



## Standard Avalanche SMD Rectifier



SMA (DO-214AC)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

### FEATURES

- Low profile package
- Ideal for automated placement
- Controlled avalanche characteristics
- Glass passivated pellet chip junction
- Low reverse current
- High surge current 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)

### DESIGN SUPPORT TOOLS AVAILABLE



3D Models

| PRIMARY CHARACTERISTICS |  |
|-------------------------|--|
| $I_{F(AV)}$             | 1.5 A                                      |
| $V_{RRM}$               | 200 V, 400 V, 600 V, 800 V, 1000 V, 1600 V |
| $I_{FSM}$               | 30 A                                       |
| $I_R$                   | 1.0 $\mu$ A                                |
| $V_F$                   | 1.15 V                                     |
| $E_R$                   | 20 mJ                                      |
| $T_J$ max.              | 150 °C                                     |
| Package                 | SMA (DO-214AC)                             |
| Circuit configuration   | Single                                     |

### TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

### 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, HM3 suffix meet JESD 201 class 2 whisker test

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

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)   |                |             |        |        |        |        |        |      |
|--|----------------|-------------|--------|--------|--------|--------|--------|------|
| PARAMETER  | SYMBOL         | BYG10D      | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | UNIT |
| Device marking code  |                | BYG10D      | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y |      |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 200         | 400    | 600    | 800    | 1000   | 1600   | V    |
| Average forward current  | $I_{F(AV)}$    | 1.5         |        |        |        |        |        | A    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load  | $I_{FSM}$      | 30          |        |        |        |        |        | A    |
| Pulse energy in avalanche mode, non repetitive (inductive load switch off)<br>$I_{(BR)R} = 1\text{ A}$ , $T_J = 25\text{ °C}$ (for BYG10D thru BYG10M)<br>$I_{(BR)R} = 0.4\text{ A}$ , $T_J = 25\text{ °C}$ (for BYG10Y) | $E_R$          | 20          |        |        |        |        |        | mJ   |
| Operating junction and storage temperature range   | $T_J, T_{STG}$ | -55 to +150 |        |        |        |        |        | °C   |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |  |                                   |          |        |        |        |        |        |        |               |
|--|--|-----------------------------------|----------|--------|--------|--------|--------|--------|--------|---------------|
| PARAMETER  | TEST CONDITIONS  |                                   | SYMBOL   | BYG10D | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | UNIT          |
| Maximum instantaneous forward voltage <sup>(1)</sup>   | $I_F = 1\text{ A}$   | $T_J = 25\text{ }^\circ\text{C}$  | $V_F$    | 1.1    |        |        |        |        |        | V             |
|  | $I_F = 1.5\text{ A}$   |                                   |          | 1.15   |        |        |        |        |        |               |
| Maximum DC reverse current   | $V_R = V_{RRM}$  | $T_J = 25\text{ }^\circ\text{C}$  | $I_R$    | 1      |        |        |        |        |        | $\mu\text{A}$ |
|  |  | $T_J = 100\text{ }^\circ\text{C}$ |          | 10     |        |        |        |        |        |               |
| Maximum reverse recovery time  | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$ |                                   | $t_{rr}$ | 4      |        |        |        |        |        | $\mu\text{s}$ |

**Note**

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

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                       |        |        |        |        |        |        |                    |  |
|---|-----------------------|--------|--------|--------|--------|--------|--------|--------------------|--|
| PARAMETER   | SYMBOL                | BYG10D | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | UNIT               |  |
| Typical thermal resistance, junction to lead  | $R_{\theta JL}$       | 25     |        |        |        |        |        | $^\circ\text{C/W}$ |  |
| Typical 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 (Al<sub>2</sub>O<sub>3</sub>), 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| BYG10M-E3/TR                          | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYG10M-E3/TR3                         | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYG10MHE3_A/H <sup>(1)</sup>          | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| BYG10MHE3_A/I <sup>(1)</sup>          | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |
| BYG10M-M3/TR                          | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYG10M-M3/TR3                         | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYG10MHM3_A/H <sup>(1)</sup>          | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| BYG10MHM3_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)

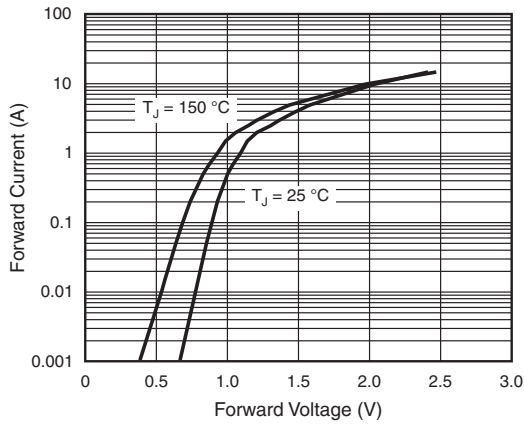


Fig. 1 - Forward Current vs. Forward Voltage

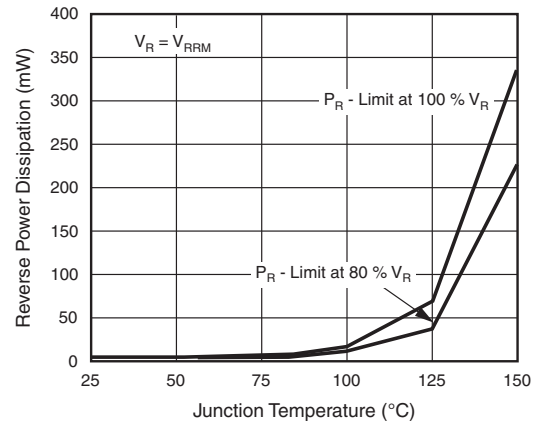


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

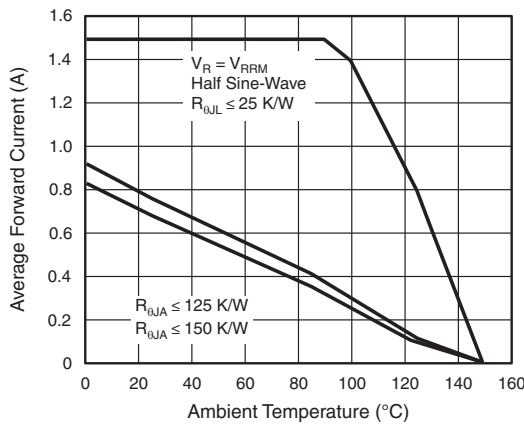


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

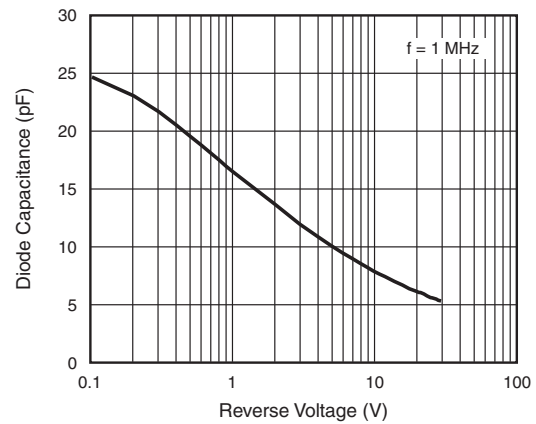


Fig. 5 - Diode Capacitance vs. Reverse Voltage

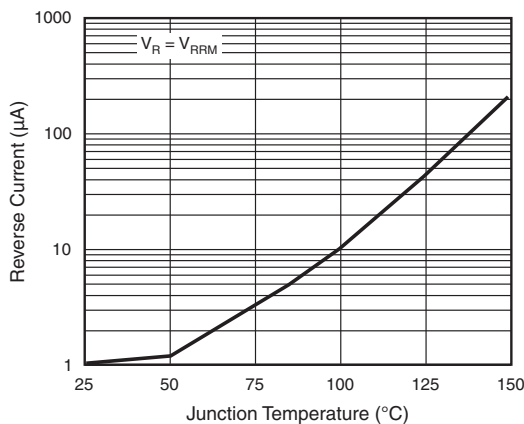


Fig. 3 - Reverse Current vs. Junction Temperature

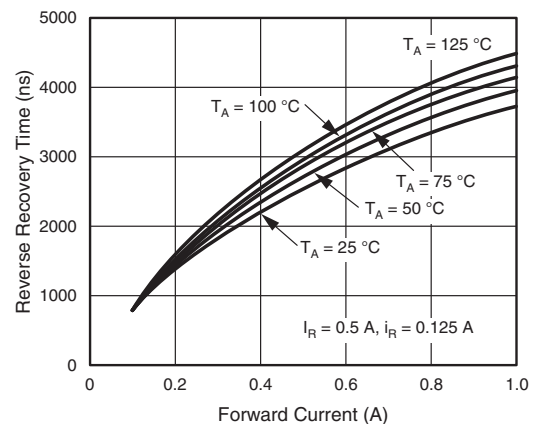


Fig. 6 - Reverse Recovery Time vs. Forward Current

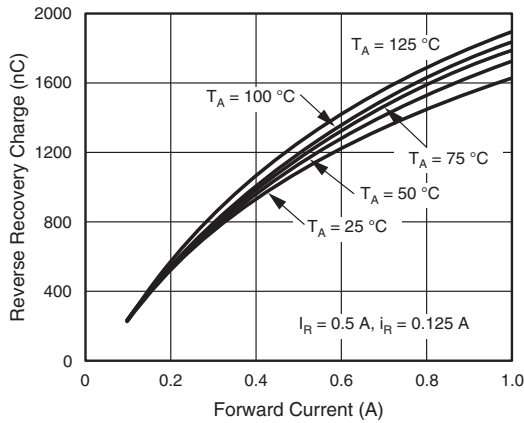
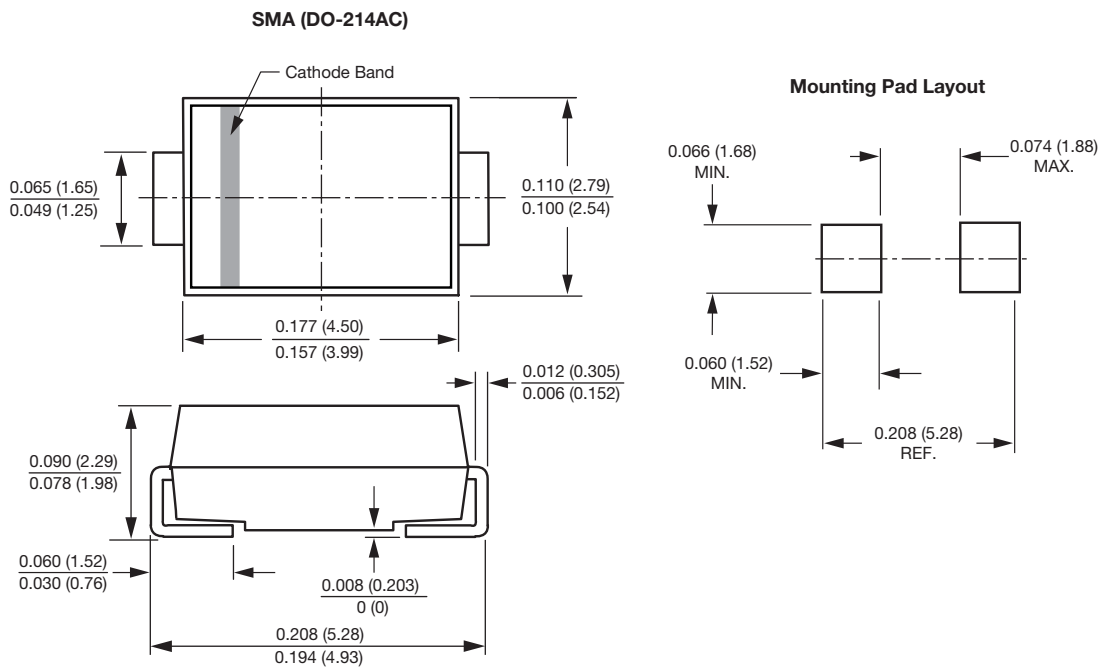


Fig. 7 - Reverse Recovery Charge vs. Forward Current

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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