

## Surface Mount Schottky Barrier Rectifier



DO-214AC (SMA)

### 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
- 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, oring diode, DC/DC converters and reverse battery protection.

### PRIMARY CHARACTERISTICS

|                    |        |
|--------------------|--------|
| $I_{F(AV)}$        | 1.5 A  |
| $V_{RRM}$          | 90 V   |
| $I_{FSM}$          | 40 A   |
| $V_F$              | 0.75 V |
| $T_J \text{ max.}$ | 150 °C |

### 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, AEC-Q101 qualified

**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

### MAXIMUM RATINGS (TA = 25 °C unless otherwise noted)

| PARAMETER                                                                   | SYMBOL         | BYS11-90      | UNIT       |
|-----------------------------------------------------------------------------|----------------|---------------|------------|
| Device marking code                                                         |                | BYS109        |            |
| 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 | 8.3 ms         | 40            | A          |
|                                                                             | 10 ms          | 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         |

| <b>ELECTRICAL CHARACTERISTICS</b> (TA = 25 °C unless otherwise noted) |                  |                |          |      |
|-----------------------------------------------------------------------|------------------|----------------|----------|------|
| PARAMETER                                                             | TEST CONDITIONS  | SYMBOL         | BYS11-90 | UNIT |
| Maximum instantaneous forward voltage <sup>(1)</sup>                  | 1.0 A            | V <sub>F</sub> | 750      | mV   |
| Maximum DC reverse current <sup>(1)</sup>                             | V <sub>RRM</sub> | I <sub>R</sub> | 100      | μA   |
|                                                                       |                  |                | 1        | mA   |

**Note**
<sup>(1)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle

| <b>THERMAL CHARACTERISTICS</b> (TA = 25 °C unless otherwise noted) |                                 |          |      |
|--------------------------------------------------------------------|---------------------------------|----------|------|
| PARAMETER                                                          | SYMBOL                          | BYS11-90 | 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 μm Cu

<sup>(3)</sup> Mounted on Al-oxide-ceramic (Al<sub>2</sub>O<sub>3</sub>), 50 mm<sup>2</sup> 35 μm Cu

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| BYS11-90-E3/TR                        | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYS11-90-E3/TR3                       | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYS11-90HE3/TR <sup>(1)</sup>         | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYS11-90HE3/TR3 <sup>(1)</sup>        | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |

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

**RATINGS AND CHARACTERISTICS CURVES**

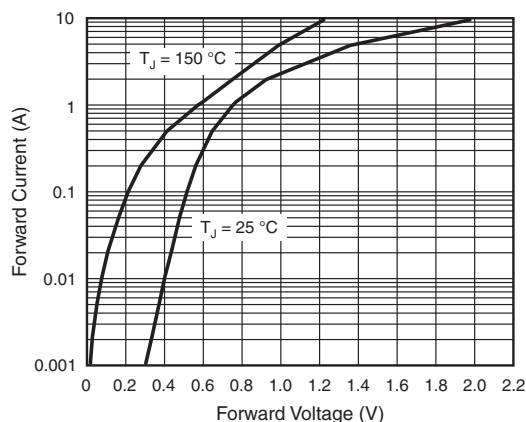
(T<sub>A</sub> = 25 °C unless otherwise noted)


Fig. 1 - Forward Current vs. Forward Voltage

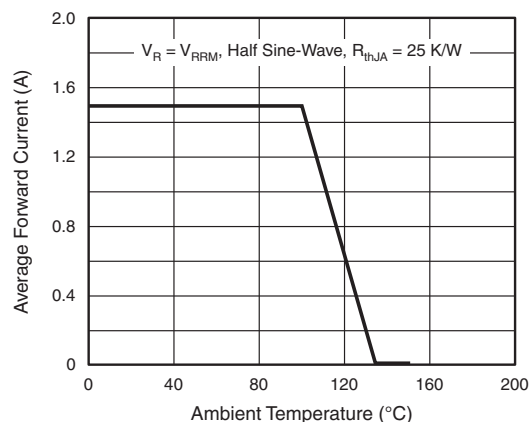


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

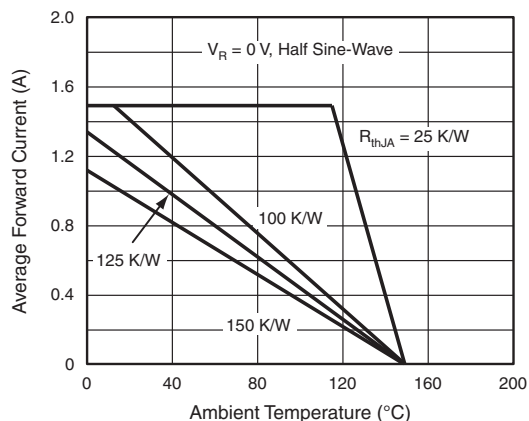


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

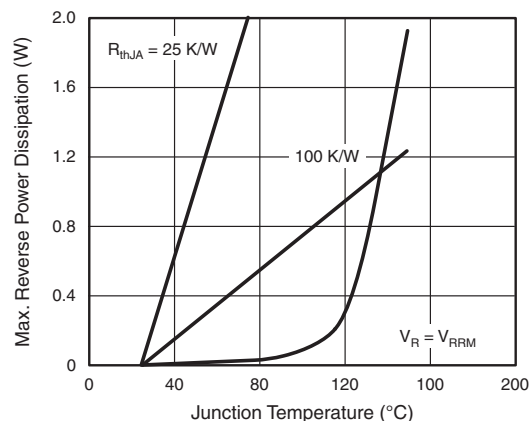


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

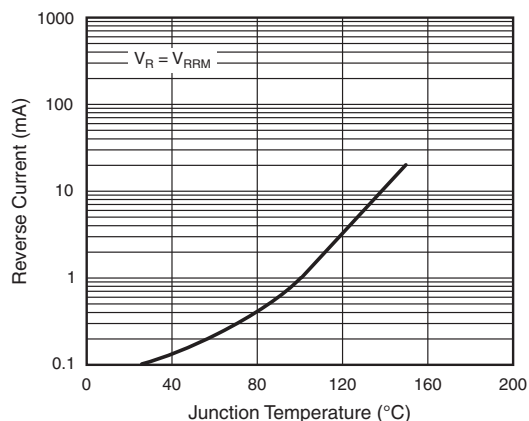


Fig. 4 - Reverse Current vs. Junction Temperature

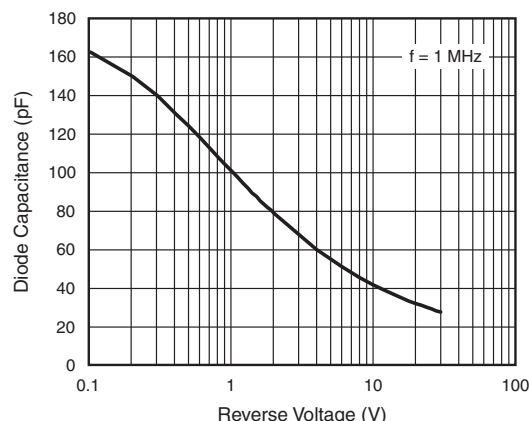
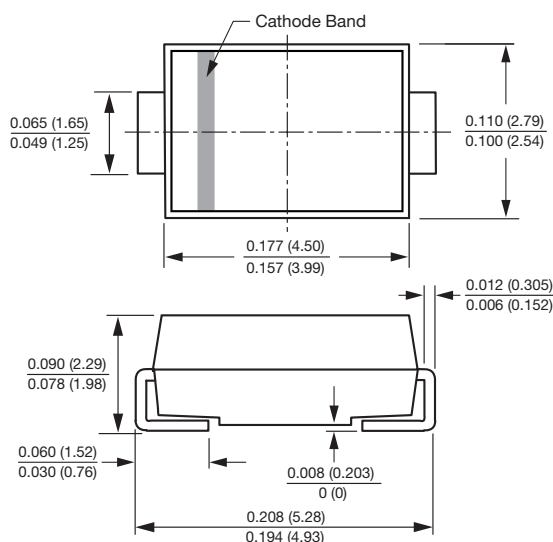


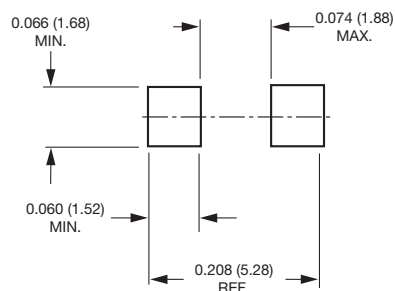
Fig. 6 - Diode Capacitance vs. Reverse Voltage

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AC (SMA)



### Mounting Pad Layout





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