

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 available
 - Automotive ordering code P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see 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 μ A |
| t_{rr} | 75 ns |
| V_F | 1.7 V |
| E_R | 20 mJ |
| T_J max. | 150 °C |
| Package | SMA (DO-214AC) |
| Circuit configuration | 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-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 ($T_A = 25$ °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 | $I_R = 100\ \mu\text{A}$ | | 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 | μA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 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 μs 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 mm² 35 μm Cu
 (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 |
| BYG23M-E3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG23M-E3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYG23MHE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYG23MHE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |
| 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 ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYG23MHM3_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)

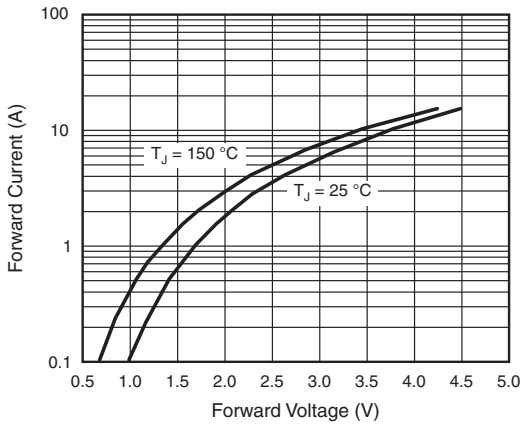


Fig. 1 - Max. Forward Current vs. Forward Voltage

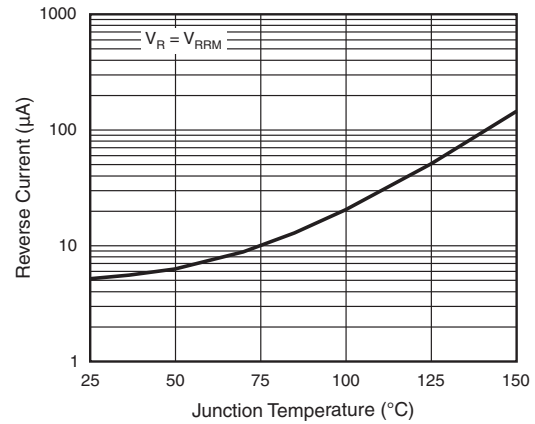


Fig. 4 - Reverse Current vs. Junction Temperature

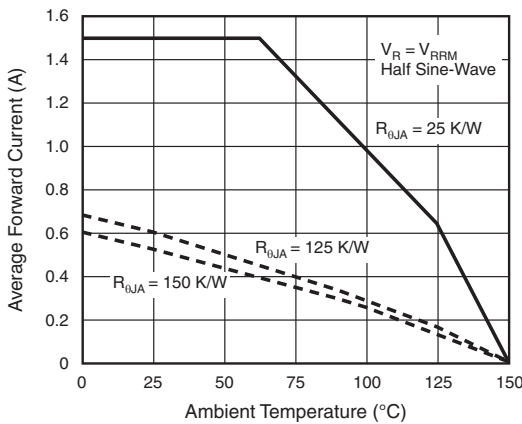


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

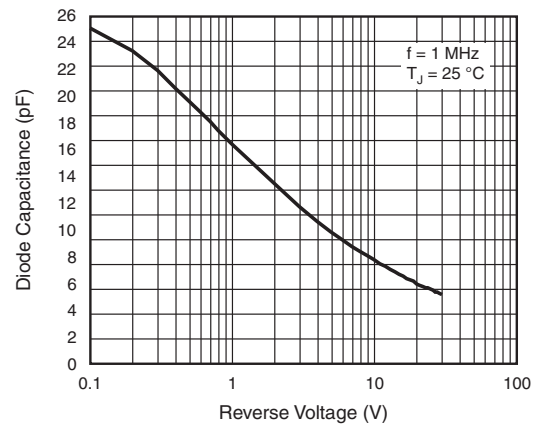


Fig. 5 - Diode Capacitance vs. Reverse Voltage

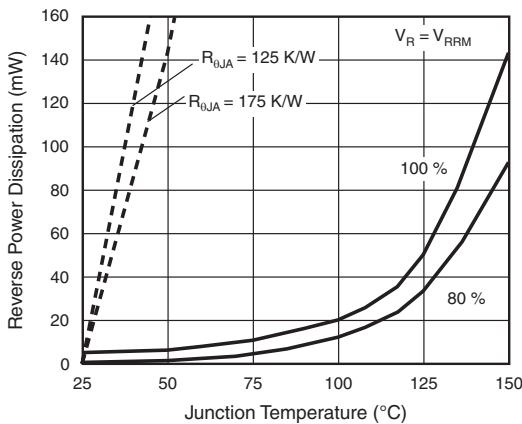
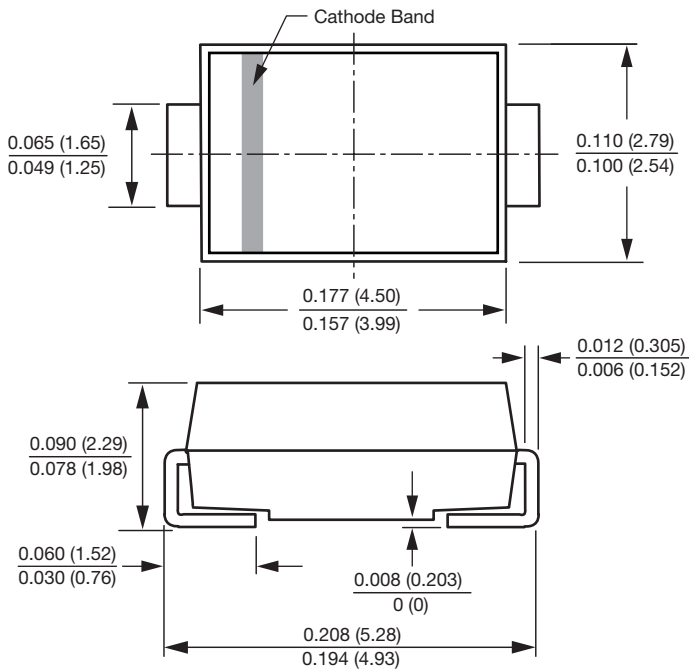


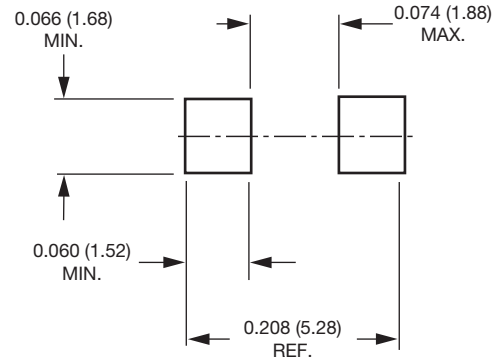
Fig. 3 - Max. Reverse Power Dissipation vs. Junction Temperature

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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