

# Surface-Mount Schottky Barrier Rectifier



**SMA (DO-214AC)**

Cathode  Anode

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |                |
|-------------------------|----------------|
| $I_{F(AV)}$             | 1.5 A          |
| $V_{RRM}$               | 90 V           |
| $I_{FSM}$               | 40 A           |
| $V_F$ at $I_F = 1.0$ A  | 0.75 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

## TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters, and reverse battery protection.

## 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/NHE3\_X - RoHS-compliant, 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 and HE3 suffix meet JESD 201 class 2 whisker test

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

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                     |                |             |            |
|-----------------------------------------------------------------------------|----------------|-------------|------------|
| PARAMETER                                                                   | SYMBOL         | BYS12-90    | UNIT       |
| Device marking code                                                         |                | BYS 209     |            |
| Maximum repetitive peak reverse voltage                                     | $V_{RRM}$      | 90          | V          |
| Maximum average forward rectified current                                   | $I_{F(AV)}$    | 1.5         | A          |
| Peak forward surge current single half sine-wave superimposed on rated load | $I_{FSM}$      | 40          | A          |
|                                                                             |                | 30          |            |
| Voltage rate of change (rated $V_R$ )                                       | $dV/dt$        | 10 000      | V/ $\mu$ s |
| Junction and storage temperature range                                      | $T_J, T_{STG}$ | -55 to +150 | °C         |

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

| PARAMETER                                            | TEST CONDITIONS      |                                     | SYMBOL | BYS12-90 | UNIT          |
|------------------------------------------------------|----------------------|-------------------------------------|--------|----------|---------------|
| Maximum instantaneous forward voltage <sup>(1)</sup> | $I_F = 1.0\text{ A}$ | $T_J = 25\text{ }^{\circ}\text{C}$  | $V_F$  | 750      | mV            |
|                                                      | $I_F = 15\text{ mA}$ |                                     |        | 360      |               |
| Maximum DC reverse current <sup>(1)</sup>            | $V_{RRM}$            | $T_J = 25\text{ }^{\circ}\text{C}$  | $I_R$  | 100      | $\mu\text{A}$ |
|                                                      |                      | $T_J = 100\text{ }^{\circ}\text{C}$ |        | 1        | 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                | BYS12-90 | UNIT                 |
|-------------------------------------------------|-----------------------|----------|----------------------|
| Maximum thermal resistance, junction to lead    | $R_{\theta JL}$       | 25       | $^{\circ}\text{C/W}$ |
| Maximum thermal resistance, junction to ambient | $R_{\theta JA}^{(1)}$ | 150      | $^{\circ}\text{C/W}$ |
|                                                 | $R_{\theta JA}^{(2)}$ | 125      |                      |
|                                                 | $R_{\theta JA}^{(3)}$ | 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                      |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| BYS12-90-E3/TR                 | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYS12-90-E3/TR3                | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYS12-90HE3_A/H <sup>(1)</sup> | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| BYS12-90HE3_A/I <sup>(1)</sup> | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |

**Note**

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

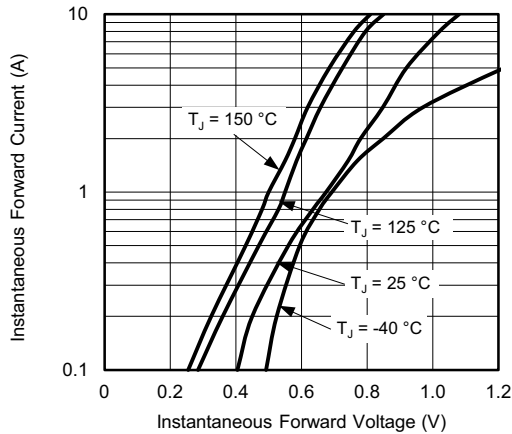
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Typical Instantaneous Forward Characteristics

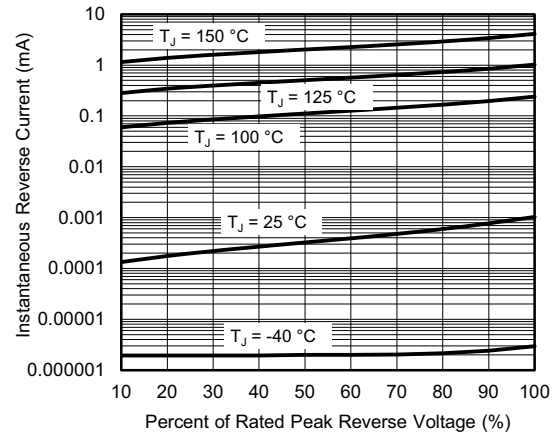


Fig. 4 - Typical Reverse Characteristics

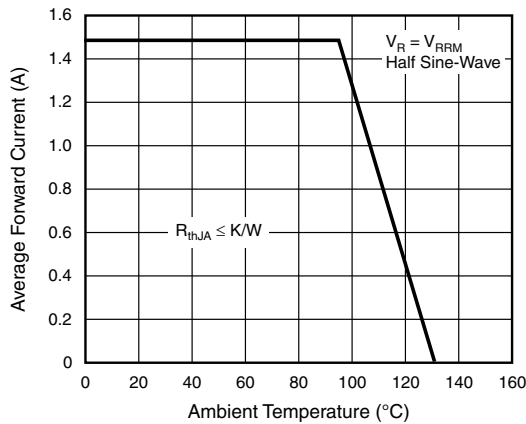


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

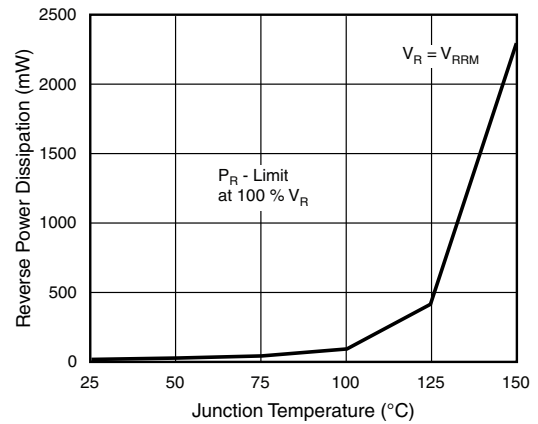


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

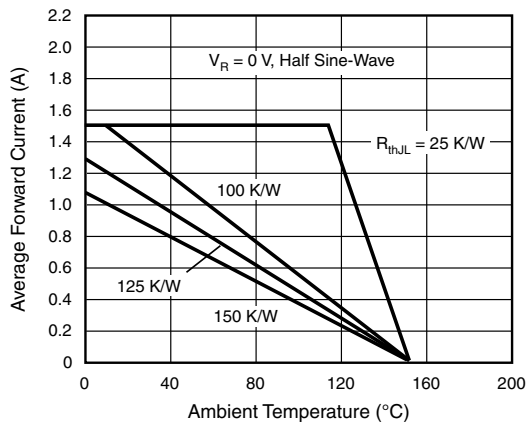


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

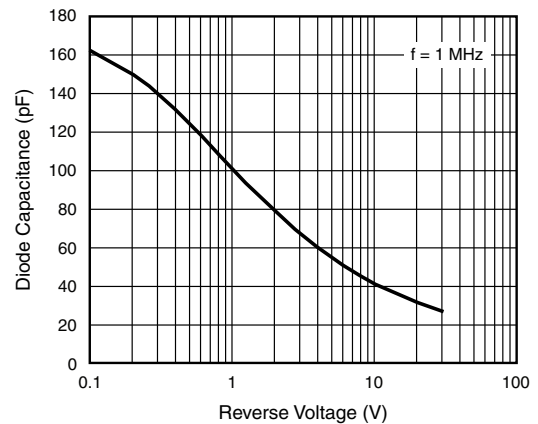
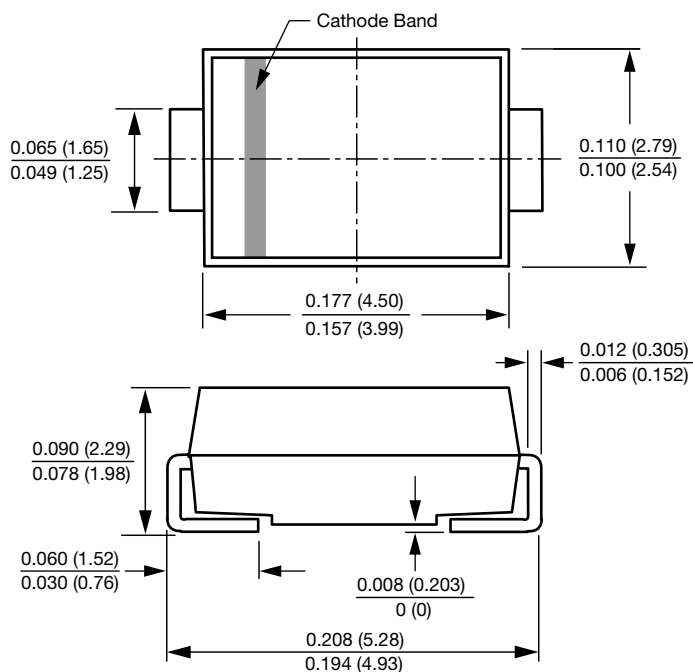


Fig. 6 - Diode Capacitance vs. Reverse Voltage

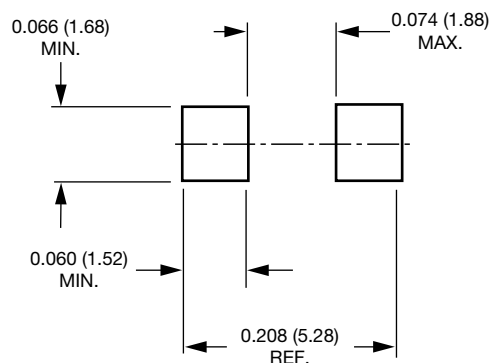


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMA (DO-214AC)**



**Mounting Pad Layout**





## Disclaimer

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