

# SPECIFICATION

Device Name : SILICON DIODE

Type Name : SD834-04-TE12R

Spec. No. : MS5D2342

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				DWG. NO.



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## 1. SCOPE

This specification provides the ratings and the test requirement for FUJI SILICON DIODE SD834-04-TE12R

## 2. OUT VIEW , MARKING , MOLDING RESIN , CHARACTERISTICS,TAPING SPECIFICATION

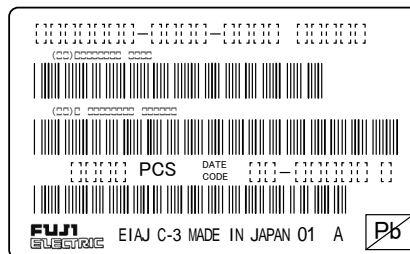
- (1)Out view is shown MS5D2342 9/12
- (2)Marking is shown MS5D2342 9/12

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 MS5D2342 10/12~12/12
- (5)Taping specification is shown MS5Q0048

## 3.LEAD AND LABEL

- (1)Outer lead material:Cu+Sn-2.5Ag(Plating)
- (2)LABEL : Sn-Cu Pb Free Mark



## 4. RATINGS

### 4.1 MAXIMUM RATINGS (at Tc=25°C unless otherwise specified.)

ITEM	SYMBOL	CONDITIONS	RATINGS	UNITS
Repetitive peak reverse voltage	$V_{RRM}$		40	V
Average output current	$I_o$	Square wave duty =1/2 $T_I = 96 \text{ }^\circ\text{C}$	4.0	A
Non-repetitive forward surge current	$I_{FSM}$	Sine wave, 10ms	70	A
Operating junction temperature	$T_j$		150	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55~+150	$^\circ\text{C}$

### 4.2 ELECTRICAL CHARACTERISTICS (at Tc=25°C unless otherwise specified.)

ITEM	SYMBOL	CONDITIONS	MAXIMUM	UNITS
Forward voltage	$V_F$	$I_F = 4.0\text{A}$	0.51	V
Reverse current	$I_R$	$V_R = V_{RRM}$	1.0	mA
Thermal resistance	$R_{th(j-l)}$	Junction to lead	18	$^\circ\text{C/W}$

### 4.3 MECHANICAL CHARACTERISTICS

Approximate mass		0.035	g
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H04-004-03a

**5. TEST AND INSPECTION**

**5.1 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.

**5.2 STRUCTURE INSPECTION**

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

**5.3 FORWARD AND REVERSE CHARACTERISTICS**

It inspect on the standard condition, Item 4.2 shall be satisfied.

**5.4 TEST**

	Test No.	Test Items	Testing methods and Conditions	Reference Standard EIAJ ED4701	Sampling number	Acceptance number
<b>Mechanical test</b>	1	Vibration	Frequency : 100Hz to 2kHz Acceleration : 100m/s <sup>2</sup> Sweeping time : 4min./1 cycle 4times for each X, Y&Z directions.	A-121	5	(0 : 1)
	2	Shock	Peak amplitude : 15km/s <sup>2</sup> Duration time : 0.5ms 3times for each X, Y&Z directions.	A-122 test code D	5	
	3	Solder ability	Solder : Sn-3Ag-0.5Cu Solder temp. : 245±5°C Immersion time : 5±0.5s Apply to flux	(A-131A)	5	
	4	Resistance to Soldering Heat 1 (Flow)	Solder temp.:260±5°C Immersion time : 10±1s Number of times:1time (Preparation) Baking treatment:125±5°C,24hr Humidification treatment: 85±2°C,85±5%RH,72±2hr	A-133A III-B	5	
		Resistance to Soldering Heat 2 (Reflow)	Solder temp.:250±5°C Immersion time : 10±1s Solder temperature maximum:255°C (230°C or more are processed within in 30sec.) Number of times:2times I <sub>R</sub> -ray Reflowing (Preparation) Baking treatment:125±5°C,24hr Humidification treatment: 85±2°C,85±5%RH,168hr	(A-133A) ( I -A)	5	

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	Test No.	Test Items	Testing methods and Conditions	Reference Standard EIAJ ED4701	Sampling number	Acceptance number
<b>Endurance test</b>	1	High Temp. Storage	Temperature :Tstg max Test duration : 1000h	B-111	22	(0 : 1)
	2	Low Temp. Storage	Temperature :Tstg min Test duration : 1000h	B-112	22	
	3	Temperature Humidity Storage	Temperature : 85±2°C Relative humidity : 85±5% Test duration : 1000h	B-121 test code C	22	
	4	Temperature Humidity Bias	Temperature : 85±2°C Relative humidity : 85±5% Bias Voltage : $V_{RRM} \times 0.8$ Test duration : 1000h	B-122 test code C	22	
	5	Unsaturated Pressurized Vapor	Temperature : 130±2°C Relative humidity : 85±5% Vapor pressure : $2.3 \times 10^5$ Pa Test duration : 48h	B-123 test code C	22	
	6	Temperature Cycle	High temp. side : Tstg max Room temp. : 5~35°C Low temp. side : Tstg min Duration time : HT 30min, RT 5min LT 30min Number of cycles : 100 cycles	(B-131)	22	
	7	Thermal Shock	Fluid :pure water(running water) High temp. side : 100+0/-5°C Low temp. side : 0+5/-0°C Duration time : HT 5min,LT 5min Number of cycles : 100 cycles	(B-141) (test code A)	22	
	8	Steady state Operating life	Ta=25±5°C Rated load Test duration : 1000h	D-402	22	
	9	Intermittent Operating life	Tj ≤ Tjmax ON:1min,OFF:2min Test duration 1000cycles	(D-403)	22	
	10	High Temp. Reverse Bias	Temperature : Ta=80 °C Bias Voltage : $V_R = V_{RRM}$ (DC) Test duration : 1000h	D-404	22	

Preparation : Test items required without fail : Test Method B-121,B-122,B-123,B-131,B-141

Baking treatment : 125±5°C, 24hr

Humidification treatment : 85±2°C,85±5%RH,72±2hr

Soldering heat for surface mounting : Reflow soldering 255°Cmax.(230°C or more are processed within in 30 sec.), 2times.

Failure Criteria	$I_R \leq USL \times 2$	USL : Upper specification Limit
	$V_F \leq USL \times 1.1$	

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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.

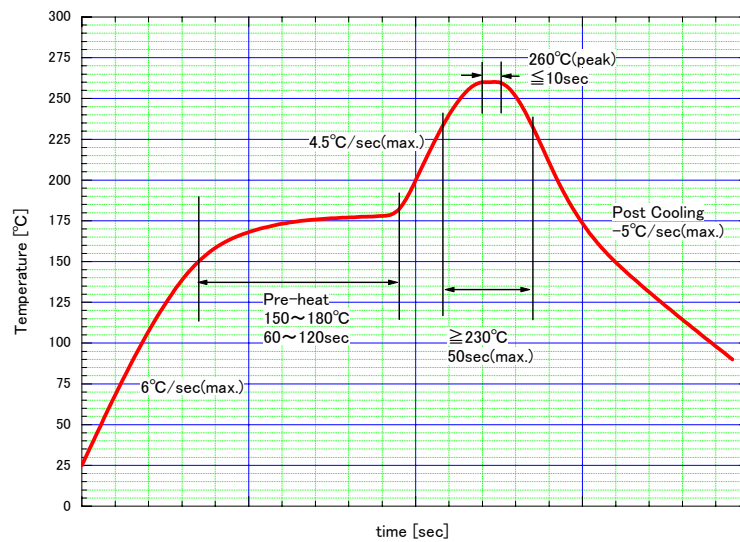
## Installation

- 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.

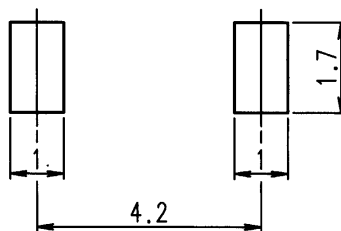
Table 1: Solder temperature and duration

Method	Solder temperature	Duration	Number of times
Flow	260±5°C	10±1second	1time
Reflow	260°Cmax. (Device body temp.)	10±1second	2times
Soldering iron	350±10°C	3.0±0.5second	1time

- Recommendation temperature profile(Reflow)



- Recommendation soldering pad



Dimensions unit:mm

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### 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.

### 7.Appendix

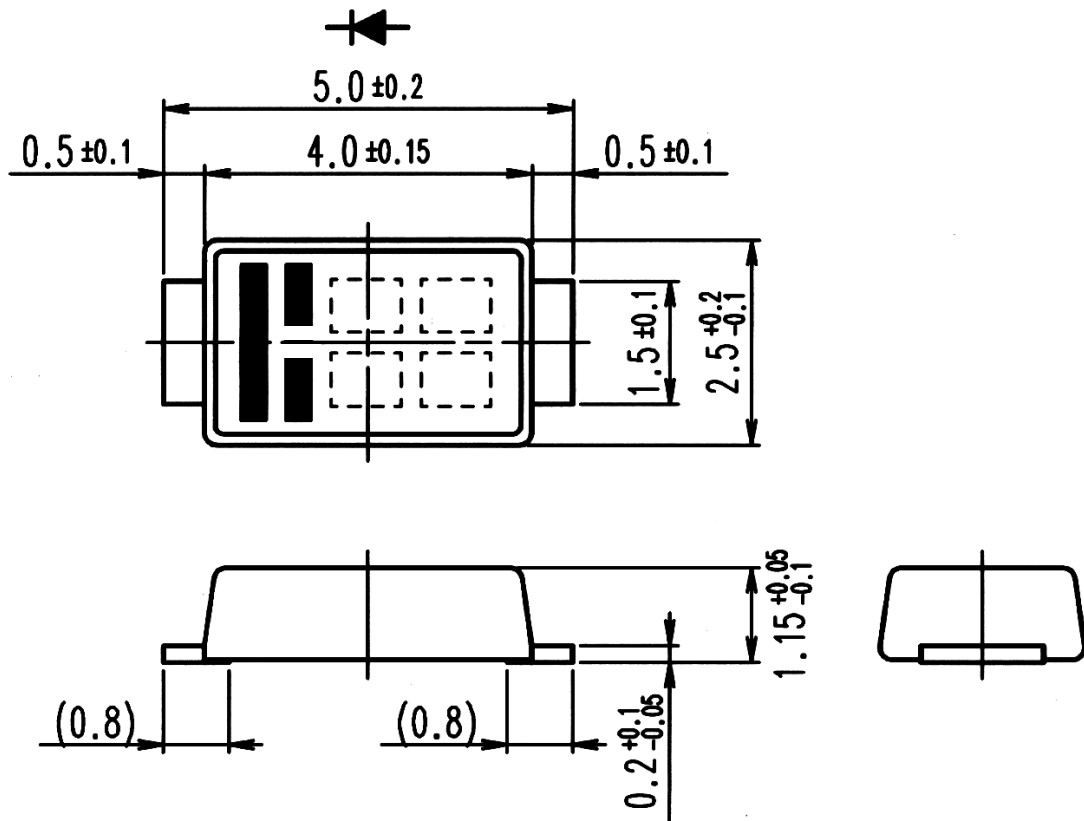
- This products does not contain PBBs (Polybrominated Biphenyl) or PBDEs (Polybrominated Diphenyl Ether ) , substances.
- This products does not contain Class-I ODS and Class-II ODS substances set force by 'Clean Air Act of US' law.

- 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.

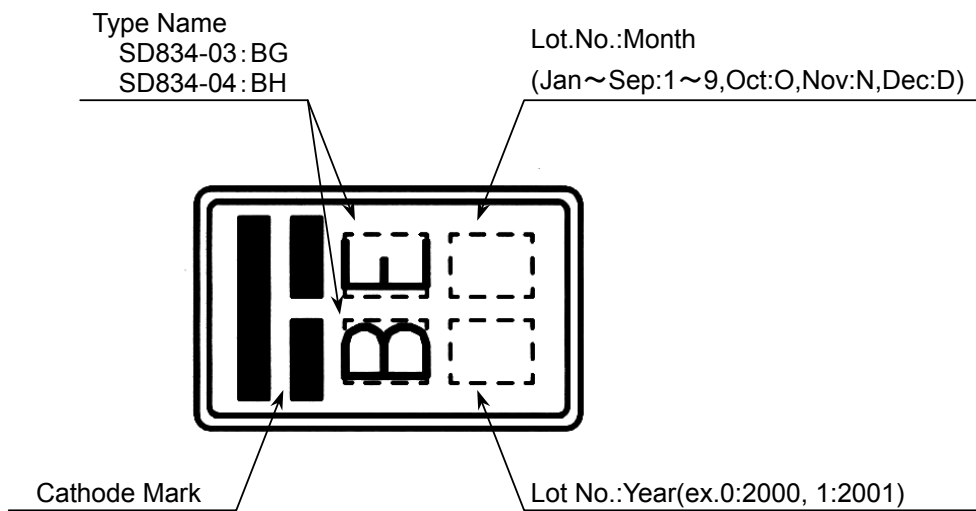


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**Out view**

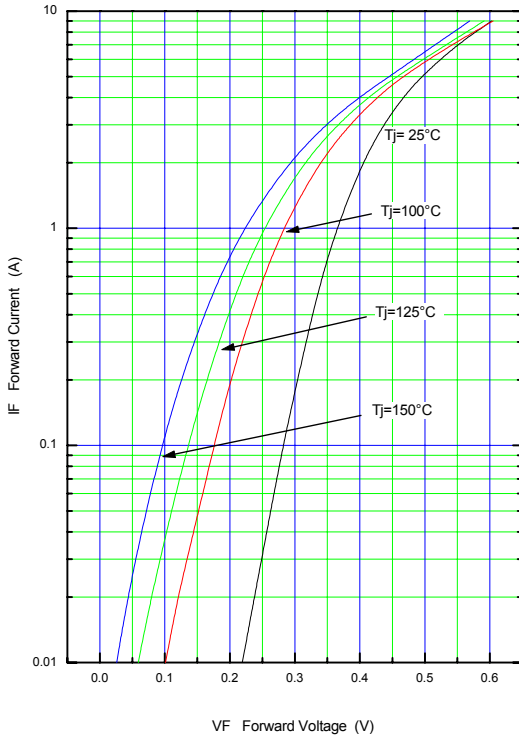


**Marking**

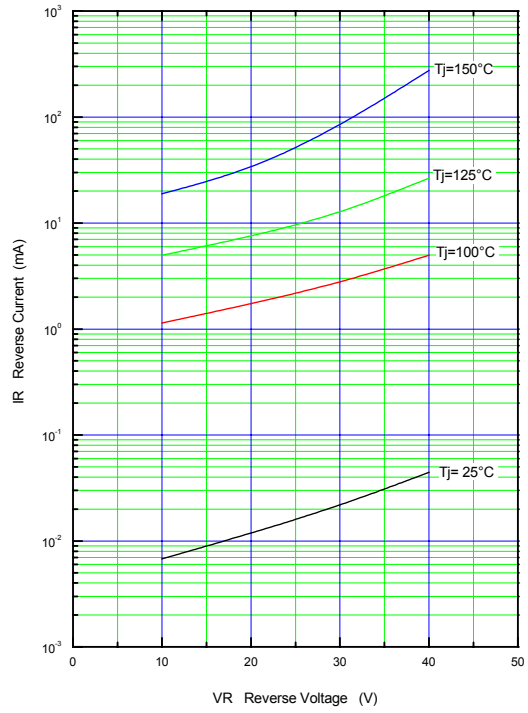


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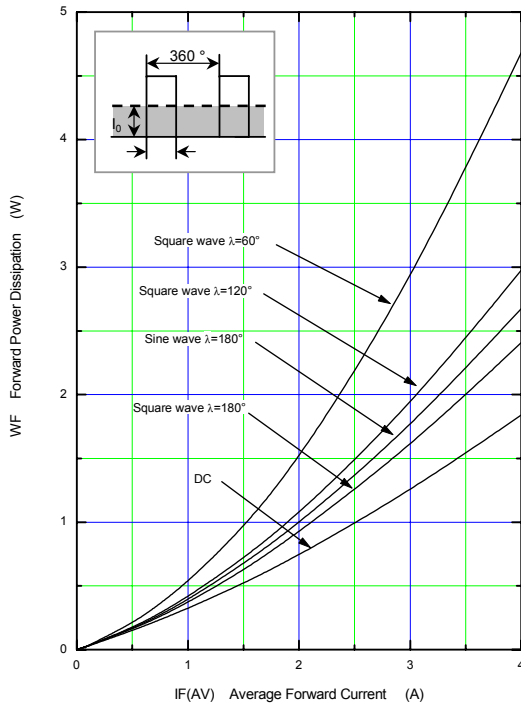
Forward Characteristic (typ.)



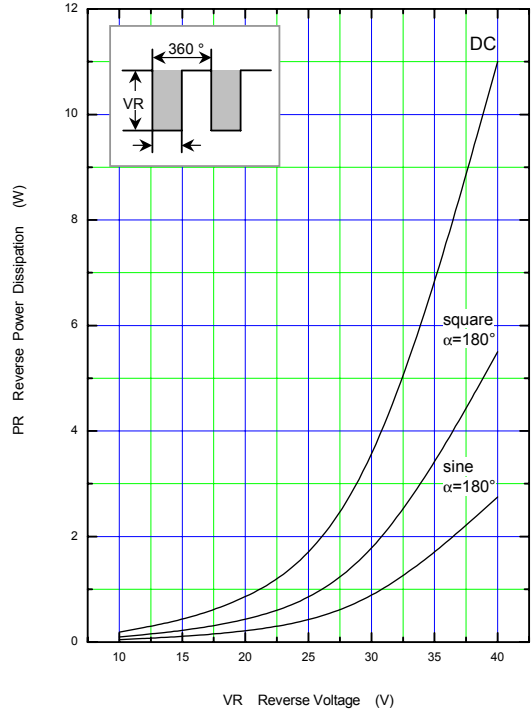
Reverse Characteristic (typ.)



Forward Power Dissipation (max.)

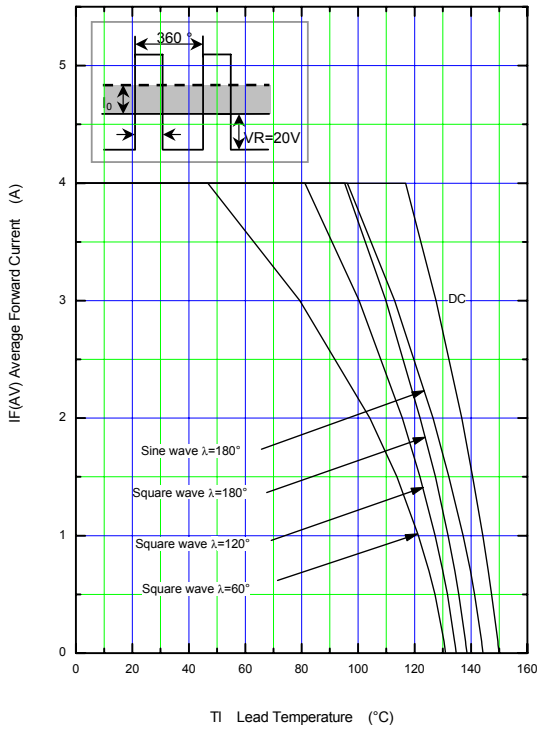


Reverse Power Dissipation (max.)

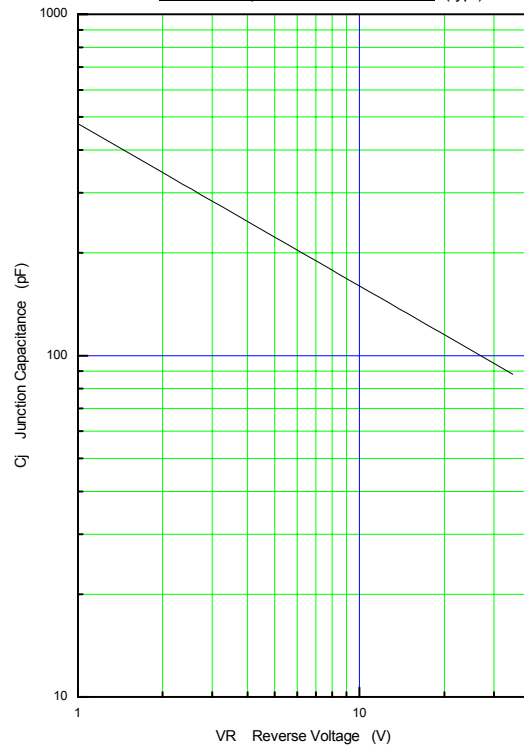


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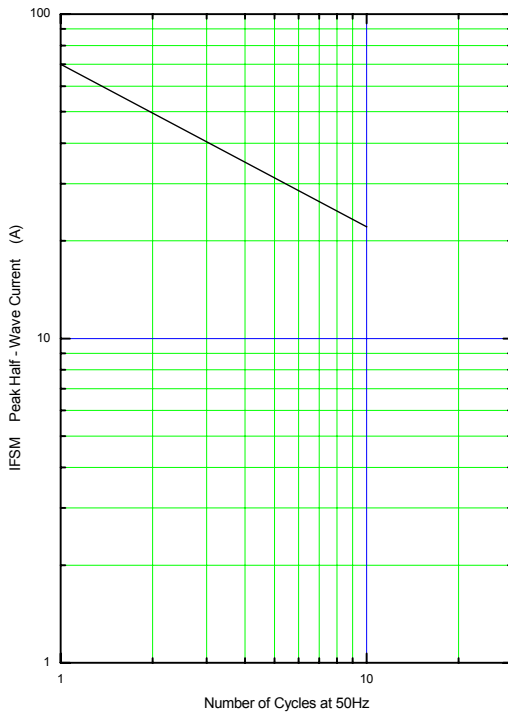
**Current Derating (IF(AV)-Tl) (max.)**



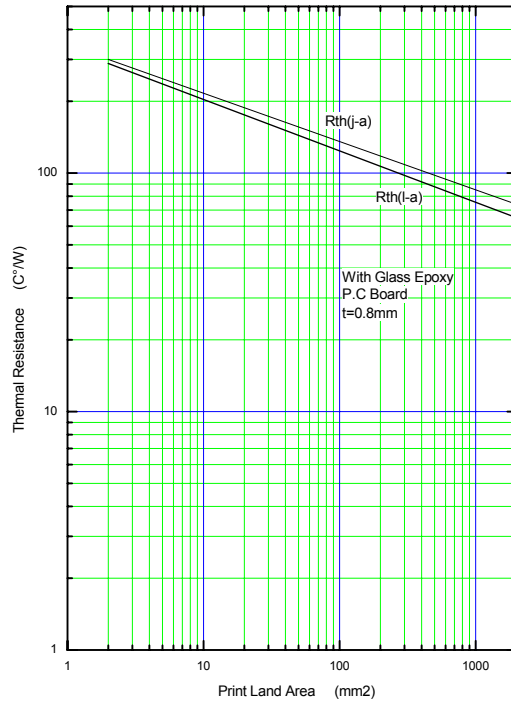
**Junction Capacitance Characteristic (typ.)**



**Surge Capability (max.)**



**Thermal Resistance Print Land (max.)**



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