

Ultrafast Avalanche SMD Rectifier


SMA (DO-214AC)

 Cathode  Anode

ADDITIONAL RESOURCES



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 available
 - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

TYPICAL APPLICATIONS

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

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

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, and 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, and 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 | 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) $I_{(BR)R} = 1\text{ A}$, $T_J = 25\text{ °C}$ | 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 | BYG22A | BYG22B | BYG22D | UNIT |
| Maximum instantaneous forward voltage | $I_F = 1.0\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 1.0 | | V |
| | $I_F = 2.0\text{ A}$ | | | 1.1 | | |
| Maximum reverse current | $V_R = V_{RRM}$ | $T_J = 25\text{ }^\circ\text{C}$ | I_R | 1 | | μA |
| | | $T_J = 100\text{ }^\circ\text{C}$ | | 10 | | |
| Maximum reverse recovery time | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$ | | | 25 | | ns |

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 | BYG22A | BYG22B | BYG22D | UNIT | |
| Maximum thermal resistance, junction to lead, $T_L = \text{const.}$ | $R_{\theta JL}$ | | 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 (Al_2O_3), 50 mm² 35 μm Cu

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| BYG22D-E3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG22D-E3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYG22DHE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYG22DHE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |
| BYG22D-M3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG22D-M3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYG22DHM3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYG22DHM3_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 °C unless otherwise noted)

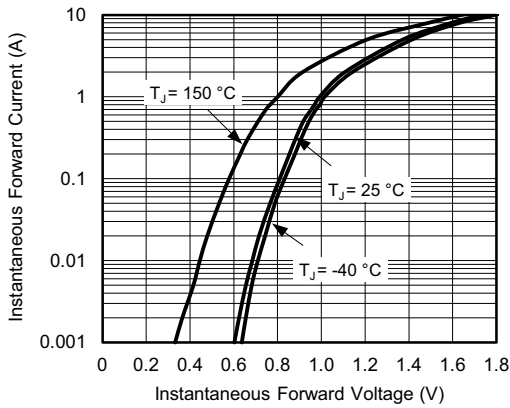


Fig. 1 - Forward Current vs. Forward Voltage

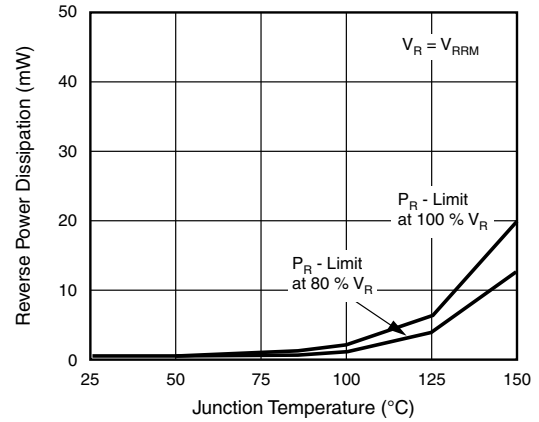


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

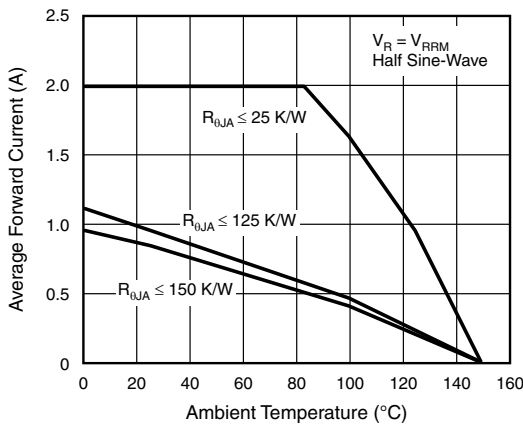


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

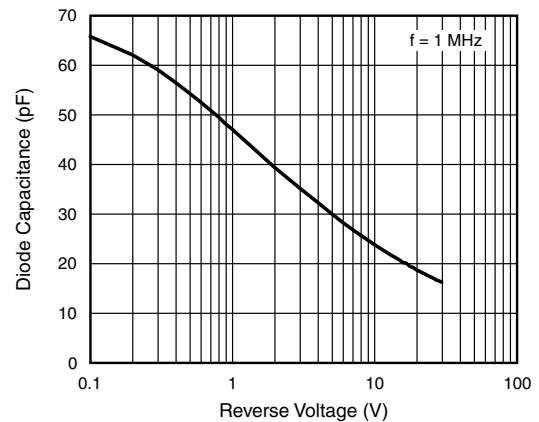


Fig. 5 - Diode Capacitance vs. Reverse Voltage

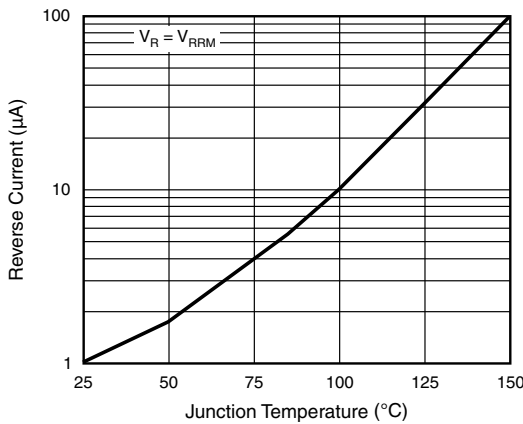


Fig. 3 - Reverse Current vs. Junction Temperature

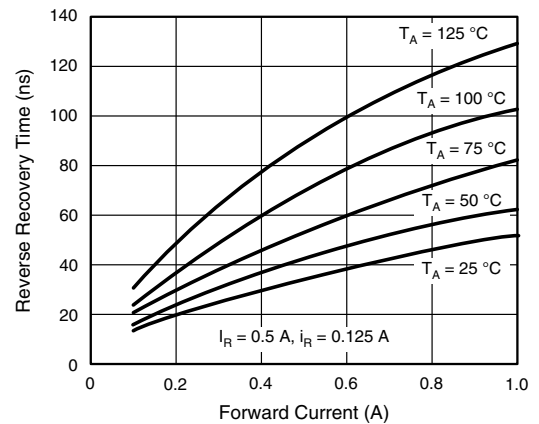


Fig. 6 - Max. Reverse Recovery Time vs. Forward Current

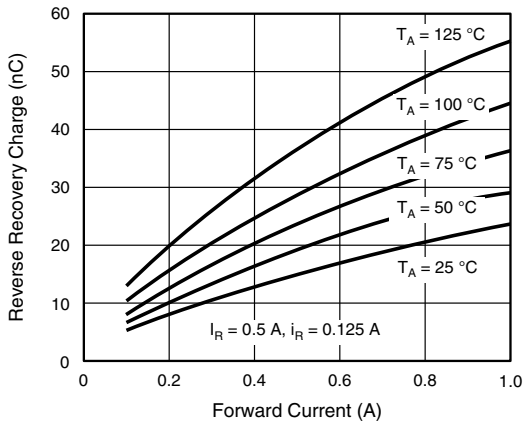


Fig. 7 - Max. Reverse Recovery Charge vs. Forward Current

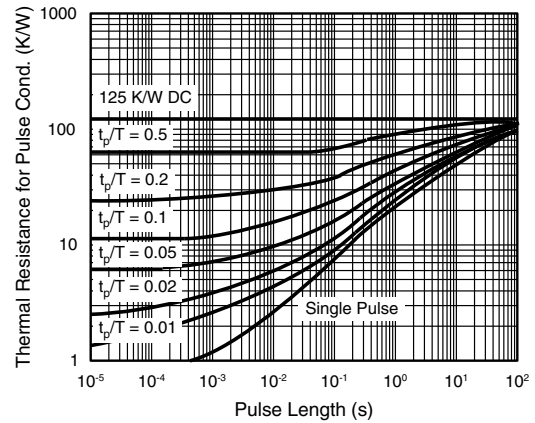
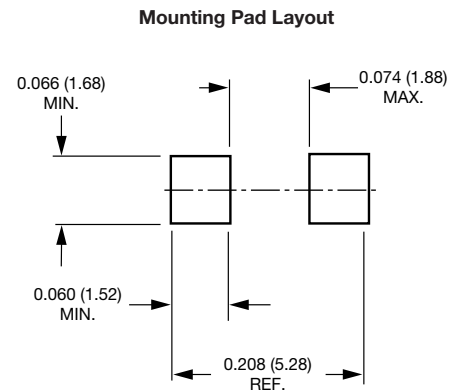
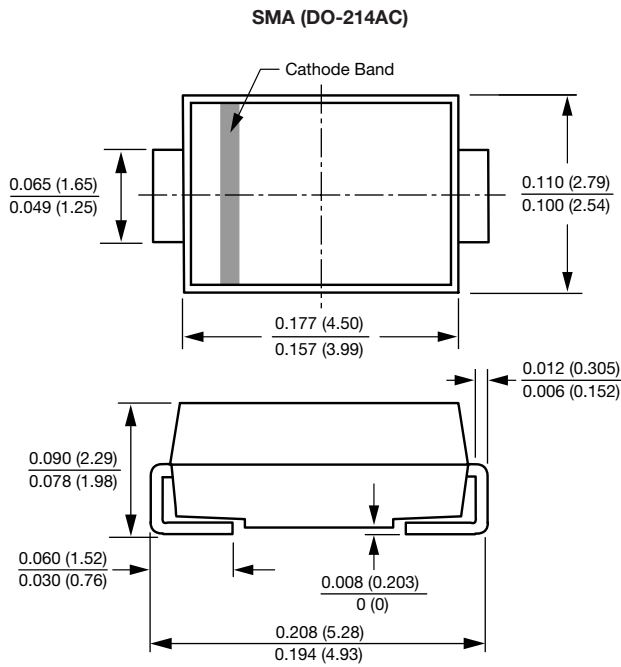


Fig. 8 - Thermal Response

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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