



	PAA193	Units
Blocking Voltage	600	V
Load Current	100	mA
Max R _{ON}	50	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

- 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 PAA193 is a Dual 1-Form-A solid state relay that uses optically coupled relay technology for the two independent relays to provide an enhanced 5000V_{RMS} isolation barrier between the input and output of the relay. The efficient MOSFET switches use Clares patented OptoMOS architecture. Each optically coupled input is controlled by a highly efficient GaAIAs infrared LED.

Dual OptoMOS relays provide a more compact design solution than discrete single pole relays in a variety of applications. The dual relays save board space by incorporating both in a single 8-pin package.

Approvals

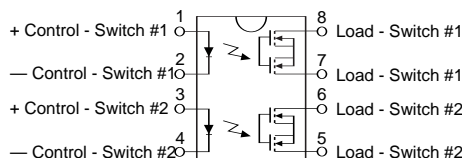
- UL Approved to UL1577
- CSA Certified
- Complies with: EN 60950

Ordering Information

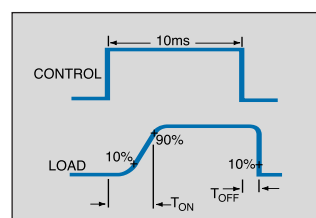
Part #	Description
PAA193	8 Pin DIP (50/Tube)
PAA193S	8 Pin Surface Mount (50/Tube)
PAA193STR	8 Pin Surface Mount (1000/Reel)

Pin Configuration

PAA193 Pinout



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings (@ 25° C)

Parameter	Ratings	Units
Input Power Dissipation	150 ¹	mW
Input Control Current	50	mA
Peak (10ms)	1	A
Reverse Input Voltage	5	V
Blocking Voltage	600	V
Total Power Dissipation	800 ²	mW
Isolation Voltage Input to Output (60 seconds)	5000	V _{RMS}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C
Soldering Temperature		
DIP Package (10 Seconds Max.)	+260	°C
Surface Mount Package	+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 conditions beyond those indicated in the operational sections of this data sheet is not implied.

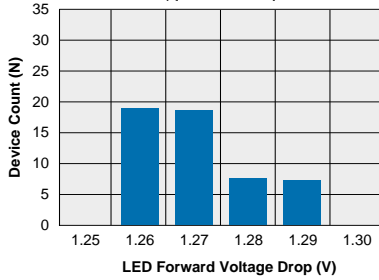
Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current* (Continuous)	-	I _L	-	-	100	mA
Peak Load Current	10ms	I _{LPK}	-	-	350	mA
On-Resistance	I _L =100mA	R _{ON}	-	-	50	Ω
Off-State Leakage Current	V _L =600V	I _{LEAK}	-	-	10	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	T _{ON}	-	-	5	ms
Turn-Off	I _F =5mA, V _L =10V	T _{OFF}	-	-	5	ms
Output Capacitance	50V; f=1MHz	C _{OUT}	-	50	-	pF
Input Characteristics @ 25°C						
Input Control Current	I _L = 100mA	I _F	5	-	-	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
Input Characteristics @ 25°C						
Input to Output Capacitance	-	C _{I/O}	-	3	-	pF

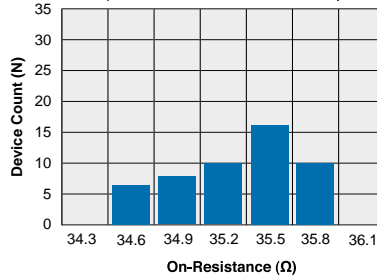
*NOTE: If both poles operate simultaneously load current must be derated so as not to exceed the package power dissipation value.

PERFORMANCE DATA*

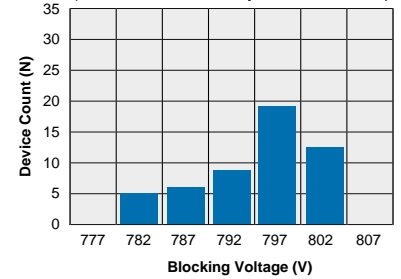
PAA193
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
($I_F = 5\text{mADC}$)



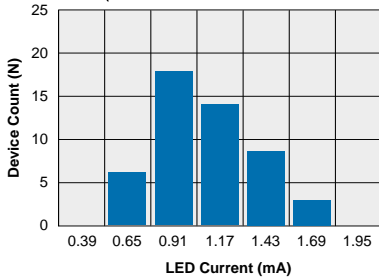
PAA193
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC)



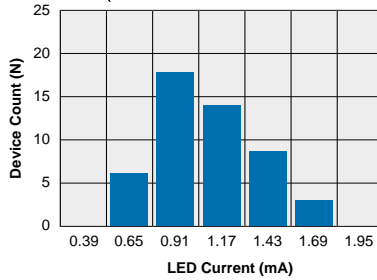
PAA193
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



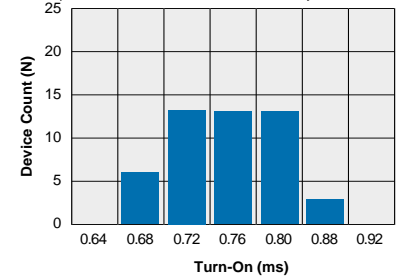
PAA193
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC)



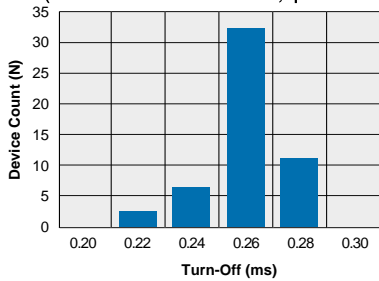
PAA193
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC)



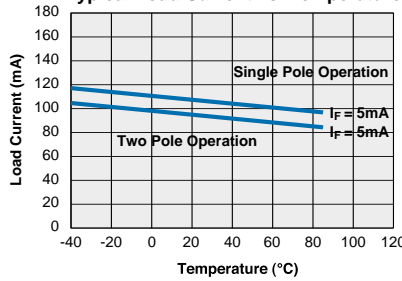
PAA193
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC; $I_F = 5\text{mADC}$)



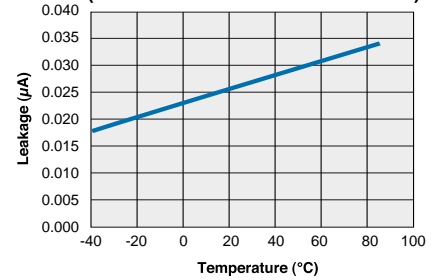
PAA193
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC; $I_F = 5\text{mADC}$)



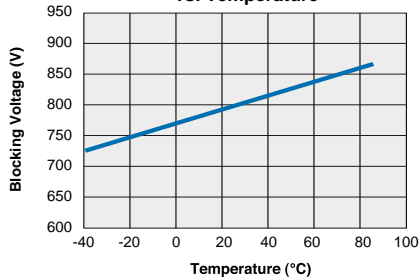
PAA193
Typical Load Current vs. Temperature



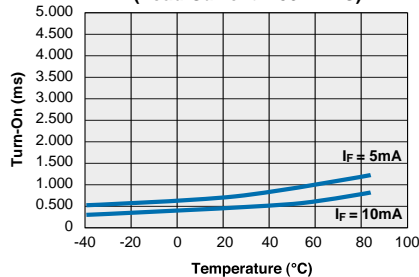
PAA193
Typical Leakage vs. Temperature
(Measured across Pins 5 & 6 or 7 & 8)



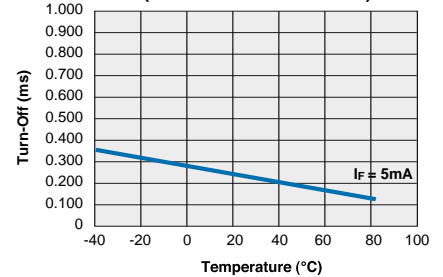
PAA193
Typical Blocking Voltage vs. Temperature



PAA193
Typical Turn-On vs. Temperature
(Load Current = 50mADC)

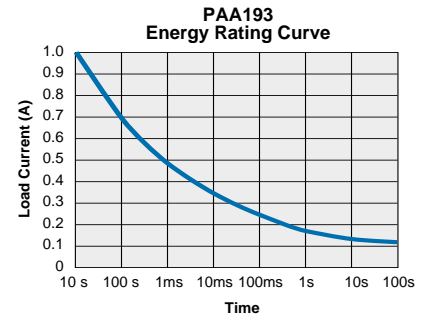
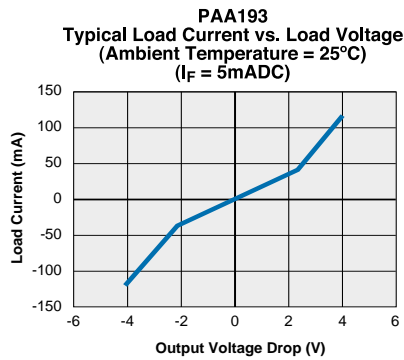
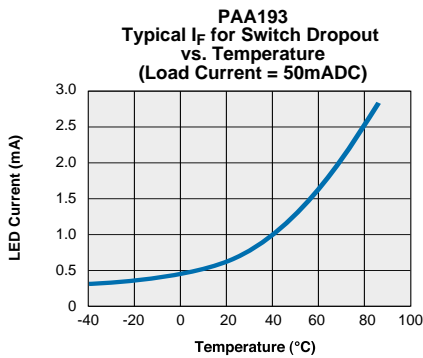
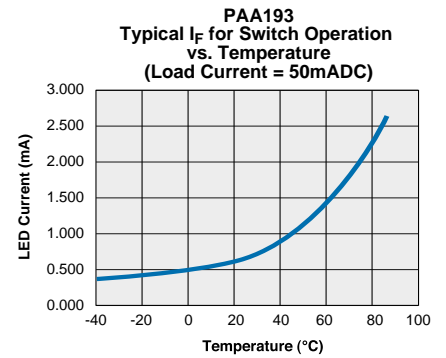
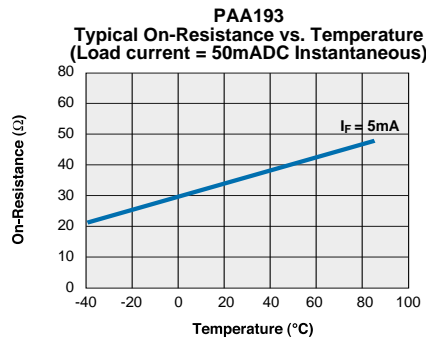
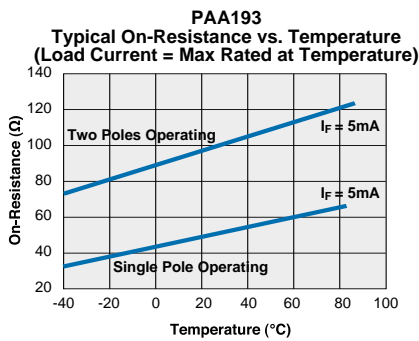
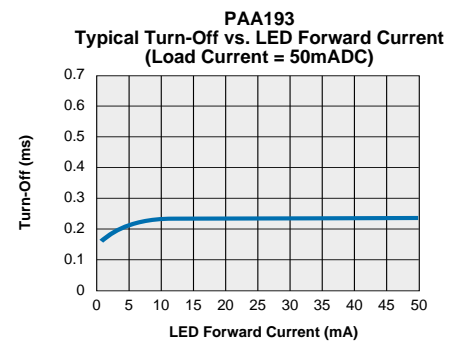
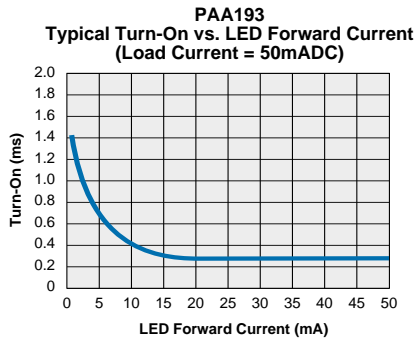
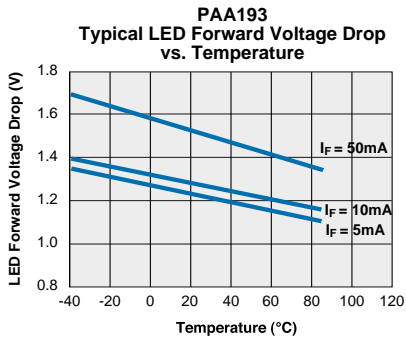


PAA193
Typical Turn-Off vs. Temperature
(Load Current = 50mADC)



*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.

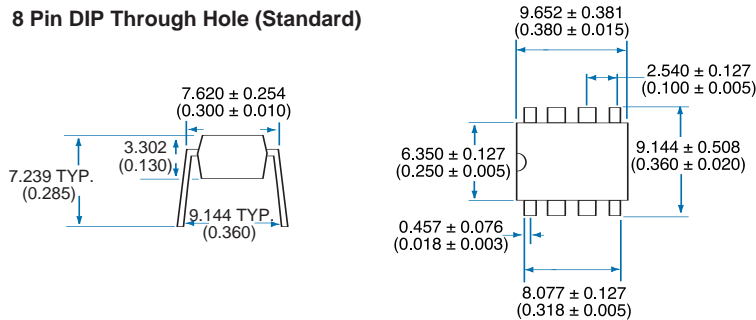
PERFORMANCE DATA*



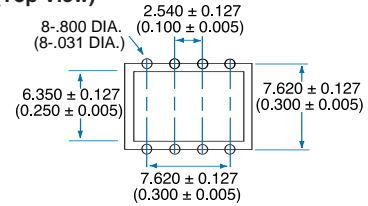
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

MECHANICAL DIMENSIONS

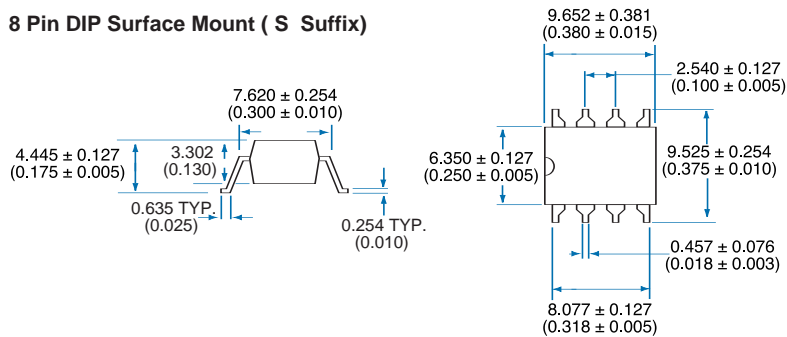
8 Pin DIP Through Hole (Standard)



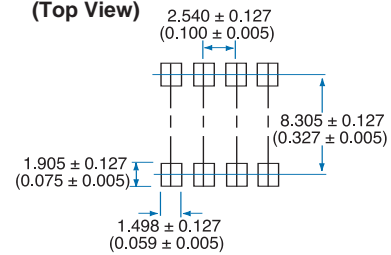
PC Board Pattern (Top View)



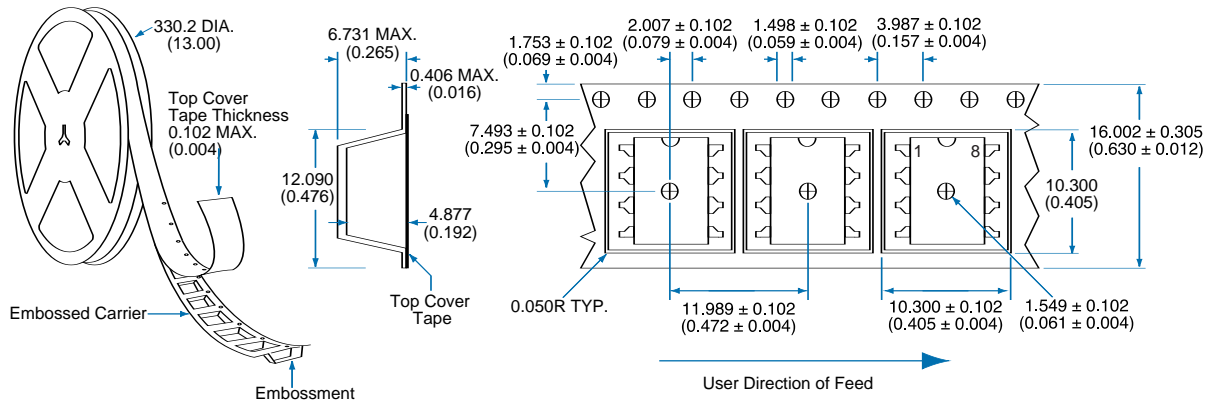
8 Pin DIP Surface Mount (S Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 8 Pin Surface Mount Package



Dimensions
mm
(inches)

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