COMPLIANT



Vishay General Semiconductor

Fast Avalanche SMD Rectifier



DO-214AC (SMA)

| PRIMARY CHARACTERISTICS | | | |
|-------------------------|---------------|--|--|
| I _{F(AV)} | 1.5 A | | |
| V_{RRM} | 800 V, 1000 V | | |
| I _{FSM} | 30 A | | |
| I _R | 1.0 μΑ | | |
| V _F | 1.6 V | | |
| t _{rr} | 120 ns | | |
| E _R | 20 mJ | | |
| T _J max. | 150 °C | | |

FEATURES

- · Low profile package
- Ideal for automated placement
- Glass passivated junction
- · Low reverse current
- Soft recovery characteristic
- · Fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per

J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

| MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted) | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------|--------|------|--|
| PARAMETER | SYMBOL | BYG21K | BYG21M | UNIT | |
| Device marking code | | BYG21K | BYG21M | | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 800 | 1000 | V | |
| Average forward current | I _{F(AV)} | 1. | 1.5 | | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I _{FSM} | 30 | | Α | |
| Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R} = 1 \text{ A}$, $T_J = 25 ^{\circ}\text{C}$ | E _R | 20 | | mJ | |
| Operating junction and storage temperature range | T _J , T _{STG} | - 55 to + 150 | | °C | |

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| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|-----------------|------------|--------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | BYG21K | BYG21M | UNIT |
| Maximum instantaneous forward voltage ⁽¹⁾ | I _F = 1 A I _F = 1.5 A | T _J = 25 °C | V _F | 1.5 1.6 | | V |
| Maximum reverse current | $V_R = V_{RRM}$ | T _J = 25 °C T _J = 100 °C | I _R | 1 10 | | μΑ |
| Maximum reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | | t _{rr} | 120 | | ns |

Note:

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

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | |
|-------------------------------------------------------------------------|----------------|----------------------------------------------------------------|--------|------|
| PARAMETER | SYMBOL | BYG21K | BYG21M | UNIT |
| Typical thermal resistance, junction to lead $T_L = const.$ | $R_{	heta JL}$ | 25 | | °C/W |
| Typical thermal resistance, junction to ambient | $R_{	heta JA}$ | 150 ⁽¹⁾ 125 ⁽²⁾ 100 ⁽³⁾ | | °C/W |

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) | PACKAGE CODE | BASE Q'TY | DELIVERY MODE | |
| BYG21K-E3/TR | 0.064 | TR | 1800 | 7" diameter plastic tape and reel | |
| BYG21K-E3/TR3 | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel | |
| BYG21KHE3/TR (1) | 0.064 | TR | 1800 | 7" diameter plastic tape and reel | |
| BYG21KHE3/TR3 (1) | 0.064 | TR3 | 7500 | 13" diameter plastic tape and reel | |

Note:

(1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

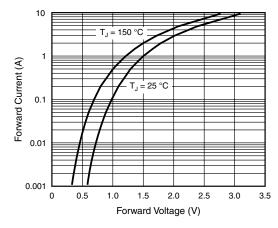


Figure 1. Forward Current vs. Forward Voltage

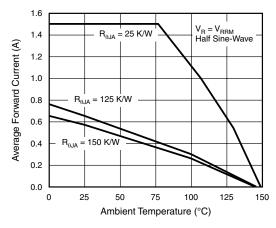


Figure 2. Max. Average Forward Current vs. Ambient Temperature



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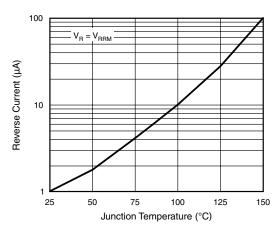


Figure 3. Reverse Current vs. Junction Temperature

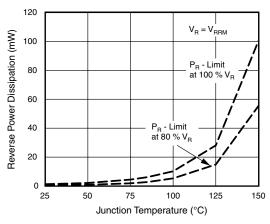


Figure 4. Max. Reverse Power Dissipation vs. Junction Temperature

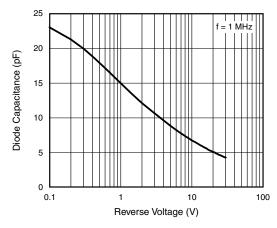


Figure 5. Diode Capacitance vs. Reverse Voltage

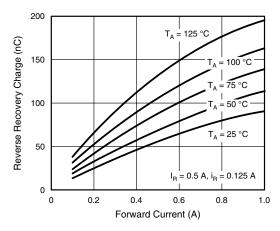


Figure 6. Max. Reverse Recovery Charge vs. Forward Current

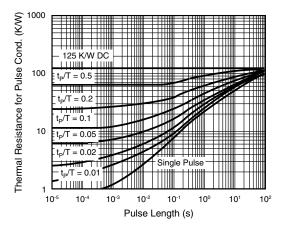


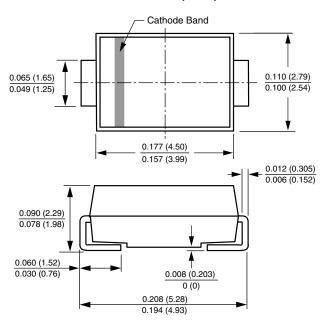
Figure 7. Thermal Response

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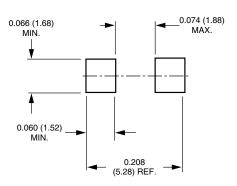


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout







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Revision: 11-Mar-11