

## Ultrafast Avalanche SMD Rectifier



**SMA (DO-214AC)**

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low reverse current
- High reverse voltage
- Ultra fast reverse recovery time
- 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  
HALOGEN  
**FREE**

### PRIMARY CHARACTERISTICS

|                  |                |
|------------------|----------------|
| $I_{F(AV)}$      | 1.5 A          |
| $V_{RRM}$        | 1000 V         |
| $I_{FSM}$        | 30 A           |
| $I_R$            | 5.0 $\mu$ A    |
| $t_{rr}$         | 75 ns          |
| $V_F$            | 1.7 V          |
| $E_R$            | 20 mJ          |
| $T_J$ max.       | 150 °C         |
| Package          | SMA (DO-214AC) |
| Diode variations | Single         |

### TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive, and telecommunication.

### MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

M3 and HM3 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         | BYG23M      | UNIT |
|-------------------------------------------------------------------------------------------------------------|----------------|-------------|------|
| Device marking code                                                                                         |                | BYG23M      |      |
| Maximum repetitive peak reverse voltage                                                                     | $V_{RRM}$      | 1000        | V    |
| Average forward current at $T_A = 65$ °C                                                                    | $I_{F(AV)}$    | 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) $I_{(BR)R} = 1$ A, $T_J = 25$ °C | $E_R$          | 20          | mJ   |
| Operating 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      | BYG23M | UNIT          |
| Minimum breakdown voltage                                                               | $I_R = 100\text{ }\mu\text{A}$                                         |                                     | $V_{BR}$    | 1000   | V             |
| Maximum instantaneous voltage                                                           | $I_F = 1.0\text{ A}$                                                   | $T_J = 25\text{ }^{\circ}\text{C}$  | $V_F^{(1)}$ | 1.7    | V             |
|                                                                                         |                                                                        | $T_J = 150\text{ }^{\circ}\text{C}$ |             | 1.35   |               |
| Maximum reverse current                                                                 | $V_R = V_{RRM}$                                                        | $T_J = 25\text{ }^{\circ}\text{C}$  | $I_R$       | 5      | $\mu\text{A}$ |
|                                                                                         |                                                                        | $T_J = 125\text{ }^{\circ}\text{C}$ |             | 50     |               |
| Maximum reverse recovery time                                                           | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$ |                                     | $t_{rr}$    | 75     | ns            |

**Note**(1) 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                | BYG23M | UNIT                 |
| Typical thermal resistance, junction to case                                         | $R_{\theta JC}$       | 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**(1) Mounted on epoxy-glass hard tissue, 17 mm<sup>2</sup> 35  $\mu\text{m}$  Cu(2) Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu(3) 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                      |
| BYG23M-M3/TR                   | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYG23M-M3/TR3                  | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYG23MHM3_A/H <sup>(1)</sup>   | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| BYG23MHM3_A/I <sup>(1)</sup>   | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

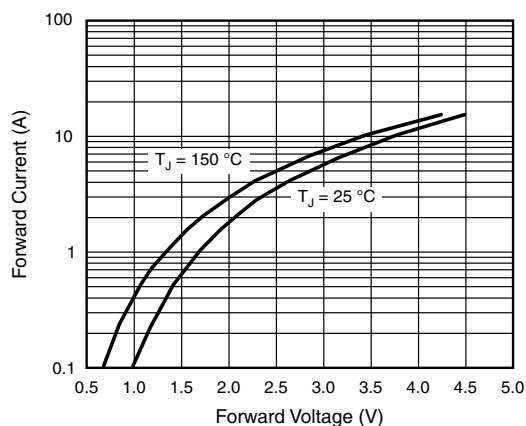
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Max. Forward Current vs. Forward Voltage

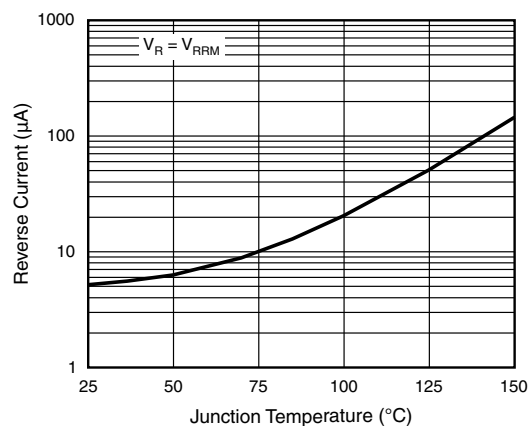


Fig. 4 - Reverse Current vs. Junction Temperature

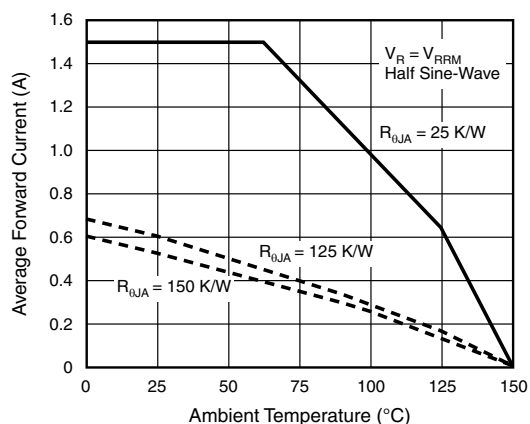


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

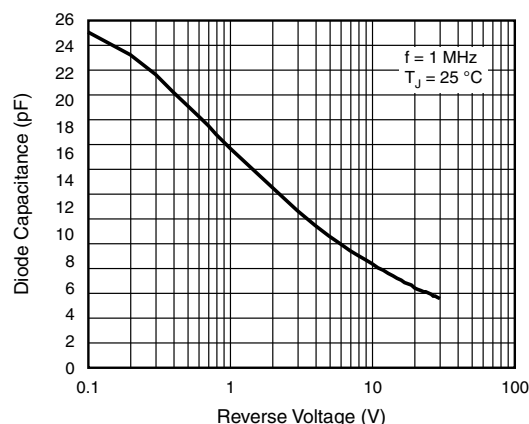


Fig. 5 - Diode Capacitance vs. Reverse Voltage

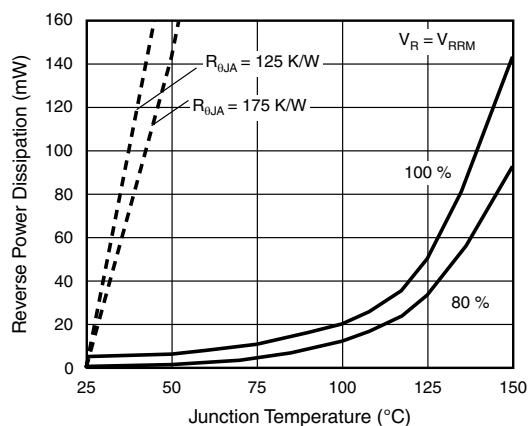
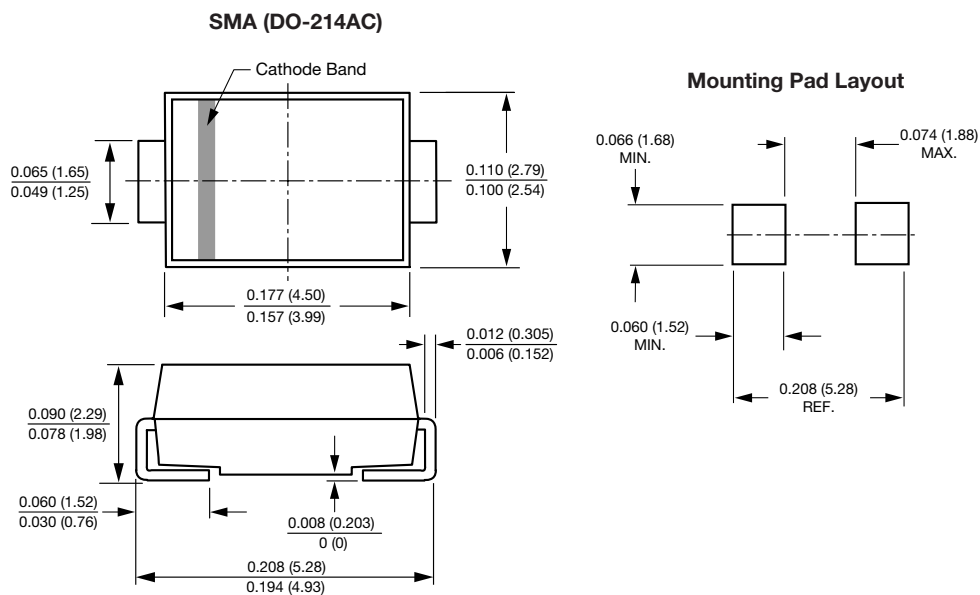


Fig. 3 - Max. Reverse Power Dissipation vs. Junction Temperature



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





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