



Parameter	Ratings	Units
Blocking Voltage	350	V_P
Load Current	150	mA_{rms} / mA_{DC}
On-Resistance (max)	18	Ω

Features

- Current Limiting
- 3750V_{rms} Input/Output Isolation
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 8 Pin Packages
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available
- Flammability classification rating: V-0

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
 - Medical Equipment-Patient/Equipment Isolation
- Meters (Watt-Hour, Water, Gas)
- Security
- Aerospace
- Industrial Controls

Description

LAA125L is a dual normally open (1-Form-A) Solid State Relay that has two independently controlled, optically coupled MOSFET switches with an additional current limiting circuit. The optically coupled combination of MOSFET switches and photovoltaic die provide 3750V_{rms} of input/output isolation.

The optically coupled outputs, which use patented OptoMOS architecture, are controlled by a highly efficient GaAlAs 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.

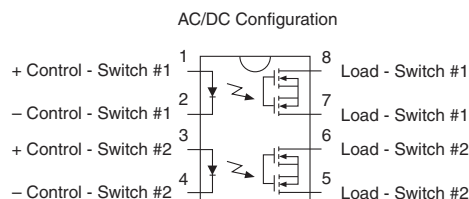
Approvals

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

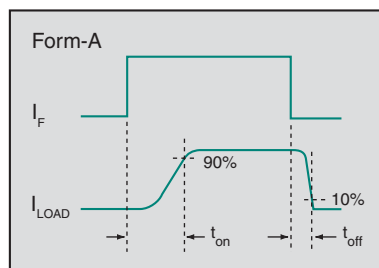
Ordering Information

Part #	Description
LAA125L	8 Pin DIP (50/Tube)
LAA125LS	8 Pin Surface Mount (50/Tube)
LAA125LSTR	8 Pin Surface Mount (1,000/Reel)
LAA125PL	8 Pin Flat Pack (50/Tube)
LAA125PLTR	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	350	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 (Unless Otherwise Noted)

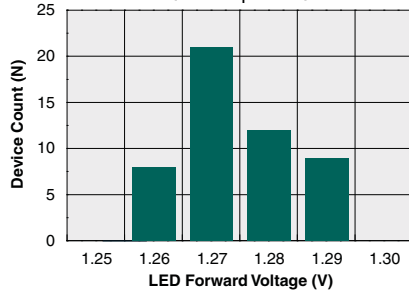
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current, Continuous ¹	-	I _L	-	-	150	mA _{rms} / mA _{DC}
Peak Load Current	10ms max	I _{LPK}	-	-	±400	mA _P
Load Current Limiting	-	I _{CL}	±190	±235	±280	mA
On-Resistance ²	I _L =Load Current	R _{ON}	-	-	18	Ω
Off-State Leakage Current	V _L =350V _P	I _{LEAK}	-	-	1	μA
Switching Speeds	I _F =5mA, V _L =10V	t _{on} t _{off}	-	-	5	ms
Turn-On						
Turn-Off						
Output Capacitance	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
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.

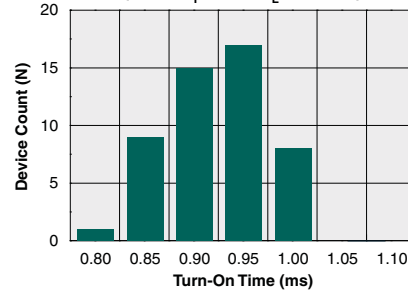
² Measurement taken within one second of on-time.

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

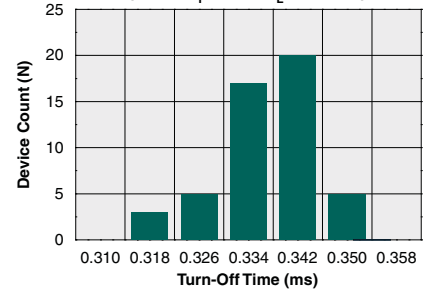
Typical LED Forward Voltage Drop
(N=50, $I_F=5\text{mA}$)



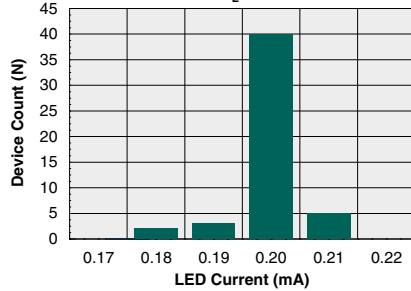
Typical Turn-On Time
(N=50, $I_F=5\text{mA}$, $I_L=150\text{mA}$)



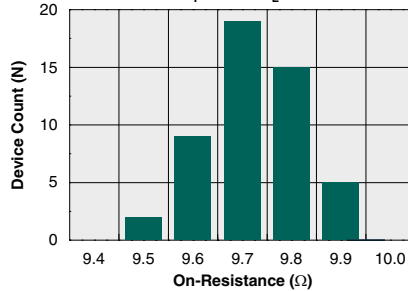
Typical Turn-Off Time
(N=50, $I_F=5\text{mA}$, $I_L=150\text{mA}$)



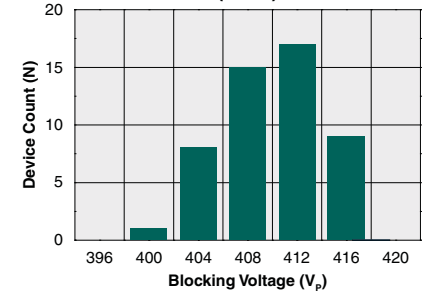
Typical I_F for Switch Operation
(N=50, $I_L=150\text{mA}$)



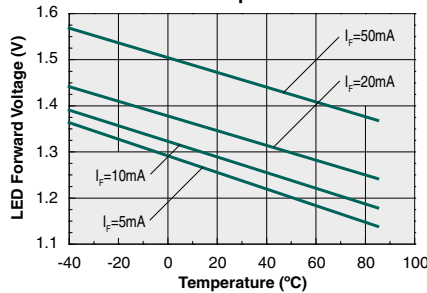
Typical On-Resistance Distribution
(N=50, $I_F=5\text{mA}$, $I_L=150\text{mA}$)



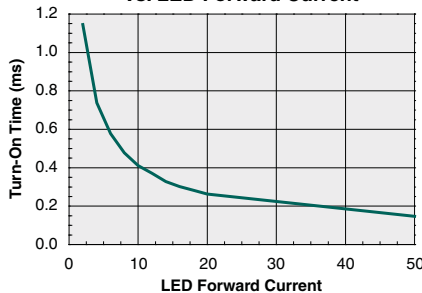
Typical Blocking Voltage Distribution
(N=50)



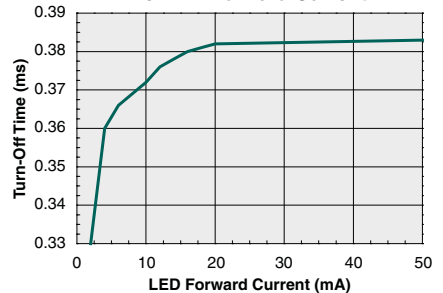
Typical LED Forward Voltage Drop
vs. Temperature



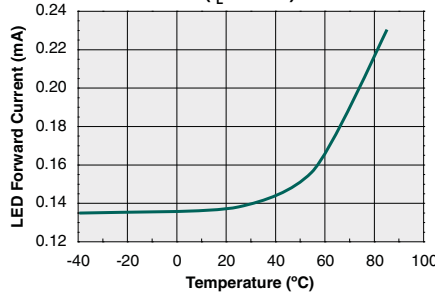
Typical Turn-On Time
vs. LED Forward Current



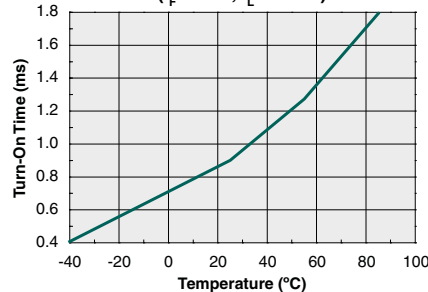
Typical Turn-Off Time
vs. LED Forward Current



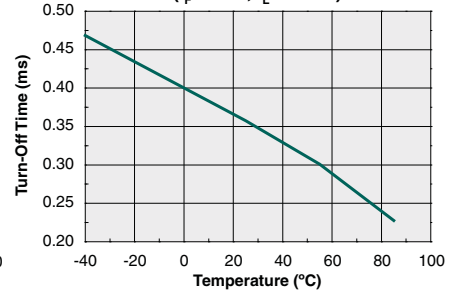
Typical I_F for Switch Operation
vs. Temperature
($I_L=80\text{mA}$)



Typical Turn-On Time vs. Temperature
($I_F=5\text{mA}$, $I_L=80\text{mA}$)



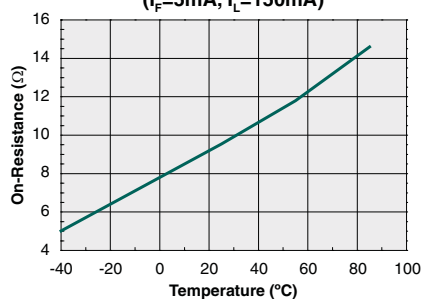
Typical Turn-Off Time vs. Temperature
($I_F=5\text{mA}$, $I_L=80\text{mA}$)



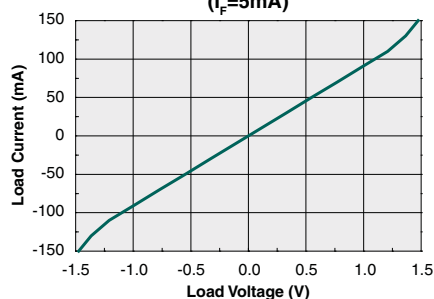
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

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

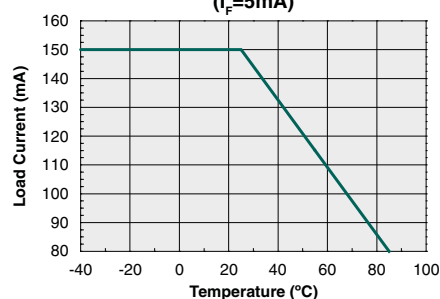
**Typical On-Resistance
vs. Temperature
($I_F=5\text{mA}$, $I_L=150\text{mA}$)**



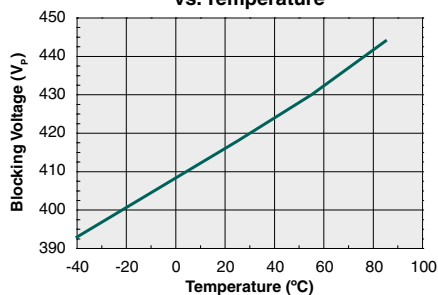
**Typical Load Current vs. Load Voltage
($I_F=5\text{mA}$)**



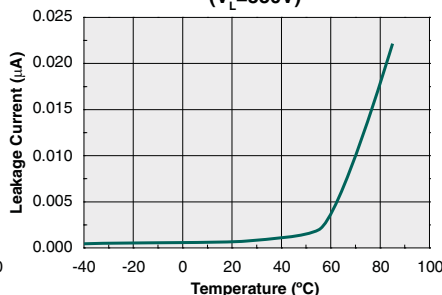
**Maximum Load Current vs. Temperature
($I_F=5\text{mA}$)**



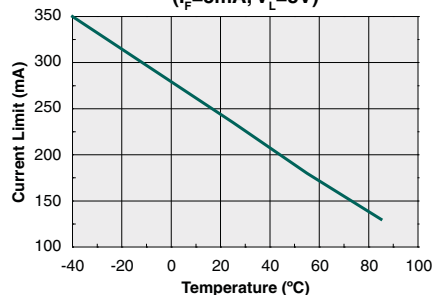
**Typical Blocking Voltage
vs. Temperature**



**Typical Leakage vs. Temperature
Measured Across Pins 5&6, 7&8
($V_L=350\text{V}$)**



**Typical Current Limiting
vs. Temperature
($I_F=5\text{mA}$, $V_L=8\text{V}$)**



*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
LAA125L / LAA125LS / LAA125PL	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
LAA125L / LAA125LS	250°C for 30 seconds
LAA125PL	260°C for 30 seconds

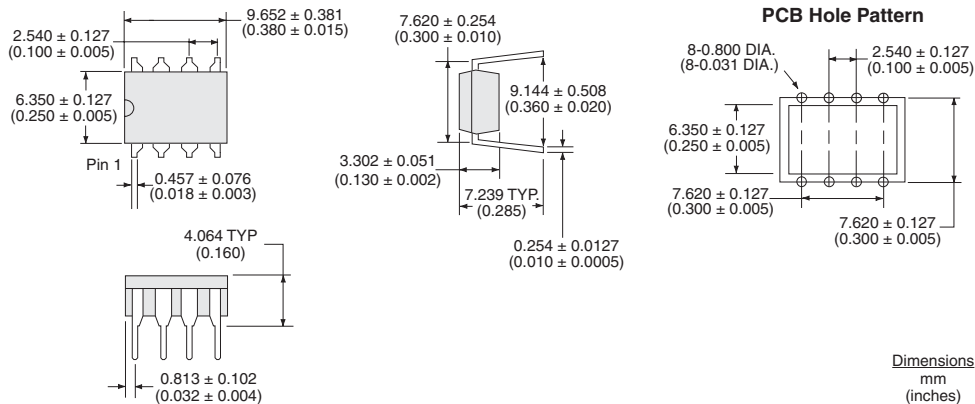
Board Wash

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.

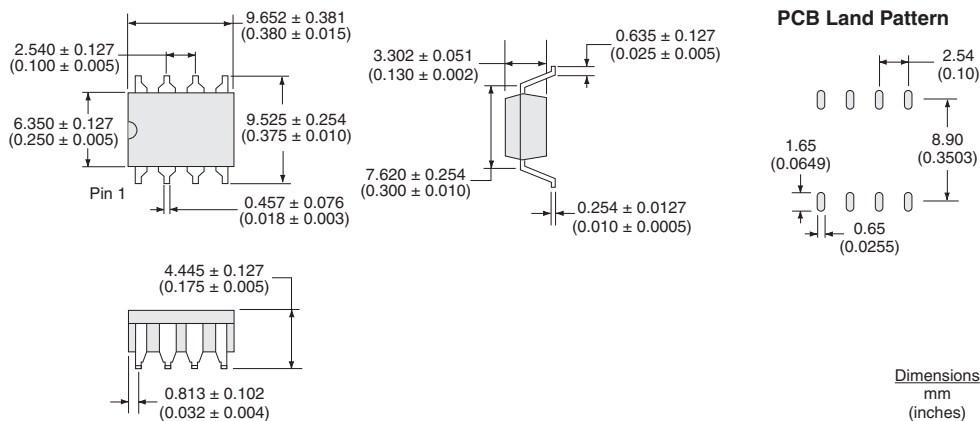


MECHANICAL DIMENSIONS

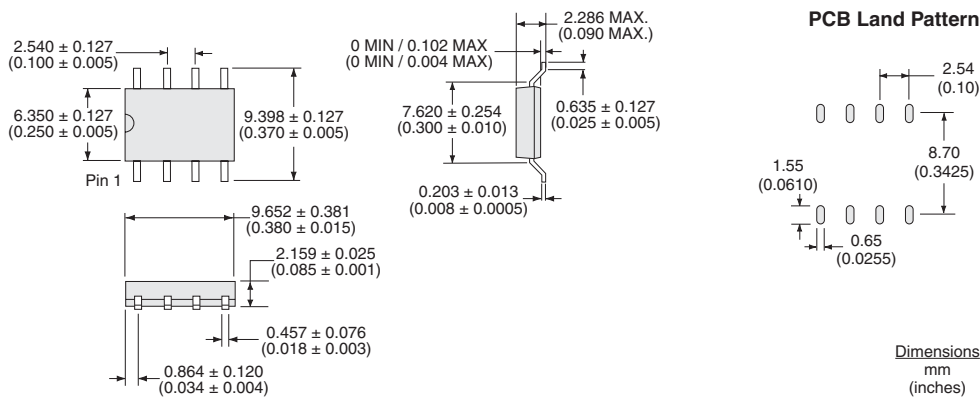
LAA125L



LAA125LS

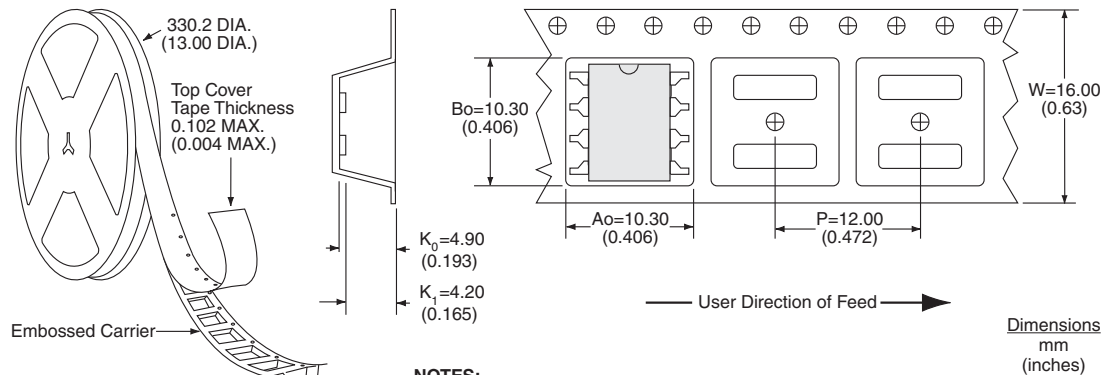


LAA125PL



MECHANICAL DIMENSIONS

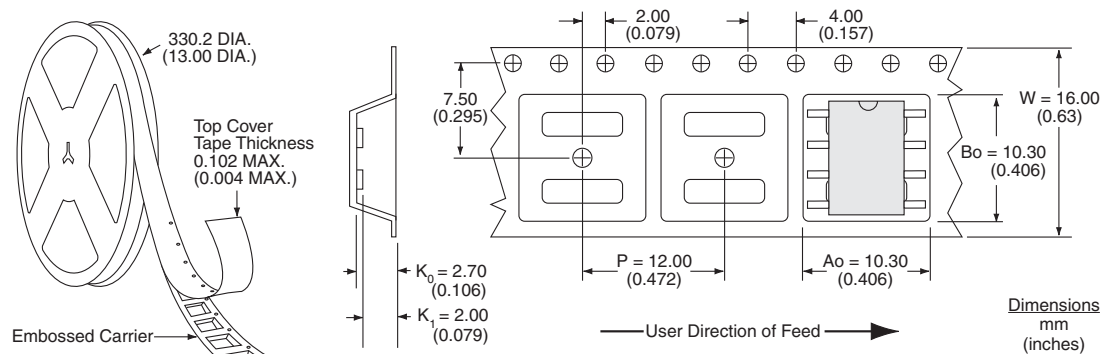
LAA125LSTR Tape & Reel



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

LAA125PLTR 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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