# SS12, SS14

# Surface Mount Schottky Power Rectifier

## SMA Power Surface Mount Package

These devices employ the Schottky Barrier principle in a large area metal−to−silicon power diode. State of the art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency rectification, or as free wheeling and polarity diodes in surface mount applications where compact size and weight are critical to the system.

### Features

- Small Compact Surface Mountable Package with J−Bent Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Stress Protection
- Pb−Free Packages are Available

### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Weight: 70 mg (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped in 12 mm tape, 5000 units per 13 inch reel
- Polarity: Cathode Lead Indicated by Polarity Band
- Device Meets MSL 1 Requirements
- ESD Ratings: Human Body Model, 3B (> 8000 V)
  Machine Model, B (> 200 V)

**ON Semiconductor®**

**http://onsemi.com**

**SCHOTTKY BARRIER RECTIFIER 1.0 AMPERES 20, 40 VOLTS**



**SMA**
**CASE 403D**
**PLASTIC**

**MARKING DIAGRAM**




| | |
|---|---|
| SS1x | = Specific Device Code |
| x | = 2 or 4 |
| A | = Assembly Location |
| Y | = Year |
| WW | = Work Week |
| ▪ | = Pb−Free Package |

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| SS12T3 | SMA | 5000/Tape & Reel |
| SS12T3G | SMA (Pb−Free) | 5000/Tape & Reel |
| SS14T3 | SMA | 5000/Tape & Reel |
| SS14T3G | SMA (Pb−Free) | 5000/Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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## MAXIMUM RATINGS

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | <br><br>SS12<br>SS14 | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | <br><br>20<br>40 | V |
| Average Rectified Forward Current<br>(At Rated $V_R$, $T_C$ = 120°C) | | $I_O$ | 1.0 | A |
| Peak Repetitive Forward Current<br>(At Rated $V_R$, Square Wave, 20 kHz, $T_C$ = 120°C) | | $I_{FRM}$ | 2.0 | A |
| Non−Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | | $I_{FSM}$ | 60 | A |
| Storage/Operating Case Temperature | | $T_{stg}$, $T_C$ | −55 to +150 | °C |
| Operating Junction Temperature | | $T_J$ | −55 to +150 | °C |
| Voltage Rate of Change<br>(Rated $V_R$, $T_J$ = 25°C) | | dv/dt | 10,000 | V/μs |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance,<br>Junction−to−Lead (Note 1)<br>Thermal Resistance,<br>Junction−to−Ambient (Note 1) | <br>$R_{\theta JL}$<br><br>$R_{\theta JA}$ | <br>35<br><br>86 | °C/W |

## ELECTRICAL CHARACTERISTICS

| | | | | | |
|---|---|---|---|---|---|
| Maximum Instantaneous Forward Voltage (Note 2)<br>see Figure 2for other Values | ($I_F$ = 1.0 A) | $V_F$ | **$T_J$ = 25°C**<br>0.47 | | V |
| Maximum Instantaneous Reverse Current<br>see Figure 4 for other Values | ($V_R$ = 20 V)<br>($V_R$ = 40 V) | $I_R$ | **$T_J$ = 25°C**<br>0.045<br>0.1 | **$T_J$ = 100°C**<br>2.0<br>5.0 | mA |

1. Mounted on 2 in Square PC Board with 1 in Square Total Pad Size, PC Board FR4.
2. Pulse Test: Pulse Width ≤ 250 μs, Duty Cycle ≤ 2.0%.

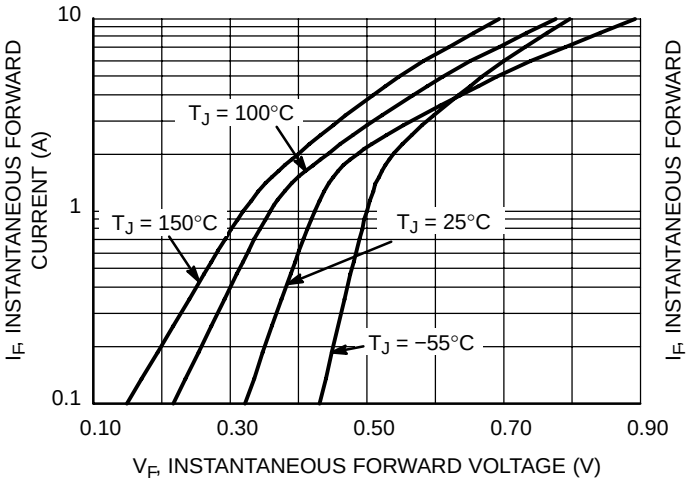



**Figure 1. Typical Forward Voltage**

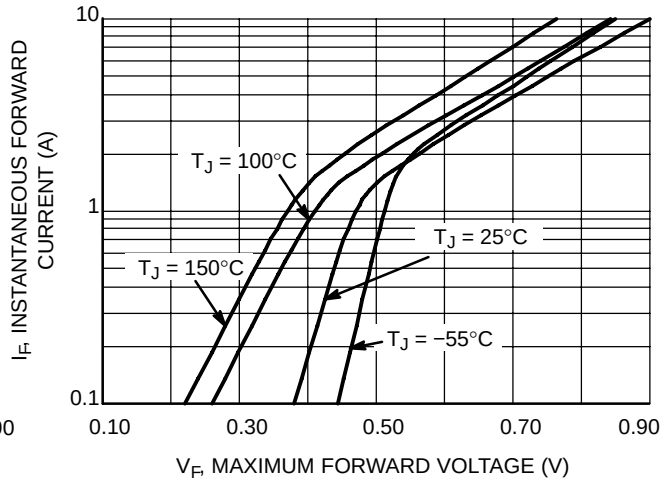



**Figure 2. Maximum Forward Voltage**

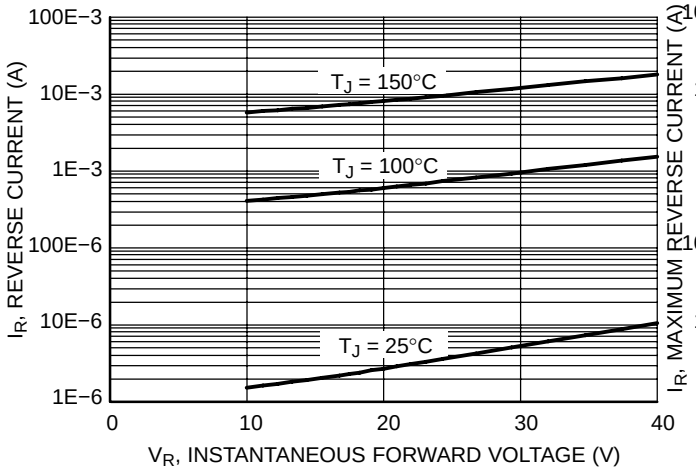



**Figure 3. Typical Reverse Current**

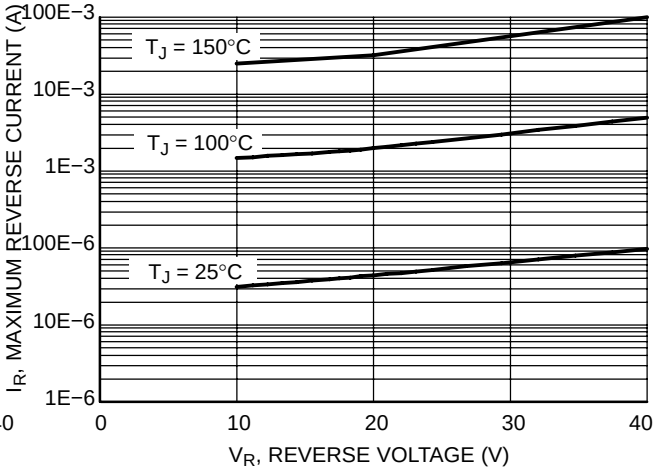



**Figure 4. Maximum Reverse Current**

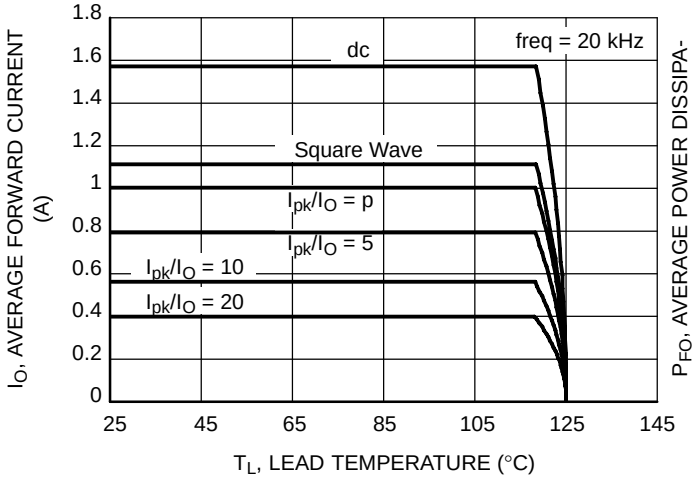



**Figure 5. Current Derating**

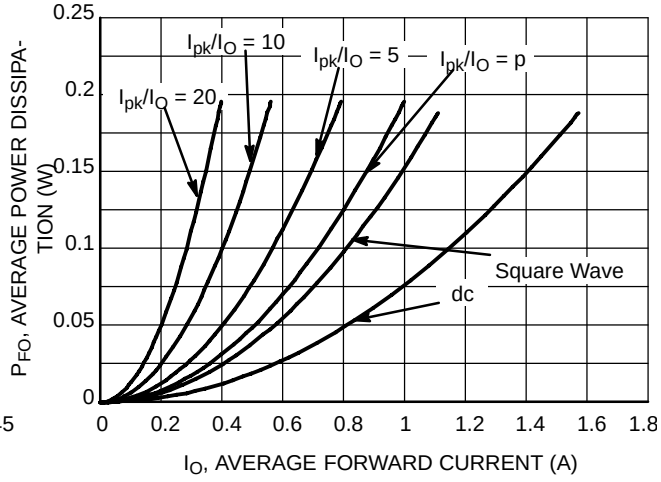



**Figure 6. Forward Power Dissipation**

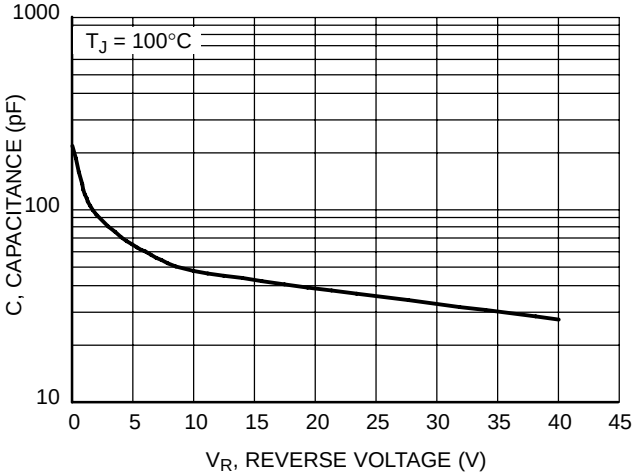



**Figure 7. Capacitance**

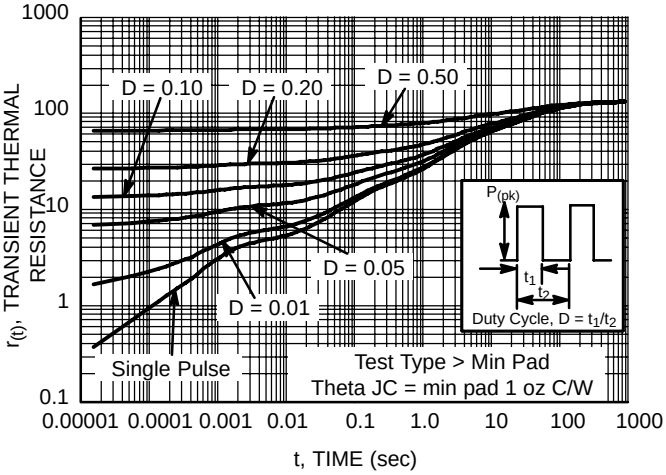
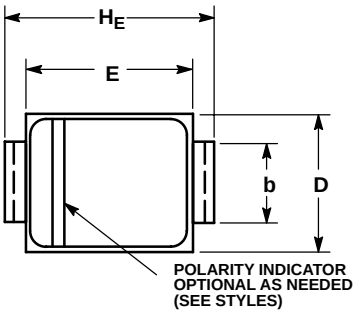



**Figure 8. Thermal Response**

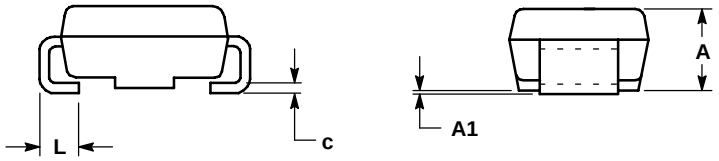
## PACKAGE DIMENSIONS

**SMA**
CASE 403D−02
ISSUE C



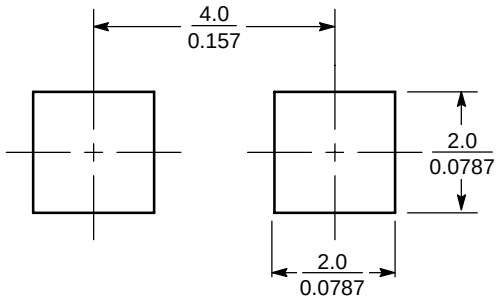

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 403D−01 OBSOLETE, NEW STANDARD IS 403D−02.

| | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| DIM | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.91 | 2.16 | 2.41 | 0.075 | 0.085 | 0.095 |
| A1 | 0.05 | 0.10 | 0.15 | 0.002 | 0.004 | 0.006 |
| b | 1.27 | 1.45 | 1.63 | 0.050 | 0.057 | 0.064 |
| c | 0.15 | 0.28 | 0.41 | 0.006 | 0.011 | 0.016 |
| D | 2.29 | 2.60 | 2.92 | 0.090 | 0.103 | 0.115 |
| E | 4.06 | 4.32 | 4.57 | 0.160 | 0.170 | 0.180 |
| $H_E$ | 4.83 | 5.21 | 5.59 | 0.190 | 0.205 | 0.220 |
| L | 0.76 | 1.14 | 1.52 | 0.030 | 0.045 | 0.060 |




STYLE 1:
PIN 1. CATHODE (POLARITY BAND)
2. ANODE

### SOLDERING FOOTPRINT*




SCALE 8:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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