

Ultrafast Avalanche SMD Rectifier


SMA (DO-214AC)

Cathode Anode

ADDITIONAL RESOURCES


RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low reverse current
- Soft recovery characteristics
- Ultrafast 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

TYPICAL APPLICATIONS

For use in high frequency rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

PRIMARY CHARACTERISTICS

| | |
|-----------------------|---------------------|
| $I_{F(AV)}$ | 1.5 A |
| V_{RRM} | 200 V, 400 V, 600 V |
| I_{FSM} | 30 A |
| I_R | 1.0 μ A |
| V_F at I_F | 1.4 V |
| t_{rr} | 75 ns |
| 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, 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, 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 | BYG20D | BYG20G | BYG20J | UNIT |
|--|----------------|-------------|--------|--------|------|
| Device marking code | | BYG20D | BYG20G | BYG20J | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | 400 | 600 | 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) $I_{(BR)R} = 1$ 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 | BYG20D | BYG20G | BYG20J | UNIT |
| Maximum instantaneous forward voltage | $I_F = 1\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 1.3 | | | V |
| | $I_F = 1.5\text{ A}$ | | | 1.4 | | | |
| 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} | 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 | BYG20D | BYG20G | BYG20J | UNIT | |
| Typical thermal resistance, junction to lead, $T_L = \text{const.}$ | $R_{\theta JL}$ | 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 (Al_2O_3), 50 mm² 35 μm Cu

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| BYG20J-E3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG20J-E3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYG20JHE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYG20JHE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |
| BYG20J-M3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel |
| BYG20J-M3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel |
| BYG20JHM3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| BYG20JHM3_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)

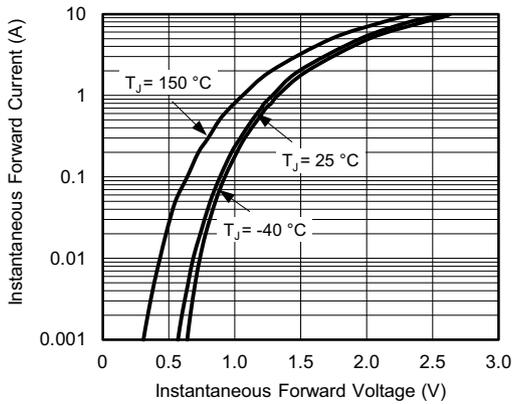


Fig. 1 - Forward Current vs. Forward Voltage

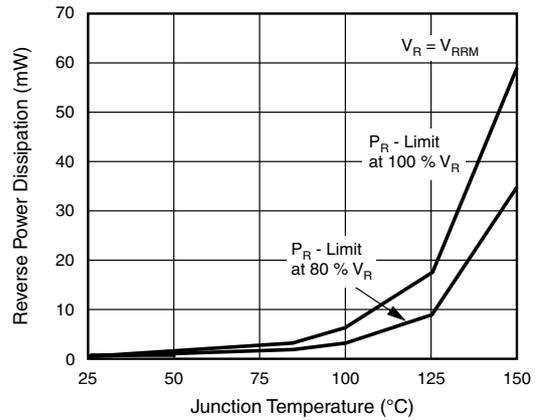


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

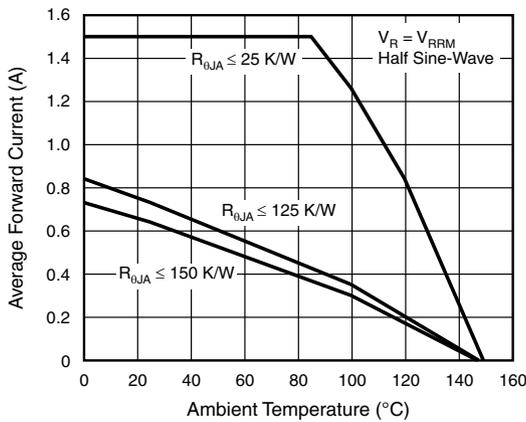


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

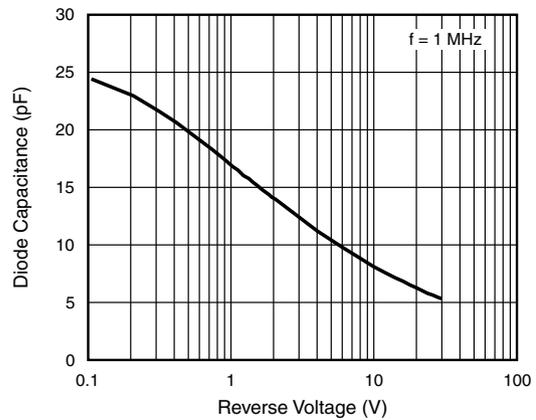


Fig. 5 - Diode Capacitance vs. Reverse Voltage

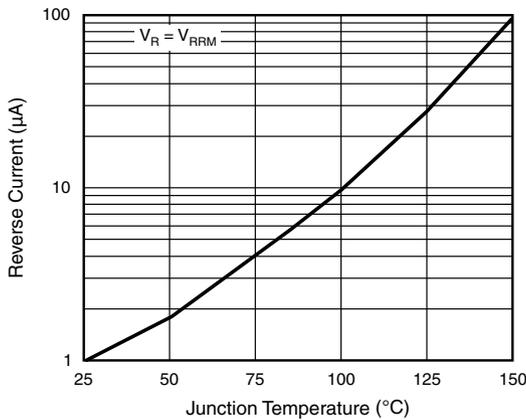


Fig. 3 - Reverse Current vs. Junction Temperature

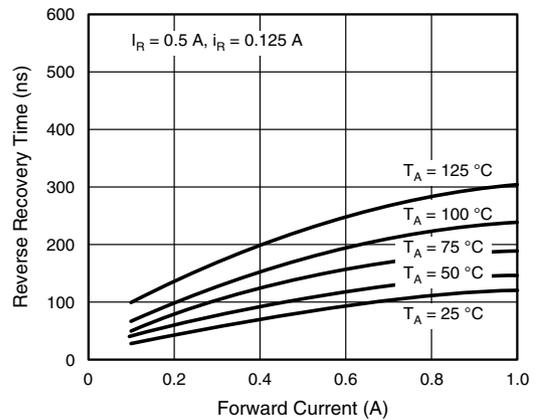


Fig. 6 - Reverse Recovery Time vs. Forward Current

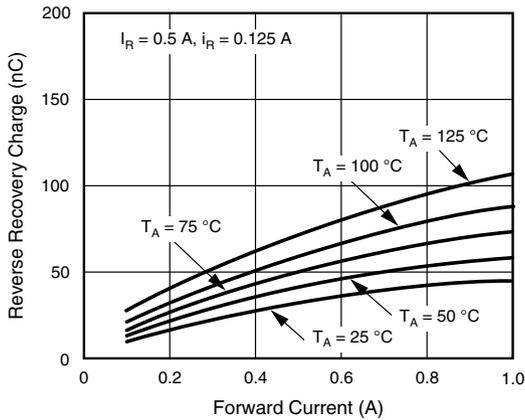


Fig. 7 - Reverse Recovery Charge vs. Forward Current

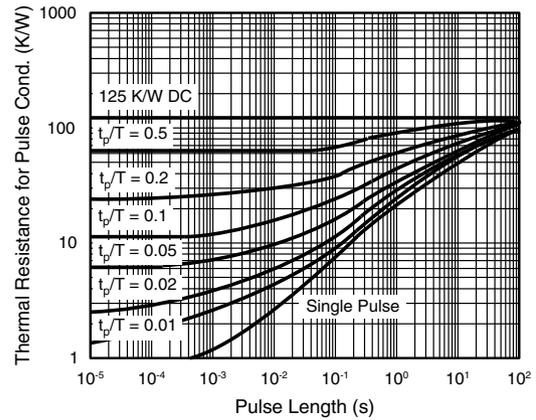
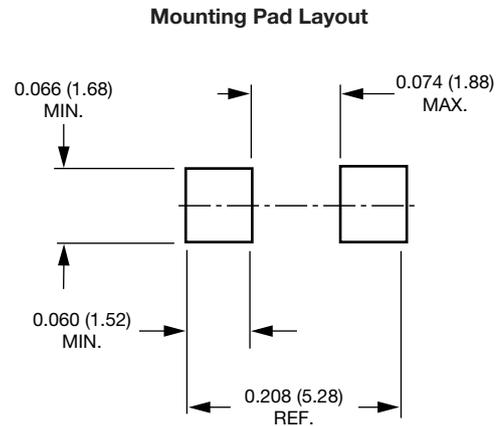
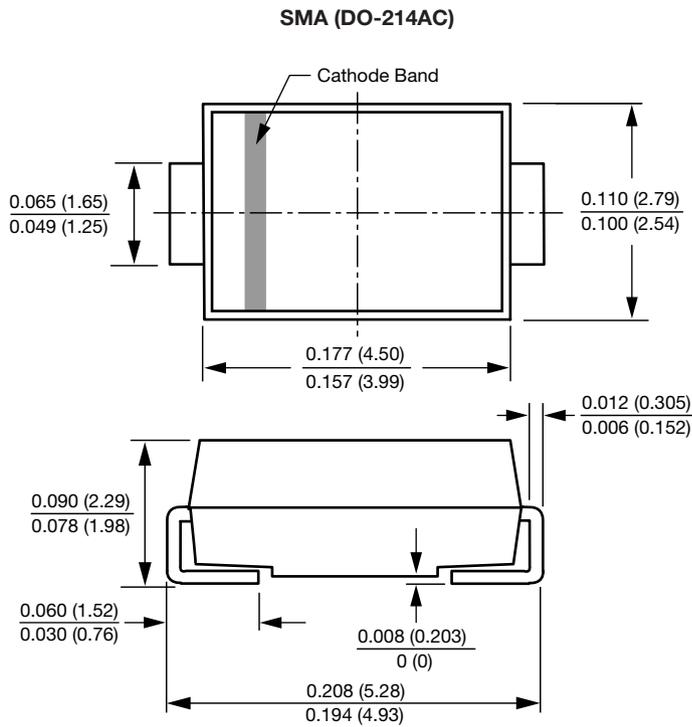


Fig. 8 - Thermal Response

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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