PAA190

Dual Single Pole OptoMOS® Relays

	PAA190	Units
Blocking Voltage	400	V
Load Current	150	mA
Max R_{ON}	22	Ω

Features

- 5000V_{RMS} Input/Output Isolation
- Small 8 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available

Applications

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringing 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

PAA190 is a dual 400V, 150mA, 22Ω 1-Form-A solid state relay. This performance leader provides high blocking voltage handling capability and improved peak load current handling, and an enhanced 5000V isolation barrier between the input and output circuits of the relay.

Approvals

- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- Complies with:
  - EN 60950
  - IEZC 950
  - AS/NZ 3260
  - EN 41003

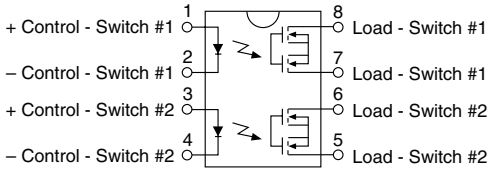
Ordering Information

Part #	Description
PAA190	8 Pin DIP (50/Tube)
PAA190S	8 Pin Surface Mount (50/Tube)
PAA190STR	8 Pin Surface Mount (1000/Reel)

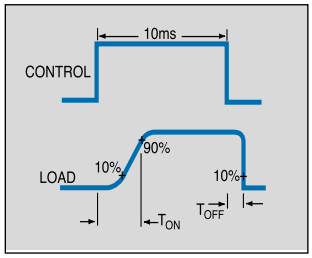
Pin Configuration

PAA190 Pinout

AC/DC 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
Blocking Voltage	-	-	400	V
Total Power Dissipation	-	-	800[2]	mW
Isolation Voltage Input to Output (60 seconds)	-	-	5000	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature	-	-	+260	°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.

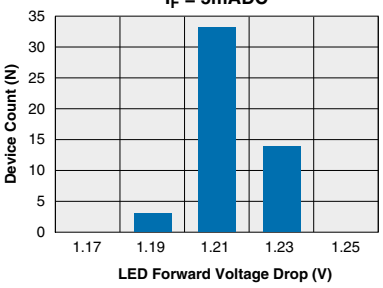
Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current* (Continuous) AC/DC Configuration	-	I_L	-	-	150	mA
Peak Load Current	10ms	I_{LPK}	-	-	400	mA
On-Resistance AC/DC Configuration	I_L=150mA	R_{ON}	-	-	22	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}	-	-	0.5	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	0.2	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
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

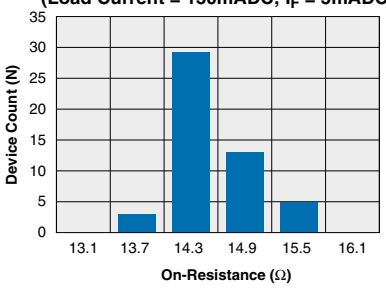
*NOTE: If both poles operate simultaneously load current must be derated so as not to exceed the package power dissipation value.

PERFORMANCE DATA*

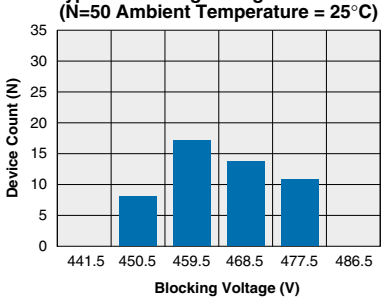
PAA190
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
I_F = 5mADC



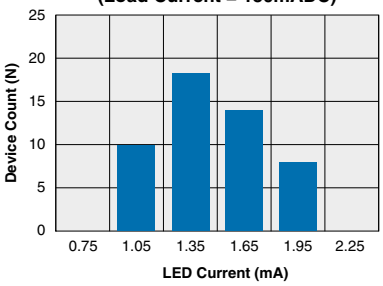
PAA190
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 150mADC; I_F = 5mADC)



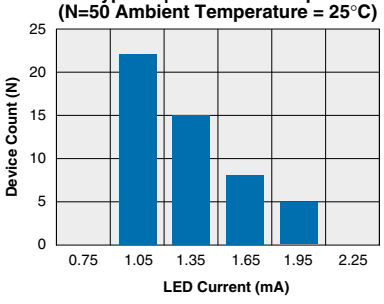
PAA190
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



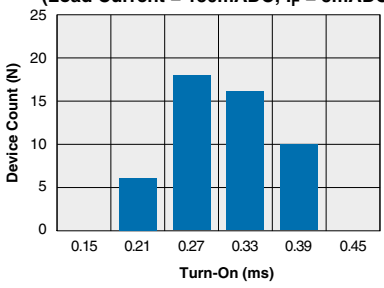
PAA190
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
(Load Current = 150mADC)



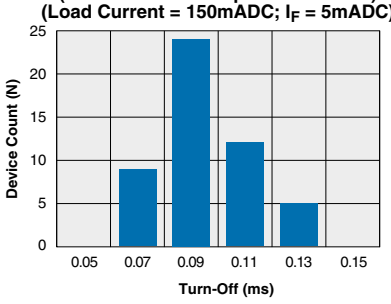
PAA190
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)



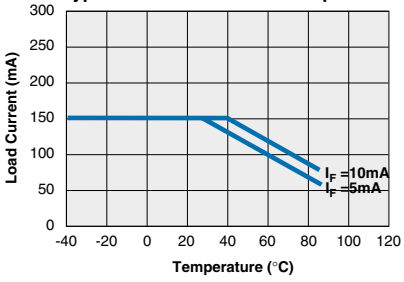
PAA190
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 150mADC; I_F = 5mADC)



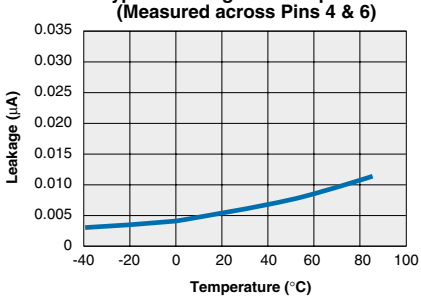
PAA190
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 150mADC; I_F = 5mADC)



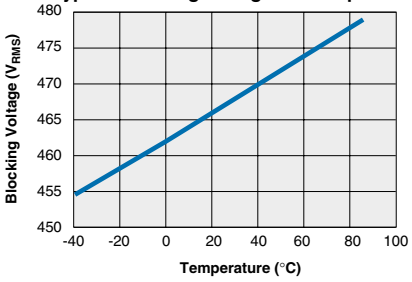
PAA190
Typical Load Current vs. Temperature



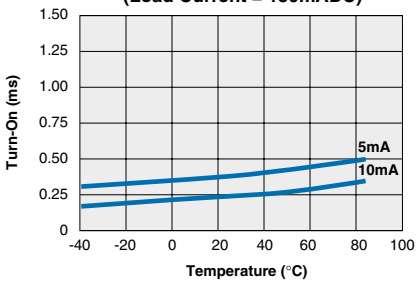
PAA190
Typical Leakage vs. Temperature
(Measured across Pins 4 & 6)



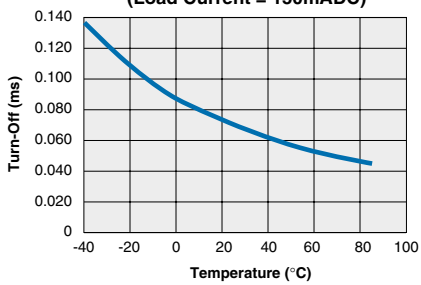
PAA190
Typical Blocking Voltage vs. Temperature



PAA190
Typical Turn-On vs. Temperature
(Load Current = 150mADC)



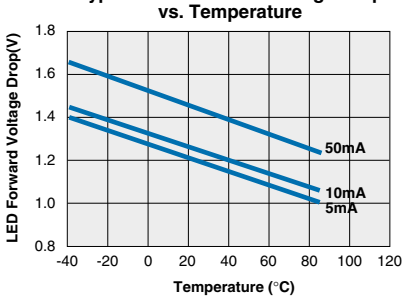
PAA190
Typical Turn-Off vs. Temperature
(Load Current = 150mADC)



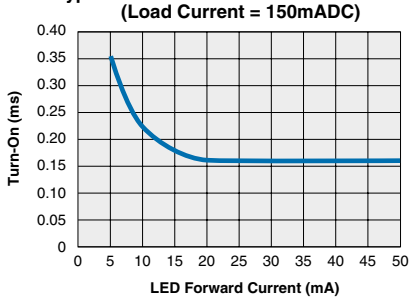
* The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

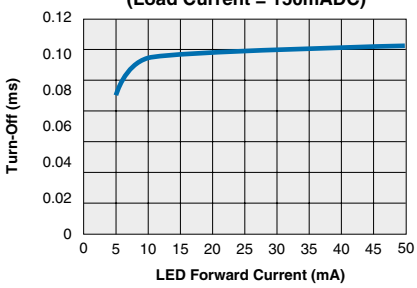
PAA190
Typical LED Forward Voltage Drop vs. Temperature



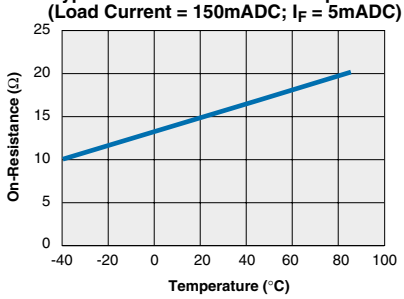
PAA190
Typical Turn-On vs. LED Forward Current (Load Current = 150mADC)



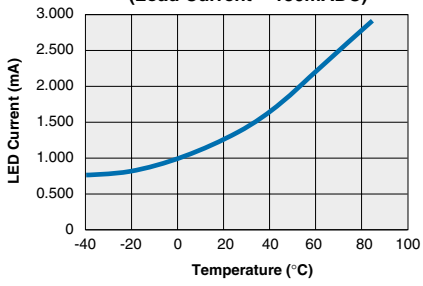
PAA190
Typical Turn-Off vs. LED Forward Current (Load Current = 150mADC)



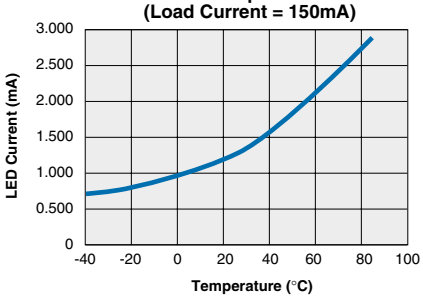
PAA190
Typical On-Resistance vs. Temperature (Load Current = 150mADC; I_F = 5mADC)



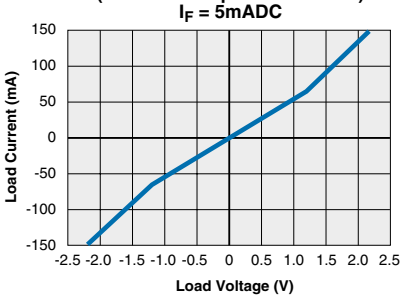
PAA190
Typical I_F for Switch Operation vs. Temperature (Load Current = 150mADC)



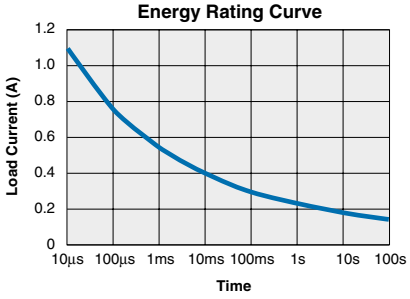
PAA190
Typical I_F for Switch Dropout vs. Temperature (Load Current = 150mA)



PAA190
Typical Load Current vs. Load Voltage (Ambient Temperature = 25°C) I_F = 5mADC



PAA190
Energy Rating Curve



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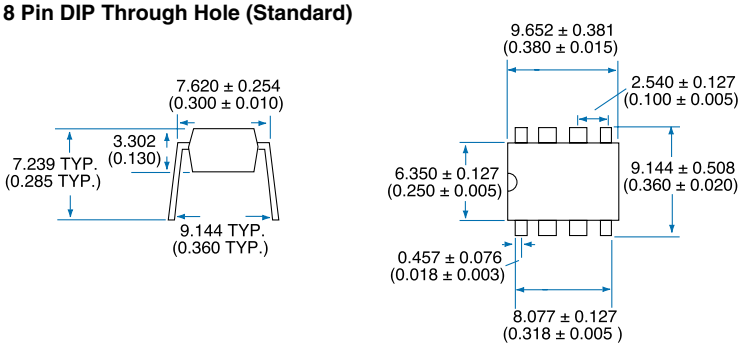
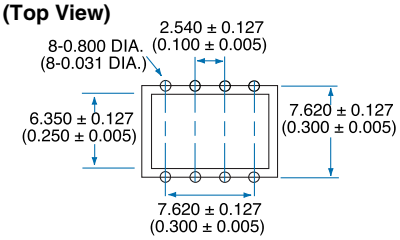
MECHANICAL DIMENSIONS

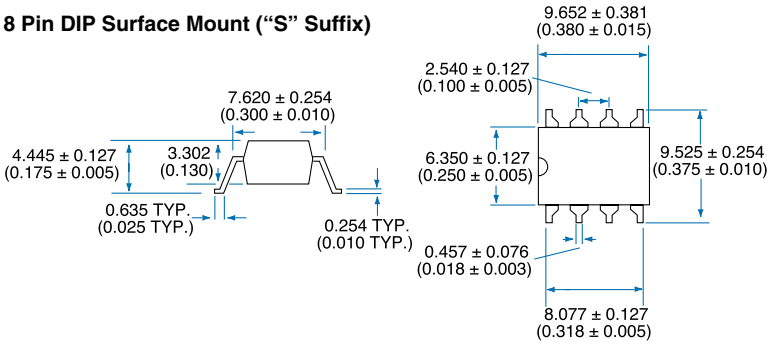
8 Pin DIP Through Hole (Standard)



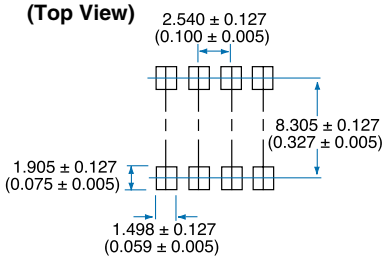
PC Board Pattern (Top View)



8 Pin DIP Surface Mount ("S" Suffix)



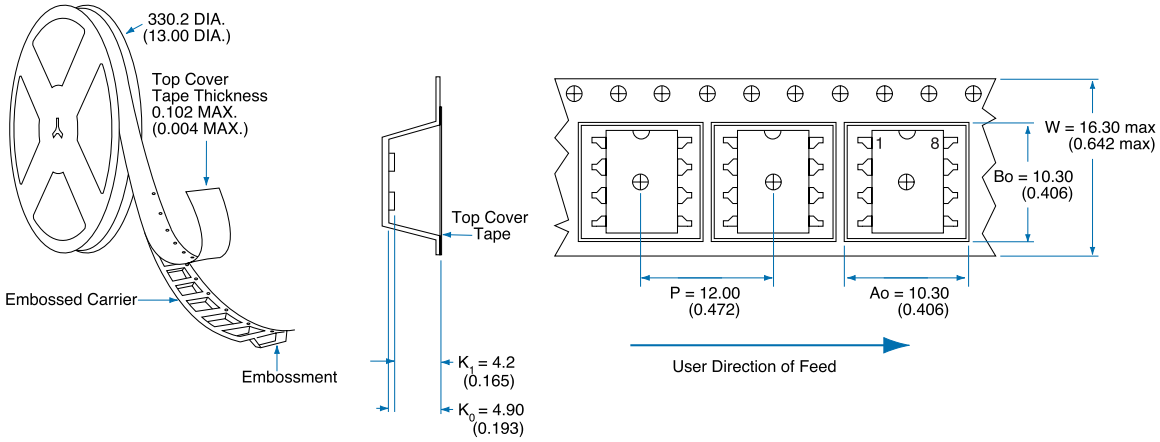
PC Board Pattern (Top View)



Dimensions
mm
(inches)

MECHANICAL DIMENSIONS

Tape and Reel Packaging for 8 Pin Surface Mount Package



NOTE: Tape dimensions not shown, comply with JEDEC Standard EIA-481-2

Dimensions
mm
(inches)

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

Specification: DS-PAA190-R02.0

6/18/03