IXYS
INTEGRATED CIRCUITS DIVISION

PLA194
Single-Pole, Normally Open OptoMOS® Relay

Parameters	Ratings	Units
Blocking Voltage	600	V_P
Load Current	130	mA_{rms} / mA_{DC}
On-Resistance (max)	35	Ω

Features
- 5000V_{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 6-Pin Package
- Machine Insertable, Wave Solderable

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

Description
The PLA194 is a single-pole, normally open (1-Form-A) solid state relay that uses optically coupled relay technology to provide an enhanced 5000V_{rms} isolation barrier between the input and the output of the relay.

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

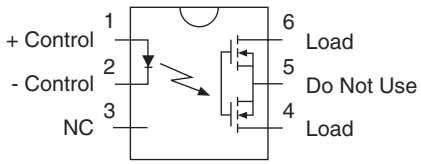
Approvals
- UL-Recognized Component: File Number E76270
- CSA Certified Component: Certificate 1117539
- Certified to EN/IEC 60950-1: TUV Certificate B 10 05 49410 006

Ordering Information

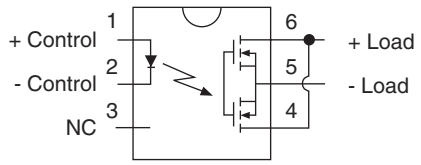
Part #	Description
PLA194	6-Pin DIP (50/Tube)
PLA194S	6-Pin Surface Mount (50/Tube)
PLA194STR	6-Pin Surface Mount (1000/Reel)

Pin Configuration

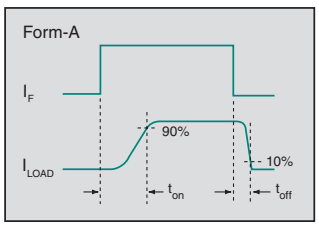
AC/DC Configuration



DC-Only Configuration



Switching Characteristics of Normally Open Devices



ПРОМЭЛЕКТРОНИКА / sales@prom-elec.com

Absolute Maximum Ratings @ 25ºC

Parameter	Min	Max	Units
Blocking Voltage	-	600	V_P
Reverse Input Voltage	-	5	V
Input Control Current	-	50	mA
Peak (10ms)	-	1	A
Input Power Dissipation [1]	-	150	mW
Total Package Dissipation [2]	-	800	mW
ESD Rating, Human Body Model	8	-	kV
Isolation Voltage, Input to Output	5000	-	V_{rms}
Operational Temperature	-40	85	ºC
Storage Temperature	-40	125	ºC

[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 Characteristics @ 25ºC

Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current [1]						
Continuous, AC/DC Configuration	-	I_L	-	-	130	mA_{rms} / mA_{DC}
Continuous, DC-Only Configuration	-	I_L	-	-	200	mA_{DC}
Peak	t=10ms	I_{LPK}	-	-	±400	mA_P
On-Resistance [2]						
AC/DC Configuration	I_L=130mA	R_{ON}	-	26	35	Ω
DC-Only Configuration	I_L=200mA	R_{ON}	-	-	18	Ω
Off-State Leakage Current	V_L=600V_P	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{on}	-	0.85	3	ms
Turn-Off	I_F=5mA, V_L=10V	t_{off}	-	0.46	2	ms
Output Capacitance	V_L=50V, f=1MHz	C_{OUT}	-	5	-	pF
Input Characteristics						
Input Control Current to Activate [3]	I_L=130mA	I_F	-	0.44	2	mA
Input Control Current to Deactivate	-	I_F	0.1	-	-	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

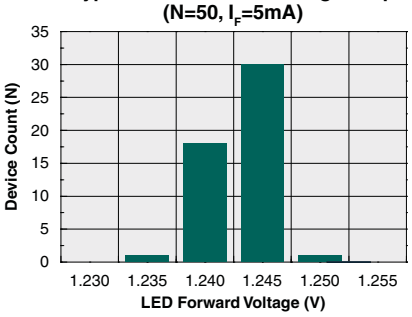
[1] Load current derates linearly from 130mA @ 25ºC to 65mA @ 85ºC.

[2] Measurement taken within 1 second of on-time.

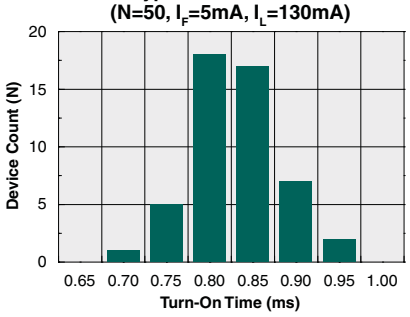
[3] For applications requiring high temperature operation (greater than 60ºC), a LED drive current of 3mA is recommended.

PERFORMANCE DATA @ 25ºC (Unless Otherwise Noted) *

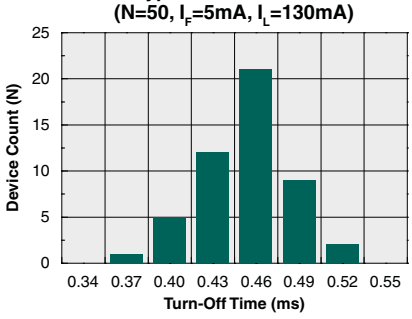
Typical LED Forward Voltage Drop (N=50, I_F=5mA)



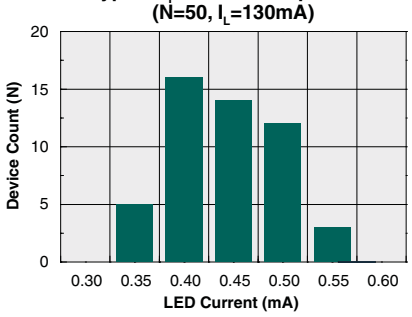
Typical Turn-On Time (N=50, I_F=5mA, I_L=130mA)



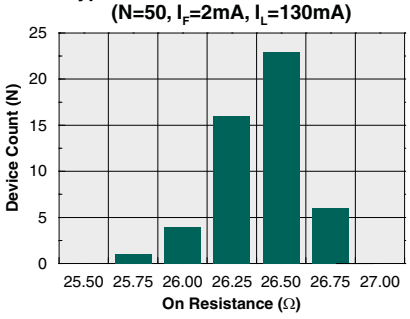
Typical Turn-Off Time (N=50, I_F=5mA, I_L=130mA)



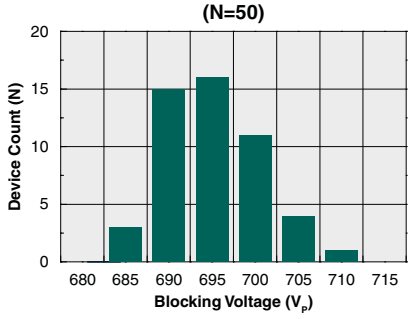
Typical I_F for Switch Operation (N=50, I_L=130mA)



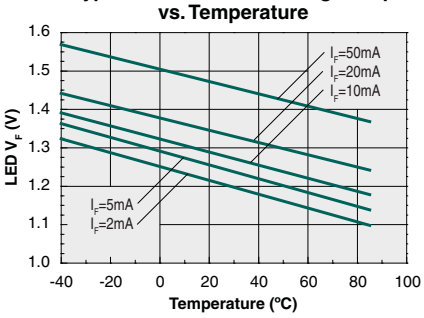
Typical On-Resistance Distribution (N=50, I_F=2mA, I_L=130mA)



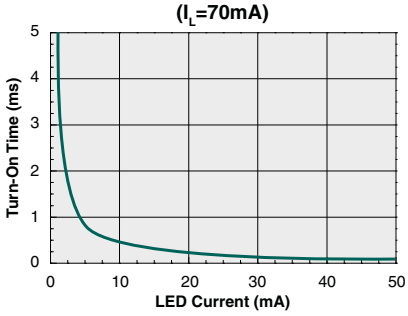
Typical Blocking Voltage Distribution (N=50)



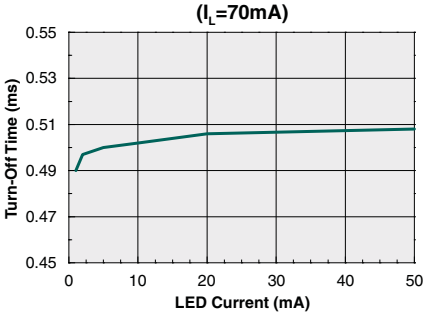
Typical LED Forward Voltage Drop vs. Temperature



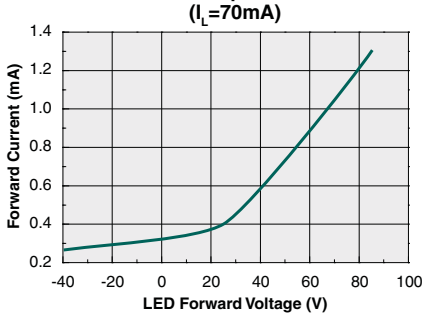
Typical Turn-On Time vs. LED Forward Current (I_L=70mA)



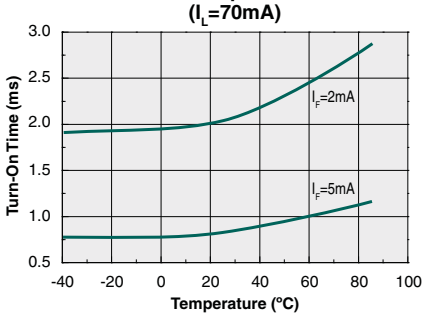
Typical Turn-Off Time vs. LED Forward Current (I_L=70mA)



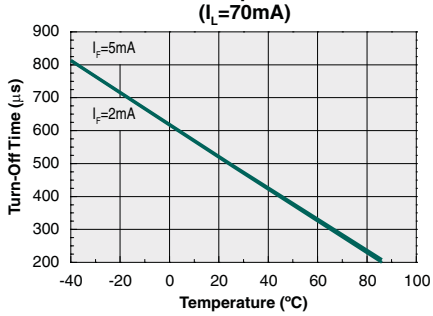
Typical I_F for Switch Operation vs. Temperature (I_L=70mA)



Typical Turn-On Time vs. Temperature (I_L=70mA)



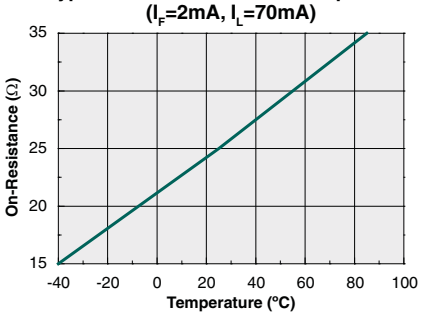
Typical Turn-Off Time vs. Temperature (I_L=70mA)



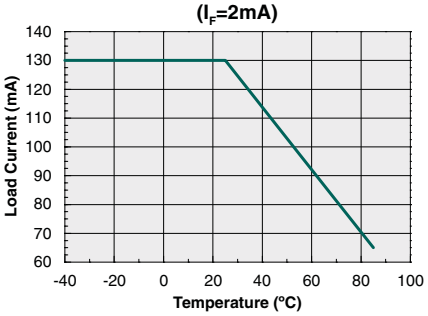
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA @ 25ºC (Unless Otherwise Noted) *

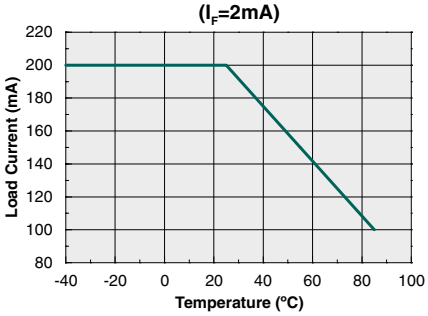
Typical On-Resistance vs. Temperature (I_F=2mA, I_L=70mA)



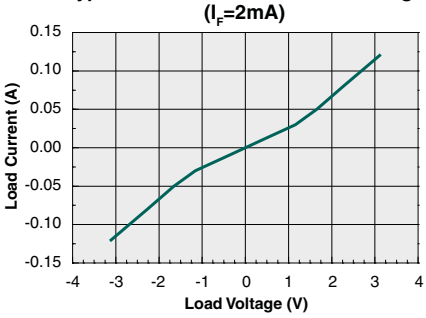
Maximum Load Current vs. Temperature AC/DC Configuration (I_F=2mA)



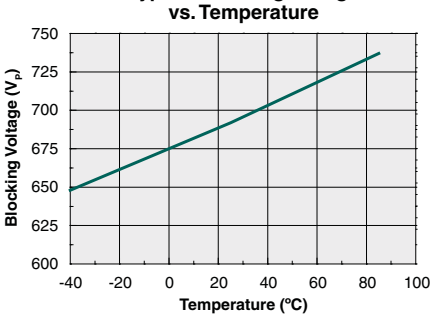
Maximum Load Current vs. Temperature DC-Only Configuration (I_F=2mA)



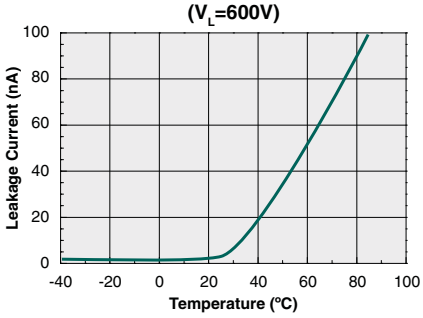
Typical Load Current vs. Load Voltage (I_F=2mA)



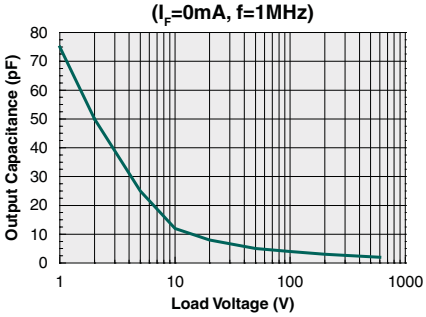
Typical Blocking Voltage vs. Temperature



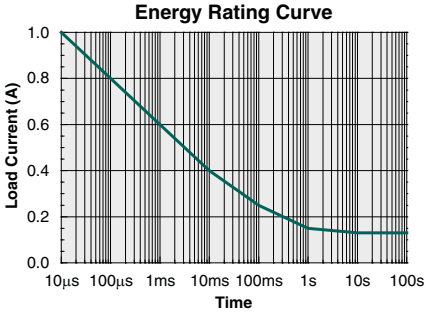
Typical Leakage vs. Temperature (V_L=600V)



Output Capacitance vs. Load Voltage (I_F=0mA, f=1MHz)



Energy Rating Curve



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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
PLA194 / PLA194S	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.

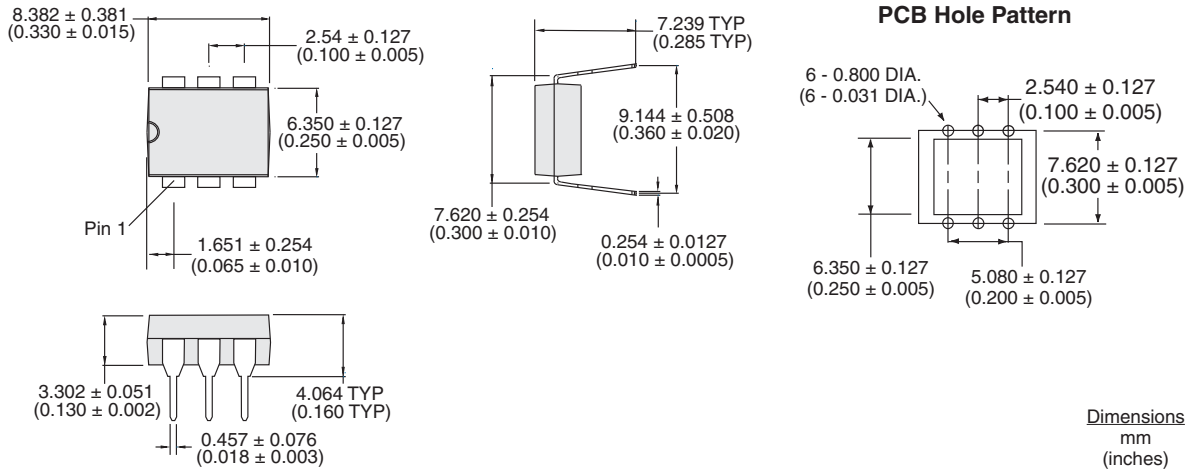
Device	Maximum Temperature x Time
PLA194 / PLA194S	250°C for 30 seconds

Board Wash

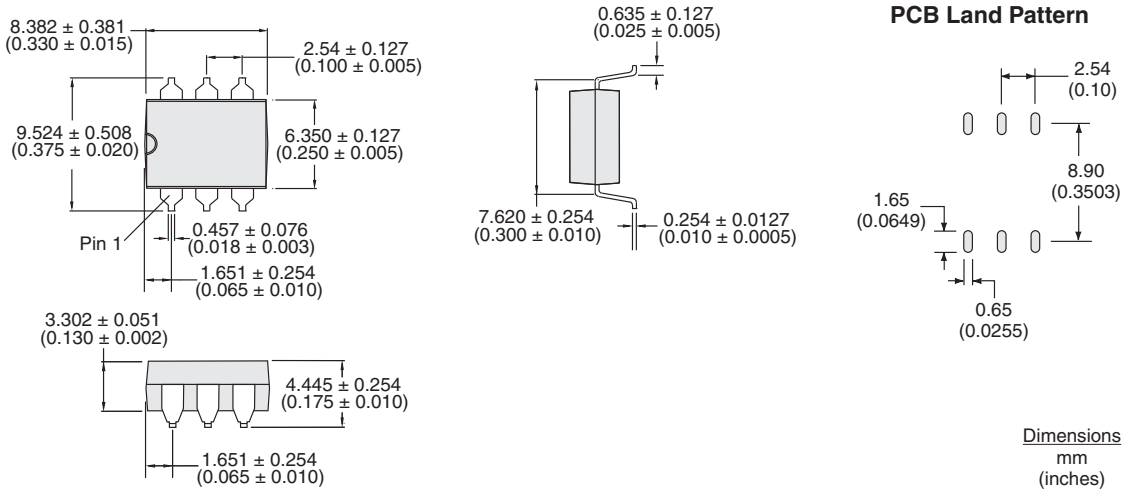
IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a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

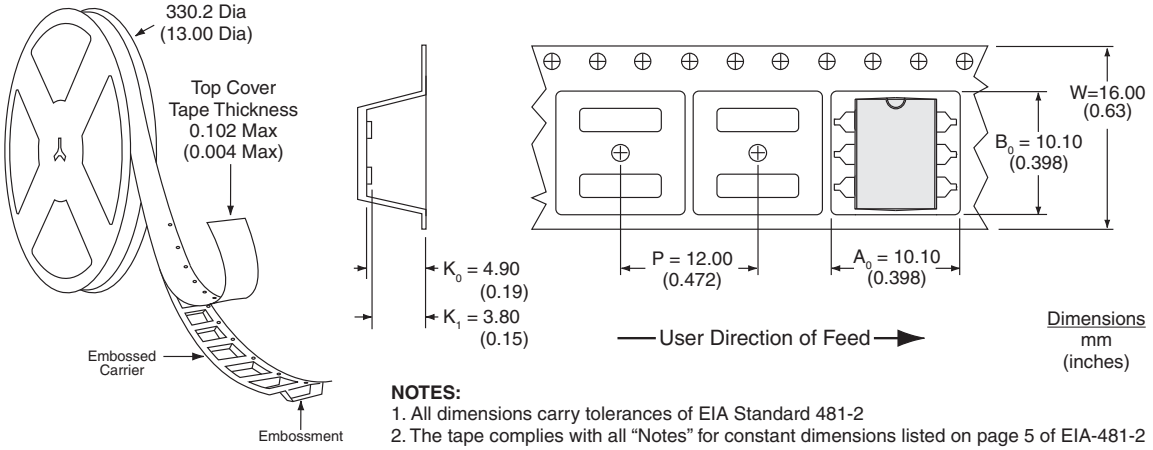
PLA194



PLA194S



PLA194STR 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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