IXYS
INTEGRATED CIRCUITS DIVISION



PM1205
AC Power Switch

Parameter	Rating	Units
AC Operating Voltage	240	V_{rms}
Load Current	500	mA_{rms}
On-State Voltage Drop (I_L=500mA_{rms})	1.4	V_{rms}

Features
- Load Current up to 0.5A_{rms}
- Blocking Voltages up to 500V_P
- 5mA Sensitivity
- Zero-Crossing Detection
- DC Control, AC Output
- Optically Isolated
- Low EMI and RFI Generation
- High Noise Immunity
- VDE compatible
- Flammability Rating UL 94 V-0

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

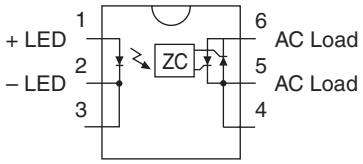
Description
The PM1205 is an AC Solid State Switch using optical coupling with dual power SCR outputs to produce an alternative to optocoupler and Triac circuits. The PM1205 switches are robust enough to provide a blocking voltage of up to 500V_P. In addition, tightly controlled zero-cross circuitry 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 PM1205 is well suited for industrial environments where electromagnetic interference could disrupt the operation of electromechanical relays.

Approvals
- UL Recognized Component: UL 508 File E69938
- CSA Certified Component: File 043639

Ordering Information

Part #	Description
PM1205	6-Lead DIP (50/Tube)
PM1205S	6-Lead Surface Mount (50/Tube)
PM1205STR	6-Lead Surface Mount (1000/Reel)

Pin Configuration



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Absolute Maximum Ratings @ 25ºC

Parameter	Min	Max	Units
Blocking Voltage	-	500	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]	-	800	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 6.67 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.

Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

Electrical Characteristics @ 25ºC

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
AC Operating Voltage	I_F=5mA	V_{OP}	20	-	240	V_{rms}
Load Current (Continuous)	V_L=120-240VAC	I_L	0.005	-	0.5	A_{rms}
Maximum Surge Current	t≤16ms	I_{PEAK}	-	-	12	A
Off-State Leakage Current	V_L=500V_{DC}	I_{LEAK}	-	-	1	mA
On-State Voltage Drop	I_L=0.5A_{rms}	-	-	-	1.4	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 [1]	1st half-cycle	-	-	2	5	V
	Subsequent half-cycle		-	-	1	V
Operating Frequency	-	-	20	-	500	Hz
Load Power Factor for Guaranteed Turn-On [2]	-	PF	0.25	-	-	-
Capacitance Input-To-Output	V_{IO}=0V, f=1MHz	C_{IO}	-	3	-	pF
Input Characteristics						
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	1.5	V
Input Dropout Voltage	-	-	0.8	-	-	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA

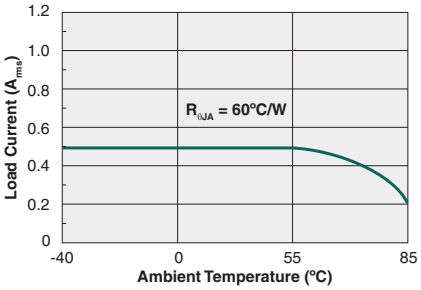
[1] Zero Cross 1st half-cycle @ < 100Hz.

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

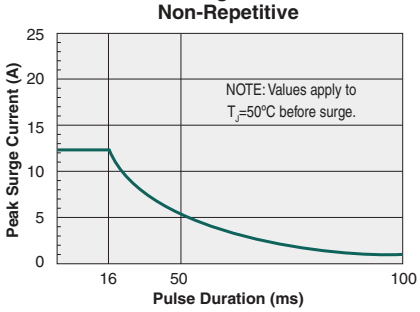
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PERFORMANCE DATA*

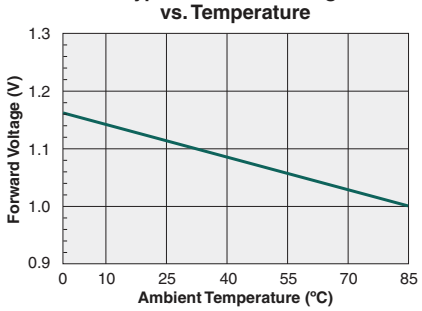
Load Current Free Air



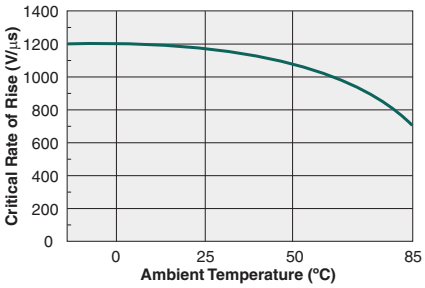
Max Surge Current Non-Repetitive



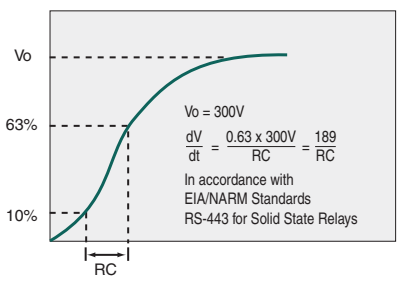
Typical Forward Voltage vs. Temperature



Typical dV/dt vs. Temperature



dV/dt Method



*Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.
For guaranteed parameters not indicated in the written specifications, please contact our application department.

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Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. IXYS Integrated Circuits classifies 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) classification 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) Classification
PM1205 / PM1205S	MSL 1

ESD Sensitivity

This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Soldering Profile

Provided in the table below is the Classification Temperature (T_C) of this product and the maximum dwell time the body temperature of this device may be (T_C - 5)°C or greater. The classification temperature sets the Maximum Body Temperature allowed for this device during lead-free reflow processes. For through-hole devices, and any other processes, the guidelines of **J-STD-020** must be observed.

Device	Classification Temperature (T_c)	Dwell Time (t_p)	Max Reflow Cycles
PM1205	250°C	30 seconds	1
PM1205S	250°C	30 seconds	3

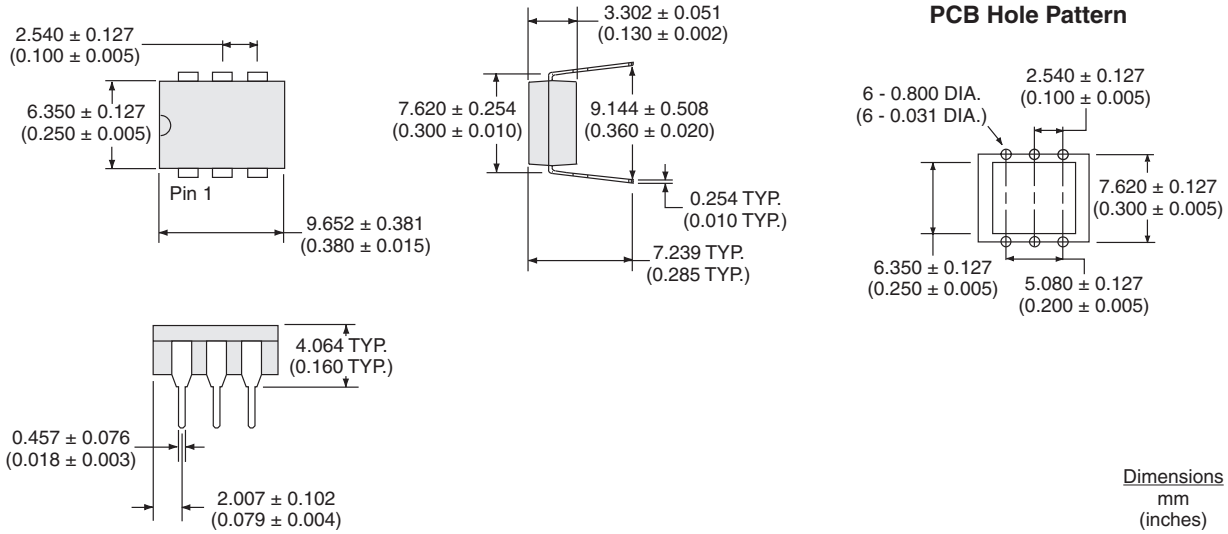
Board Wash

IXYS Integrated Circuits recommends the use of no-clean flux formulations. Board washing to reduce or remove flux residue following the solder reflow process is acceptable provided proper precautions are taken to prevent damage to the device. These precautions include, but are not limited to: using a low pressure wash and providing a follow up bake cycle sufficient to remove any moisture trapped within the device due to the washing process. Due to the variability of the wash parameters used to clean the board, determination of the bake temperature and duration necessary to remove the moisture trapped within the package is the responsibility of the user (assembler). Cleaning or drying methods that employ ultrasonic energy may damage the device and should not be used. Additionally, the device must not be exposed to flux or solvents that are Chlorine- or Fluorine-based.

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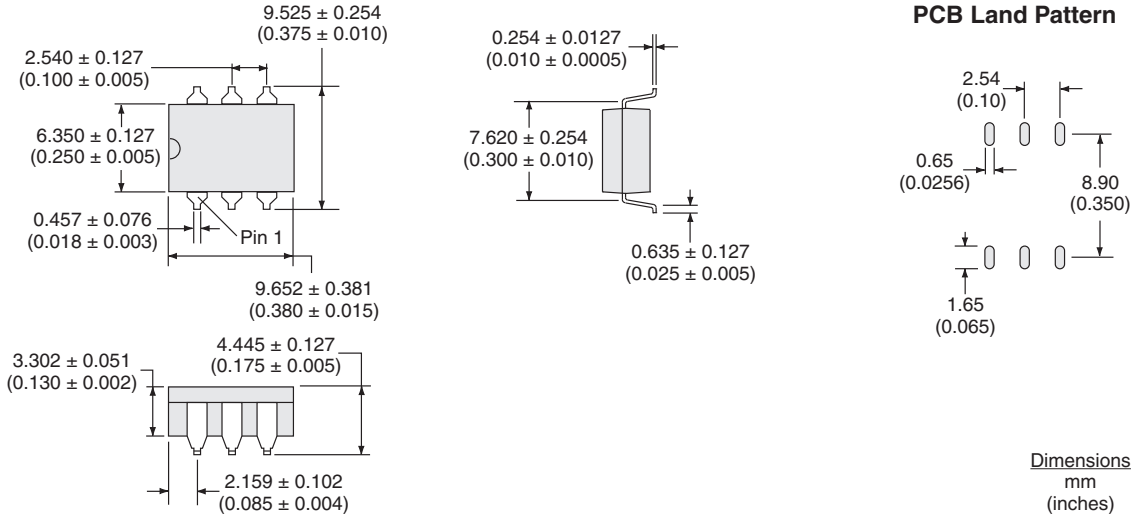
Mechanical Dimensions

PM1205



Dimensions
mm
(inches)

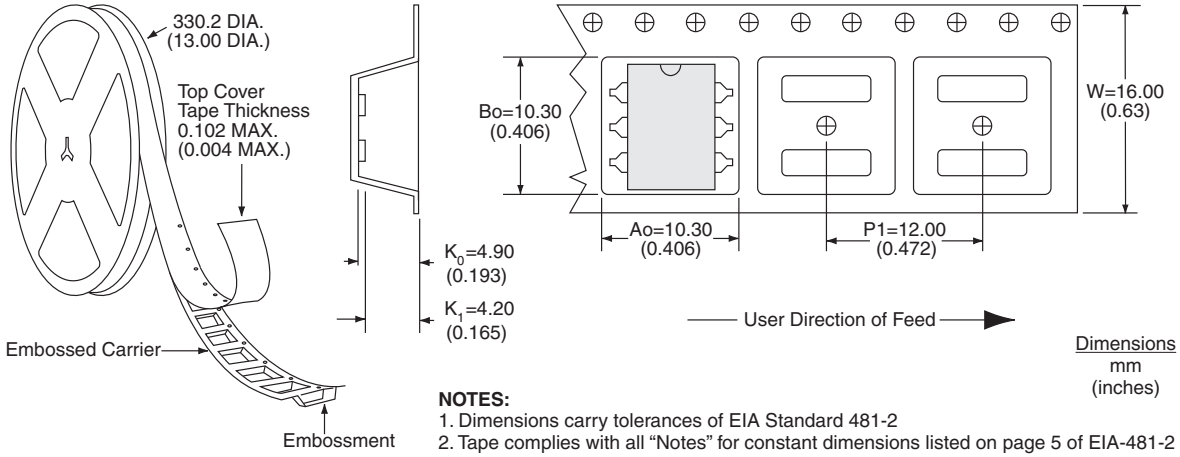
PM1205S



Dimensions
mm
(inches)

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PM1205STR Tape & Reel



NOTES:
1. Dimensions carry tolerances of EIA Standard 481-2
2. 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.ixysic.com

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Specification: DS-PM1205-R11
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