

Standard Avalanche SMD Rectifier


DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Controlled avalanche characteristics
- Glass passivated junction
- Low reverse current
- High surge current capability
- 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


RoHS
COMPLIANT

| PRIMARY CHARACTERISTICS | |
|-------------------------|--|
| $I_{F(AV)}$ | 1.5 A |
| V_{RRM} | 200 V, 400 V, 600 V, 800 V, 1000 V, 1600 V |
| I_{FSM} | 30 A |
| I_R | 1.0 μ A |
| V_F | 1.15 V |
| E_R | 20 mJ |
| T_J max. | 150 °C |
| Package | DO-214AC (SMA) |
| Diode variations | Single die |

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, 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

Note

- BYG10Y for commercial grade only

Polarity: Color band denotes the cathode end

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | | | | | | |
|--|----------------|---------------|--------|--------|--------|--------|--------|------|
| PARAMETER | SYMBOL | BYG10D | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | UNIT |
| Device marking code | | BYG10D | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | 400 | 600 | 800 | 1000 | 1600 | V |
| Average forward current | $I_{F(AV)}$ | 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) $I_{(BR)R} = 1\text{ A}$, $T_J = 25\text{ °C}$ (for BYG10D thru BYG10M) $I_{(BR)R} = 0.4\text{ A}$, $T_J = 25\text{ °C}$ (for BYG10Y) | 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 | BYG10D | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | UNIT |
| Maximum instantaneous forward voltage ⁽¹⁾ | $I_F = 1\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | V_F | 1.1 | | | | | | V |
| | $I_F = 1.5\text{ A}$ | | | 1.15 | | | | | | |
| Maximum DC 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 | $I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$ | | t_{rr} | 4 | | | | | | μs |

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 | BYG10D | BYG10G | BYG10J | BYG10K | BYG10M | BYG10Y | UNIT | | |
| Typical thermal resistance, junction to lead | $R_{\theta JL}$ | 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
- ⁽²⁾ Mounted on epoxy-glass hard tissue, 50 mm² 35 μm Cu
- ⁽³⁾ Mounted on Al-oxide-ceramic (Al₂O₃), 50 mm² 35 μm Cu

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| BYG10D-E3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG10D-E3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYG10DHE3/TR ⁽¹⁾ | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG10DHE3/TR3 ⁽¹⁾ | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |

Note

⁽¹⁾ AEC-Q101 qualified

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

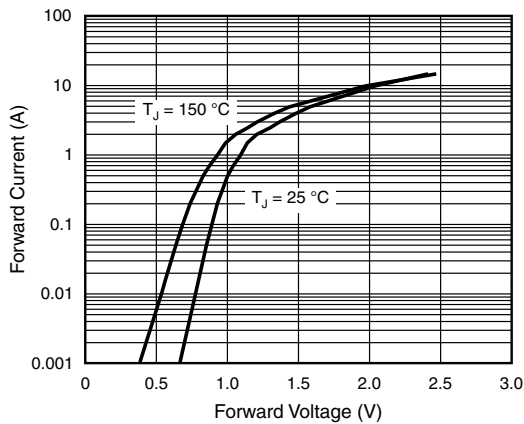


Fig. 1 - Forward Current vs. Forward Voltage

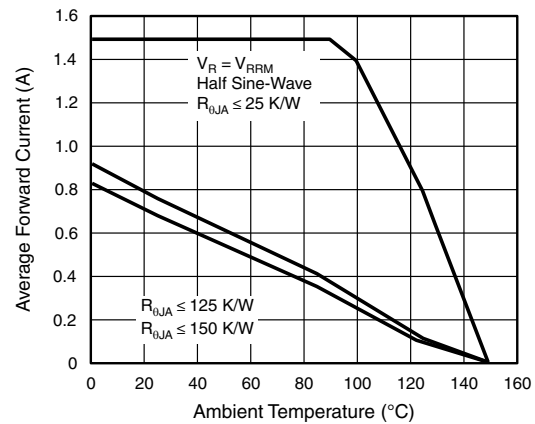


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

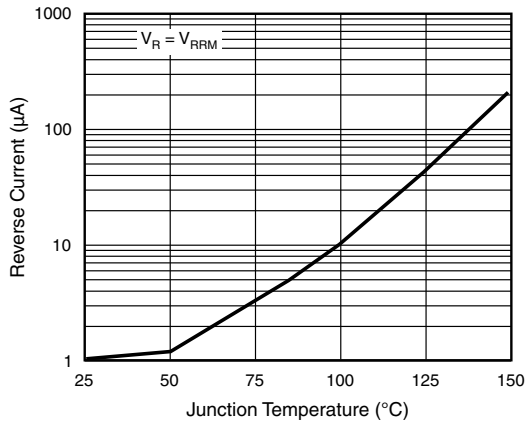


Fig. 3 - Reverse Current vs. Junction Temperature

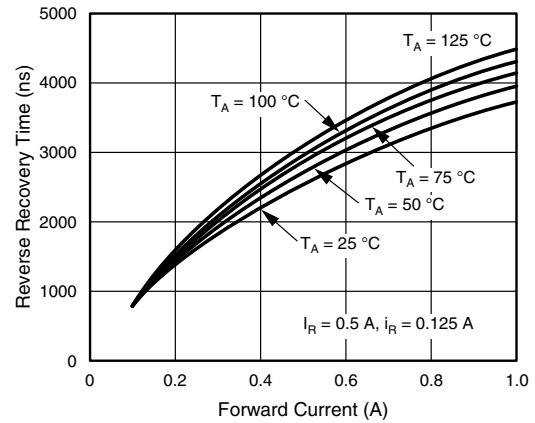


Fig. 6 - Reverse Recovery Time vs. Forward Current

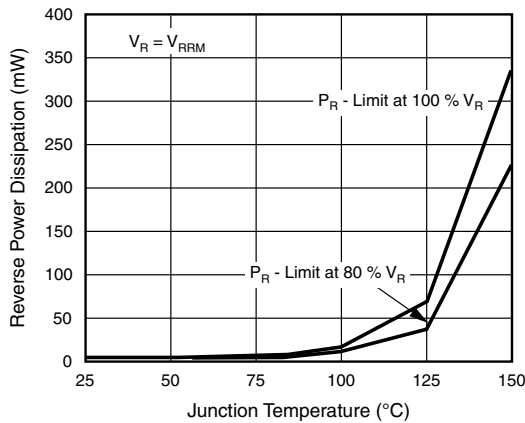


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

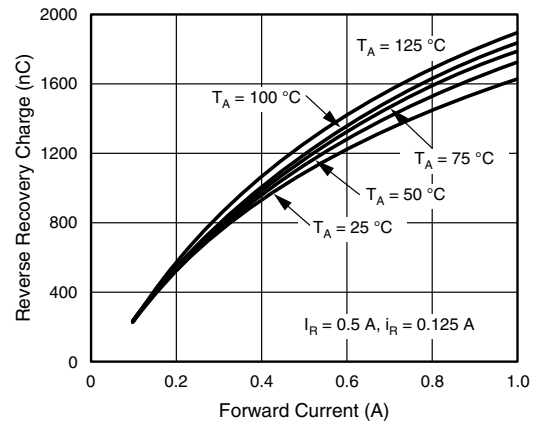


Fig. 7 - Reverse Recovery Charge vs. Forward Current

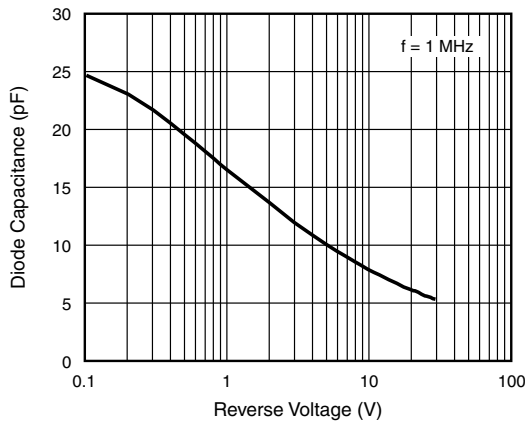
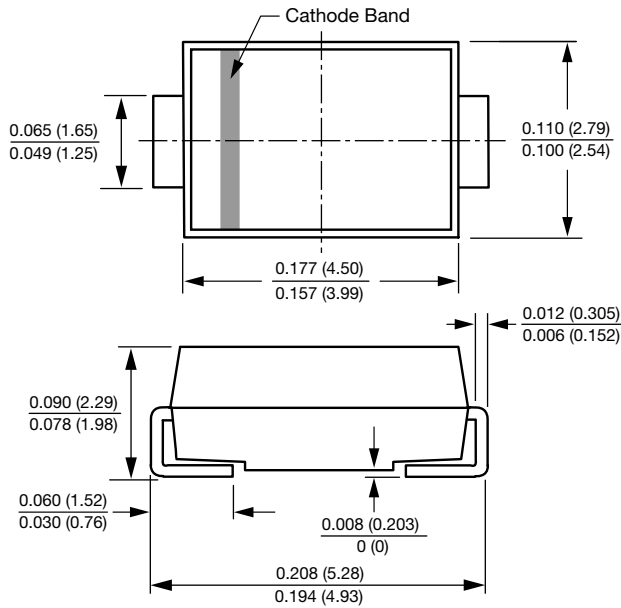


Fig. 5 - Diode Capacitance vs. Reverse Voltage

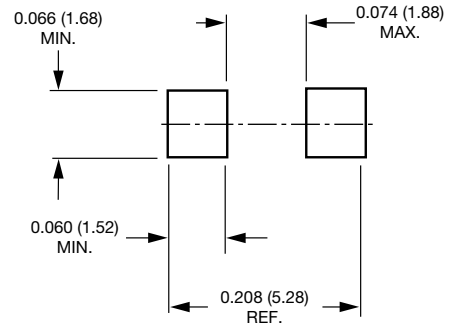


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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