IXYS
INTEGRATED CIRCUITS DIVISION



PLA170
Single-Pole, Normally Open OptoMOS® Relay

Parameter	Rating	Units
Blocking Voltage	800	V_P
Load Current		
AC/DC Configuration	100	mA_{rms} / mA_{DC}
DC Configuration	180	mA_{DC}
On-Resistance (max)		
AC/DC Configuration	50	Ω
DC Configuration	14	

Features

- 800V_P Blocking Voltage
- 3750V_{rms} Input/Output Isolation
- 100% Solid State
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 6-Pin Package
- Machine Insertable, Wave Solderable

Applications

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

Description

PLA170 is a single-pole, normally open (1-Form-A) Solid State Relay that uses optically coupled MOSFET technology to provide an enhanced input-to-output isolation of 3750V_{rms}.

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

Designed to replace electromechanical relays, the PLA170 offers the superior reliability associated with solid state devices, and provides bounce-free switching in a more compact surface mount or thru-hole package.

Approvals

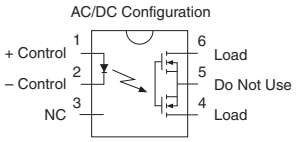
- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1175739
- EN/IEC 60950-1 Certified Component: TUV Certificate B 09 07 49410 004

Ordering Information

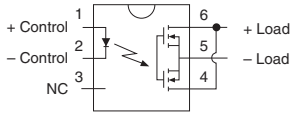
Part #	Description
PLA170	6-Pin DIP (50/tube)
PLA170S	6-Pin Surface Mount (50/tube)
PLA170STR	6-Pin Surface Mount (1000/Reel)

Pin Configuration

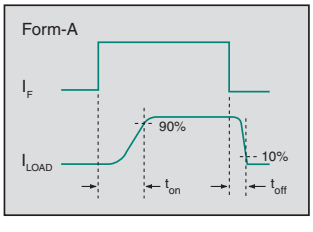
AC/DC Configuration



DC Only Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	800	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 / ºC
[2] Derate linearly 6.67 mW / ºC

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.

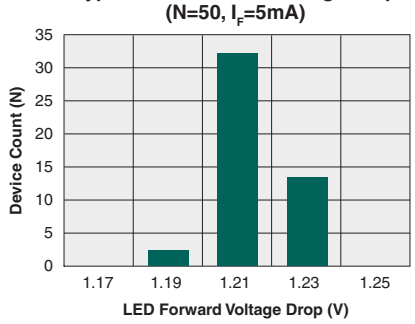
Electrical Characteristcs @ 25ºC

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current, Continuous						
AC/DC Configuration [1]	-	I_L	-	-	100	mA_{rms} / mA_{DC}
DC Configuration					180	mA_{DC}
Peak Load Current	t=10ms	I_{LPK}	-	-	±350	mA_P
On-Resistance [2]						
AC/DC Configuration	I_L=Load Current	R_{ON}	-	-	50	Ω
DC Configuration			-	-	14	
Off-State Leakage Current	V_L=800V_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 [3]	I_L=Load Current	I_F	-	-	5	mA
Input Control Current to Deactivate	-	I_F	0.3	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

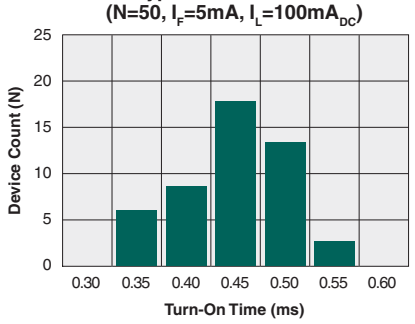
[1] Load derates linearly from 100mA @ 25ºC to 90mA @80ºC.
[2] Measurement taken within 1 second of on-time.
[3] For applications requiring high temperature operation (greater than 60ºC) a LED drive current of 10mA is recommended.

PERFORMANCE DATA @ 25ºC (Unless Otherwise Noted) *

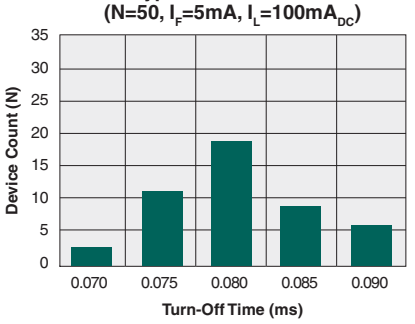
Typical LED Forward Voltage Drop (N=50, I_F=5mA)



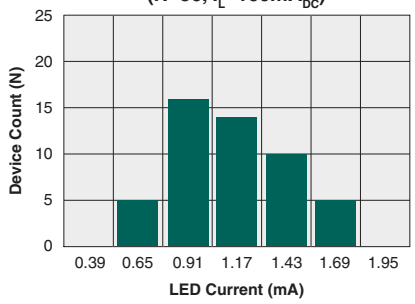
Typical Turn-On Time (N=50, I_F=5mA, I_L=100mA$_{DC}$)



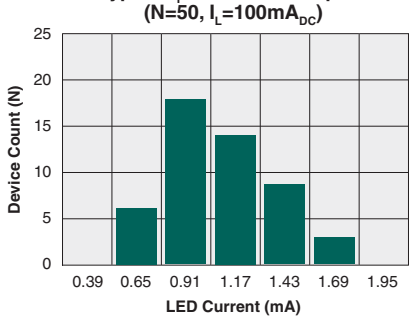
Typical Turn-Off Time (N=50, I_F=5mA, I_L=100mA$_{DC}$)



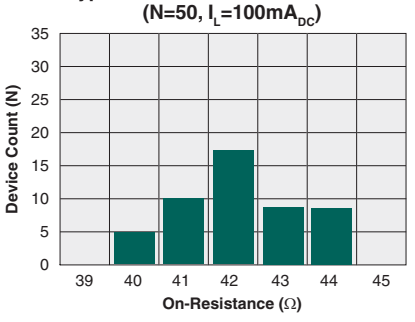
Typical I_F for Switch Operation (N=50, I_L=100mA$_{DC}$)



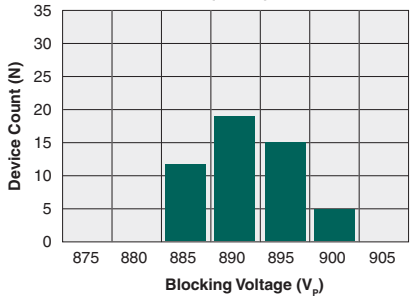
Typical I_F for Switch Dropout (N=50, I_L=100mA$_{DC}$)



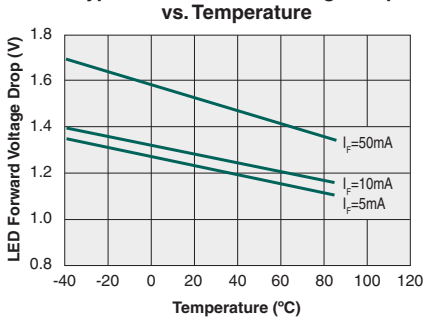
Typical On-Resistance Distribution (N=50, I_L=100mA$_{DC}$)



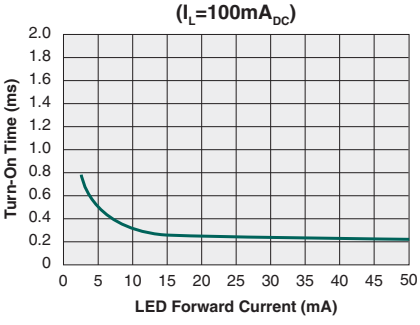
Typical Blocking Voltage Distribution (N=50)



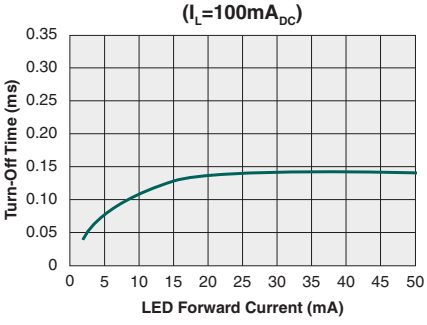
Typical LED Forward Voltage Drop vs. Temperature



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



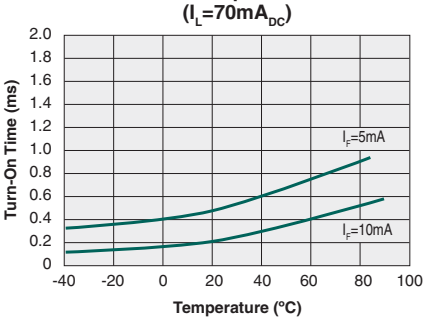
Typical Turn-Off Time vs. LED Forward Current (I_L=100mA$_{DC}$)



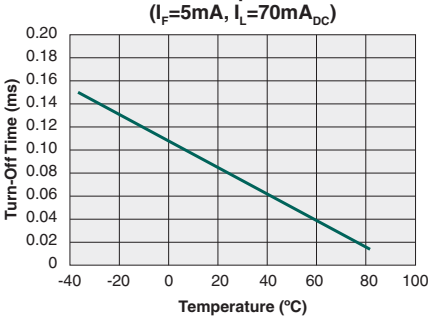
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA @ 25ºC (Unless Otherwise Noted) *

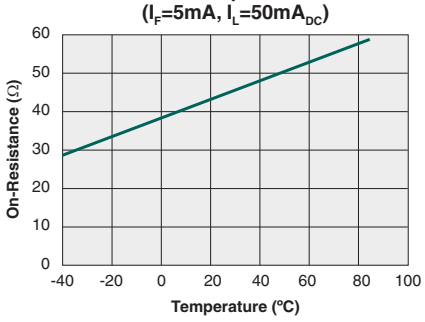
Typical Turn-On Time vs. Temperature (I_L=70mA$_{DC}$)



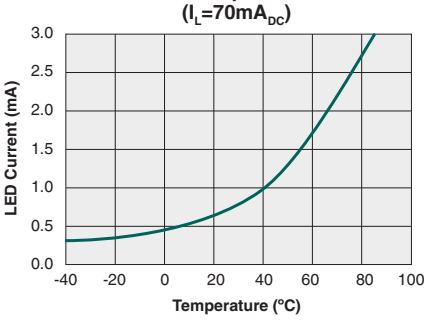
Typical Turn-Off Time vs. Temperature (I_F=5mA, I_L=70mA$_{DC}$)



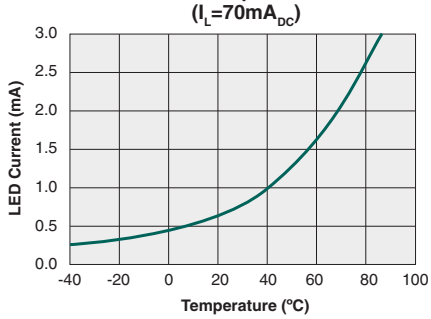
Typical On-Resistance vs. Temperature (I_F=5mA, I_L=50mA$_{DC}$)



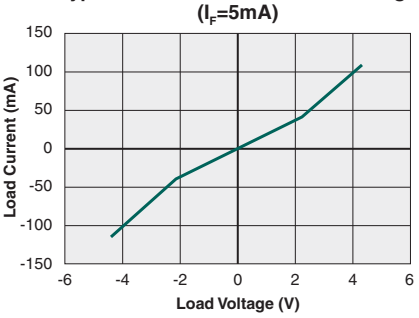
Typical I_F for Switch Operation vs. Temperature (I_L=70mA$_{DC}$)



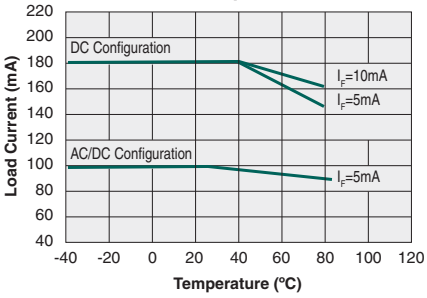
Typical I_F for Switch Dropout vs. Temperature (I_L=70mA$_{DC}$)



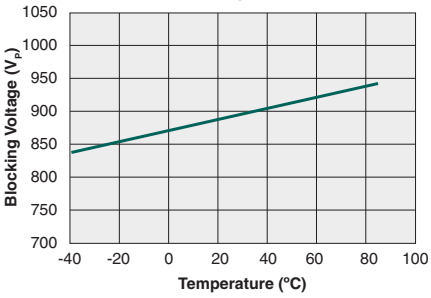
Typical Load Current vs. Load Voltage (I_F=5mA)



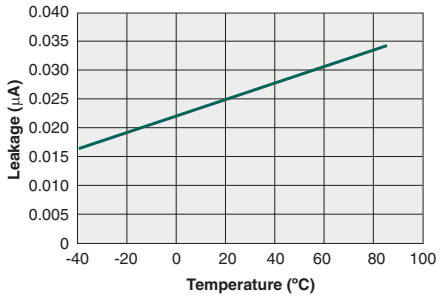
Maximum Load Current vs. Temperature



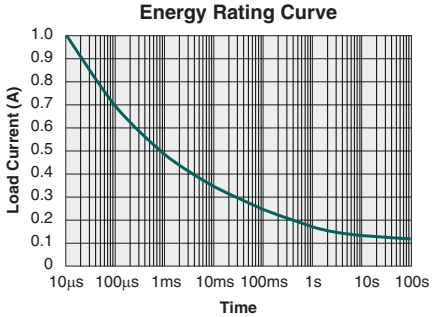
Typical Blocking Voltage vs. Temperature



Typical Leakage vs. Temperature Measured across Pins 4&6



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 ingression. 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
PLA170 / PLA170S	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
PLA170 / PLA170S	250°C for 30 seconds

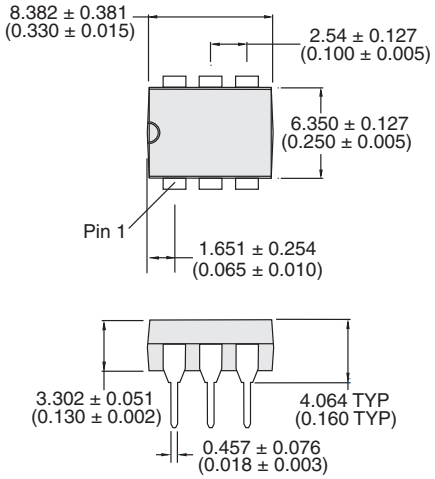
Board Wash

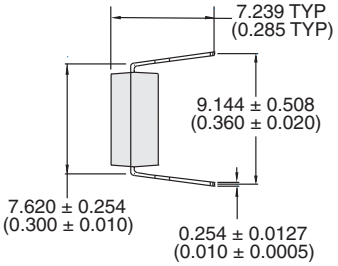
IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a 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.



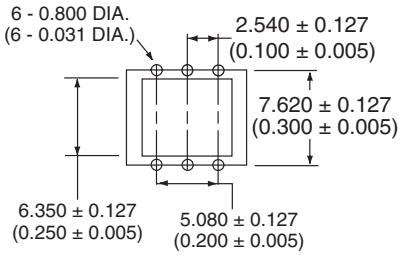
Mechanical Dimensions

PLA170



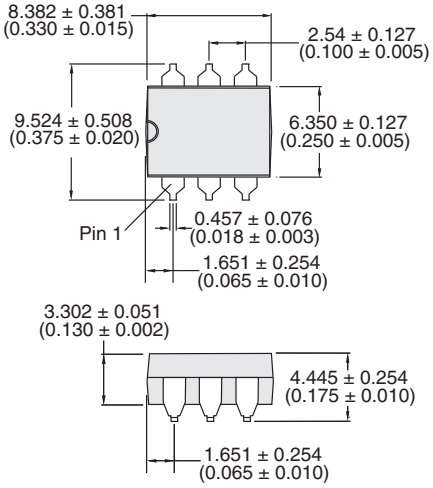


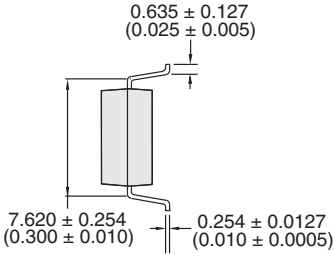
PCB Hole Pattern



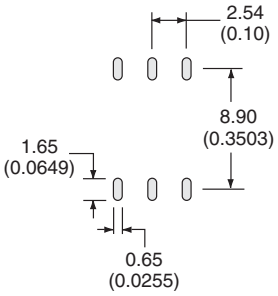
Dimensions
mm
(inches)

PLA170S



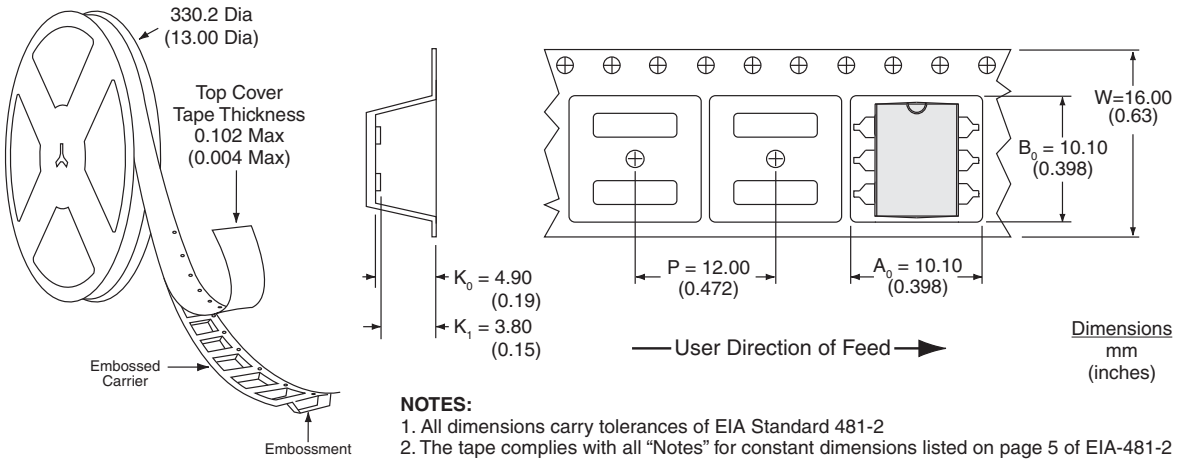


PCB Land Pattern



Dimensions
mm
(inches)

PLA170STR 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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Specification: DS-PLA170-R04
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