SPECIFICATION

DEVICE NAME : SILICON DIODE

TYPE NAME : PA905C4R

SPEC. NO. : MS5D3029

	DATE	NAME	APPROVED	Fu	ji Electric Device Technology Co.,L	td
DRAWN	FEB26-'07	M. Chinose			The Electric Device Teermology Co., E	
	FEB26-'07		T. HOSER	G.NO	MS5D3029 1/12	
CHECKED	FEB26-'07	O. Panada		DWG.	6555525 ., .2	

H04-004-01c

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Revised Records

Date	Classifi- cation	Ind.	Contents	Applied Date	Drawn	Che	cked	Approved
FEB26 -2007	Enactment	_	_	Issued Date	M. Chinore	T.Watoshina	O. Famada	T. HOSER

Fuji Electric Device Technology Co.,Ltd. MS5D3029 2/12 H04-004-02b

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1. SCOPE

This specification provides the ratings and the test requirement for FUJI SILICON DIODE PA905C4R

2. OUT VIEW, MARKING, MOLDING RESIN, CHARACTERISTICS

(1) Out view is shown MS5D3029 9/12

(2) Marking is shown MS5D3029 9/12

It is marked to type name or abbreviated type name, polarity and Lot No.

(3) Molding resin

Epoxy resin UL:V-0

(4) Characteristics is shown MS5D3029 10/12~12/12

Bar Code Label of EIAJ C-3 Specification. Indispensable description items are shown as below.

- (1) Type Name
- (2) Production Code
- (3) Quantity
- (4) Lot No.(Date code)
- (5) Company Code

3. RATINGS

3.1 MAXIMUM RATINGS (at Ta=25°C unless otherwise specified.)

(at its 25 5 amount of the control o						
ITEM	SYMBOL	CONDITIONS	RATINGS	UNITS		
Repetitive peak reverse voltage	V_{RRM}		400	٧		
Average output current	lo	50Hz Square wave duty =1/2 Tc = 107°C	20 *	А		
Non-repetitive forward surge current**	I _{FSM}	Sine wave, 10ms 1shot	70	Α		
Operating junction temperature	Tj		150	°C		
Storage temperature	Tstg		-40~+150	°C		

Out put current of center tap full wave connection.

3.2 ELECTRICAL CHARACTERISTICS (at Ta=25°C unless otherwise specified.)

	•	•		
ITEM	SYMBOL	CONDITIONS	MAXIMUM	UNITS
Forward voltage ***	V _F	I _F = 10 A	1.5	V
Reverse current ***	I _R	$V_R = V_{RRM}$	500	μΑ
Reverse recovery time***	trr	I _F =0.1A,I _R =0.2A,Irec=0.05A	0.05	μs
Thermal resistance	Rth(j-c)	Junction to case	1.5	°C/W

^{***} Rating per element

3.3 MECHANICAL CHARACTERISTICS

Mounting torque	Recommended torque	0.4~0.6	N·m
Approximate mass		5.5	g

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[&]quot;Rating per element

4. TEST AND INSPECTION

4.1 STANDARD TEST CONDITION

Standard test condition is Ta=25°C, 65%R.H.

If judgment is no doubt, the test condition is possible to test in normal condition Ta=5~35°C, 48~85%R.H.

4.2 STRUCTURE INSPECTION

It inspect with eye and measure, Item 2 shall be satisfied.

4.3 FORWARD AND REVERSE CHARACTERISTICS

It inspect on the standard condition, Item 3.2 shall be satisfied.

4.4 TEST

				Reference		
	Test	Test	Testing methods and Conditions	Standard	Sampling	Acceptance
	No.	Items	· ·	EIAJ	number	number
				ED4701		
	1	Terminal	Pull force : 25N	EIAJ		
		Strength	Force maintaining duration :10±1s	ED4701/401	5	
		(Tensile)		method 1		
	2	Terminal	Load force : 10N	EIAJ		
		Strength	Number of times : 2times(90deg./time)	ED4701/401	5	
		(Bending)		method 3		
	3	Mounting	Screwing torque value:(M3) : 50±10N·cm	EIAJ	5	
		Strength		ED4701/402 method 2	5	
	4	Vibration	Frequency: 100Hz to 2kHz			
			Acceleration: 100m/s ²	EIAJ ED4701/403	5	
			Sweeping time: 4min./1 cycle	test code D	5	
est			4times for each X, Y&Z directions.			
calt	5	Shock	Peak amplitude : 15km/s ²	FIA.I		
ani			Duration time: 0.5ms	EIAJ ED4701/404	5	(0:1)
Mechanical test			3times for each X, Y&Z directions.	test code D		
2	6	Solder ability 1	Solder : Sn-37Pb	EIAJ ED4701/303		
			Solder temp. : 235±5°C	test code A	_	
			Immersion time: 5±0.5s		5	
			Apply to flux			
		Solder ability 2	Solder : Sn-3Ag-0.5Cu	 		
			Solder temp. : 245±5°C		_	
			Immersion time: 5±0.5s		5	
			Apply to flux			
	7	Resistance to	Solder temp. : 260±5°C	EIAJ		
		Soldering	Immersion time : 10±1s	ED4701/302	5	
		Heat	Number of times : 1times	test code A		
		i icat	Number of unies . Tunies			

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	Test	Test		Reference	Sampling	Acceptance
	No.	Items	Testing methods and Conditions	Standard	number	number
		III T		EIAJ ED4701		
	1 High Temp. Temperature :Tstg max		ED4701/201	22		
		Storage	Test duration : 1000h			
	2	Low Temp.	Temperature :Tstg min	EIAJ ED4701/202	22	
		Storage	Test duration : 1000h	LD4701/202		
	3	Temperature	Temperature : 85±2°C	EIAJ		
		Humidity	Relative humidity: 85±5%	ED4701/103 test code C	22	
		Storage	Test duration : 1000h			
	4	Temperature	Temperature : 85±2°C			
		Humidity	Relative humidity: 85±5%	EIAJ ED4701/103	22	
		Bias	Bias Voltage : V _{RRM} × 0.8	test code C		
			Test duration : 1000h			
	5	Unsaturated	Temperature : 130±2°C			
		Pressurized	Relative humidity : 85±5%	EIAJ ED4701/103	22	
		Vapor	Vapor pressure : 230kPa	test code F		
l			Test duration : 48h			
test	6	Temperature	High temp. side : Tstg max			
nce		Cycle	Room temp. : 5~35°C	EIAJ		(0:1)
Endurance test			Low temp. side : Tstg min	ED4701/105	22	(-)
End			Duration time: HT 30min,RT 5min LT 30min			
			Number of cycles : 100 cycles			
	7	Thermal	Fluid : pure water(running water)			
		Shock	High temp. side : 100+0/-5°C	EIAJ		
			Low temp. side : 0+5/-0°C	ED4701/307 test code A	22	
			Duration time: HT 5min,LT 5min			
			Number of cycles : 100 cycles			
	8	Steady state	Ta=25±5°C			
		Operating	Rated load		22	
		life	Test duration : 1000h			
	9	Intermittent	Tj=Tjmax ~50°C			
		Operating	3min ON, 3min OFF	EIAJ ED4701/106	22	
	life Test du		Test duration: 10000cycles	2547017100		
	10	High Temp.	Temperature : Ta=100 °C			
		Reverse	Bias Voltage : VR=V _{RRM} duty=1/2	EIAJ ED4701/101	22	
		Bias	Test duration : 1000h	EBTIONIO		

Failure Criteria	I _R ≦USL x 5	USL: Upper specification Limit
	V _F ≦USL x 1.1	

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5.Cautions

- Although Fuji Electric is continually improving product quality and reliability, a small percentage of semiconductor products may become faulty. When using Fuji Electric semiconductor products in your equipment, you are requested to take adequate safety measures to prevent the equipment from causing physical injury, fire, or other problem in case any of the products fail. It is recommended to make your design fail-safe, flame retardant, and free of malfunction.
- •The products described in this specification are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
 - Computers •OA equipment •Communications equipment (Terminal devices)
 - Measurement equipment
 Machine tools
 AV equipment
 - · Electrical home appliances · Personal equipment · Industrial robots etc.
- •The products described in this Specification are not designed or manufactured to be used in equipment or systems used under life-threatening situations. If you are considering using these products in the equipment listed below, first check the system construction and required reliability, and take adequate safety measures such as a backup system to prevent the equipment from malfunctioning.
 - •Transportation equipment (automobiles, trains, ships, etc.)
 - Backbone network equipment
 Traffic-signal control equipment
 - ·Gas alarms, leakage gas auto breakers ·Submarine repeater equipment
 - ·Burglar alarms, fire alarms, emergency equipment · Medical equipment
 - · Nuclear control equipment etc.
- •Do not use the products in this Specification for equipment requiring strict reliability such as (but not limited to):
 - · Aerospace equipment · Aeronautical equipment

6.Warnings

- The Diodes should be used in products within their absolute maximum rating (voltage, current, temperature, etc.). The diodes may be destroyed if used beyond the rating.
- •The equipment containing Diodes should have adequate fuses or circuit breakers to prevent the equipment from causing secondary destruction (ex. fire, explosion etc...).
- •Use the Diodes within their reliability and lifetime under certain environments or conditions.

The Diodes may fail before the target lifetime of your products if used under certain reliability conditions.

- •You must design the Diodes to be operated within the specified maximum ratings (voltage, current, temperature, etc.) to prevent possible failure or destruction of devices.
- Consider the possible temperature rise not only for the junction and case, but also for the outer leads.
- •Do not directly touch the leads or package of the Diodes while power is supplied or during operation, to avoid electric shock and burns.
- •The Diodes are made of incombustible material. However, if a Diode fails, it may emit smoke of flame. Also, operating the Diodes near any flammable place or material may cause the Diodes to emit smoke or flame in case the Diodes become even hotter during operation.

Design the arrangement to prevent the spread of fire.

- •The Diodes should not used in an environment in the presence of acid, organic matter, or corrosive gas. (hydrogen sulfide, sulfurous acid gas.)
- •The Diodes should not used in an irradiated field since they are not radiation proof.

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Installation

•Soldering involves temperatures which exceed the device storage temperature rating. To avoid device damage and to ensure reliability, observe the following guidelines from the quality assurance standard.

Table 1: Solder temperature and duration

Method	Solder temperature	Duration
Flow	260±5°C	10±1sec
Soldering iron	350±10℃	3.5±0.5sec

- •The immersion depth of the lead should basically be up to the lead stopper and the distance should be a maximum of 1.5mm from the device.
- When flow-soldering, be careful to avoid immersing the package in the solder bath.
- •Refer to the following torque reference When mounting the device on a heat sink. Excess torque applied to the mounting screw causes damage to the device and weak torque will increase the thermal resistance, both of which conditions may destroy the device.

Table 2:Recommended tightening torque

Package style	Screw	Recommended tightening torque
TO-3P	M3	0.4~0.6N·m

- •The heat sink should have a flatness within $\pm 30 \,\mu$ m and roughness within $10 \,\mu$ m. Also, keep the tightening torque within the limits of this specification.
- •Improper handling may cause isolation breakdown leading to a critical accident.
- •We recommend the use of thermal compound to optimize the efficiency of heat radiation. It is important to evenly apply the compound and to eliminate any air voids.

Storage

- •The Diodes must be stored at a standard temperature of 5 to 35°C and relative humidity of 45 to 75%. If the storage area is very dry, a humidifier may be required. In such a case, use only deionized water or boiled water, since the chlorine in tap water may corrode the leads.
- •The Diodes should not be subjected to rapid changes in temperature to avoid condensation on the surface of the Diodes. Therefore, store the Diodes in a place where the temperature is steady.
- •The Diodes should not be stored on top of each other, since this may cause excessive external force on the case.
- •The Diodes should not be stored with the lead terminals remaining unprocessed. Rust may cause presoldered connections to go fail during later processing.
- •The Diodes should be stored in antistatic containers or shipping bags.

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7.Appendix

- This products does not contain PBBs (Polybrominated Biphenyl) or PBDEs (Polybrominated Diphenyl Ether), substances.
- •This products does not contain Class-I ODS and Class-II ODS substances set force by 'Clean Air Act of US' law.
- •If you have any questions about any part of this Specification, please contact Fuji Electric Device Technology or its sales agent before using the product
- •Neither Fuji nor its agents shall be held liable for any injury caused by using the products not in accordance with the instructions.
- •The application examples described in this specification are merely typical uses of Fuji Electric DeviceTechnology products.
- This specification does not confer any industrial property rights or other rights, nor constitute a license for such rights.

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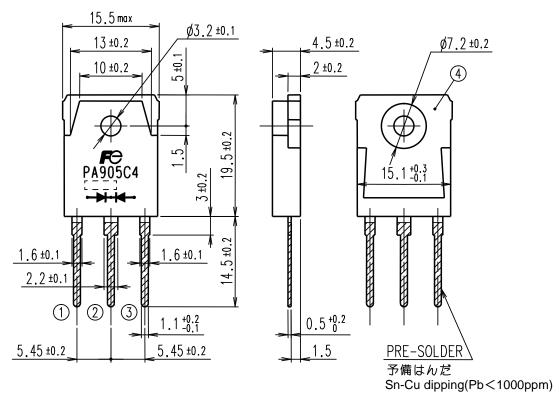
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FUJI SILICON DIODE

TYPE: PA905C4R

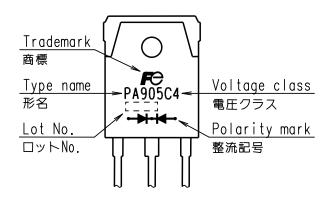
OUT VIEW 外形寸法図

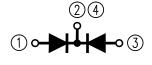


MARKING 表示図

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CONNECTION 結線図





UNIT:mm 寸法単位:mm

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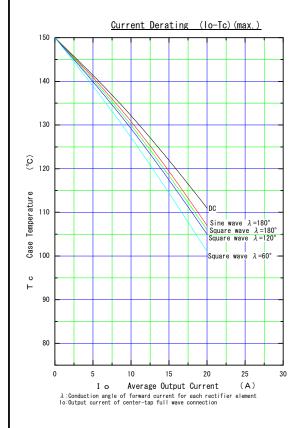
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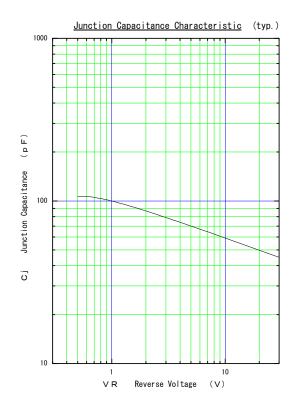
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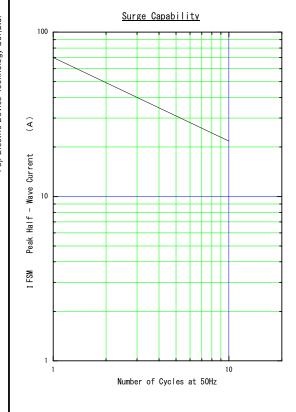
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Forward Characteristic (typ.) Reverse Characteristic (typ.) 10³ Tj=100°C Tj=150℃ Tj=125℃ Tj=125℃ T j=25°C Tj=100℃ (A A) 10¹ Reverse Current 3 Tj= 25℃ Forward Current 10° I.R This material and the information herein is the property of Fuji Electric Device Technology Co.,Ltd. They shall be neither reproduced, copied,lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Device Technology Co.,Ltd. ш 10^{-1} 10^{-2} 0 100 0.0 0. 2 0.6 0.8 $\vee R$ Reverse Voltage Forward Voltage Reverse Power Dissipation(max.) Forward Power Dissipation(max.) 0.6 18 16 Square wave λ=120° 0.5 Sine wave λ=180° 14 Square wave λ=180° **→** λ **←** € $\tilde{\mathbf{s}}$ DC 12 0.4 Dissipation 0.0 Forward Power Dissipation 10 Power Reverse 0.5 α=180° Υ ጥ ແ 0.1 0 0.0 0 100 200 300 400 600 500 Average Output Current (A) Reverse Voltage DWG.NO. Fuji Electric Device Technology Co.,Ltd. MS5D3029 10/12 H04-004-03a

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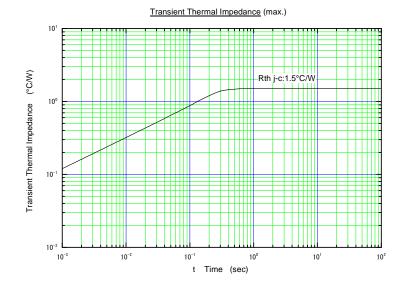
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