

## High Voltage Ultrafast Avalanche SMD Rectifiers



**DO-214AC (SMA)**



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

### FEATURES

- Glass passivated pellet chip junction
- Low profile package
- Ideal for automated placement
- 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### MECHANICAL DATA

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

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

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test

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

| PRIMARY CHARACTERISTICS                  |                |
|------------------------------------------|----------------|
| $I_{F(AV)}$                              | 1.0 A          |
| $V_{RRM}$                                | 1300 V         |
| $I_{FSM}$                                | 18 A           |
| $t_{rr}$                                 | 75 ns          |
| $E_R$                                    | 5 mJ           |
| $V_F$ at $I_F = 1.0$ A ( $T_A = 125$ °C) | 1.39 V         |
| $T_J$ max.                               | 150 °C         |
| Package                                  | DO-214AC (SMA) |
| Diode variations                         | Single die     |

### TYPICAL APPLICATIONS

For use in high voltage, high frequency rectification specially suited for freewheeling, clamping, snubbing in power supply, ignition drive of HID, UHP and industrial ballast and snubber for PDP TV power supply application.

| MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)                                                       |             |             |      |
|---------------------------------------------------------------------------------------------------------------|-------------|-------------|------|
| PARAMETER                                                                                                     | SYMBOL      | BYG23T      | UNIT |
| Device marking code                                                                                           |             | BYG23T      |      |
| Maximum repetitive peak reverse voltage                                                                       | $V_{RRM}$   | 1300        | V    |
| Maximum DC forward current (fig.1)                                                                            | $I_F^{(1)}$ | 1.0         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load                            | $I_{FSM}$   | 18          | A    |
| Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R} = 0.4$ A, $T_L = 25$ °C | $E_R$       | 5           | mJ   |
| Maximum operating junction temperature                                                                        | $T_J$       | 150         | °C   |
| Storage temperature range                                                                                     | $T_{STG}$   | -55 to +150 | °C   |

#### Note

- Free air, mounted on recommended copper pad area



| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                                                                                     |                         |                        |                 |      |      |    |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|------------------------|-----------------|------|------|----|
| PARAMETER                                                                  | TEST CONDITIONS                                                                     |                         | SYMBOL                 | TYP.            | MAX. | UNIT |    |
| Instantaneous forward voltage <sup>(1)</sup>                               | I <sub>F</sub> = 1.0 A                                                              | T <sub>A</sub> = 25 °C  | V <sub>F</sub>         | 1.74            | 1.9  | V    |    |
|                                                                            |                                                                                     | T <sub>A</sub> = 125 °C |                        | 1.39            | 1.65 |      |    |
| Reverse current <sup>(2)</sup>                                             | V <sub>R</sub> = 1300 V                                                             | T <sub>A</sub> = 25 °C  | I <sub>R</sub>         | -               | 5.0  | μA   |    |
|                                                                            |                                                                                     | T <sub>A</sub> = 125 °C |                        | 2.9             | 50   |      |    |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A            |                         | T <sub>A</sub> = 25 °C | t <sub>rr</sub> | 65   | 75   | ns |
| Forward recovery time                                                      | I <sub>F</sub> = 1.5 A, dI/dt = 12 A/μs, V <sub>F</sub> = 1.1 x V <sub>F</sub> max. |                         | T <sub>A</sub> = 25 °C | t <sub>fr</sub> | 620  | -    |    |
| Peak forward voltage                                                       |                                                                                     |                         |                        | V <sub>FP</sub> | 9.0  | -    |    |
| Typical junction capacitance                                               | 4.0 V, 1 MHz                                                                        |                         | C <sub>J</sub>         | 9.0             | -    | pF   |    |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |        |                             |
|--------------------------------------------------------------------------------------|-----------------|--------|-----------------------------|
| PARAMETER                                                                            | SYMBOL          | BYG23T | UNIT                        |
| Typical thermal resistance <sup>(1)</sup>                                            | $R_{\theta JA}$ | 120    | $^{\circ}\text{C}/\text{W}$ |
|                                                                                      | $R_{\theta JM}$ | 20     |                             |

**Note**(1) Free air, mounted on recommended PCB 1 oz. pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient,  $R_{\theta JM}$  - junction to mount.

| ORDERING INFORMATION (Example) |                 |                        |              |                                    |
|--------------------------------|-----------------|------------------------|--------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QANTITY | DELIVERY MODE                      |
| BYG23T-M3/TR                   | 0.064           | TR                     | 1800         | 7" diameter plastic tape and reel  |
| BYG23T-M3/TR3                  | 0.064           | TR3                    | 7500         | 13" diameter plastic tape and reel |

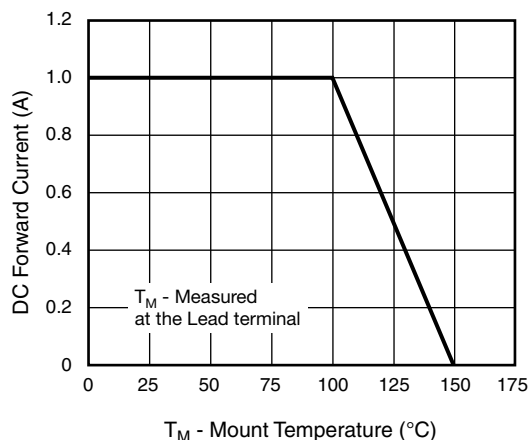
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Max. Forward Current Derating Curve

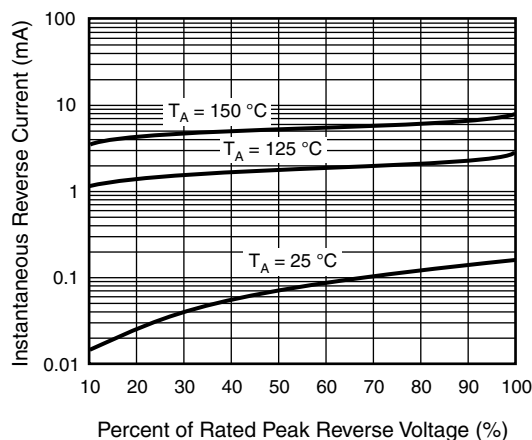


Fig. 4 - Typical Reverse Characteristics

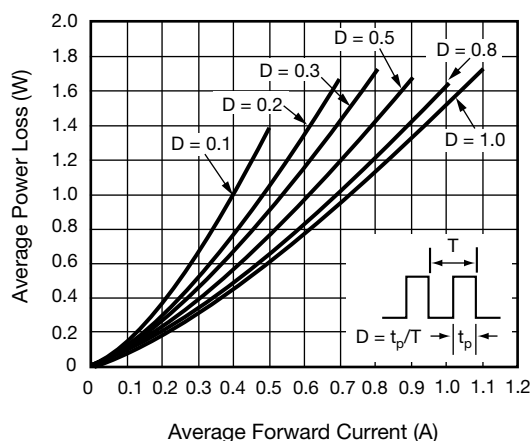


Fig. 2 - Forward Power Loss Characteristics

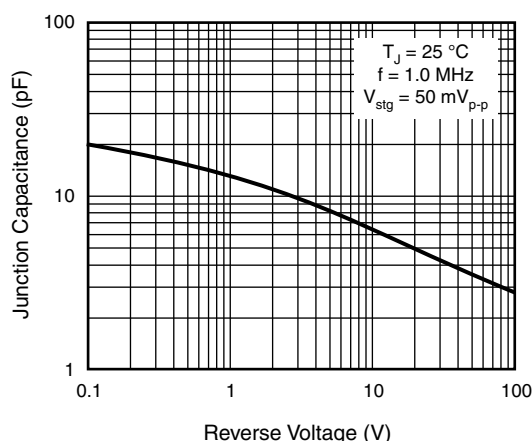


Fig. 5 - Typical Junction Capacitance

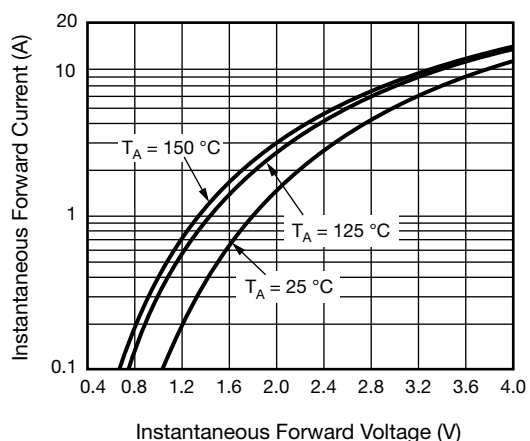


Fig. 3 - Typical Instantaneous Forward Characteristics

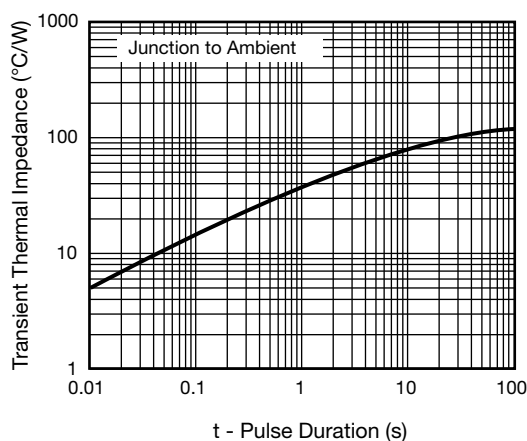
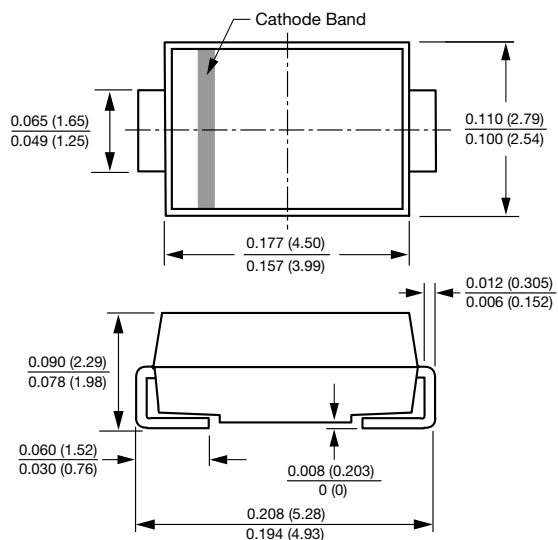


Fig. 6 - Typical Transient Thermal Impedance

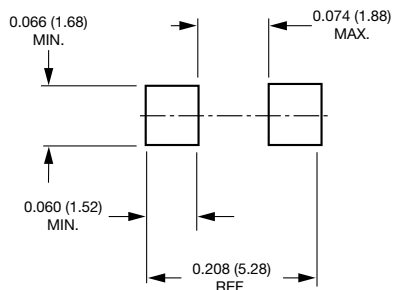


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-214AC (SMA)**



**Mounting Pad Layout**





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