

Standard Recovery Diodes, (Stud Version), 85 A



DO-203AB (DO-5)

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 400 V V_{RRM}
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

PRODUCT SUMMARY

| | |
|-----------------------|-----------------|
| $I_{F(AV)}$ | 85 A |
| Package | DO-203AB (DO-5) |
| Circuit configuration | Single diode |

MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER | TEST CONDITIONS | 85HF(R) | UNITS |
|--------------|-----------------|------------|------------------|
| | | 400 | |
| $I_{F(AV)}$ | | 85 | A |
| | T_C | 140 | °C |
| $I_{F(RMS)}$ | | 133 | A |
| I_{FSM} | 50 Hz | 1700 | A |
| | 60 Hz | 1800 | |
| I^2t | 50 Hz | 14 500 | A ² s |
| | 60 Hz | 13 500 | |
| V_{RRM} | Range | 400 | V |
| T_J | | -65 to 180 | °C |

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

| TYPE NUMBER | VOLTAGE CODE | V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I_{RRM} MAXIMUM AT $T_J = T_J$ MAXIMUM mA |
|-------------|--------------|--|--|--|
| VS-85HF(R) | 40 | 400 | 500 | 9 |



| FORWARD CONDUCTION | | | | | |
|---|---------------|---|---------------------------|---|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | 85HF(R) | UNITS |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | 85 | A |
| | | | | 140 | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | | | 133 | A |
| Maximum peak, one-cycle forward, non-repetitive surge current | I_{FSM} | t = 10 ms | No voltage reapplied | Sinusoidal half wave, initial $T_J = T_J$ maximum | 1700 |
| | | t = 8.3 ms | | | 1800 |
| | | t = 10 ms | 100 % V_{RRM} reapplied | | 1450 |
| | | t = 8.3 ms | | | 1500 |
| Maximum I^2t for fusing | I^2t | t = 10 ms | No voltage reapplied | | 14 500 |
| | | t = 8.3 ms | | | 13 500 |
| | | t = 10 ms | 100 % V_{RRM} reapplied | | 10 500 |
| | | t = 8.3 ms | | | 9400 |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reapplied | | 16 000 | $A^2\sqrt{s}$ |
| Value of threshold voltage (up to 1200 V) | $V_{F(TO)}$ | $T_J = T_J$ maximum | | 0.68 | V |
| Value of threshold voltage (for 1400 V, 1600 V) | | | | 0.69 | |
| Value of forward slope resistance (up to 1200 V) | r_f | $T_J = T_J$ maximum | | 1.62 | mW |
| Value of forward slope resistance (for 1400 V, 1600 V) | | | | 1.75 | |
| Maximum forward voltage drop | V_{FM} | $I_{pk} = 267$ A, $T_J = 25$ °C, $t_p = 400$ μ s rectangular wave | | 1.2 | V |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | |
|--|----------------|---|--|-----------------|---------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | 85HF(R) | UNITS |
| Maximum junction operating and storage temperature range | T_J, T_{Stg} | | | -65 to 180 | °C |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation | | 0.35 | K/W |
| Maximum thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth, flat and greased | | 0.25 | |
| Maximum allowable mounting torque + 0 %, - 10 % | | Not lubricated thread, tightening on nut | | 3.4 (30) | N · m (lbf · in) |
| | | Lubricated thread, tightening on nut | | 2.3 (20) | |
| | | Not lubricated thread, tightening on hexagon | | 4.2 (37) | |
| | | Lubricated thread, tightening on hexagon | | 3.2 (28) | |
| Approximate weight | | Unleaded device | | 17 | g |
| | | | | 0.6 | oz. |
| Case style | | See dimensions - link at the end of datasheet | | DO-203AB (DO-5) | |

| ΔR_{thJC} CONDUCTION | | | | |
|------------------------------|-----------------------|------------------------|---------------------|-------|
| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS | UNITS |
| 180° | 0.10 | 0.08 | $T_J = T_J$ maximum | K/W |
| 120° | 0.11 | 0.11 | | |
| 90° | 0.13 | 0.13 | | |
| 60° | 0.17 | 0.17 | | |
| 30° | 0.26 | 0.26 | | |

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

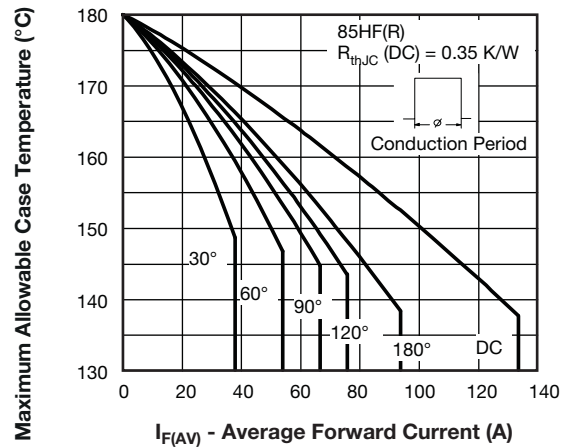


Fig. 2 - Current Ratings Characteristics

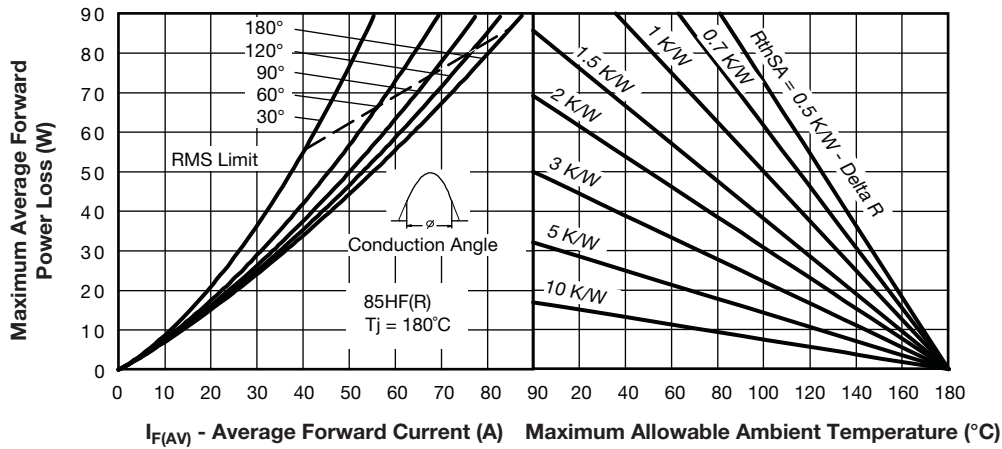


Fig. 3 - Forward Power Loss Characteristics

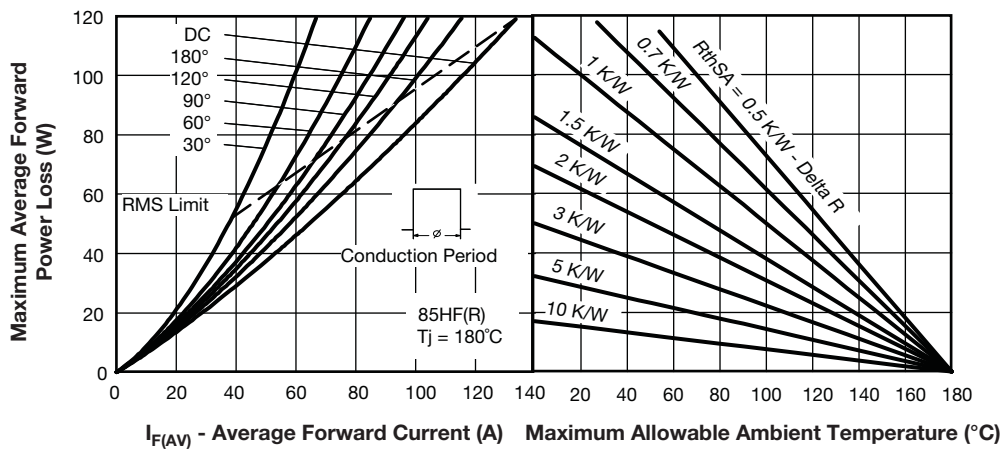


Fig. 4 - Forward Power Loss Characteristics



Fig. 5 - Maximum Non-Repetitive Surge Current



Fig. 7 - Forward Voltage Drop Characteristics

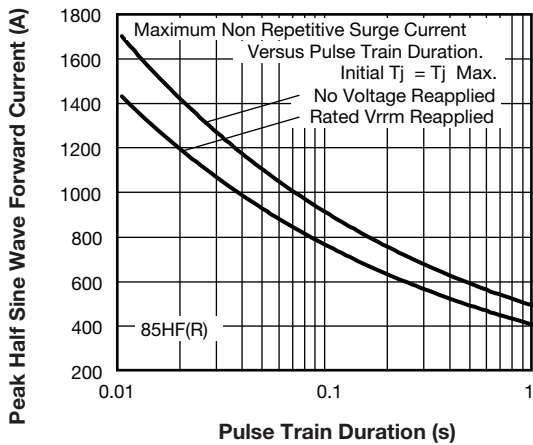


Fig. 6 - Maximum Non-Repetitive Surge Current



Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

| | | | | | | |
|-------------|------------|-----------|-----------|----------|-----------|-----------|
| Device code | VS- | 85 | HF | R | 40 | M8 |
| | ① | ② | ③ | ④ | ⑤ | ⑥ |

- 1** - Vishay Semiconductors product
- 2** - 85 = Standard device
- 3** - HF = Standard diode
- 4** - None = Stud normal polarity (cathode to stud)
R = Stud reverse polarity (anode to stud)
- 5** - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)
- 6** - M8 = Stud base DO-203AB (DO-5) M8 x 1.25

LINKS TO RELATED DOCUMENTS

| | |
|------------|--|
| Dimensions | www.vishay.com/doc?95342 |
|------------|--|



DO-203AB (DO-5) for 85HF(R) Series

DIMENSIONS in millimeters (inches)





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