# Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

## FEATURES

AUTOMOTIVE GRADE Available

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low switching losses
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications

RoHS COMPLIANT

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

## MECHANICAL DATA

**Case:** DO-214AC (SMA)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, automotive grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes the cathode end

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 1.5 A |
| $V_{RRM}$ | 25 V to 45 V |
| $I_{FSM}$ | 40 A |
| $V_F$ | 0.50 V |
| $T_J$ max. | 150 °C |

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | | SYMBOL | BYS10-25 | BYS10-35 | BYS10-45 | UNIT |
|---|---|---|---|---|---|---|
| Device marking code | | | BYS 025 | BYS 035 | BYS 045 | |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 25 | 35 | 45 | V |
| Maximum average forward rectified current | | $I_{F(AV)}$ | 1.5 | | | A |
| Peak forward surge current single half sine-wave superimposed on rated load | 8.3 ms | $I_{FSM}$ | 40 | | | A |
| | 10 ms | | 30 | | | |
| Junction and storage temperature range | | $T_J$, $T_{STG}$ | - 65 to + 150 | | | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **BYS10-25** | **BYS10-35** | **BYS10-45** | **UNIT** |
| Maximum instantaneous forward voltage (1) | 1.0 A | | $V_F$ | 500 | | | mV |
| Maximum DC reverse current (1) | $V_{RRM}$ | $T_J$ = 25 °C | $I_R$ | 500 | | | µA |
| | | $T_J$ = 100 °C | | 10 | | | mA |

**Note**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **BYS10-25** | **BYS10-35** | **BYS10-45** | **UNIT** |
| Maximum thermal resistance, junction to lead | $R_{\theta JL}$ | 25 | | | °C/W |
| Maximum thermal resistance, junction to ambient | $R_{\theta JA}$ (1) | 150 | | | °C/W |
| | $R_{\theta JA}$ (2) | 125 | | | |
| | $R_{\theta JA}$ (3) | 100 | | | |

**Notes**

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 $mm^2$ 35 µm Cu

(3) Mounted on Al-oxide-ceramic ($Al_2O_3$), 50 $mm^2$ 35 µm Cu

| ORDERING INFORMATION (Example) | | | | |
|---|---|---|---|---|
| **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PREFERRED PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| BYS10-45-E3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYS10-45-E3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYS10-45HE3/TR (1) | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYS10-45HE3/TR3 (1) | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |

**Note**

(1) Automotive grade

## RATINGS AND CHARACTERISTICS CURVES

($T_A$ = 25 °C unless otherwise noted)

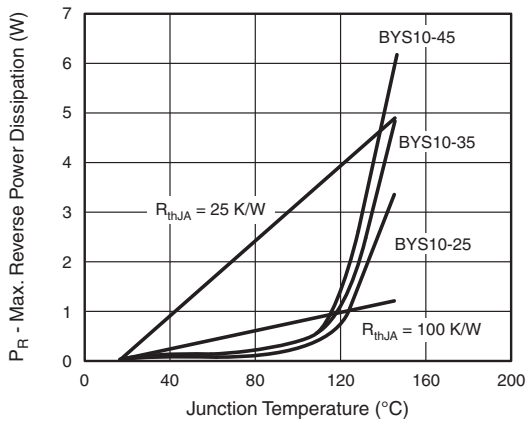


Fig. 1 - Max. Reverse Power Dissipation vs. Junction Temperature

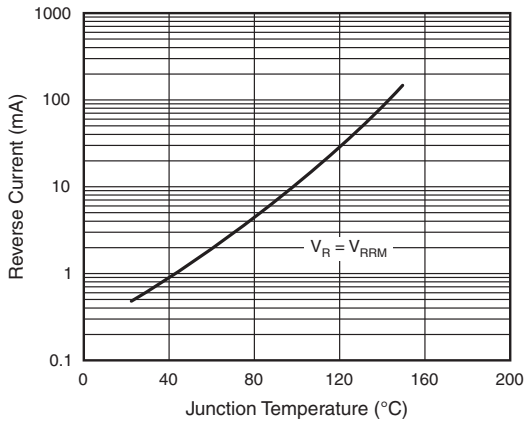


Fig. 2 - Max. Reverse Current vs. Junction Temperature




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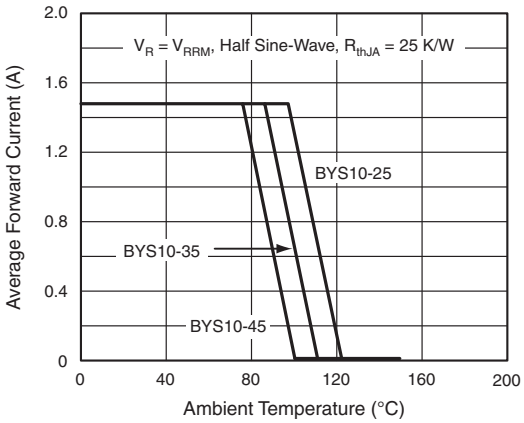



Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

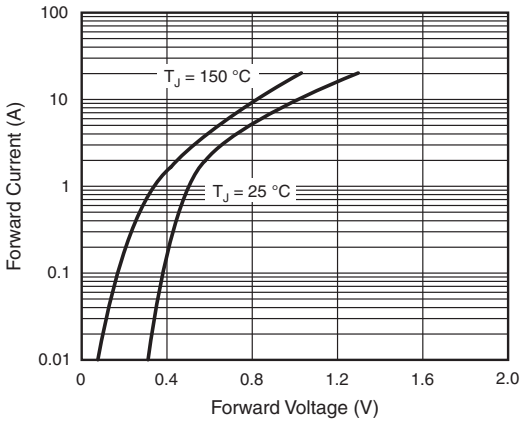



Fig. 5 - Max. Forward Current vs. Forward Voltage

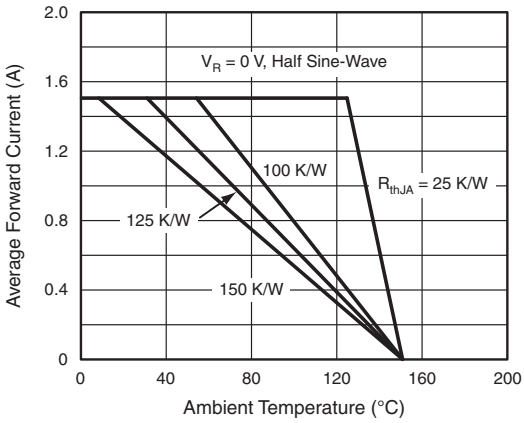



Fig. 4 - Max. Average Forward Current vs. Ambient Temperature

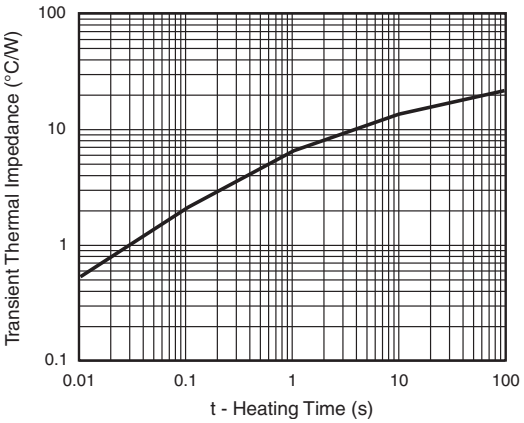
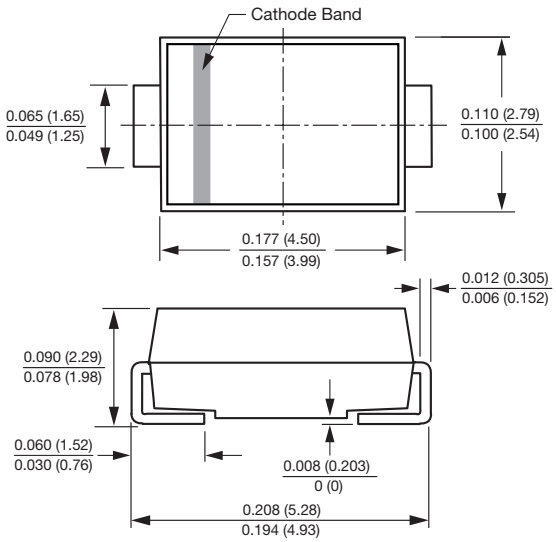


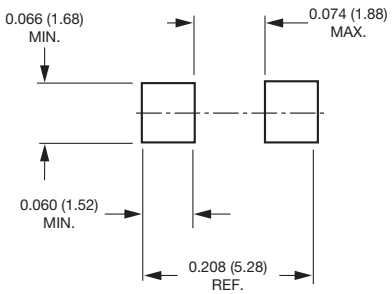

Fig. 6 - Typical Transient Thermal Impedance

## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

### DO-214AC (SMA)




### Mounting Pad Layout



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