _{rms} / mA _{DC} |
| Peak | t = 10ms | I _{LPK} | - | - | ±400 | mA _P |
| On-Resistance ² | I _L =170mA | R _{ON} | - | 15 | 20 | Ω |
| Off-State Leakage Current | V _L =250V _P | I _{LEAK} | - | - | 1 | μA |
| Switching Speeds | | | | | | |
| Turn-On | I _F =5mA, V _L =10V | t _{on} | - | - | 5 | ms |
| Turn-Off | | t _{off} | - | - | 5 | |
| Output Capacitance | V _L =50V, f=1MHz | C _{OUT} | - | 50 | - | pF |
| Input Characteristics | | | | | | |
| Input Control Current to Activate | I _L =170mA | I _F | - | - | 5 | mA |
| Input Control Current to Deactivate | - | - | 0.4 | 0.7 | - | 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 | | | | | | |
| Input to Output Capacitance | - | C _{I/O} | - | 3 | - | pF |

¹ If both poles operate, then the load current must be derated so that it does not exceed the package power dissipation value.
² Measurement taken within 1 second of on-time.

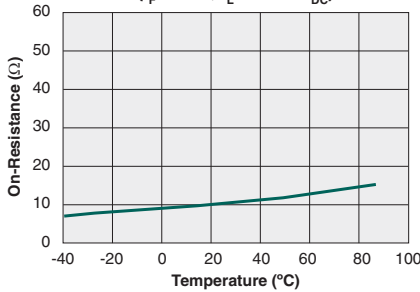
PERFORMANCE DATA @25°C (Unless Otherwise Noted)*



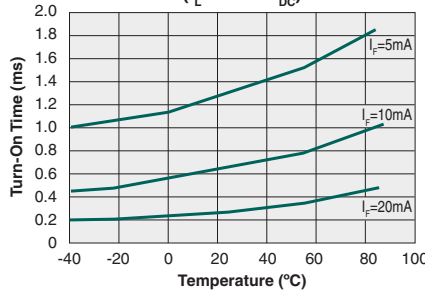
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

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

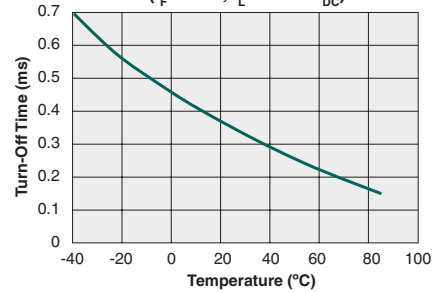
Typical On-Resistance vs. Temperature
($I_F=5mA, I_L=170mA_{DC}$)



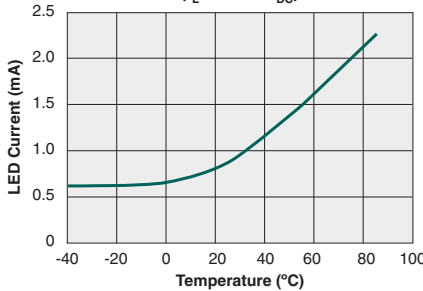
Typical Turn-On Time vs. Temperature
($I_L=170mA_{DC}$)



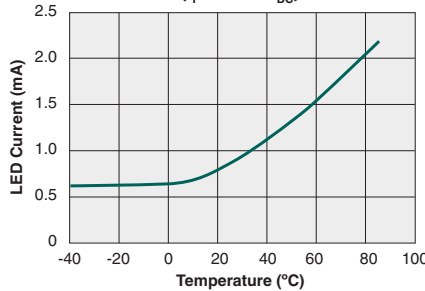
Typical Turn-Off Time vs. Temperature
($I_F=5mA, I_L=170mA_{DC}$)



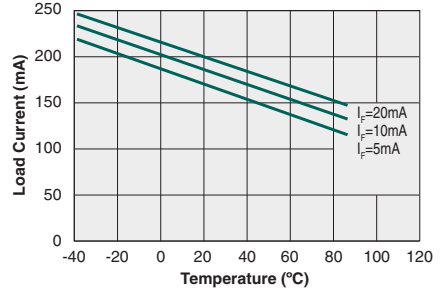
Typical I_F for Switch Operation vs. Temperature
($I_L=170mA_{DC}$)



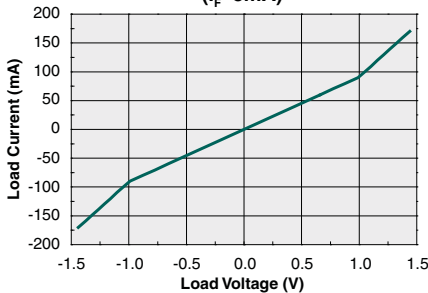
Typical I_F for Switch Dropout vs. Temperature
($I_F=170mA_{DC}$)



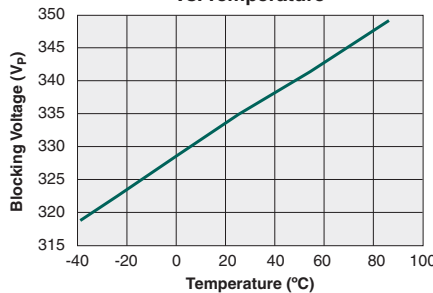
Maximum Load Current vs. Temperature



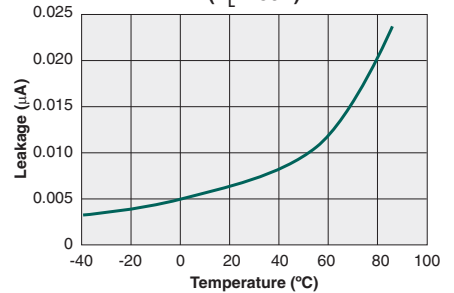
Typical Load Voltage vs. Load Current
($I_F=5mA$)



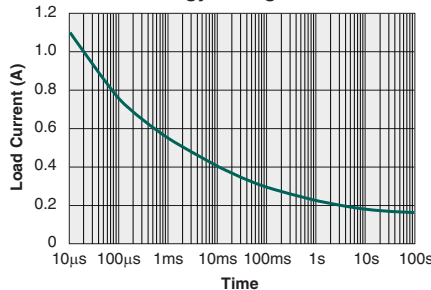
Typical Blocking Voltage vs. Temperature



Typical Leakage vs. Temperature Measured across Pins 5&6 or 7&8
($V_L=250V$)



Energy Rating Curve



*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 |
|----------------------------|---|
| LAA120 / LAA120S / LAA120P | 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 |
|------------------|----------------------------|
| LAA120 / LAA120S | 250°C for 30 seconds |
| LAA120P | 260°C for 30 seconds |

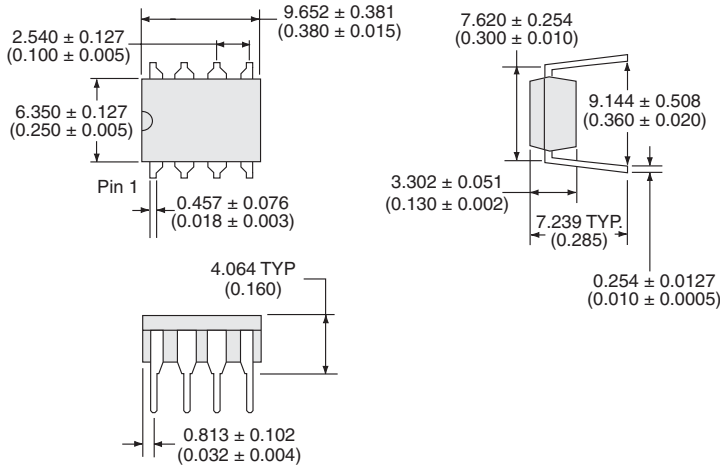
Board Wash

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.

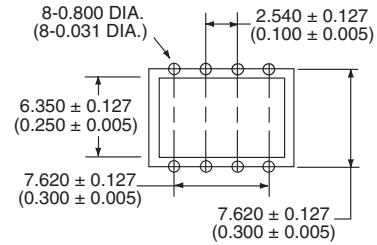


MECHANICAL DIMENSIONS

LAA120

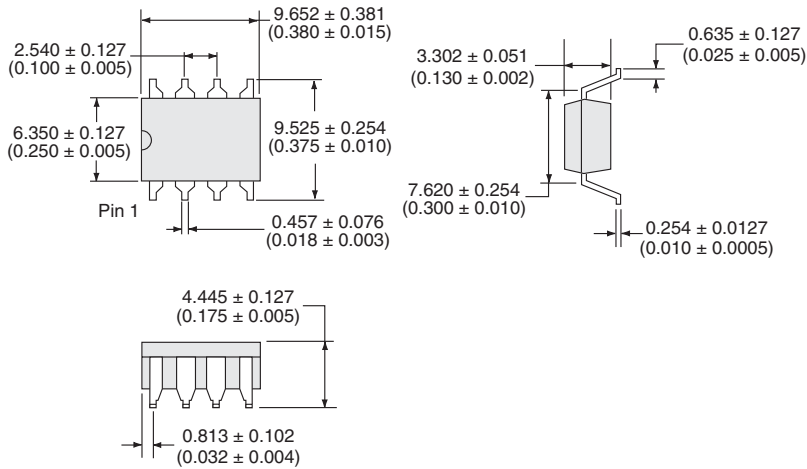


PCB Hole Pattern

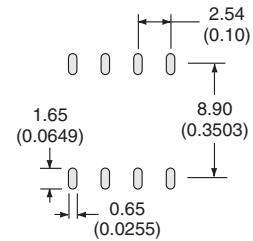


Dimensions
mm
(inches)

LAA120S

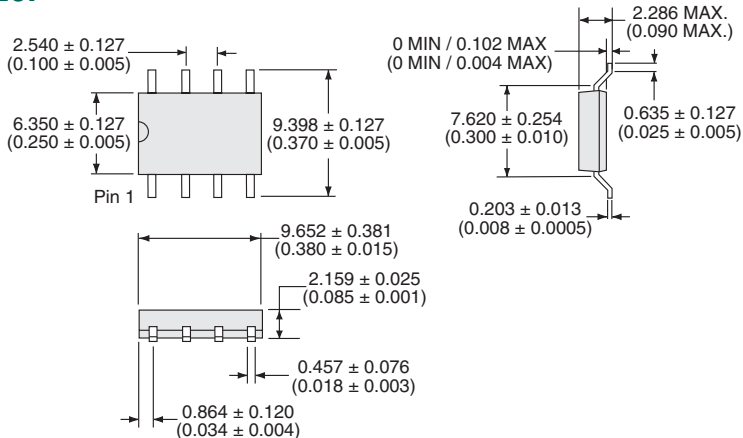


PCB Land Pattern

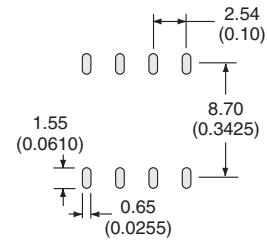


Dimensions
mm
(inches)

LAA120P



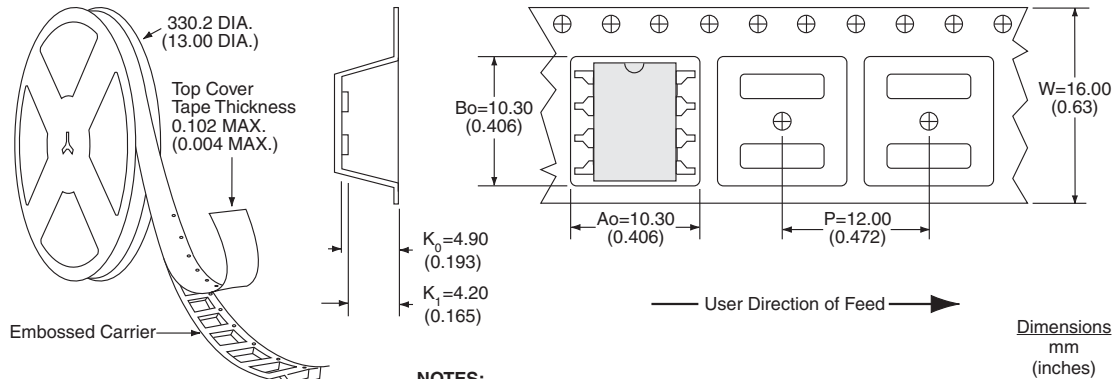
PCB Land Pattern



Dimensions
mm
(inches)

MECHANICAL DIMENSIONS

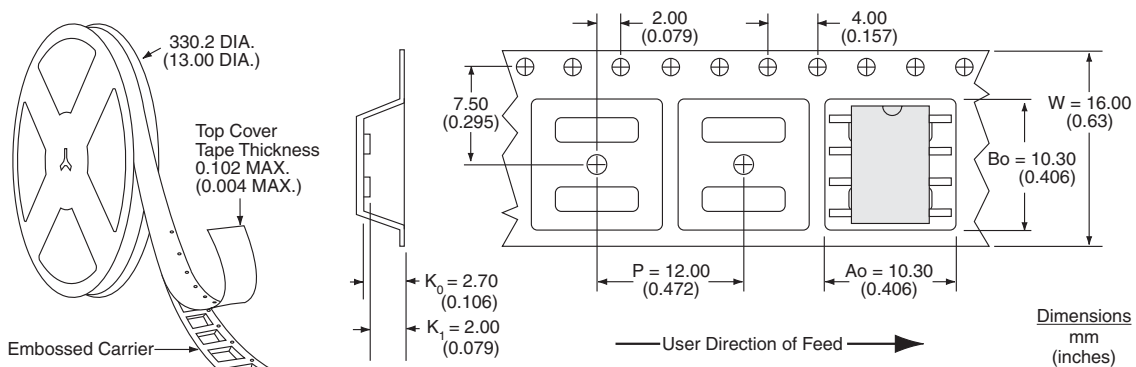
LAA120STR Tape & Reel



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

LAA120PTR 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

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

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