

## Surface-Mount Schottky Barrier Rectifier



SMA (DO-214AC)

Cathode  Anode

### LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |                  |
|-------------------------|------------------|
| $I_{F(AV)}$             | 1.5 A            |
| $V_{RRM}$               | 25 V, 35 V, 45 V |
| $I_{FSM}$               | 40 A             |
| $V_F$                   | 0.50 V           |
| $T_J$ max.              | 150 °C           |
| Package                 | SMA (DO-214AC)   |
| Circuit configuration   | Single           |

### FEATURES

- 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 available
  - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

### MECHANICAL DATA

**Case:** SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3\_X - RoHS-compliant and AEC-Q101 qualified  
Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("X" denotes revision code e.g. A, B, .....)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3, M3, HE3, and HM3 suffix meets JESD 201 class 2 whisker test

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

| MAXIMUM RATINGS (T <sub>A</sub> = 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 <sub>RRM</sub>                  | 25          | 35       | 45       | V    |
| Maximum average forward rectified current                                   |        | I <sub>F(AV)</sub>                | 1.5         |          |          | A    |
| Peak forward surge current single half sine-wave superimposed on rated load | 8.3 ms | I <sub>FSM</sub>                  | 40          |          |          | A    |
|                                                                             | 10 ms  |                                   | 30          |          |          |      |
| Junction and storage temperature range                                      |        | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 |          |          | °C   |

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                                            | TEST CONDITIONS | SYMBOL                              | BYS10-25 | BYS10-35 | BYS10-45 | UNIT          |
|------------------------------------------------------|-----------------|-------------------------------------|----------|----------|----------|---------------|
| Maximum instantaneous forward voltage <sup>(1)</sup> | 1.0 A           | $V_F$                               | 500      |          |          | mV            |
| Maximum DC reverse current <sup>(1)</sup>            | $V_{RRM}$       | $T_J = 25\text{ }^{\circ}\text{C}$  | 500      |          |          | $\mu\text{A}$ |
|                                                      |                 | $T_J = 100\text{ }^{\circ}\text{C}$ | 10       |          |          | mA            |

**Note**

<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

**THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                                       | SYMBOL                          | BYS10-25 | BYS10-35 | BYS10-45 | UNIT |
|-------------------------------------------------|---------------------------------|----------|----------|----------|------|
| Maximum thermal resistance, junction-to-lead    | R <sub>θJL</sub>                | 25       |          |          | °C/W |
| Maximum thermal resistance, junction-to-ambient | R <sub>θJA</sub> <sup>(1)</sup> | 150      |          |          | °C/W |
|                                                 | R <sub>θJA</sub> <sup>(2)</sup> | 125      |          |          |      |
|                                                 | R <sub>θJA</sub> <sup>(3)</sup> | 100      |          |          |      |

**Notes**

<sup>(1)</sup> Mounted on epoxy-glass hard tissue

<sup>(2)</sup> Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu

<sup>(3)</sup> Mounted on Al-oxide-ceramic ( $\text{Al}_2\text{O}_3$ ), 50 mm<sup>2</sup> 35  $\mu\text{m}$  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_A/H <sup>(1)</sup> | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| BYS10-45HE3_A/I <sup>(1)</sup> | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |
| BYS10-45-M3/TR                 | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYS10-45-M3/TR3                | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYS10-45HM3_A/H <sup>(1)</sup> | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| BYS10-45HM3_A/I <sup>(1)</sup> | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |

**Note**

<sup>(1)</sup>AEC-Q101 qualified



## RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

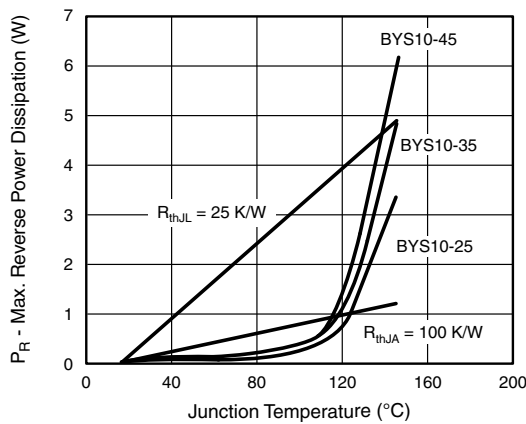


Fig. 1 - Max. Reverse Power Dissipation vs. Junction Temperature

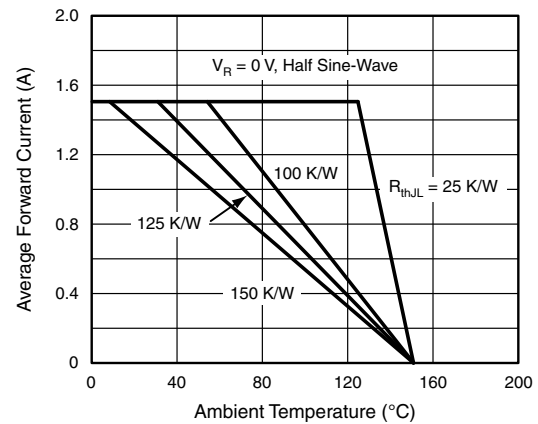


Fig. 4 - Max. Average Forward Current vs. Ambient Temperature

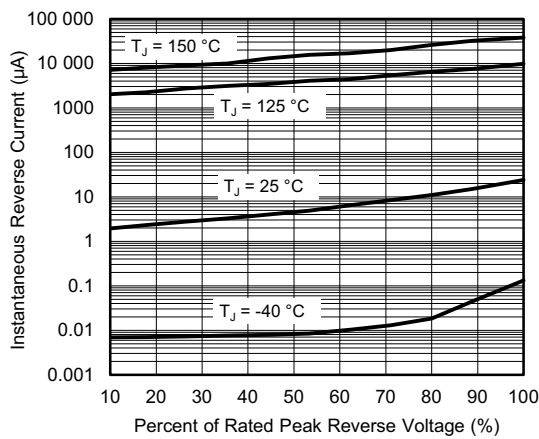


Fig. 2 - Typical Reverse Characteristics

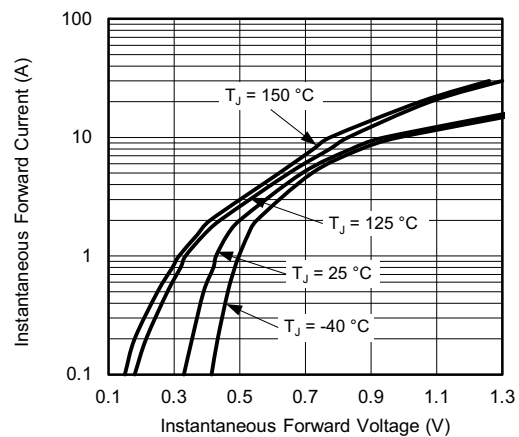


Fig. 5 - Typical Instantaneous Forward Characteristics

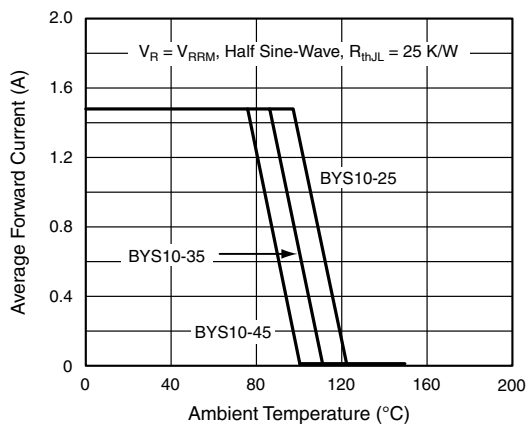


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

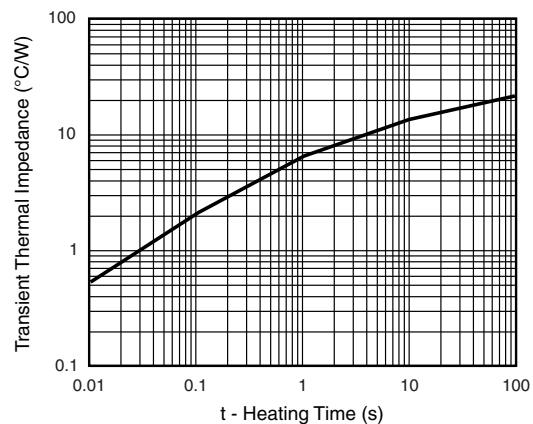
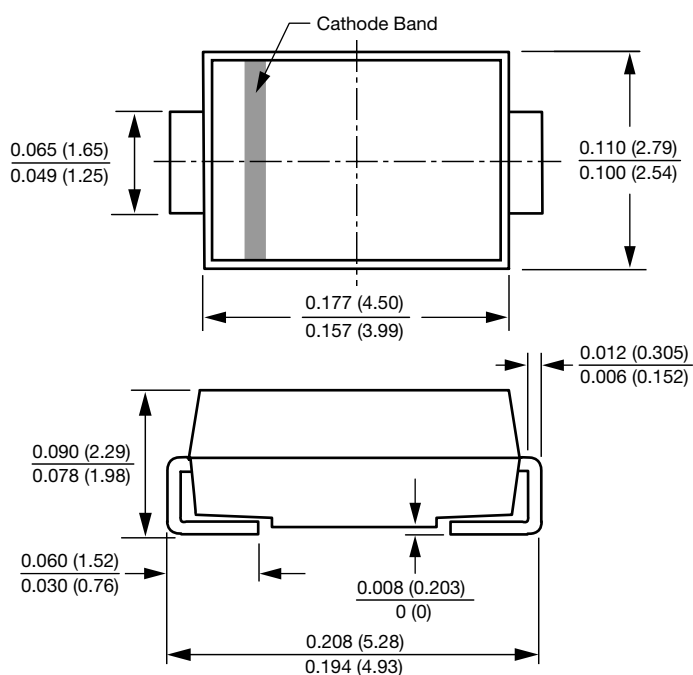


Fig. 6 - Typical Transient Thermal Impedance

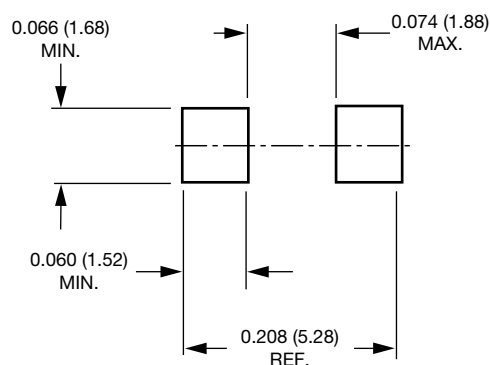


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)



### Mounting Pad Layout





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