PLA110

Single Pole OptoMOS® Relays



	PLA110	Units
Load Voltage	400	V
Load Current	150	mA
Max R_{ON}	22	Ω

Features

- Small 6 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V_{RMS} Input/Output Isolation
- FCC Compatible
- VDE Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

Applications

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringer Injection
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

Description

PLA110 is a 1-Form-A solid state relay which uses optically coupled MOSFET technology to provide 3750V of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS® architecture. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED. The PLA110 can be used to replace mechanical relays and offers the superior reliability associated with semiconductor devices. Because they have no moving parts, they can offer faster, bounce-free switching in a more compact surface mount or through hole package.

Approvals

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- BSI Certified:
  - BS EN 60950:1992 (BS7002:1992) Certificate #:7344
  - BS EN 41003:1993 Certificate #:7344

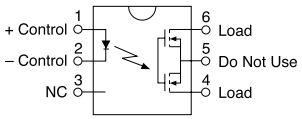
Ordering Information

Part #	Description
PLA110	6 Pin Dip (50/Tube)
PLA110S	6 Pin Surface Mount (50/Tube)
PLA110STR	6 Pin Surface Mount (1000/Reel)

Pin Configuration

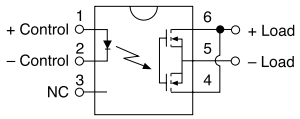
PLA110 Pinout

AC/DC Configuration

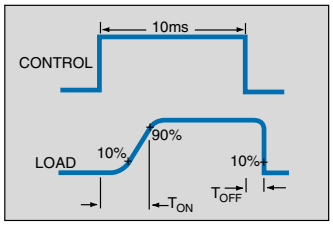


PLA110 Pinout

DC Only Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings (@ 25° C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150[1]	mW
Input Control Current	-	-	50	mA
Peak (10ms)	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800[2]	mW
Isolation Voltage Input to Output	3750	-	-	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature				
DIP Package	-	-	+260	°C
Surface Mount Package (10 Seconds Max.)	-	-	+220	°C

[1] Derate Linearly 1.33 mw/°C

[2] Derate Linearly 6.67 mw/°C

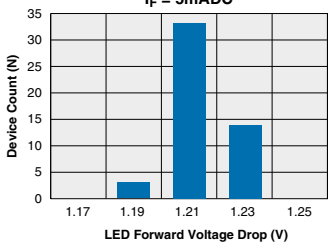
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.

Electrical Characteristics

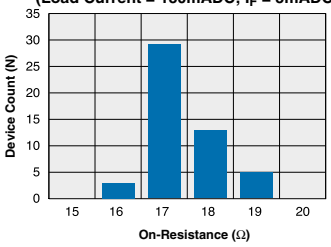
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Voltage (Peak)	-	V_L	-	-	400	V
Load Current (Continuous)						
AC/DC Configuration	-	I_L	-	-	150	mA
DC Configuration	-	I_L	-	-	250	mA
Peak Load Current	10ms	I_L	-	-	400	mA
On-Resistance						
AC/DC Configuration	I_L=150mA	R_{ON}	-	-	22	Ω
DC Configuration	I_L=250mA	R_{ON}	-	-	7	Ω
Off-State Leakage Current	V_L=400V	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	T_{ON}	-	-	1	ms
Turn-Off	I_F=5mA, V_L=10V	T_{OFF}	-	-	0.50	ms
Output Capacitance	50V; f=1MHz	C_{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current	I_L=150mA	I_F	5	-	50	mA
Input Dropout Current	-	I_F	0.4	0.7	-	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Reverse Input Voltage	-	V_R	-	-	5	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics @ 25°C						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF
Input to Output Isolation	-	$V_{I/O}$	3750	-	-	V_{RMS}

PERFORMANCE DATA*

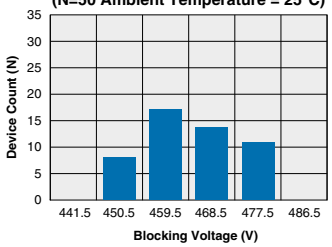
PLA110
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
I_F = 5mADC



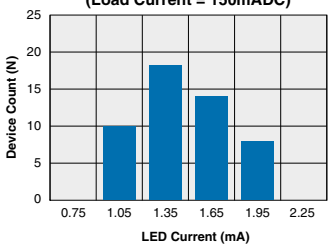
PLA110
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 150mADC; I_F = 5mADC)



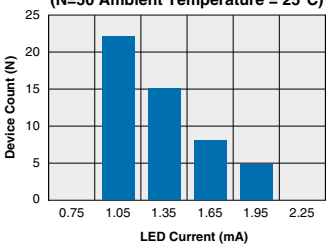
PLA110
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



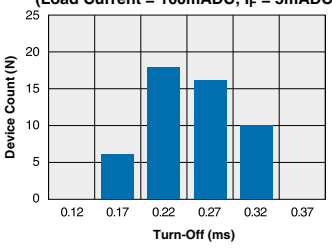
PLA110
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
(Load Current = 150mADC)



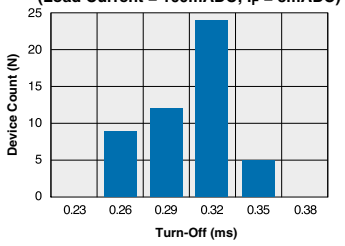
PLA110
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)



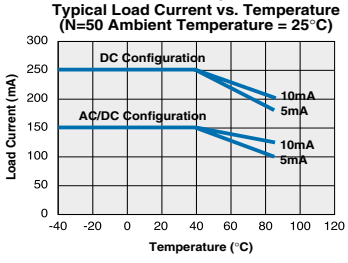
PLA110
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC; I_F = 5mADC)



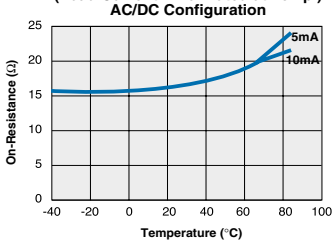
PLA110
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC; I_F = 5mADC)



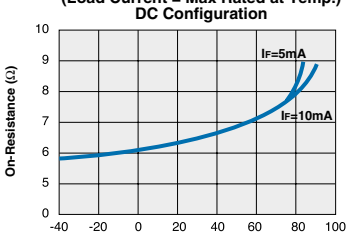
PLA110
Typical Load Current vs. Temperature
(N=50 Ambient Temperature = 25°C)



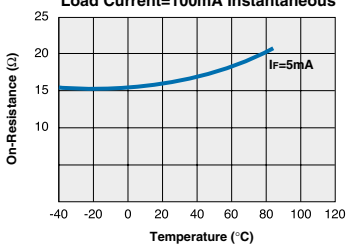
PLA110
Typical On-Resistance vs. Temperature
(Load Current = Max rated at Temp.)
AC/DC Configuration



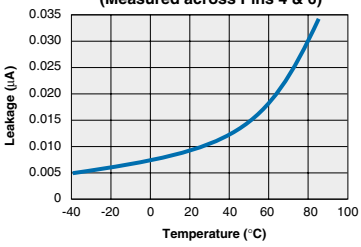
PLA110
Typical On-Resistance vs. Temperature
(Load Current = Max Rated at Temp.)
DC Configuration



PLA110
Typical On Resistance vs. Temp.
Load Current=100mA Instantaneous



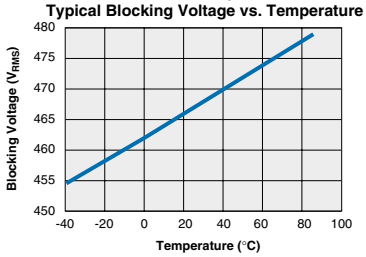
PLA110
Typical Leakage vs. Temperature
(Measured across Pins 4 & 6)



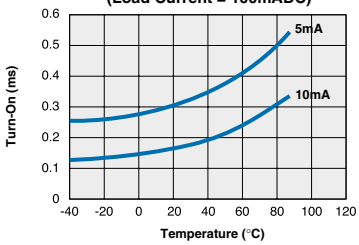
The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

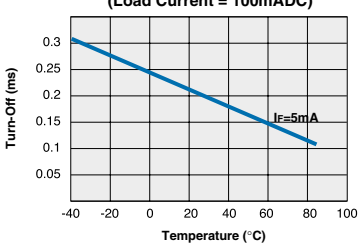
PLA110
Typical Blocking Voltage vs. Temperature



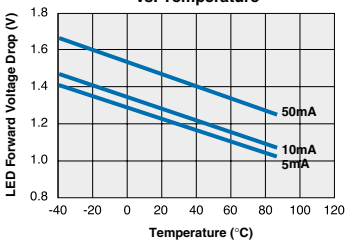
PLA110
Typical Turn-On vs. Temperature
(Load Current = 100mADC)



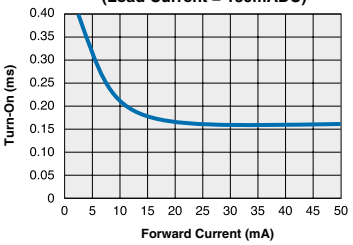
PLA110
Typical Turn-Off vs. Temperature
(Load Current = 100mADC)



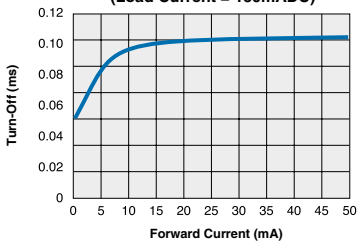
PLA110
Typical LED Forward Voltage Drop
vs. Temperature



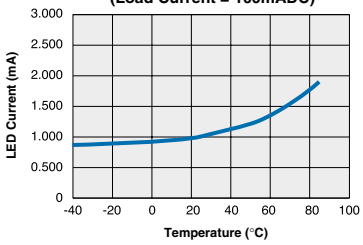
PLA110
Typical Turn-On vs. LED Forward Current
(Load Current = 150mADC)



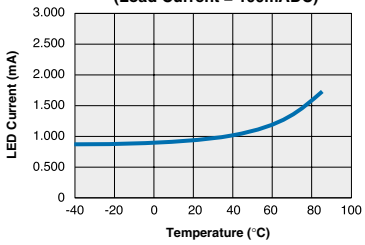
PLA110
Typical Turn-Off vs. LED Forward Current
(Load Current = 150mADC)



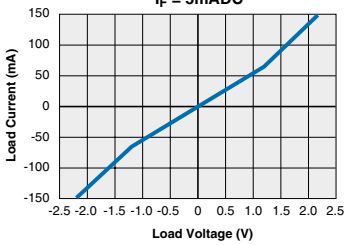
PLA110
Typical I_F for Switch Operation
vs. Temperature
(Load Current = 100mADC)



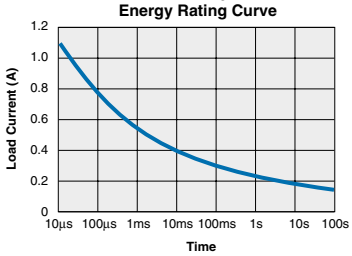
PLA110
Typical I_F for Switch Dropout
vs. Temperature
(Load Current = 100mADC)



PLA110
Typical Load Current vs. Load Voltage
(Ambient Temperature = 25°C)
I_F = 5mADC



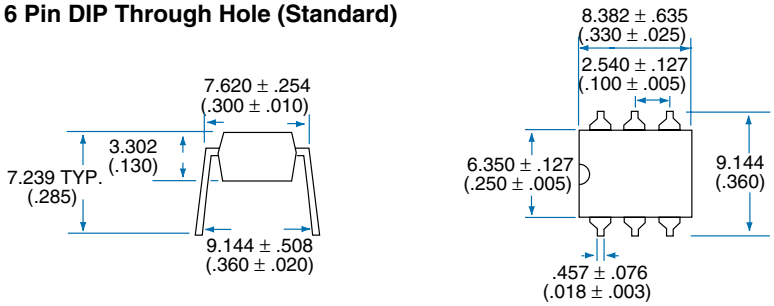
PLA110
Energy Rating Curve



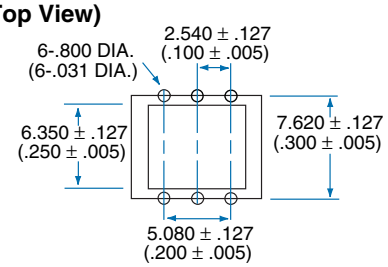
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Mechanical Dimensions

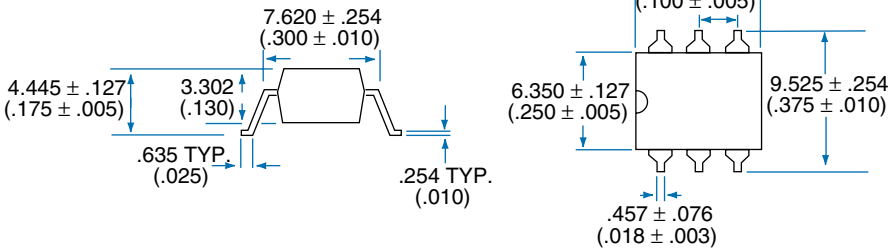
6 Pin DIP Through Hole (Standard)



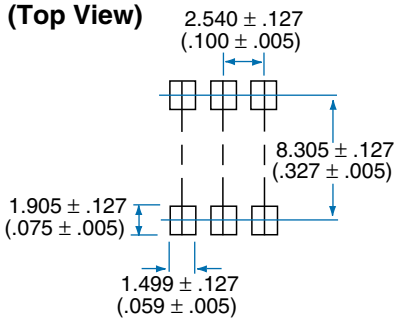
PC Board Pattern (Top View)



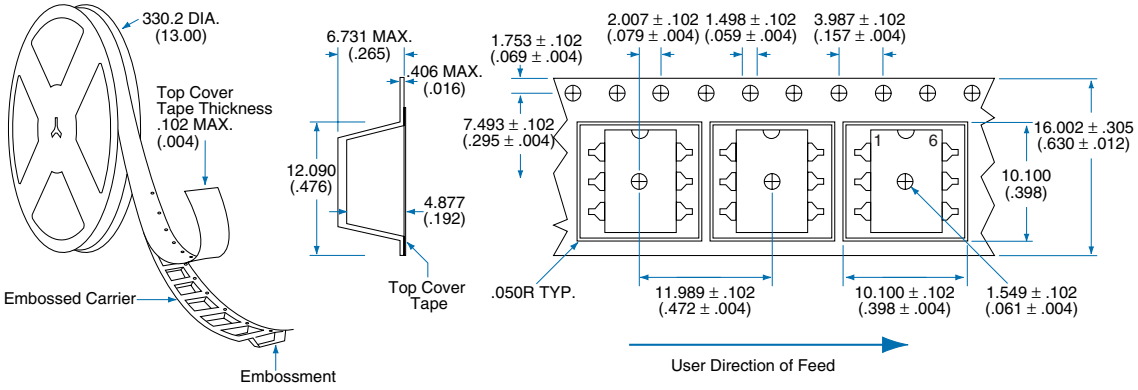
6 Pin DIP Surface Mount ("S" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 6 Pin Surface Mount Package



Dimensions
mm
(inches)

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Macro Solutions.

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Specification: DS-PLA110-R5
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4/3/01