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www.vishay.com

## BYG22A, BYG22B, BYG22D

Vishay General Semiconductor

### Ultrafast Avalanche SMD Rectifier



DO-214AC (SMA)

#### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low reverse current
- Low forward voltage
- Soft recovery characteristic
- 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

#### PRIMARY CHARACTERISTICS

|                  |                    |
|------------------|--------------------|
| $I_{F(AV)}$      | 2.0 A              |
| $V_{RRM}$        | 50 V, 100 V, 200 V |
| $I_{FSM}$        | 35 A               |
| $I_R$            | 1.0 $\mu$ A        |
| $V_F$ at $I_F$   | 1.1 V              |
| $t_{rr}$         | 25 ns              |
| $E_R$            | 20 mJ              |
| $T_J$ max.       | 150 °C             |
| Package          | DO-214AC (SMA)     |
| Diode variations | Single die         |

#### 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:** 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 2 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         | BYG22A      | BYG22B | BYG22D | UNIT |
|----------------------------------------------------------------------------------------------------------------|----------------|-------------|--------|--------|------|
| Device marking code                                                                                            |                | BYG22A      | BYG22B | BYG22D |      |
| Maximum repetitive peak reverse voltage                                                                        | $V_{RRM}$      | 50          | 100    | 200    | V    |
| Average forward current                                                                                        | $I_{F(AV)}$    | 2.0         |        |        | A    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load                              | $I_{FSM}$      | 35          |        |        | A    |
| Pulse energy in avalanche mode, non repetitive (inductive load switch off)<br>$I_{BR(R)} = 1$ A, $T_J = 25$ °C | $E_R$          | 20          |        |        | mJ   |
| Operating junction and storage temperature range                                                               | $T_J, T_{STG}$ | -55 to +150 |        |        | °C   |



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| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                                                          |                         |                               |        |        |        |      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------|-------------------------------|--------|--------|--------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                          |                         | SYMBOL                        | BYG22A | BYG22B | BYG22D | UNIT |
| Maximum instantaneous forward voltage                                      | I <sub>F</sub> = 1.0 A                                                   | T <sub>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 1.0    |        |        | V    |
|                                                                            | I <sub>F</sub> = 2.0 A                                                   |                         |                               | 1.1    |        |        |      |
| Maximum reverse current                                                    | V <sub>R</sub> = V <sub>RRM</sub>                                        | T <sub>J</sub> = 25 °C  | I <sub>R</sub>                | 1      |        |        | μA   |
|                                                                            |                                                                          | T <sub>J</sub> = 100 °C |                               | 10     |        |        |      |
| 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>rr</sub>               | 25     |        |        | ns   |

### Note

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

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                 |        |        |        |      |
|-------------------------------------------------------------------------|---------------------------------|--------|--------|--------|------|
| PARAMETER                                                               | SYMBOL                          | BYG22A | BYG22B | BYG22D | UNIT |
| Maximum thermal resistance, junction to lead, T <sub>L</sub> = const.   | 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

- (1) Mounted on epoxy-glass hard tissue  
 (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                      |
| BYG22A-E3/TR                   | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYG22A-E3/TR3                  | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |
| BYG22AHE3/TR <sup>(1)</sup>    | 0.064           | TR                     | 1800          | 7" diameter plastic tape and reel  |
| BYG22AHE3/TR3 <sup>(1)</sup>   | 0.064           | TR3                    | 7500          | 13" diameter plastic tape and reel |

### Note

(1) AEC-Q101 qualified



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

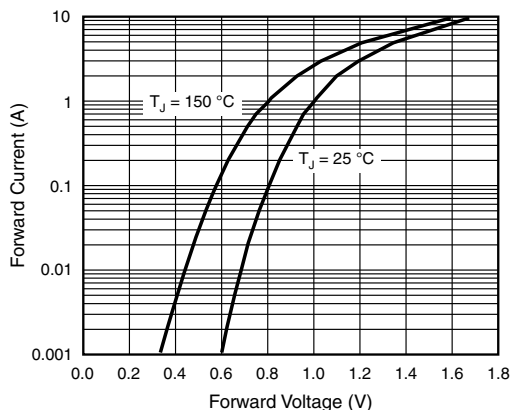


Fig. 1 - Forward Current vs. Forward Voltage

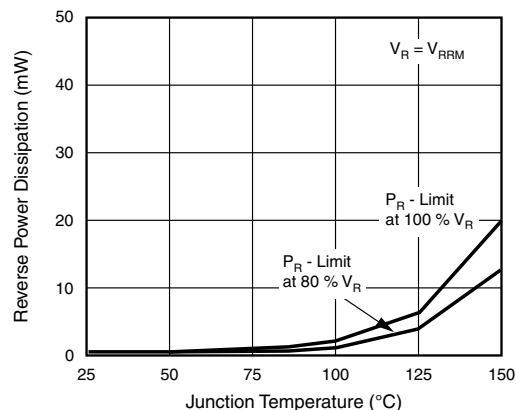


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

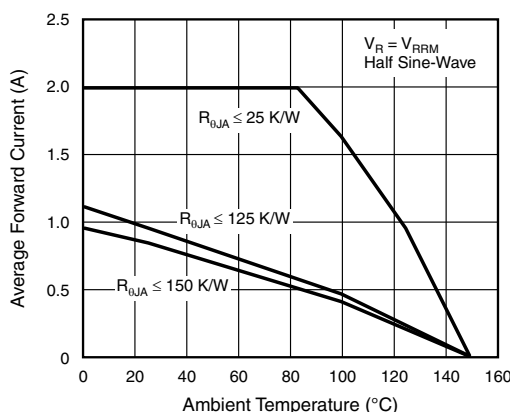


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

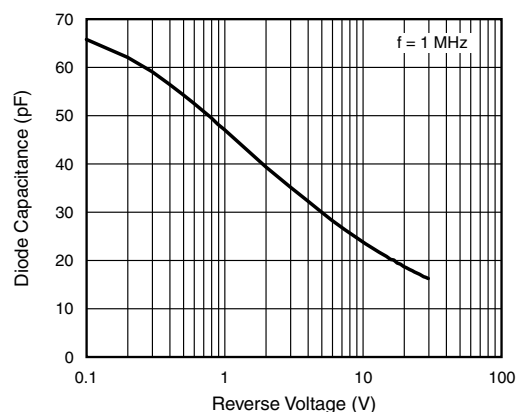


Fig. 5 - Diode Capacitance vs. Reverse Voltage

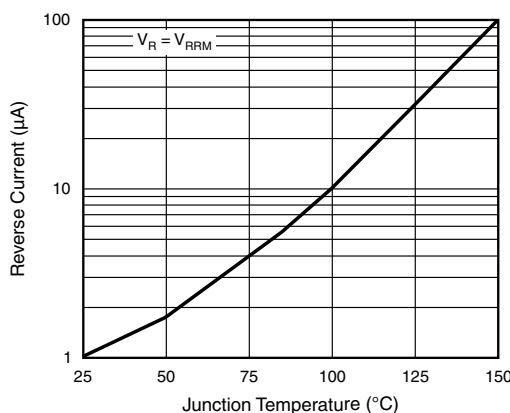


Fig. 3 - Reverse Current vs. Junction Temperature

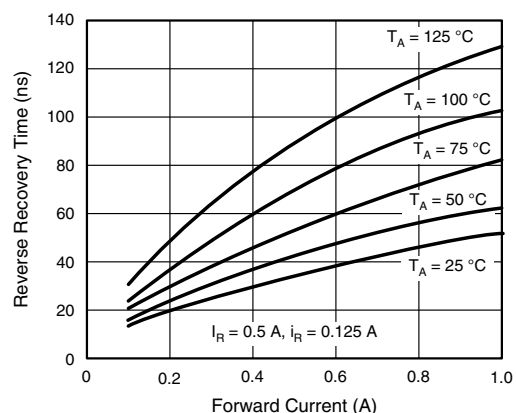


Fig. 6 - Max. Reverse Recovery Time vs. Forward Current



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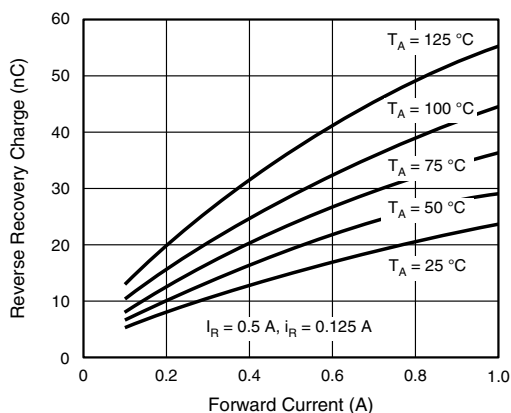


Fig. 7 - Max. Reverse Recovery Charge vs. Forward Current

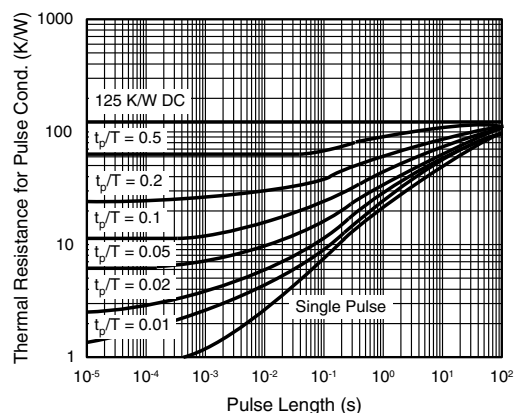
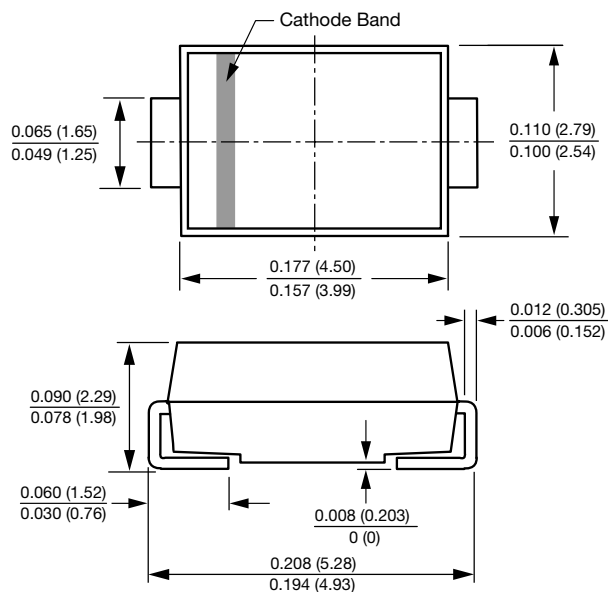


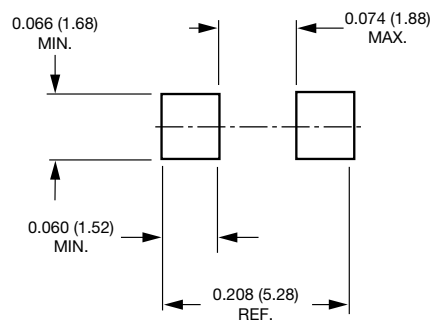
Fig. 8 - Thermal Response

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### DO-214AC (SMA)



#### Mounting Pad Layout





## Disclaimer

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