New Product



AR1PD thru AR1PM

Vishay General Semiconductor

Surface Mount Fast Avalanche Rectifiers



DO-220AA (SMP)

| PRIMARY CHARACTERISTICS | | | | | | |
|-------------------------|-----------------|--|--|--|--|--|
| I _{F(AV)} | 1.0 A | | | | | |
| V _{RRM} | 200 V to 1000 V | | | | | |
| I _{FSM} | 30 A, 25 A | | | | | |
| t _{rr} | 140 ns, 120 ns | | | | | |
| I _R | 1 µA | | | | | |
| E _{AS} | 20 mJ | | | | | |
| T _J max. | 175 °C | | | | | |

TYPICAL APPLICATIONS

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

FEATURES

- Very low profile typical height of 1.0 mm
- · Ideal for automated placement
- Glass passivated chip junction
- · Fast switching for high efficiency
- · Low reverse current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- · Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

MECHANICAL DATA

Case: DO-220AA (SMP)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS compliant, and automotive grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

| MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted) | | | | | | | | |
|--|-----------------------------------|---------------|-------|-------|-------|-------|------|--|
| PARAMETER | SYMBOL | AR1PD | AR1PG | AR1PJ | AR1PK | AR1PM | UNIT | |
| Device marking code | | ARD | ARG | ARJ | ARK | ARM | | |
| Maximum repetitive peak reverse voltage | V _{RRM} | 200 | 400 | 600 | 800 | 1000 | V | |
| Average forward current | I _{F(AV)} | 1.0 | | | | | А | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I _{FSM} | 30 25 | | | | А | | |
| Non-repetitive avalanche energy at $I_{AS} = 1.0 \text{ A}, T_A = 25 \text{ °C}$ | E _{AS} | 20 | | | | | mJ | |
| Operating junction and storage temperature range | T _J , T _{STG} | - 55 to + 175 | | | | | °C | |



RoHS COMPLIANT

HALOGEN

FREE

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| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | |
|---|---|---|-------------------------------|-------------------|------|-------|-------|------|----|
| PARAMETER | TEST CO | NDITIONS | SYMBOL | AR1PD AR1PG AR1PJ | | AR1PK | AR1PM | UNIT | |
| Maximum instantaneous | I _F = 1.0 A | T _A = 25 °C T _A = 125 °C | V _F ⁽¹⁾ | | 1.25 | | 1.6 | | v |
| forward voltage | 1 _F = 1.0 A | T _A = 125 °C | VF \'' | 1.15 | | | 1.4 | | v |
| Maximum reverse current Rated V _P | | T _A = 25 °C | I _B ⁽²⁾ | 1.0 | | | | | |
| waximum reverse current | Rated V _R | T _A = 125 °C | 'R '' | 100 | | | | | μA |
| Maximum reverse recovery time | I _F = 0.5 A, I I _{rr} = 0.25 A | _R = 1.0 A, | t _{rr} | 140 | | 120 | | ns | |
| Typical junction capacitance | 4.0 V, 1 MH | łz | CJ | 12.5 8 | | .5 | pF | | |

Notes

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

⁽²⁾ Pulse test: Pulse width \leq 40 ms

| THERMAL CHARACTERISTICS ($T_A = 25$ °c unless otherwise noted) | | | | | | | | |
|--|---------------------------------|-------|-------|-------|-------|-------|------|--|
| PARAMETER | SYMBOL | AR1PD | AR1PG | AR1PJ | AR1PK | AR1PM | UNIT | |
| Typical thermal resistance | R _{0JA} ⁽¹⁾ | 132 | | | | | °C/W | |
| | R _{0JM} ⁽¹⁾ | 15 | | | | | 0/10 | |

Note

 $^{(1)}$ Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient, $R_{\theta JM}$ - junction to mount at the terminal cathode band

| ORDERING INFORMATION (Example) | | | | | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|--|--|--|--|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE | | | | |
| AR1PJ-M3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel | | | | |
| AR1PJ-M3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel | | | | |
| AR1PJHM3/84A (1) | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel | | | | |
| AR1PJHM3/85A ⁽¹⁾ | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel | | | | |

Note

⁽¹⁾ Automotive grade

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

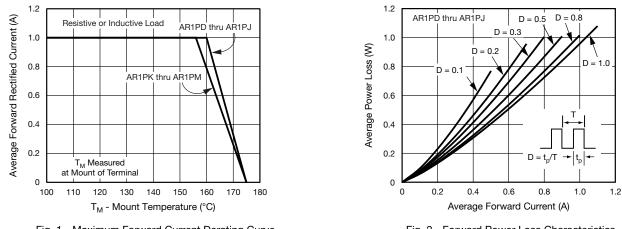


Fig. 1 - Maximum Forward Current Derating Curve

Fig. 2 - Forward Power Loss Characteristics

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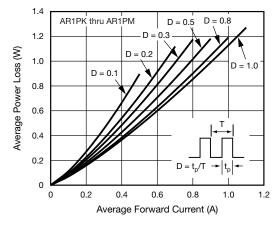


Fig. 3 - Forward Power Loss Characteristics

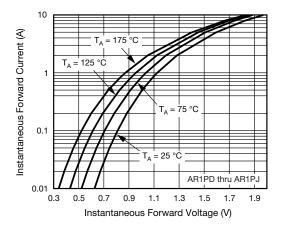


Fig. 4 - Typical Instantaneous Forward Characteristics

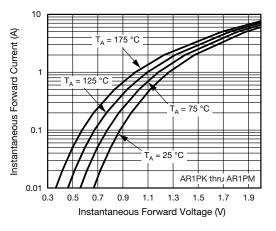


Fig. 5 - Typical Instantaneous Forward Characteristics

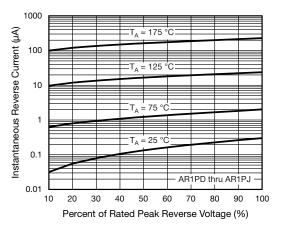


Fig. 6 - Typical Reverse Characteristics

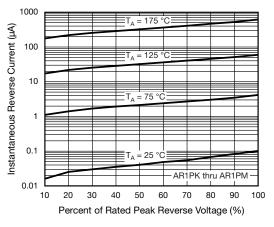


Fig. 7 - Typical Reverse Characteristics

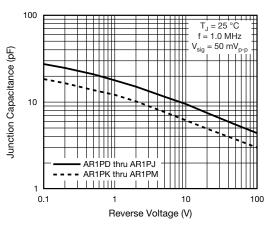


Fig. 8 - Typical Junction Capacitance

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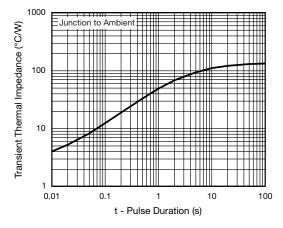
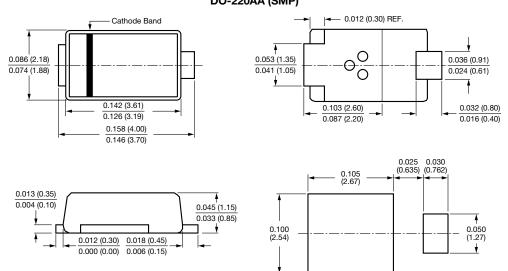


Fig. 9 - Typical Transient Thermal Impedance





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