# Ultrafast Avalanche SMD Rectifier

**SMA (DO-214AC)**

Cathode ○—|◀|—○ Anode

## 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

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

## ADDITIONAL RESOURCES

3D Models

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

## 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 °C unless otherwise noted) | | | | | |
|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | BYG23M | UNIT |
| Minimum breakdown voltage | $I_R$ = 100 µA | | $V_{BR}$ | 1000 | V |
| Maximum instantaneous voltage | $I_F$ = 1.0 A | $T_J$ = 25 °C | $V_F$ (1) | 1.7 | V |
| | | $T_J$ = 150 °C | | 1.35 | |
| Maximum reverse current | $V_R = V_{RRM}$ | $T_J$ = 25 °C | $I_R$ | 5 | µA |
| | | $T_J$ = 125 °C | | 50 | |
| Maximum reverse recovery time | $I_F$ = 0.5 A, $I_R$ = 1.0 A, $I_{rr}$ = 0.25 A | | $t_{rr}$ | 75 | ns |

**Note**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | |
|---|---|---|---|
| PARAMETER | SYMBOL | BYG23M | UNIT |
| Typical thermal resistance, junction to case | $R_{\theta JC}$ | 25 | °C/W |
| Typical thermal resistance, junction to ambient | $R_{\theta JA}$ (1) | 150 | °C/W |
| | $R_{\theta JA}$ (2) | 125 | |
| | $R_{\theta JA}$ (3) | 100 | |

**Notes**

(1) Mounted on epoxy-glass hard tissue, 17 $mm^2$ 35 µm Cu
(2) Mounted on epoxy-glass hard tissue, 50 $mm^2$ 35 µm Cu
(3) Mounted on Al-oxide-ceramic ($Al_2O_3$), 50 $mm^2$ 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)

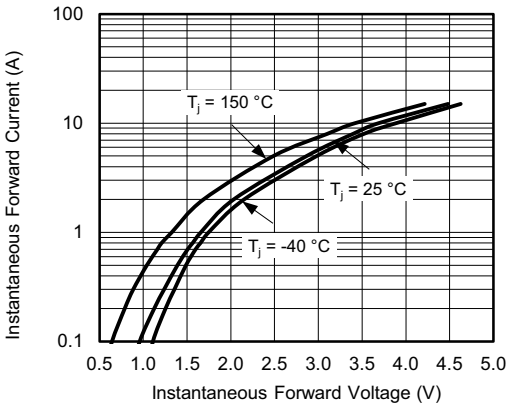



Fig. 1 - Max. Forward Current vs. Forward Voltage

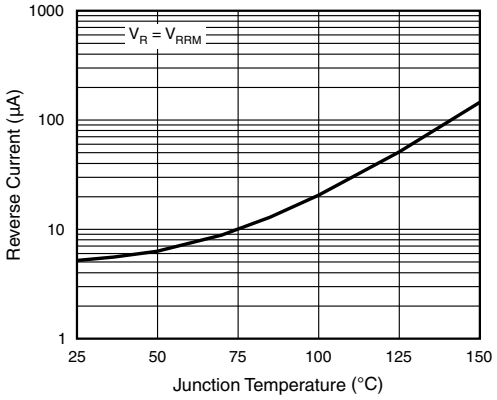



Fig. 4 - Reverse Current vs. Junction Temperature

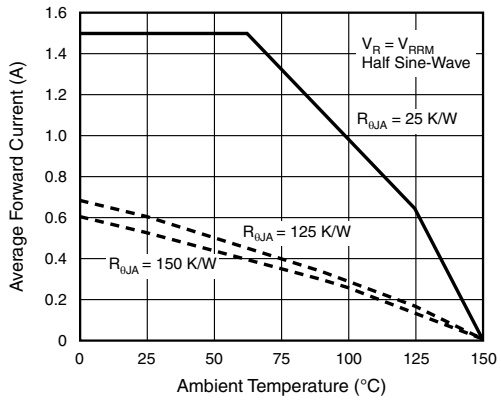



Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

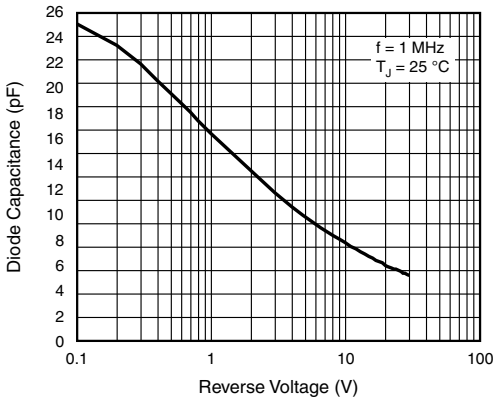



Fig. 5 - Diode Capacitance vs. Reverse Voltage

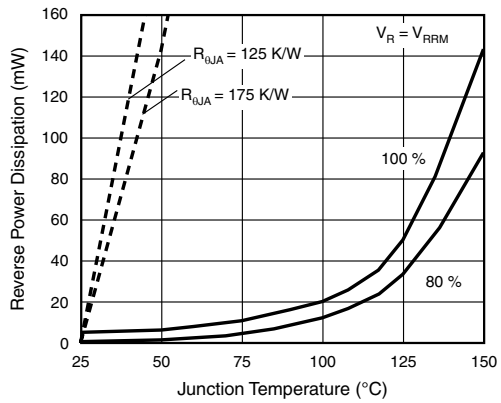
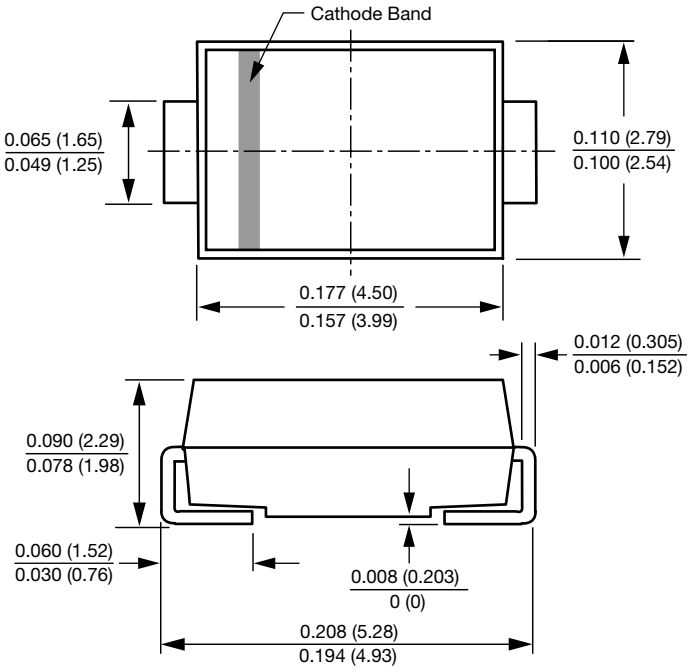


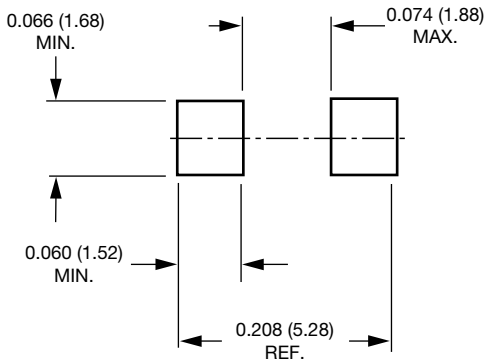

Fig. 3 - Max. Reverse Power Dissipation vs. Junction Temperature

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

**SMA (DO-214AC)**




**Mounting Pad Layout**



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