

Standard Recovery Diodes (Stud Version), 12 A



DO-203AA (DO-4)

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200 V V_{RRM}
- RoHS compliant
- Designed and qualified for industrial and consumer level



RoHS
COMPLIANT

TYPICAL APPLICATIONS

- Battery charges
- Converters
- Power supplies
- Machine tool controls

PRODUCT SUMMARY

| | |
|-------------|------|
| $I_{F(AV)}$ | 12 A |
|-------------|------|

MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER | TEST CONDITIONS | VALUES | UNITS |
|--------------|-----------------|-------------|------------------|
| $I_{F(AV)}$ | | 12 | A |
| | T_C | 144 | °C |
| $I_{F(RMS)}$ | | 19 | A |
| I_{FSM} | 50 Hz | 265 | A |
| | 60 Hz | 280 | |
| I^2t | 50 Hz | 351 | A ² s |
| | 60 Hz | 320 | |
| V_{RRM} | Range | 100 to 1200 | V |
| T_J | | - 65 to 175 | °C |

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

| TYPE NUMBER | VOLTAGE CODE | V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V | $V_{R(BR)}$, MINIMUM AVALANCHE VOLTAGE V ⁽¹⁾ | I_{RRM} MAXIMUM AT $T_J = 175$ °C mA |
|-------------|--------------|--|--|---|---|
| 12F(R) | 10 | 100 | 150 | - | 12 |
| | 20 | 200 | 275 | - | |
| | 40 | 400 | 500 | 500 | |
| | 60 | 600 | 725 | 750 | |
| | 80 | 800 | 950 | 950 | |
| | 100 | 1000 | 1200 | 1150 | |
| | 120 | 1200 | 1400 | 1350 | |

Note

⁽¹⁾ Avalanche version only available from V_{RRM} 400 V to 1200 V

12F(R) Series



Vishay High Power Products Standard Recovery Diodes
(Stud Version), 12 A

| FORWARD CONDUCTION | | | | | | |
|---|---------------|---|----------------------------|---|------------|---------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS | |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | 12 | A | |
| | | | | 144 | °C | |
| Maximum RMS forward current | $I_{F(RMS)}$ | | | 19 | A | |
| Maximum on-repetitive peak reverse power | $P_R^{(1)}$ | 10 μ s square pulse, $T_J = T_J$ maximum | | 7 | K/W | |
| Maximum peak, one-cycle forward, non-repetitive surge current | I_{FSM} | t = 10 ms | No voltage reappplied | 265 | A | |
| | | t = 8.3 ms | | Sinusoidal half wave, initial $T_J = T_J$ maximum | | 280 |
| | | t = 10 ms | 100 % V_{RRM} reappplied | | | 225 |
| | | t = 8.3 ms | | | | 235 |
| Maximum I^2t for fusing | I^2t | t = 10 ms | No voltage reappplied | | 351 | A ² s |
| | | t = 8.3 ms | | 100 % V_{RRM} reappplied | 320 | |
| | | t = 10 ms | 250 | | | |
| | | t = 8.3 ms | 226 | | | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reappplied | | | 3510 | A ² \sqrt{s} |
| Low level value of threshold voltage | $V_{F(TO)1}$ | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 0.77 | V | |
| High level value of threshold voltage | $V_{F(TO)2}$ | $(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 0.97 | | |
| Low level value of forward slope resistance | r_{f1} | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 10.70 | m Ω | |
| High level value of forward slope resistance | r_{f2} | $(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 6.20 | | |
| Maximum forward voltage drop | V_{FM} | $I_{pk} = 38$ A, $T_J = 25$ °C, $t_p = 400$ μ s rectangular wave | | 1.26 | V | |

Note

(1) Available only for avalanche version, all other parameters the same as 12F

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | |
|--|------------|---|--|-----------------|----------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction operating temperature range | T_J | | | - 65 to 175 | °C |
| Maximum storage temperature range | T_{Stg} | | | - 65 to 200 | |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation | | 2 | K/W |
| Maximum thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth, flat and greased | | 0.5 | |
| Allowable mounting torque | | Not lubricated threads | | 1.5 + 0 - 10 % | N · m |
| | | | | 13 | lbf · in |
| | | Lubricated threads | | 1.2 + 0 - 10 % | N · m |
| | | | | 10 | lbf · in |
| Approximate weight | | | | 7 | g |
| | | | | 0.25 | oz. |
| Case style | | See dimensions - link at the end of datasheet | | DO-203AA (DO-4) | |

| ΔR_{thJC} CONDUCTION | | | | |
|------------------------------|-----------------------|------------------------|---|-------|
| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS | UNITS |
| 180° | 0.33 | 0.26 | T _J = T _J maximum | K/W |
| 120° | 0.41 | 0.44 | | |
| 90° | 0.53 | 0.58 | | |
| 60° | 0.78 | 0.81 | | |
| 30° | 1.28 | 1.29 | | |

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

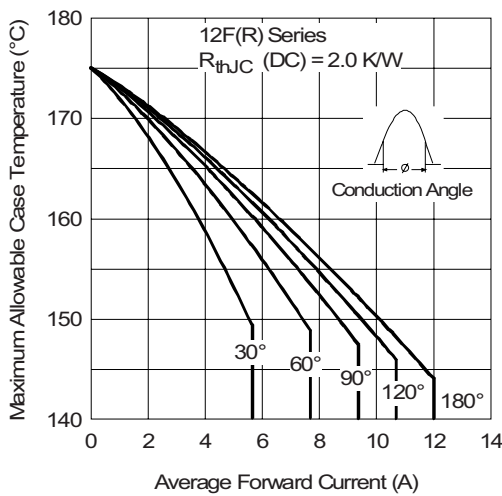


Fig. 1 - Current Ratings Characteristics

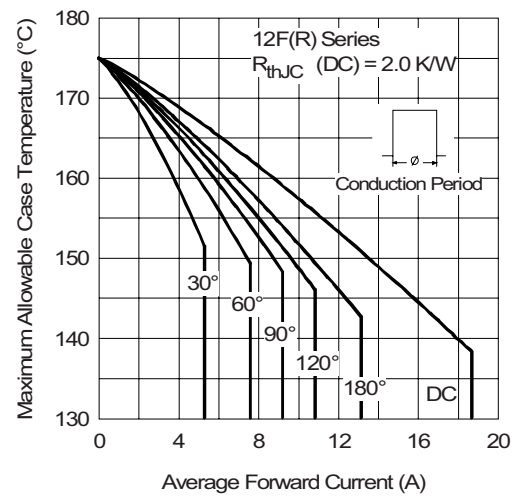


Fig. 2 - Current Ratings Characteristics

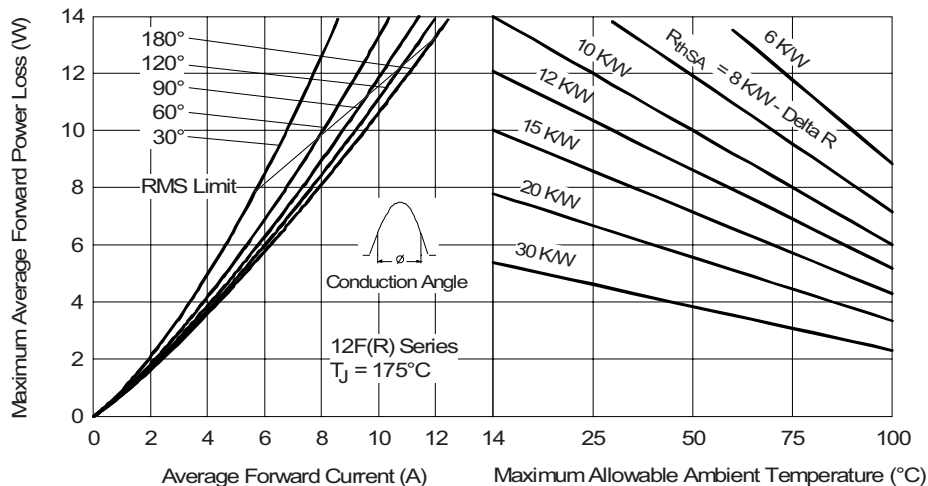


Fig. 3 - Forward Power Loss Characteristics

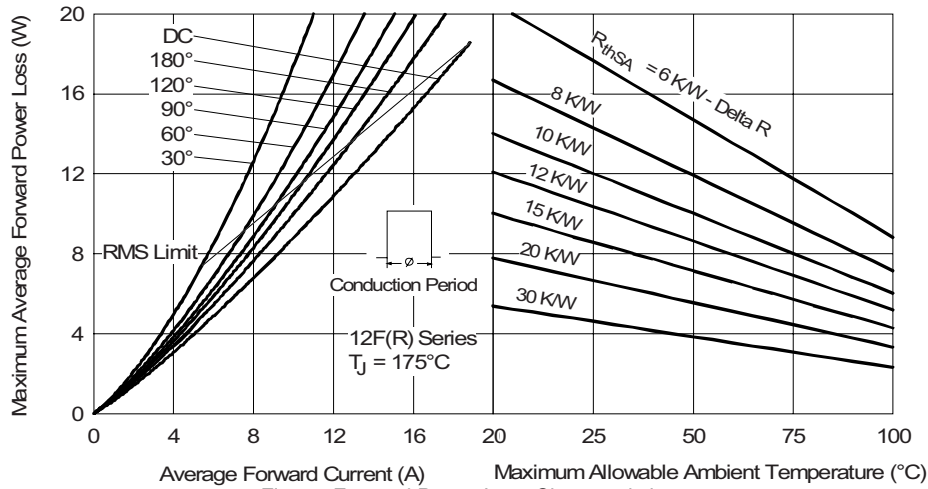


Fig. 4 - Forward Power Loss Characteristics

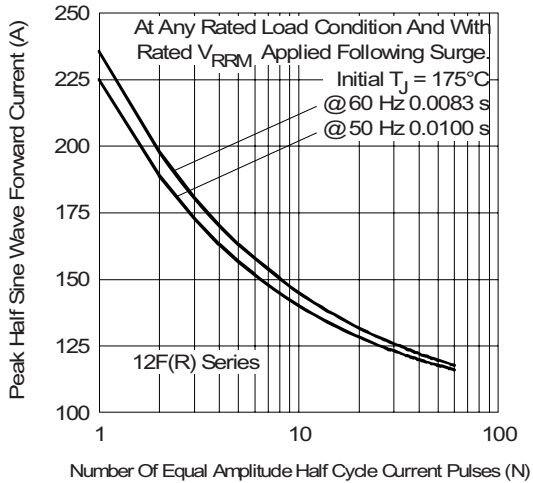


Fig. 5 - Maximum Non-Repetitive Surge Current

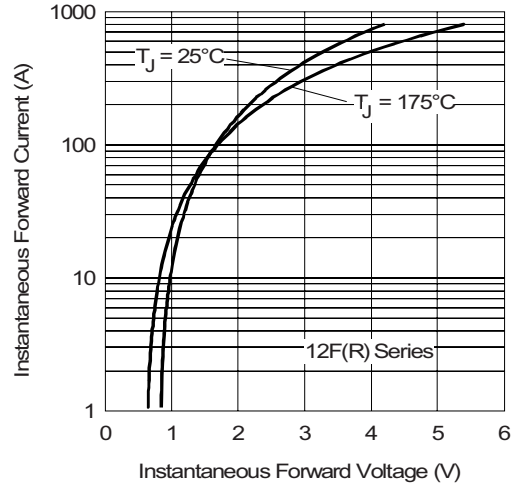


Fig. 7 - Forward Voltage Drop Characteristics

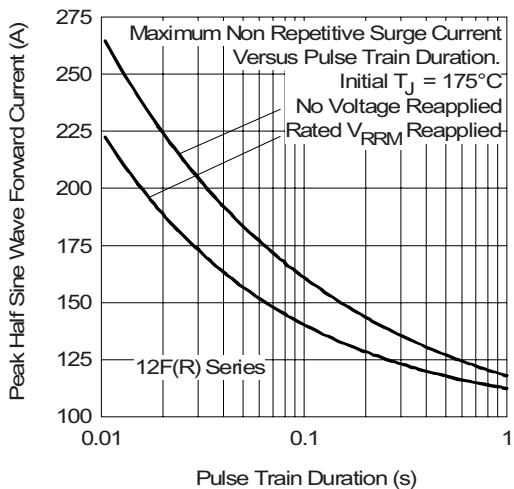


Fig. 6 - Maximum Non-Repetitive Surge Current

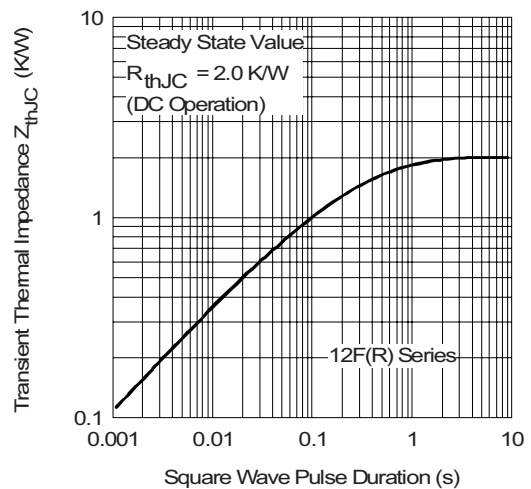
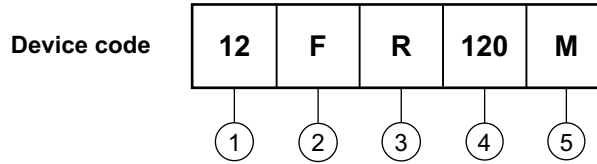


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE



- 1** - Current rating: Code = $I_{F(AV)}$
- 2** - F = Standard device
- 3** - None = Stud normal polarity (cathode to stud)
 R = Stud reverse polarity (anode to stud)
- 4** - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)
- 5** - None = Stud base DO-203AA (DO-4) 10-32UNF-2A
 M = Stud base DO-203AA (DO-4) M5 x 0.8
 (not available for avalanche diodes)

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95311 |

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