SPECIFICATIONS

DEVICE TYPE NAME

SANKEN SILICON SCHOTTKY BARRIER DIODE FMB-24M



1. Scope

The present specifications shall apply to Sanken silicon diode, FMB-24M.

2. General

2.1 Type
Silicon Schottky Barrier Diode

2.2 Structure
Resin Molded

2.3 Application
Pulse Rectification, etc

3. Flammability

UL94V-0 (Equivalent)

4. Dimensions, Inner Structure and Marking

4.1 Appearance

The body shall be clean and shall not bear any stain, rust or flaw.
The color of the case will be black.

4.2 Dimensions Refer to 9.1

4.3 Marking : Refer to 9.2

4.4 Inner Structure : Refer to 9.3

| | | | |
|---|---|---|---|
| DATE of PROCESSING | September/28/ 2013 | | |
| PREPAREE BY | M.TSURUOKA | / / | |
| CHECKED BY | H.UCHINO | / / | SPECIFICATION NUMBER |
| APPROVED BY | Y.ARAI | / / | SSA-03414 |



61330

5. Absolute Maximum Ratings

| | | | | FMB-24M | |
|---|---|---|---|---|---|
| No. | Item | Symbol | Unit | Rating | Conditions |
| 1 | Transient Peak Reverse Voltage | $V_{RSM}$ | V | 45 | |
| 2 | Peak Reverse Voltage | $V_{RM}$ | V | 40 | |
| 3 | Average Forward Current | $I_{F(AV)}$ | A | 6.0 | Tc≦123℃, Sinewave |
| 4 | Peak Surge Forward Current | $I_{FSM}$ | A | 60 | half sinewave, one shot |
| 5 | $I^2t$ Limiting Value | $I^2t$ | $A^2s$ | 18 | 1msec≦t≦10msec |
| 6 | Junction Temperature | $T_j$ | ℃ | -40～+150 | |
| 7 | Storage Temperature | $T_{stg}$ | ℃ | -40～+150 | |
| 8 | Dielectric Strength | | kV | A.C. 1.0 | Junction and case(1min.) |



6. Electrical Characteristics (Ta=25℃, unless otherwise specified)

| No. | Item | Symbol | Unit | Value | Conditions |
|---|---|---|---|---|---|
| 1 | Forward Voltage Drop | $V_F$ | V | 0.55 max. | $I_F$=3.0A |
| 2 | Reverse Leakage Current | $I_R$ | mA | 3.0 max. | $V_R=V_{RM}$ |
| 3 | Reverse Leakage Current Under High Temperature | H・$I_{R1}$ | mA | 30 max. | $V_R=V_{RM}$, $T_j$=125℃ |
| | | H・$I_{R2}$ | mA | 100 max. | $V_R=V_{RM}$, $T_j$=150℃ |
| 4 | Thermal Resistance | $R_{th(j-C)}$ | ℃/W | 4.0 Max. | Between Junction and case |

* No.1,2&3 show characteristics per one chip.

7. Reliability Test

7.1 Test Conditions

| No. | Item | Rating | Conditions |
|---|---|---|---|
| 1 | Thermal Fatigue Test | 5000 cycles | ⊿Tj=100℃ |
| 2 | High Temperature Reverse Bias Test | 1000 hours | Ta=80℃, $V_R$=$V_{RM}$(D.C.) With Fin |
| 3 | Humidity Reverse Bias Test | 500 hours | Ta=85℃, R.H.=85%, VR=VRM×0.8(D.C.) |
| 4 | High Temperature Storage Test | 1000 hours | Ta=150℃ |
| 5 | Moisture Resistance Test | 1000 hours | Ta=85℃, 85%R.H. |
| 6 | Thermal Shock Test | 100 cycle | Ice-water(5min.) ~ R.T.(30sec.) ~ Boiling-water(5min.) |
| 7 | Temperature Cycle Test | 100 cycle | -40℃(30min.) ~ +150℃(30min.) |
| 8 | Pressure Cooker Test | 96 hours | 2.03×$10^5$Pa, 100%R.H., Unsaturated equipment |
| 9 | Resistance to Soldering Heat Test | 10 sec. | 260±5℃, Dipping up to 1.5mm form case |
| | | 3 sec. | 350±5℃, Dipping up to 1.5mm from case |
| 10 | Solderability Test | 95% | 235±5℃, 5sec., Using rosin flux |
| 11 | Lead Bend Test | 2 times | Apply EIAJ ED-4701 A-111 |
| 12 | Lead Pull Test | 10 sec. | |
| 13 | Lead Twist Test | 2 times | |
| 14 | Drop Test | 10 times | Naturally drop from 1m height on maple plate |



7.2 Acceptance Criteria

Base on the fulfillment of electrical characteristics of 6.Lead shall be not cut of No.11, 12 and 13.

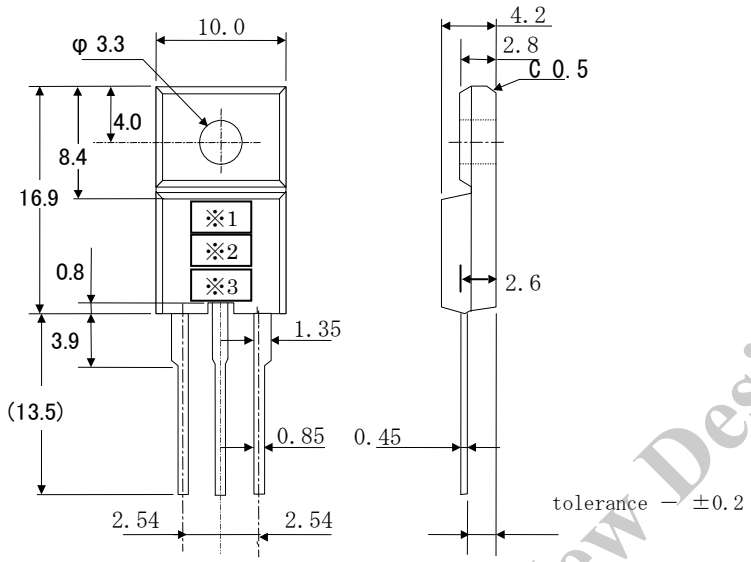
8. Standard Test Condition

Standard test conditions are at Ta=25℃ and R.H=60%.

But it is also acceptable to do test under ordinary temperature and ordinary R.H.(Ta=5~35 ℃, R.H=45~85%)

9. Dimensions, Inner Structure and Marking

9.1 Dimensions Refer

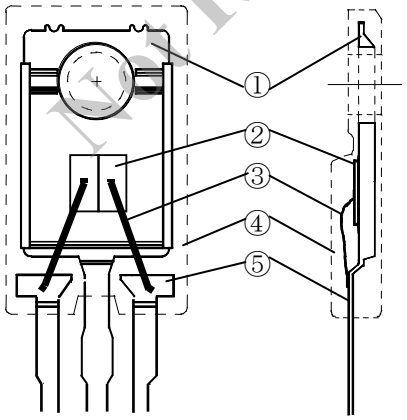



Dimensions in mm

9.2 Marking

| Type Name | Marking | | |
|---|---|---|---|
| | ＊1<br>Type Name | ＊2<br>Polarity | ＊3<br>Lot number |
| FMB-24M | FMB24M |  | 1st letter: Last digit of year<br>2nd letter: Month From 1 to 9 for Jan. to Sep.,<br>O for Oct., N for Nov., D for Dec.<br>3rd & 4th letter: Day<br>ex. 0125 (Jan.25, 2000) |

9.3 Inner Structure and Material List

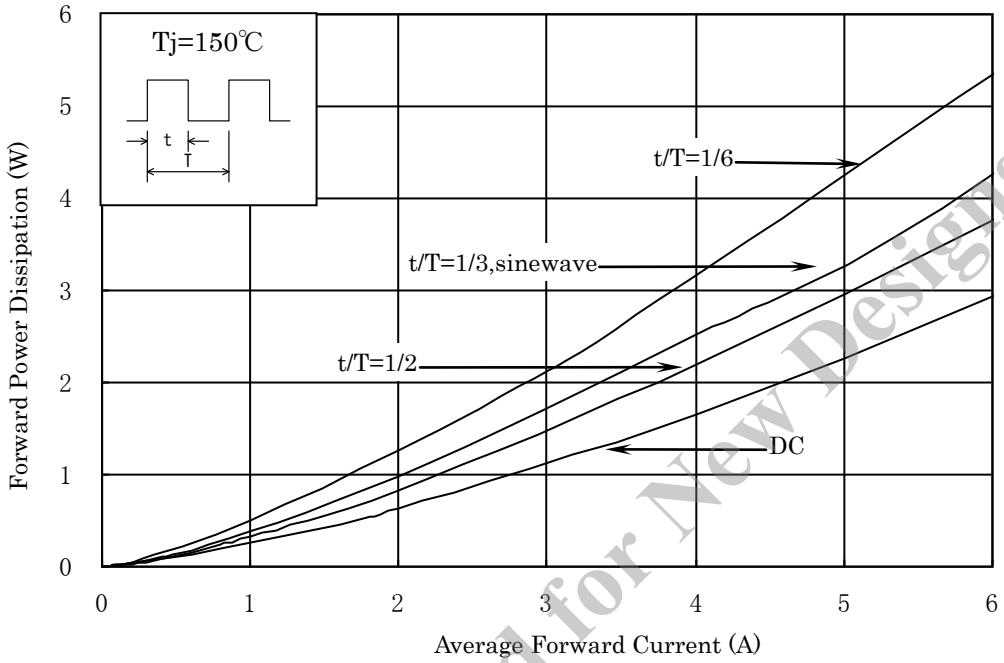



| No. | Name of part | Materials |
|---|---|---|
| ① | Frame: Heat Sink | Nickel Plated Copper |
| ② | Chip | Silicon |
| ③ | Inner Leads | Aluminum Wire |
| ④ | Resin body | Epoxy Resin |
| ⑤ | Frame: Pin | Nickel Plated Copper + Solder Dipped |

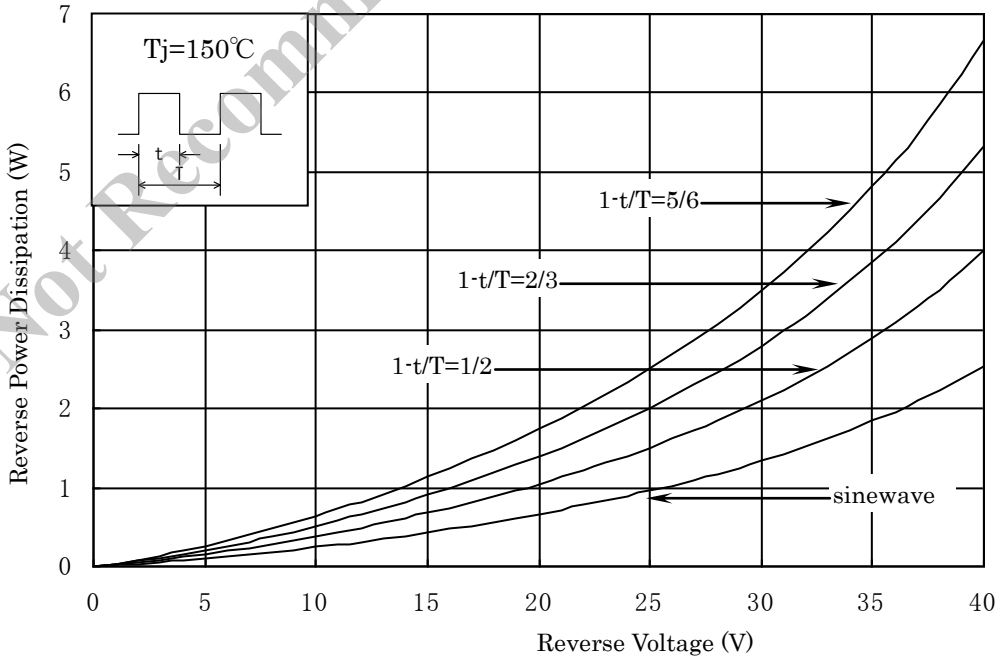
Weight of products: Approx. 2.1g

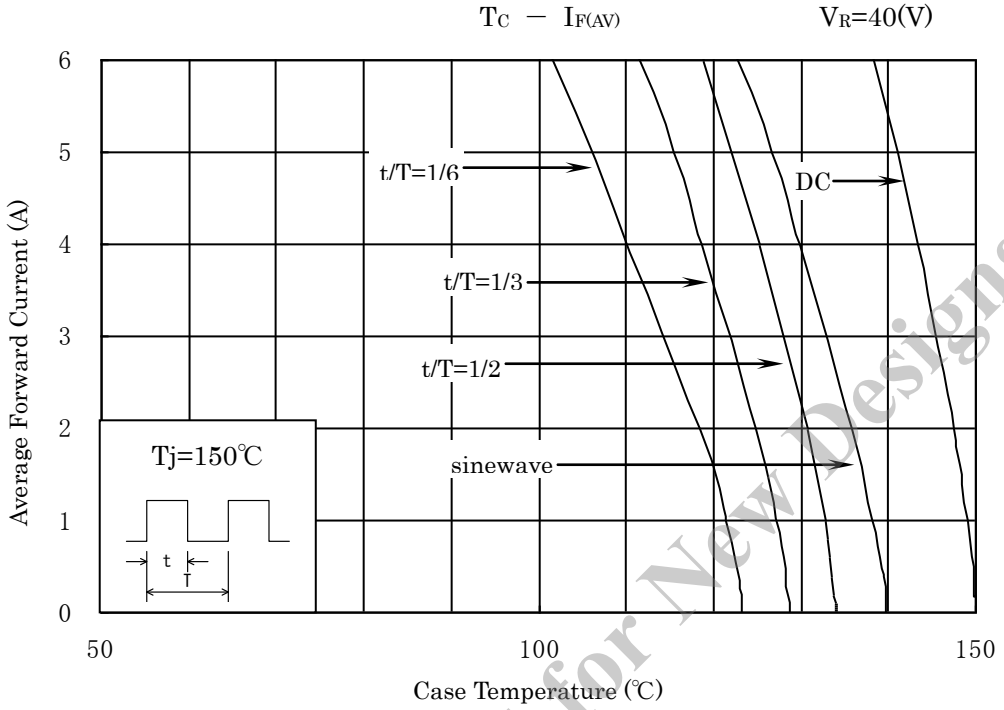
10. Characteristics

$I_{F(AV)}$ – $P_F$




$V_R$ – $P_R$





# † CAUTION/ WARNING

Remarks in using silicone grease for a heat-sink

When silicone grease is used in mounting this product on a heat-sink, it shall be applied evenly and thinly. If more silicone grease than required is applied, it may produce forced stress.

Volatile type silicone grease may produce cracks after elapse of long term, resulting in reducing heat radiation effect. Silicone grease with low consistency (hard grease) may cause cracks in the mold resin when screwing the product to a heat-sink.

Depending on silicone grease to be used base oil separated from the silicone grease may penetrate into the product through possible thinner gaps between the mold resin and the lead-frame to cause wire breakage or cracks in the mold resin by swelling the coating material inside the product, resulting in the shorter product life. Therefore, silicone grease which contains base oil not causing swelling of coating materials must be selected.

Our recommended silicone grease for heat radiation purpose which will not cause any adverse effect on the product life is indicated below:

| Type | Suppliers |
|---|---|
| G746 | Shin-Etsu Chemical Co., Ltd. |
| YG6260 | Toshiba Silicone Co., Ltd. |
| SC102 | Dow Corning Toray Silicone Co., Ltd. |



(2) Mounting Method of Heatsink

● Torque when Tightening Screws Mounting

Thermal resistance increases when tightening torque is small, and radiation effects are decreased. When the torque is too high, the screw can cut, the heatsink can be deformed, and/or distortion can be arise in the product's frame. To avoid these problems, Table1. show the recommended tightening torque for each product type.

Table1. Screw Tightening Torque

| Package | Screw Tightening Torque |
|---|---|
| MT25 FM20 (TO-220 & Full Mold) | 0.490 to 0.686 N・m (5 to 7 kgf・cm) |
| MT100 FM100 (TO-3P & Full Mold) | 0.686 to 0.882 N・m (7 to 9 kgf・cm) |

● Diameter of hole of heatsink: Less than 4mm $\phi$

As the slack of press mold for making the hole will be the cause of resin crack at the mounting, please pay special attention for that.

(3) Others

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