



| Parameter | Rating | Units |
|---------------------|--------|----------------------|
| Blocking Voltage | 400 | V_P |
| Load Current | 250 | mA_{rms} / mA_{DC} |
| On-Resistance (max) | 8 | Ω |

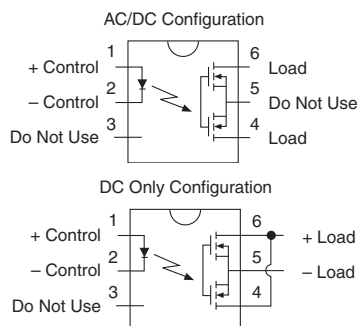
Features

- Low On-Resistance, High Current Handling
- Low Drive Power Requirements (TTL/CMOS Compatible)
- 3750V_{rms} Input/Output Isolation
- High Reliability
- VDE Compatible
- FCC Compatible
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Small 6-Pin Package
- Surface Mount Tape & Reel Version Available

Applications

- Telecommunications
 - Telecomm Switching
 - Hook Switch
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls
- Automotive

Pin Configuration



Description

The PLA140 is a single-pole normally open (1-Form-A) Solid State Relay that uses optically coupled MOSFET technology to provide 3750V_{rms} of input-to-output isolation.

MOSFET output switches, which use IXYS Integrated Circuits Division's patented OptoMOS architecture, are controlled by a highly efficient GaAIAs infrared LED.

The PLA140's combination of low on-resistance and high load current handling makes it suitable for a variety of industrial applications.

Because Solid State Relays like the PLA140 have no moving parts, they offer faster, bounce-free switching in a more compact surface mount or through hole package than traditional electromechanical relays.

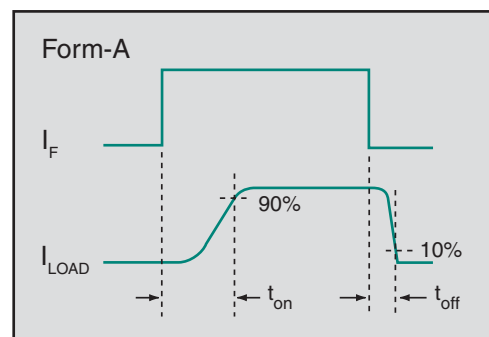
Approvals

- UL Certified Component: File E76270
- CSA Certified Component: Certificate 1175739
- Certified to EN60950
TUV Certificate B 09 07 49410 004

Ordering Information

| Part Number | Description |
|-------------|----------------------------------|
| PLA140 | 6-Pin DIP (50/Tube) |
| PLA140S | 6-Pin Surface Mount (50/Tube) |
| PLA140STR | 6-Pin Surface Mount (1,000/Reel) |

Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25°C

| 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

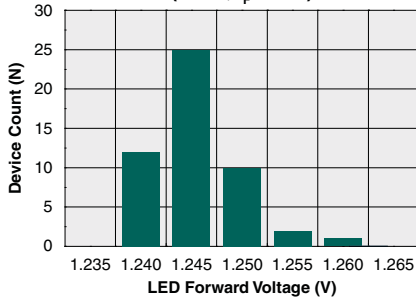
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics @ 25°C

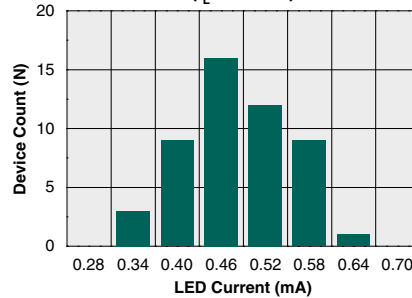
| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|-------------------------------------|---|-------------------|---|------|------|--------------------------------------|
| Output Characteristics | | | | | | |
| Load Current (Continuous) | | | | | | |
| AC/DC Configuration | I _F =5mA | I _L | - | - | 250 | mA _{rms} / mA _{DC} |
| DC Configuration | | | - | - | 350 | mA _{DC} |
| Peak Load Current | I _F =5mA , t=10ms | I _{LPK} | - | - | ±500 | mA _p |
| On-Resistance | | | | | | |
| AC/DC Configuration | I _F =5mA , I _L =250mA | R _{ON} | - | 5.5 | 8 | Ω |
| DC Configuration | | | I _F =5mA , I _L =350mA | - | 1.5 | |
| Off-State Leakage Current | V _L =400V _p | I _{LEAK} | - | - | 1 | μA |
| Switching Speeds | | | | | | |
| Turn-On | I _F =5mA, V _L =10V | t _{on} | - | 0.4 | 3 | ms |
| Turn-Off | | t _{off} | - | 0.19 | 1 | |
| Output Capacitance | I _F =0mA , V _L =50V, f=1MHz | C _{OUT} | - | 18 | - | pF |
| Input Characteristics | | | | | | |
| Input Control Current to Activate | I _L =250mA | I _F | - | 0.46 | 5 | mA |
| Input Control Current to Deactivate | - | I _F | 0.2 | 0.44 | - | 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 _{IO} | - | 3 | - | pF |

PERFORMANCE DATA*

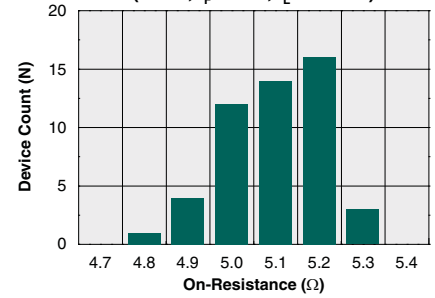
Typical LED Forward Voltage Drop
(N=50, $I_F=5mA$)



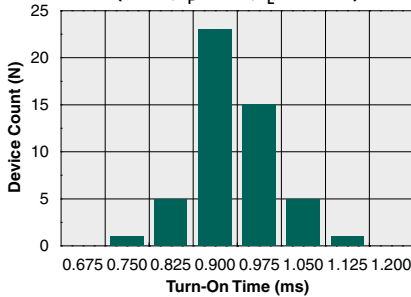
Typical I_F for Switch Operation
($I_L=250mA$)



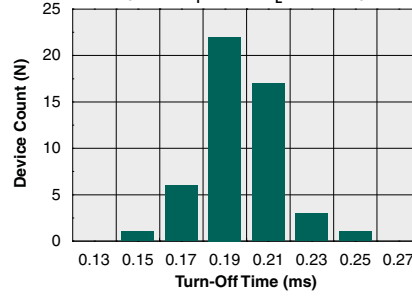
Typical On-Resistance Distribution
(N=50, $I_F=5mA$, $I_L=250mA$)



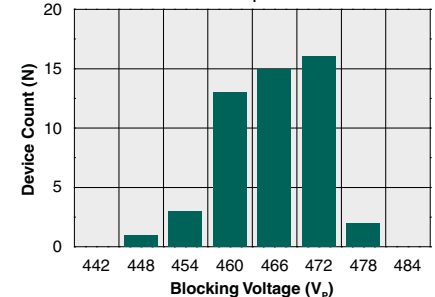
Typical Turn-On Time
(N=50, $I_F=5mA$, $I_L=100mA$)



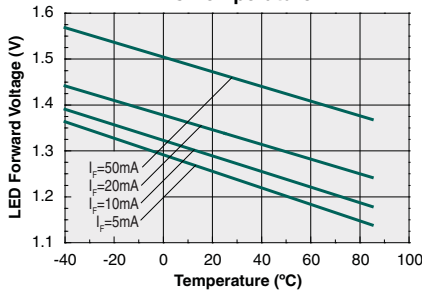
Typical Turn-Off Time
(N=50, $I_F=5mA$, $I_L=100mA$)



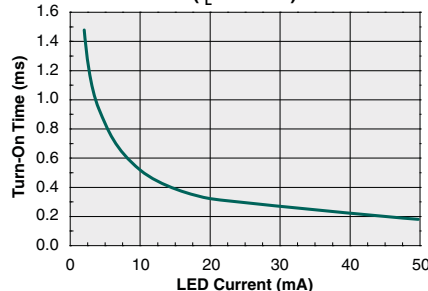
Typical Blocking Voltage Distribution
(N=50, $I_F=0mA$)



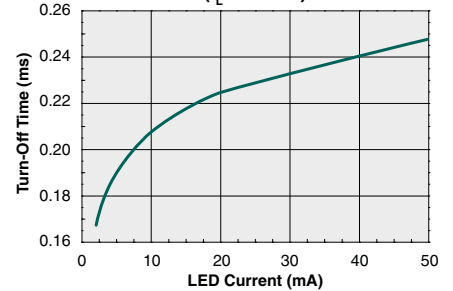
Typical LED Forward Voltage Drop vs. Temperature



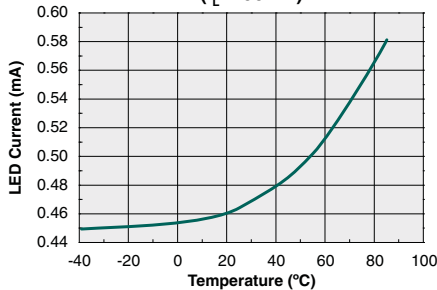
Typical Turn-On Time vs. LED Forward Current
($I_L=100mA$)



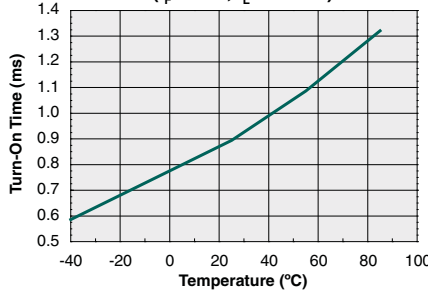
Typical Turn-Off Time vs. LED Forward Current
($I_L=100mA$)



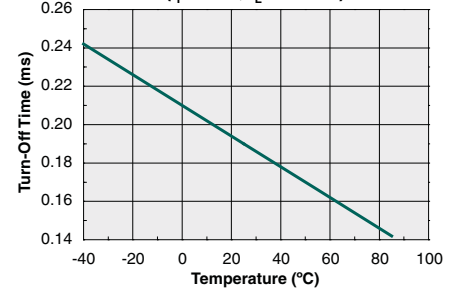
Typical I_F for Switch Operation vs. Temperature
($I_L=100mA$)



Typical Turn-On Time vs. Temperature
($I_F=5mA$, $I_L=100mA$)



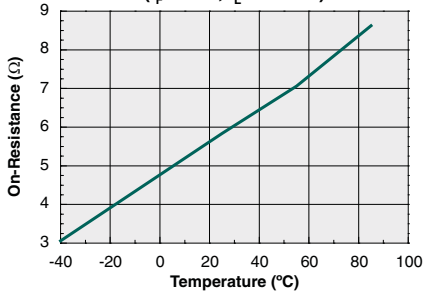
Typical Turn-Off Time vs. Temperature
($I_F=5mA$, $I_L=100mA$)



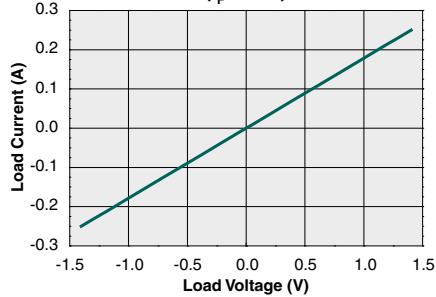
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

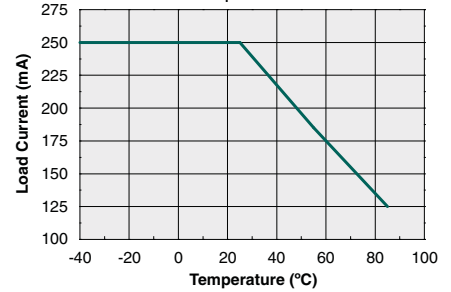
**Typical On-Resistance vs. Temperature
AC/DC Configuration
($I_F=5mA$, $I_L=100mA$)**



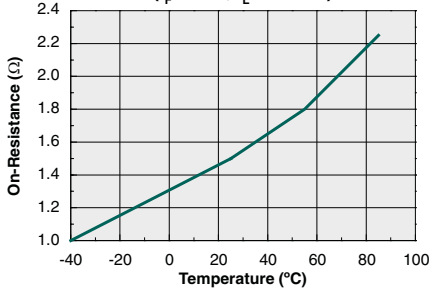
**Typical Load Current vs. Load Voltage
AC/DC Configuration
($I_F=5mA$)**



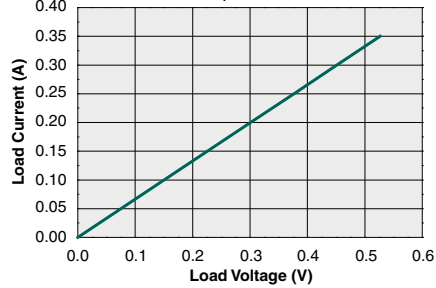
**Maximum Load Current
vs. Temperature - AC/DC Configuration
($I_F=5mA$)**



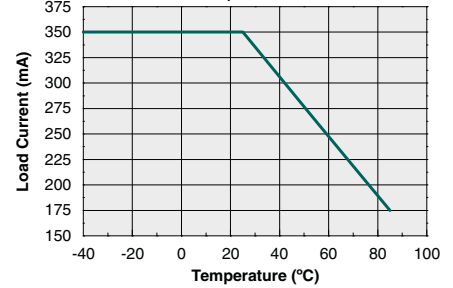
**Typical On-Resistance vs. Temperature
DC-Only Configuration
($I_F=5mA$, $I_L=100mA$)**



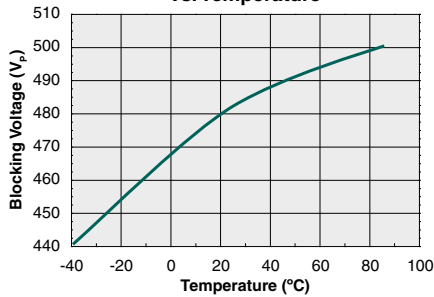
**Typical Load Current vs. Load Voltage
DC-Only Configuration
($I_F=5mA$)**



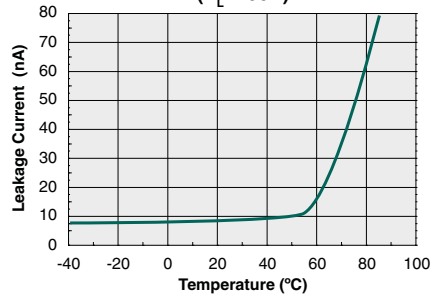
**Maximum Load Current
vs. Temperature - DC-Only Configuration
($I_F=5mA$)**



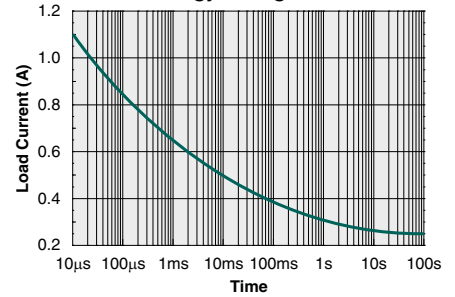
**Typical Blocking Voltage
vs. Temperature**



**Typical Leakage vs. Temperature
Measured Across Pins 4&6
($V_L=400V$)**



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 |
|------------------|---|
| PLA140 / PLA140S | 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 |
|------------------|----------------------------|
| PLA140 / PLA140S | 250°C for 30 seconds |

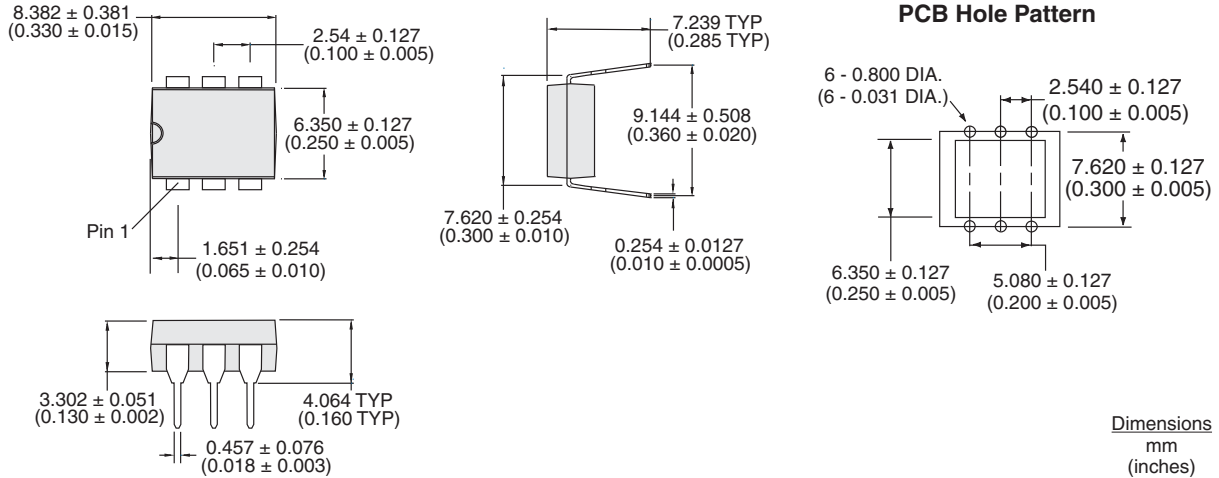
Board Wash

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.

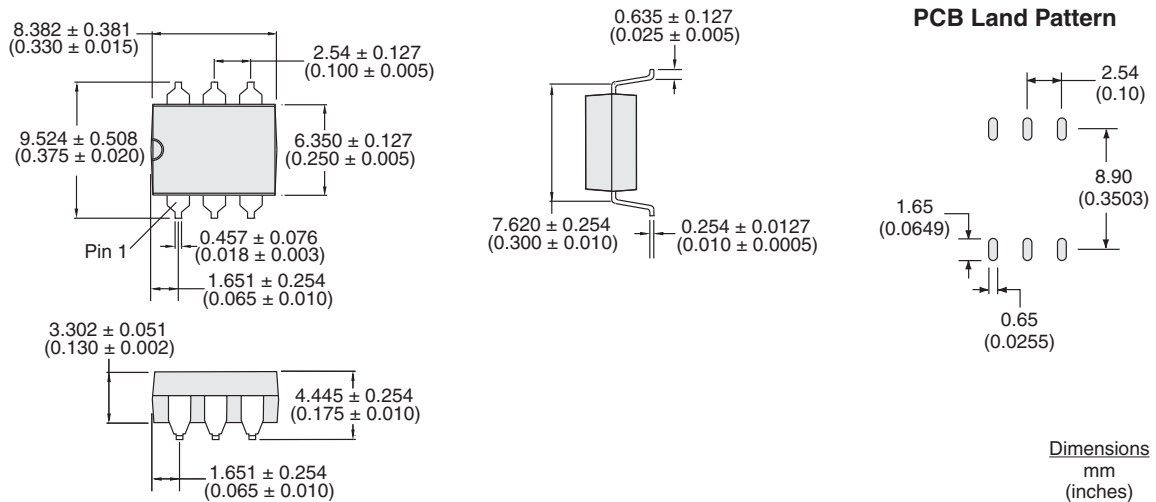


MECHANICAL DIMENSIONS

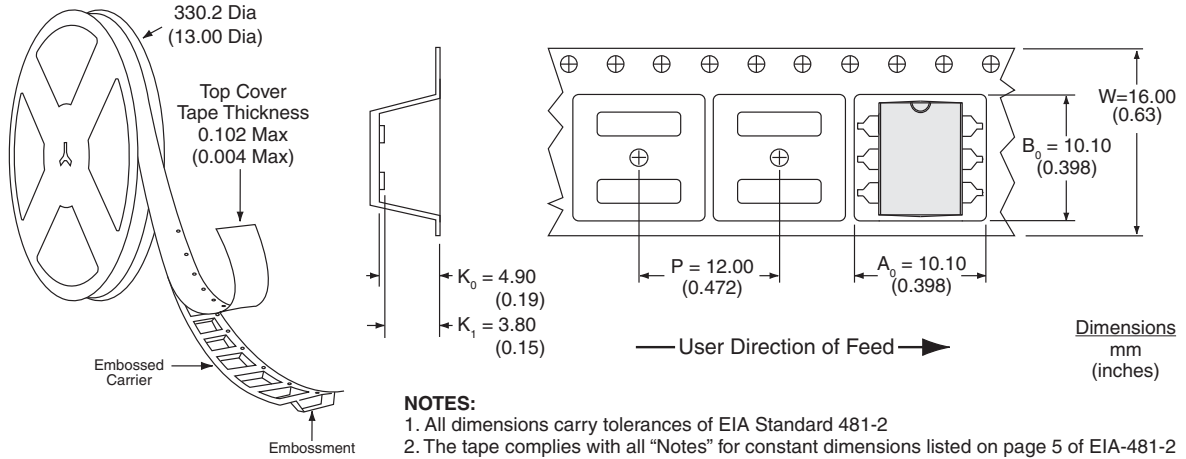
PLA140



PLA140S



PLA140STR Tape & Reel



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

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