PLA134
Single-Pole, Normally Open OptoMOS® Relay

Parameter	Rating	Units
Blocking Voltage	100	V_P
Load Current	350	mA
Max On-resistance	3	Ω

Features

- 3750V_{rms} Input/Output Isolation
- Small 6-Pin Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount Tape & Reel Version Available
- Flammability Classification Rating of V-0

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

The PLA134 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. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture. The optically coupled output is controlled by a highly efficient GaAlAs infrared LED.

The PLA134's combination of low on-resistance and high load current handling makes it suitable for a variety of industrial applications. Because Solid State Relays have no moving parts, they can offer faster, bounce-free switching in a more compact surface mount or though hole package than traditional electromechanical relays.

Approvals

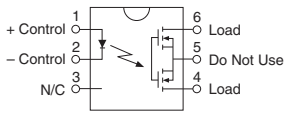
- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1175739
- EN/IEC 60950-1 Certified Component: TUV Certificate B 09 07 49410 004

Ordering Information

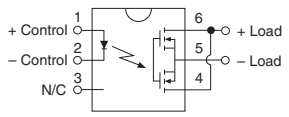
Part Number	Description
PLA134	6-Pin DIP (50/Tube)
PLA134S	6-Pin Surface Mount (50/Tube)
PLA134STR	6-Pin Surface Mount (1,000/Reel)

Pin Configuration

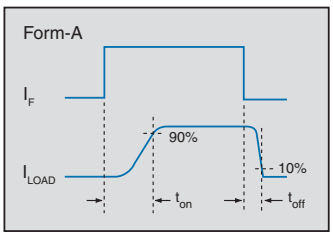
AC/DC Configuration



DC Only Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	100	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

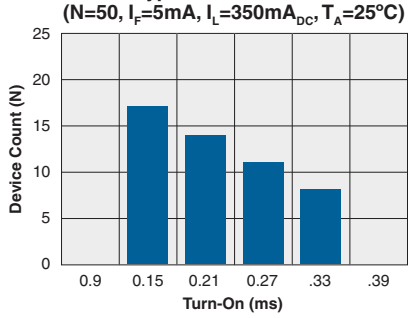
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics @ 25ºC

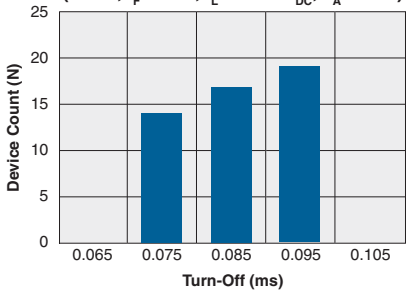
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current (Continuous)						
AC/DC Configuration	-	I_L	-	-	350	mA
DC Configuration			-	-	750	
Peak Load Current	t=10ms	I_{LPK}	-	-	1	A
On-Resistance						
AC/DC Configuration	I_F=350mA	R_{ON}	-	-	3	Ω
DC Configuration	I_F=750mA		-	-	0.8	
Off-State Leakage Current	V_L=100V_P	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, I_L=10mA	t_{on}	-	-	5	ms
Turn-Off		t_{off}				
Input Characteristics						
Input Control Current	I_L=350mA	I_F	-	-	5	mA
Input Dropout Current	-	I_F	0.4	-	-	mA
Input Voltage Drop	I_F=10mA	V_F	0.9	1.2	1.4	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Capacitance, Input to Output	-	$C_{I/O}$	-	3	-	pF

PERFORMANCE DATA*

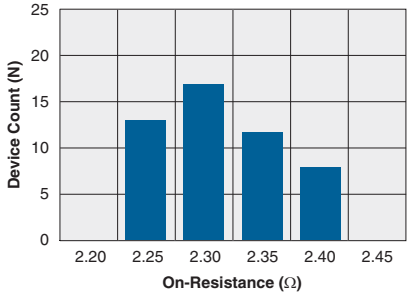
Typical Turn-On Time
(N=50, I_F=5mA, I_L=350mA$_{DC}$, T_A=25°C)



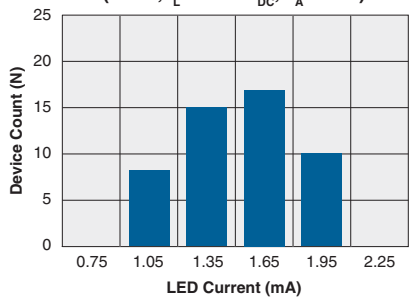
Typical Turn-Off Time
(N=50, I_F=5mA, I_L=350mA$_{DC}$, T_A=25°C)



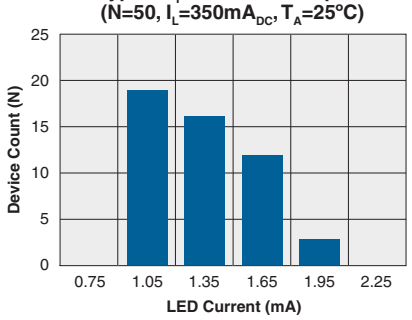
Typical On-Resistance Distribution
(N=50, I_F=5mA, I_L=350mA$_{DC}$, T_A=25°C)



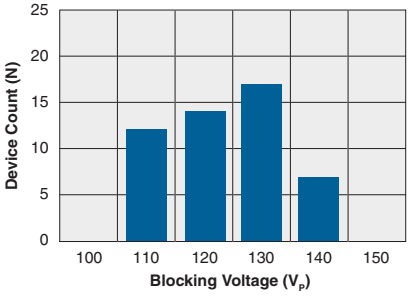
Typical I_F for Switch Operation
(N=50, I_L=350mA$_{DC}$, T_A=25°C)



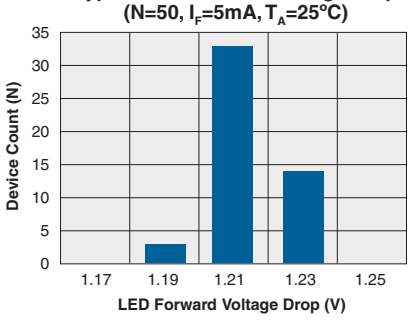
Typical I_F for Switch Dropout
(N=50, I_L=350mA$_{DC}$, T_A=25°C)



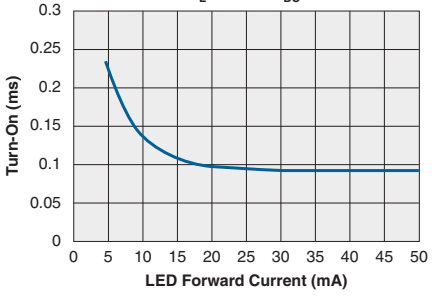
Typical Blocking Voltage Distribution
(N=50, T_A=25°C)



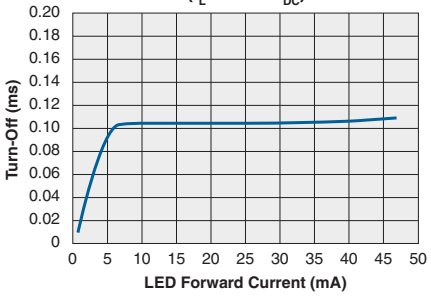
Typical LED Forward Voltage Drop
(N=50, I_F=5mA, T_A=25°C)



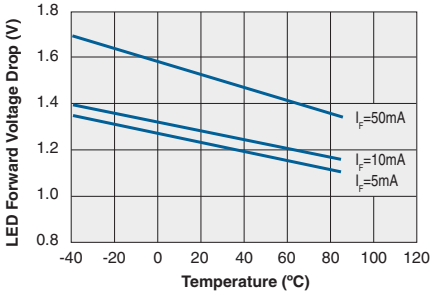
Typical Turn-On
vs. LED Forward Current
(I_L=200mA$_{DC}$)



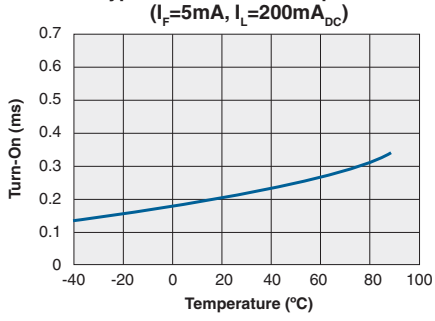
Typical Turn-Off
vs. LED Forward Current
(I_L=200mA$_{DC}$)



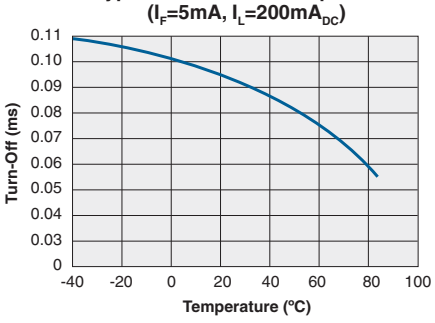
Typical LED Forward Voltage Drop
vs. Temperature



Typical Turn-On vs. Temperature
(I_F=5mA, I_L=200mA$_{DC}$)



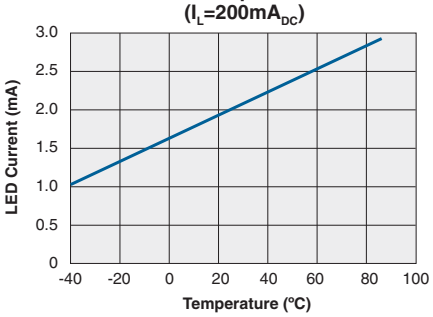
Typical Turn-Off vs. Temperature
(I_F=5mA, I_L=200mA$_{DC}$)



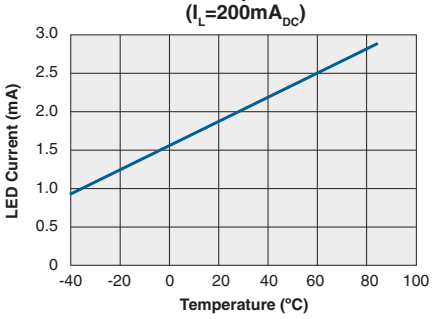
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

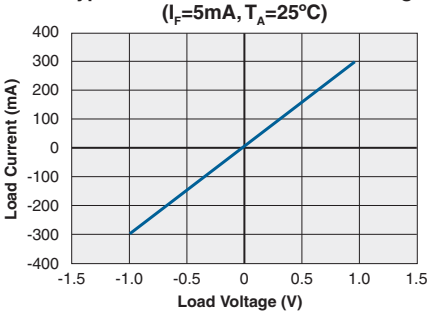
Typical I_F for Switch Operation vs. Temperature (I_L=200mA$_{DC}$)



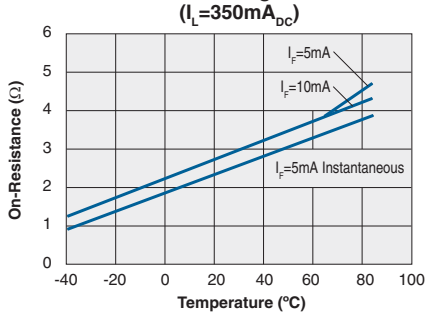
Typical I_F for Switch Dropout vs. Temperature (I_L=200mA$_{DC}$)



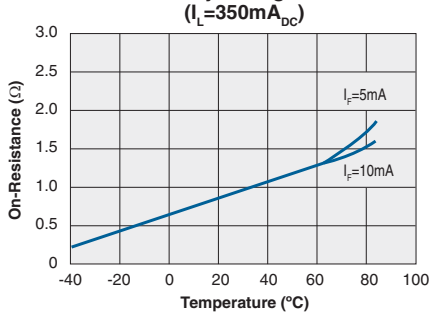
Typical Load Current vs. Load Voltage (I_F=5mA, T_A=25°C)



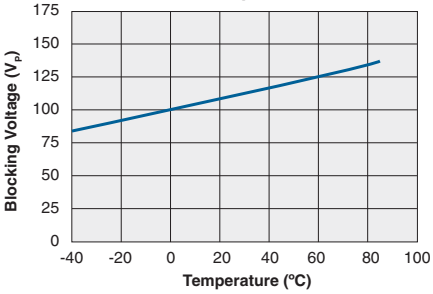
Typical On-Resistance vs. Temperature AC/DC Configuration (I_L=350mA$_{DC}$)



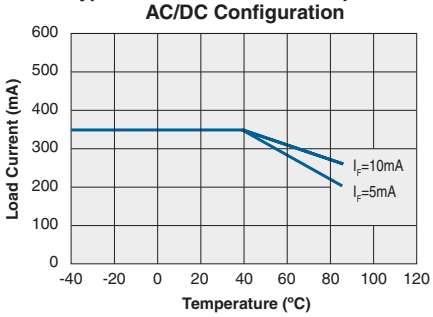
Typical On-Resistance vs. Temperature DC-Only Configuration (I_L=350mA$_{DC}$)



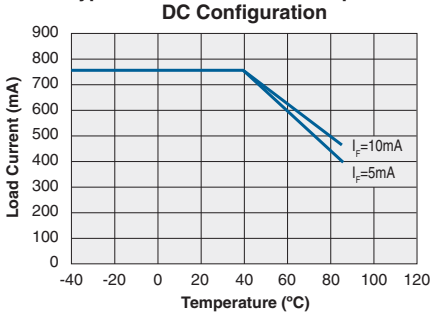
Typical Blocking Voltage vs. Temperature



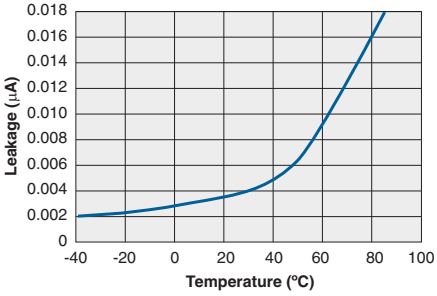
Typical Load Current vs. Temperature AC/DC Configuration



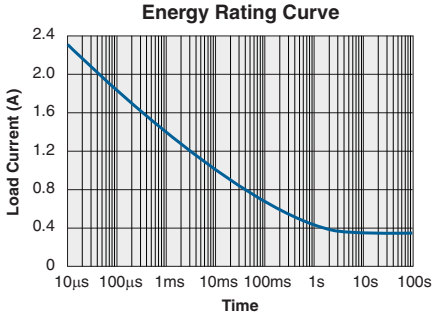
Typical Load Current vs. Temperature DC Configuration



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. Clare 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
PLA134 / PLA134S	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.

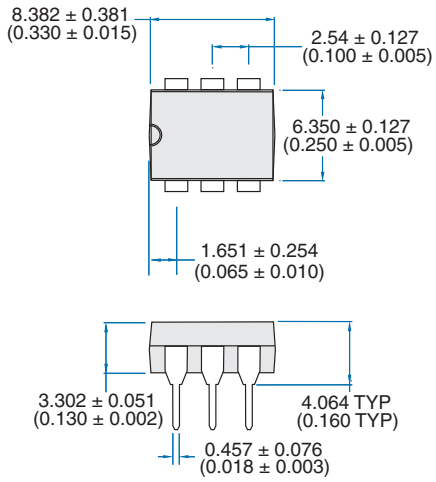
Device	Maximum Temperature x Time
PLA134 / PLA134S	250°C for 30 seconds

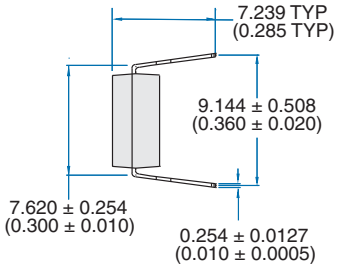
Board Wash

Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare 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.

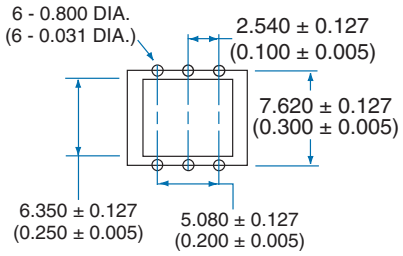
MECHANICAL DIMENSIONS

PLA134



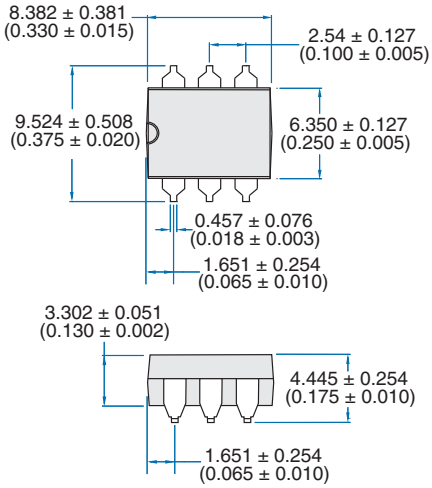


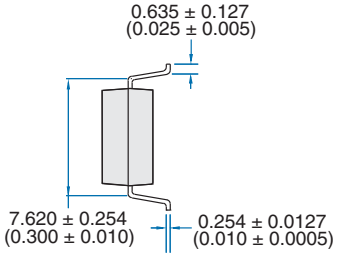
PCB Hole Pattern



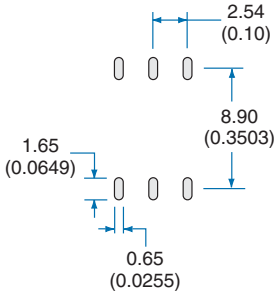
Dimensions
mm
(inches)

PLA134S



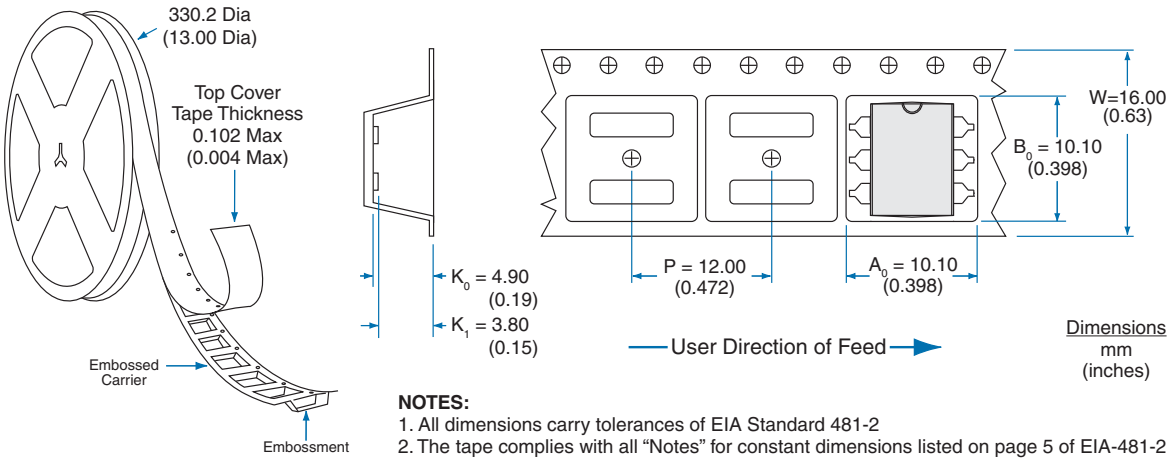


PCB Land Pattern



Dimensions
mm
(inches)

PLA134S



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.clare.com

Specification: DS-PLA134-R04

8/13/2010