

Surface Mount Schottky Barrier Rectifier


DO-214AC (SMA)

| 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 | DO-214AC (SMA) |
| Diode variations | Single die |

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


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: 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

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 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 ($T_A = 25$ °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/ μ 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 ⁽¹⁾ | $I_F = 1.0\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | V_F | 750 | mV |
| | $I_F = 15\text{ mA}$ | | | 360 | |
| Maximum DC reverse current ⁽¹⁾ | V_{RRM} | $T_J = 25\text{ }^\circ\text{C}$ | I_R | 100 | μA |
| | | $T_J = 100\text{ }^\circ\text{C}$ | | 1 | mA |

Note

⁽¹⁾ Pulse test: 300 μs 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

⁽¹⁾ Mounted on epoxy-glass hard tissue

⁽²⁾ Mounted on epoxy-glass hard tissue, 50 mm² 35 μm Cu

⁽³⁾ Mounted on Al-oxide-ceramic (Al₂O₃), 50 mm² 35 μm 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/TR ⁽¹⁾ | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYS12-90HE3/TR3 ⁽¹⁾ | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYS12-90HE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYS12-90HE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |

Note

⁽¹⁾ AEC-Q101 qualified

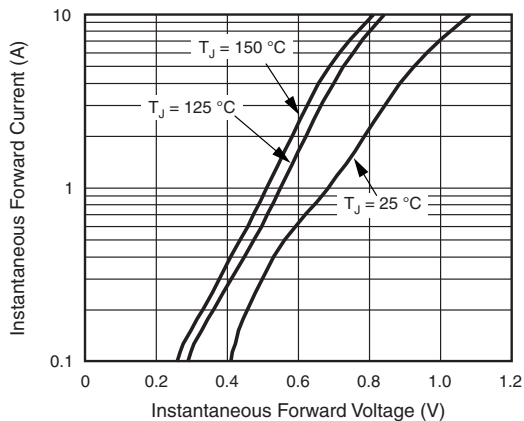
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current vs. Forward Voltage

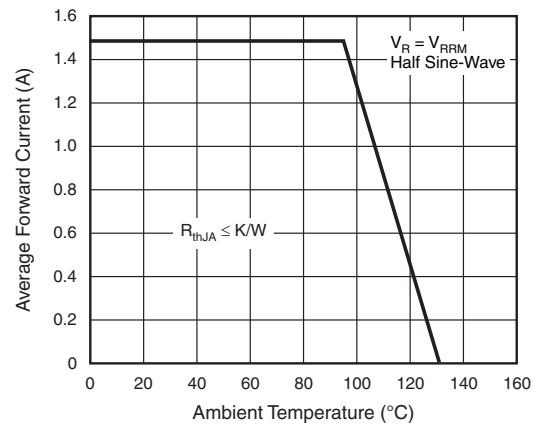


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

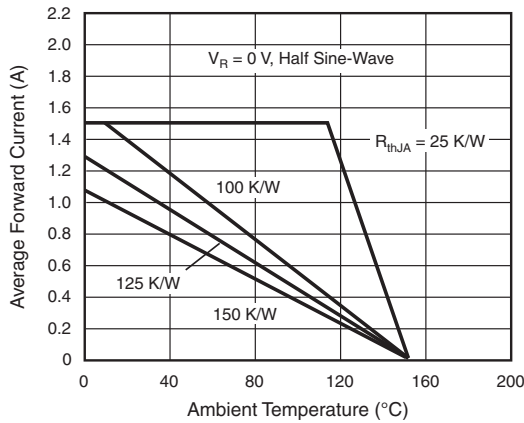


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

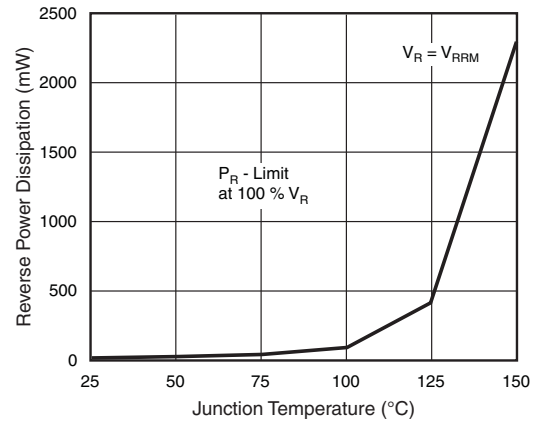


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

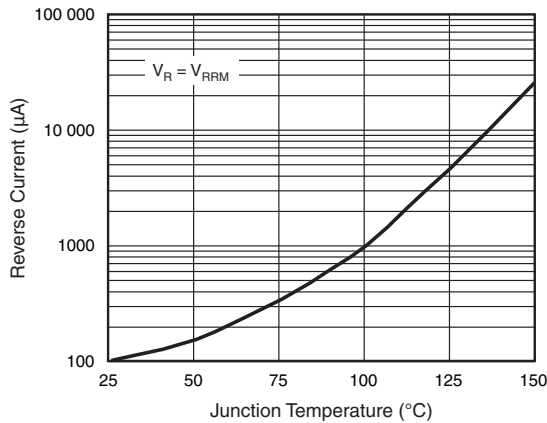


Fig. 4 - Reverse Current vs. Junction Temperature

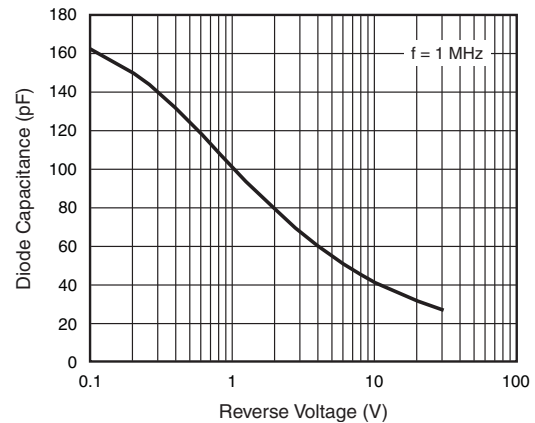
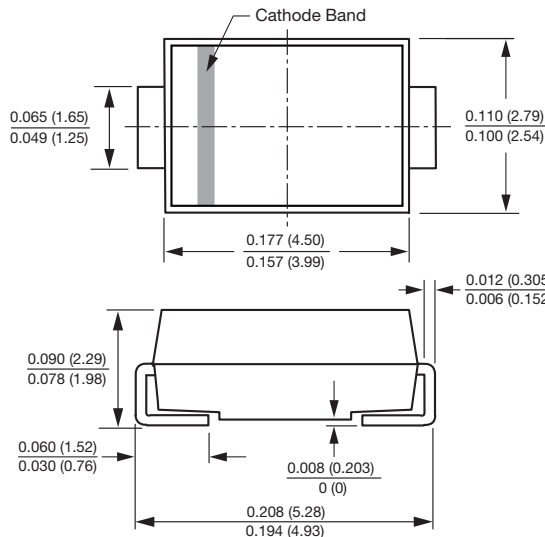


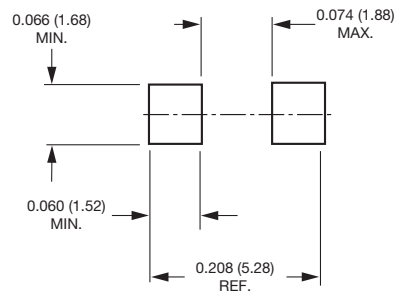
Fig. 6 - Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.