PD1201
AC Power Switch

Parameter	Rating	Units
AC Operating Voltage	120	V_{rms}
Load Current	1	A_{rms}
On-State Voltage Drop (I_L=1A_{rms})	1.2	V_{rms}

Features
- Load Current up to 1A_{rms}
- Blocking Voltages up to 400V_P
- 5mA Sensitivity
- Zero-Crossing Detection
- DC Control, AC Output
- Optically Isolated
- TTL and CMOS Compatible
- Low EMI and RFI Generation
- High Noise Immunity
- VDE compatible
- Machine Insertable, Wave Solderable

Applications
- Programmable Control
- Process Control
- Power Control Panels
- Remote Switching
- Gas Pump Electronics
- Contactors
- Large Relays
- Solenoids
- Motors
- Heaters

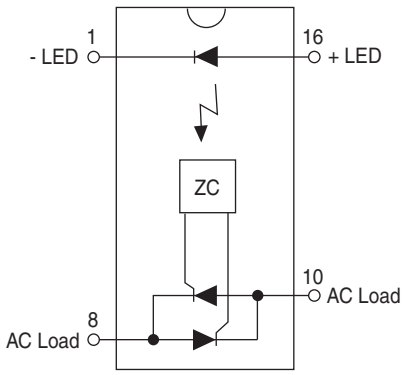
Description
The PD1201 is an AC Solid State Switch using optical coupling with dual power SCR outputs to produce an alternative to optocoupler and Triac circuits. The PD1201 switches are robust enough to provide a blocking voltage of up to 400V_P and max surge current rating of 20A. In addition, tightly controlled zero-cross circuitry ensures switching of AC loads without the generation of transients. The input and output circuits are optically coupled to provide 3750V_{rms} of isolation and noise immunity between control and load circuits. As a result the PD1201 is well suited for industrial environments where electromagnetic interference would disrupt the operation of electromechanical relays.

Approvals
- UL Recognized Component: UL 508, File # E69938
- CSA Certified Component: Certificate # LR43639-8

Ordering Information

Part #	Description
PD1201	4-Lead, 16-Pin, DIP Package (25/Tube)

Pin Configuration



Absolute Maximum Ratings (@ 25˚C)

Parameter	Min	Max	Units
Blocking Voltage	-	400	V_P
Reverse Input Voltage	-	5	V
Input Control Current	-	100	mA
Peak (10ms)	-	1	A
Input Power Dissipation [1]	-	150	mW
Total Package Dissipation [2]	-	1600	mW
Isolation Voltage, Input to Output	3750	-	V_{rms}
Operational Temperature	-40	+85	ºC
Storage Temperature	-40	+125	ºC

[1] Derate Linearly 1.33 mW / ºC

[2] Derate Linearly 16.6 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

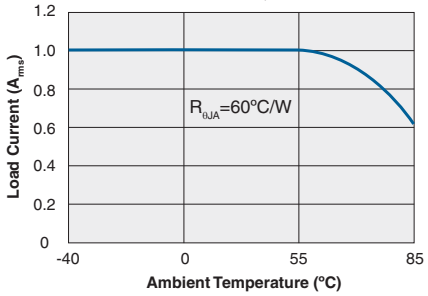
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
AC Operating Voltage	I_F=5mA	V_{OP}	20	-	120	V_{rms}
Load Current (Continuous)	V_L=120-240VAC	I_L	0.005	-	1	A_{rms}
Maximum Surge Current	t≤16ms	I_{PEAK}	-	-	20	A
Off-State Leakage Current	V_L=400V_{DC}	I_{LEAK}	-	-	1	mA
On-State Voltage Drop	I_L=1.0A_{rms}	-	-	-	1.2	V_{rms}
Critical Rate of Rise	-	dV/dt	1000	1200	-	V/µs
Switching Speeds						
Turn-On	I_F=5mA	T_{ON}	-	-	0.5	Cycles
Turn-Off		T_{OFF}	-	-	0.5	
Zero-Cross Turn-On Voltage	1st half-cycle	-	-	2	5	V
	Subsequent half-cycle		-	-	1	V
Operating Frequency [1]	-	-	20	-	500	Hz
Load Power Factor for Guaranteed Turn-On [2]	-	PF	0.25	-	-	-
Capacitance Input-To-Output	-	$C_{I/O}$	-	3	-	pF
Input Characteristics @ 25°C						
Input Control Current						
For Normal Environment	-	I_F	-	-	5	mA
For High Noise Environment	-		-	-	10	
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Input Dropout Voltage	-	-	0.8	-	-	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA

[1] Zero Cross 1st half-cycle @ < 100Hz.

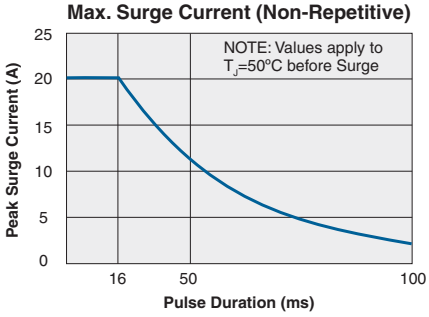
[2] Snubber circuits may be required at low power factors.

PERFORMANCE DATA*

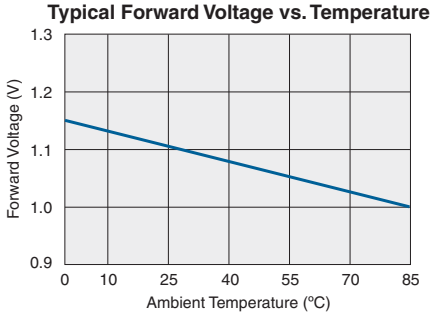
PD1201
Load Current, Free Air



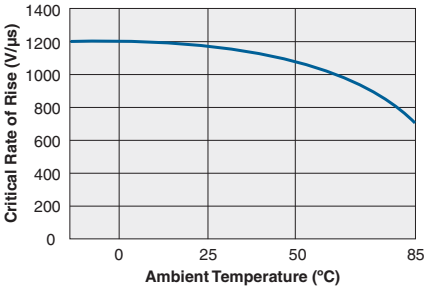
PD1201
Max. Surge Current (Non-Repetitive)



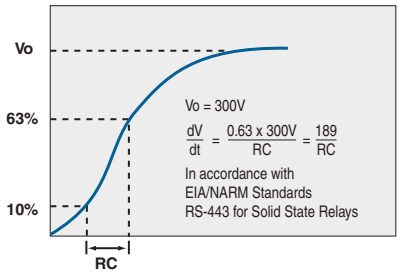
PD1201
Typical Forward Voltage vs. Temperature



PD1201
Typical dV/dt vs. Temperature



PD1201
dV/dt Method



*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

Soldering

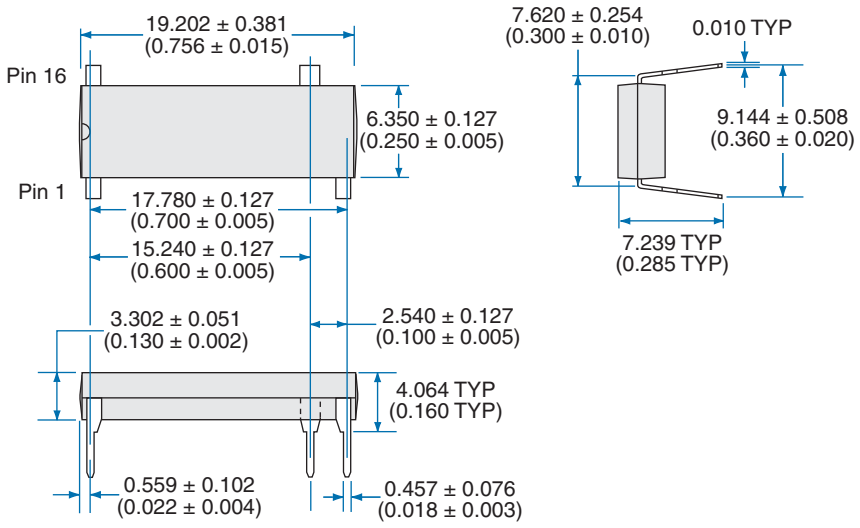
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

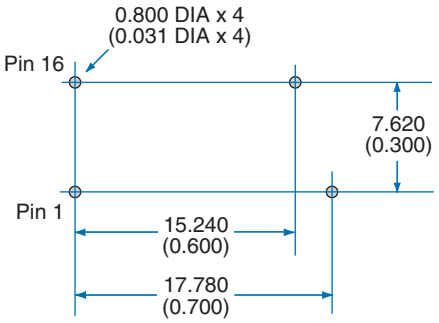
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

4-Lead, 16-Pin, DIP Package



Recommended PCB Hole Pattern



Dimensions
mm
(inches)

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