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Vishay Semiconductor/Diodes Division
VS-240U100D

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# Standard Recovery Diodes (Stud Version), 320 A

DO-205AB (DO-9)

## FEATURES

- Diffused diode
- Wide current range
- High voltage ratings up to 1200 V
- High surge current capabilities
- Stud cathode and stud anode version
- Hermetic metal case
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

## TYPICAL APPLICATIONS

- Welders
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications
- Battery charges
- Freewheeling diodes

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 320 A |
| Package | DO-205AB (DO-9) |
| Circuit configuration | Single diode |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| PARAMETER | TEST CONDITIONS | VALUES | UNITS |
| $I_{F(AV)}$ | | 320 | A |
| | $T_C$ | 100 | °C |
| $I_{F(RMS)}$ | | 500 | A |
| $I_{FSM}$ | 50 Hz | 4500 | A |
| | 60 Hz | 4700 | |
| $I^2t$ | 50 Hz | 101 | $kA^2s$ |
| | 60 Hz | 92 | |
| $V_{RRM}$ | Range | 600 to 1200 | V |
| $T_J$ | | -40 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-240U(R).. | 60 | 600 | 700 | 15 |
| | 80 | 800 | 900 | |
| | 100 | 1000 | 1100 | |
| | 120 | 1200 | 1300 | |

| FORWARD CONDUCTION | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | | | VALUES | UNITS |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | | 320 | A |
| | | | | | 100 | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | DC at 80 °C case temperature | | | 500 | 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 | 4500 | |
| | | t = 8.3 ms | | | 4700 | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 3800 | |
| | | t = 8.3 ms | | | 4000 | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | No voltage reapplied | | 101 | $kA^2s$ |
| | | t = 8.3 ms | | | 92 | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 72 | |
| | | t = 8.3 ms | | | 66 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied | | | 1010 | $kA^2\sqrt{s}$ |
| Slope resistance | $r_f$ | $T_J = T_J$ maximum | | | 0.6 | mΩ |
| Threshold voltage | $V_{F(T0)}$ | | | | 0.83 | V |
| Maximum forward voltage drop | $V_{FM}$ | $I_{pk}$ = 750 A, $T_J$ = 25 °C, $t_p$ = 10 ms sinusoidal wave | | | 1.33 | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum junction operating and storage temperature range | $T_J$, $T_{Stg}$ | | -40 to 180 | °C |
| Maximum thermal resistance, junction to case | $R_{thJC}$ | DC operation | 0.18 | K/W |
| Maximum thermal resistance, case to heatsink | $R_{thCS}$ | Mounting surface, smooth, flat and greased | 0.08 | |
| Maximum allowable mounting torque +0 -20 % | | Not lubricated threads | 37 (330) | N · m (lbf · in) |
| | | Lubricated threads | 28 (250) | |
| Approximate weight | | | 250 | g |
| Case style | | See dimensions - link at the end of datasheet | DO-205AB (DO-9 | |

| $\Delta R_{thJC}$ CONDUCTION | | | | |
|---|---|---|---|---|
| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS | UNITS |
| 180° | 0.019 | 0.015 | $T_J = T_J$ maximum | K/W |
| 120° | 0.023 | 0.025 | | |
| 90° | 0.030 | 0.034 | | |
| 60° | 0.045 | 0.047 | | |
| 30° | 0.076 | 0.076 | | |

**Note**

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

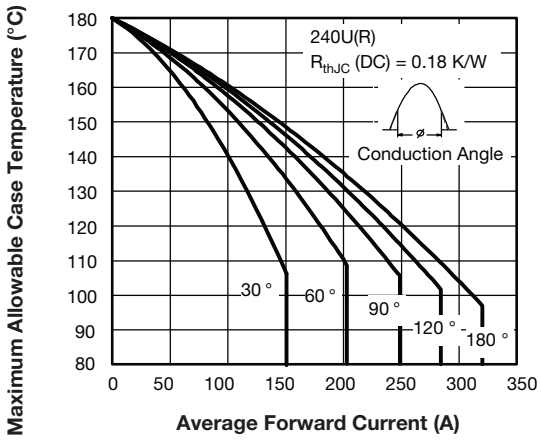



Fig. 1 - Current Ratings Characteristics

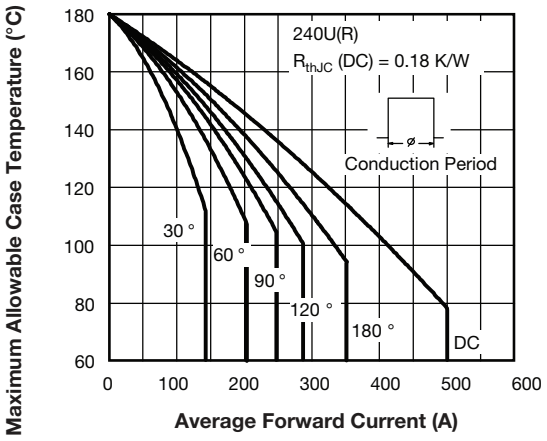



Fig. 2 - Current Ratings Characteristics

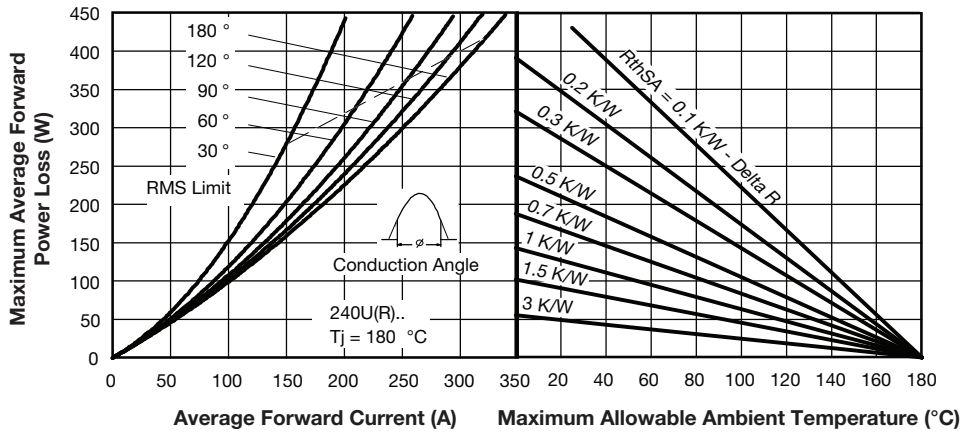



Fig. 3 - Forward Power Loss Characteristics

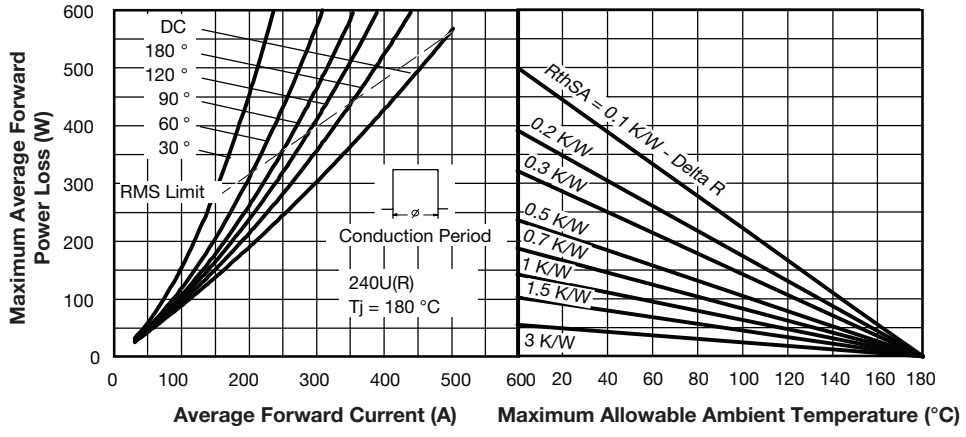



Fig. 4 - Forward Power Loss Characteristics

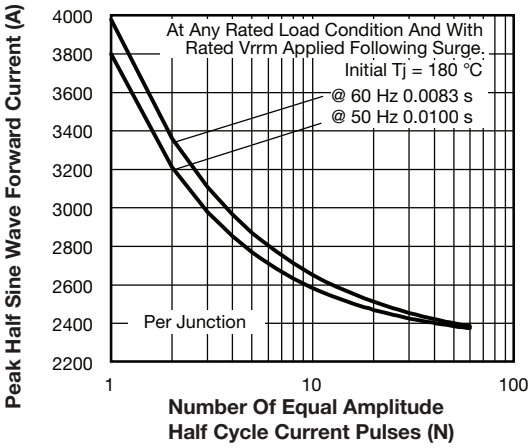



Fig. 5 - Maximum Non-Repetitive Surge Current

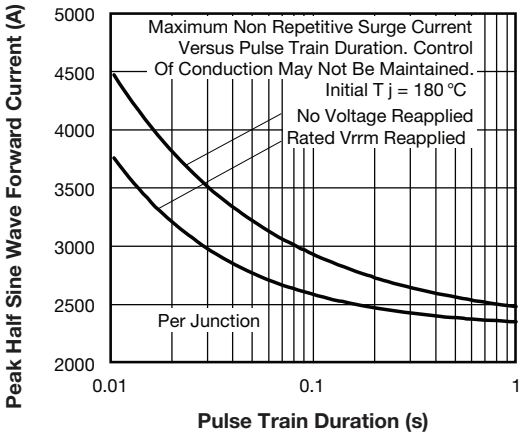



Fig. 6 - Maximum Non-Repetitive Surge Current

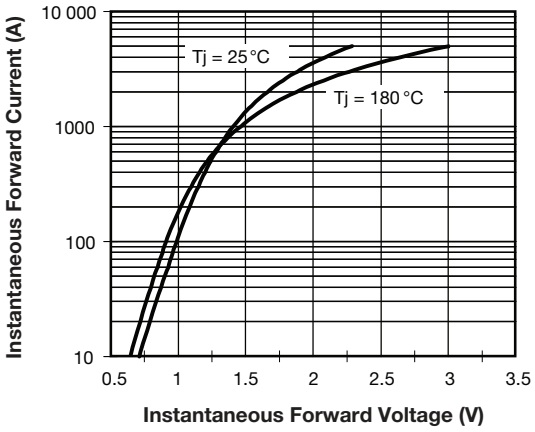



Fig. 7 - Forward Voltage Drop Characteristics

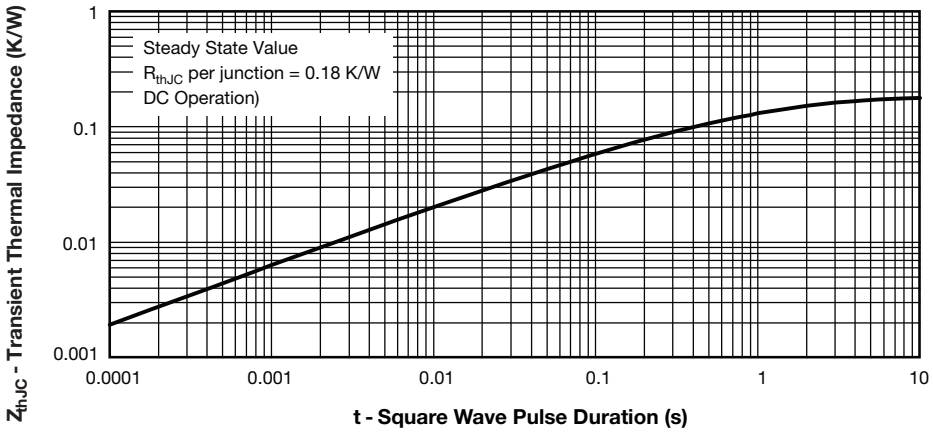



Fig. 8 - Thermal Impedance $Z_{thJC}$ Characteristic

## ORDERING INFORMATION TABLE

Device code

| VS- | 24 | 0 | U | R | 60 | D |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

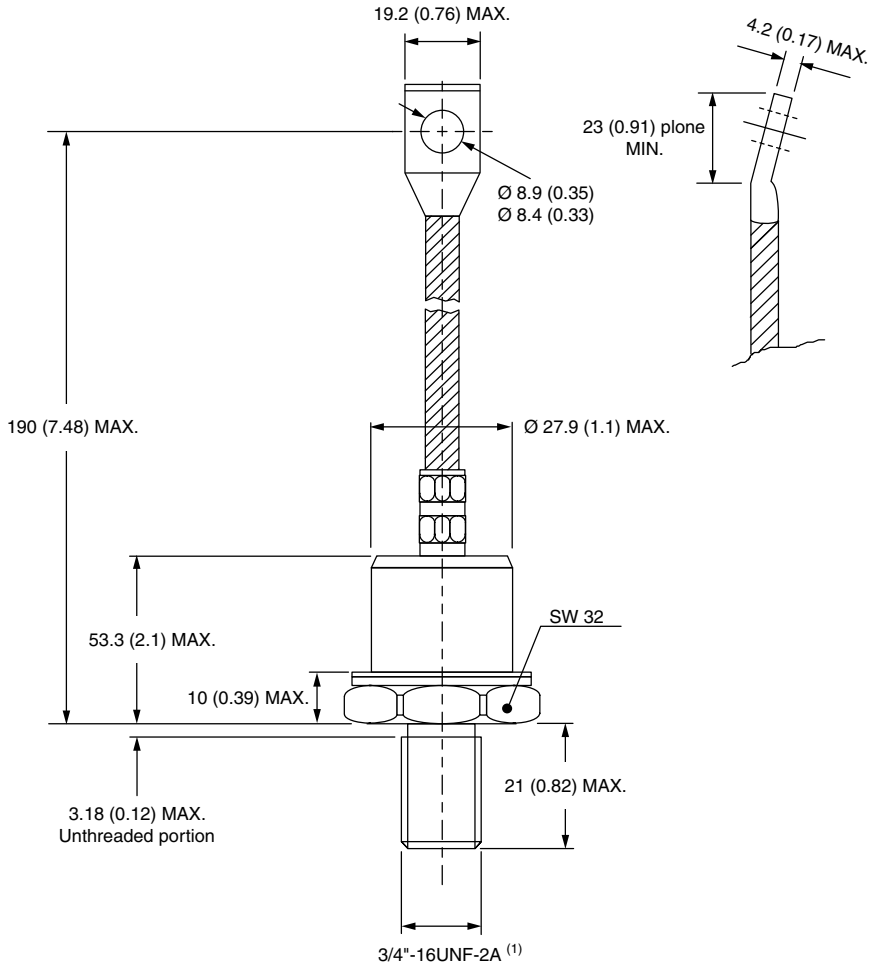
1 - Vishay Semiconductors product
2 - 24 = essential part number
3 - 0 = standard device
4 - U = stud normal polarity (cathode to stud)
5 - • None = stud normal polarity (cathode to stud)
• R = stud reverse polarity (anode to stud)
6 - Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)
7 - Diffused diode

Note = For metric device M16 x 1.5 contact factory

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | www.vishay.com/doc?95317 |

# DO-205AB (DO-9) for 240U(R) Series

**DIMENSIONS** in millimeters (inches)




**Note**

(1) For metric device M16 x 1.5 contact factory

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