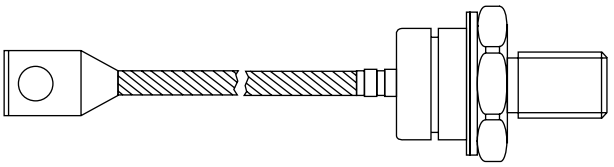
# Standard Recovery Diodes (Stud Version), 200 A



DO-205AC (DO-30)

## FEATURES

- Wide current range
- High voltage ratings up to 2400 V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC types
- Compression bonded encapsulations
- RoHS complaint
- Lead (Pb)-free
- Designed and qualified for industrial level

Pb-free
RoHS COMPLIANT

## TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 200 A |

| MAJOR RATINGS AND CHARACTERISTICS | | | | |
|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | SD200N/R | | UNITS |
| | | 1600 to 2000 | 2400 | |
| $I_{F(AV)}$ | | 200 | | A |
| | $T_C$ | 110 | | °C |
| $I_{F(RMS)}$ | | 314 | | A |
| $I_{FSM}$ | 50 Hz | 4700 | | |
| | 60 Hz | 4920 | | |
| $I^2t$ | 50 Hz | 110 | | $kA^2s$ |
| | 60 Hz | 101 | | |
| $V_{RRM}$ | Range | 1600 to 2000 | 2400 | V |
| $T_J$ | | - 40 to 180 | 150 | °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 |
| SD200N/R | 16 | 1600 | 1700 | 15 |
| | 20 | 2000 | 2100 | |
| | 24 | 2400 | 2500 | |

## FORWARD CONDUCTION

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | 200 | A |
| | | | 110 | °C |
| Maximum average forward current at case temperature | | | 220 | A |
| | | | 100 | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | DC at 95 °C case temperature | 314 | 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 | 4700 | A |
| | | t = 8.3 ms, No voltage reapplied | 4920 | |
| | | t = 10 ms, 100 % $V_{RRM}$ reapplied | 3950 | |
| | | t = 8.3 ms, 100 % $V_{RRM}$ reapplied | 4140 | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms, No voltage reapplied | 110 | $kA^2s$ |
| | | t = 8.3 ms, No voltage reapplied | 101 | |
| | | t = 10 ms, 100 % $V_{RRM}$ reapplied | 78 | |
| | | t = 8.3 ms, 100 % $V_{RRM}$ reapplied | 71 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied | 1100 | $kA^2\sqrt{s}$ |
| Low level value of threshold voltage | $V_{F(TO)1}$ | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum | 0.90 | V |
| High level value of threshold voltage | $V_{F(TO)2}$ | (I > $\pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum | 1.00 | |
| Low level value of forward slope resistance | $r_{f1}$ | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum | 0.79 | mΩ |
| High level value of forward slope resistance | $r_{f2}$ | (I > $\pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum | 0.64 | |
| Maximum forward voltage drop | $V_{FM}$ | $I_{pk}$ = 630 A, $T_J = T_J$ maximum, $t_p$ = 10 ms sinusoidal wave | 1.40 | V |

## THERMAL AND MECHANICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | SD200N/R | | UNITS |
|---|---|---|---|---|---|
| | | | 1600 to 2000 | 2400 | |
| Maximum junction operating temperature range | $T_J$ | | - 40 to 180 | - 40 to 150 | °C |
| Maximum storage temperature range | $T_{Stg}$ | | - 55 to 200 | | |
| Maximum thermal resistance, junction to case | $R_{thJC}$ | DC operation | 0.23 | | K/W |
| Maximum thermal resistance, case to heatsink | $R_{thCS}$ | Mounting surface, smooth, flat and greased | 0.08 | | |
| Maximum allowed mounting torque ± 10 % | | Not-lubricated threads | 14 | | Nm |
| Approximate weight | | | 120 | | g |
| Case style | | See dimensions (link at the end of datasheet) | DO-205AC (DO-30) | | |

| $\Delta R_{thJC}$ CONDUCTION | | | | |
|---|---|---|---|---|
| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS | UNITS |
| 180° | 0.041 | 0.030 | $T_J = T_J$ maximum | K/W |
| 120° | 0.049 | 0.051 | | |
| 90° | 0.063 | 0.068 | | |
| 60° | 0.093 | 0.096 | | |
| 30° | 0.156 | 0.157 | | |

**Note**

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

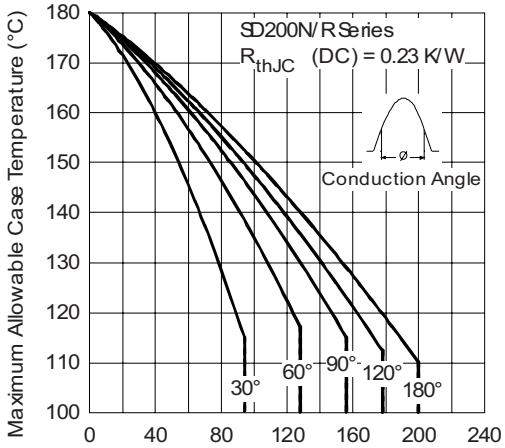



Fig. 1 - Current Ratings Characteristics

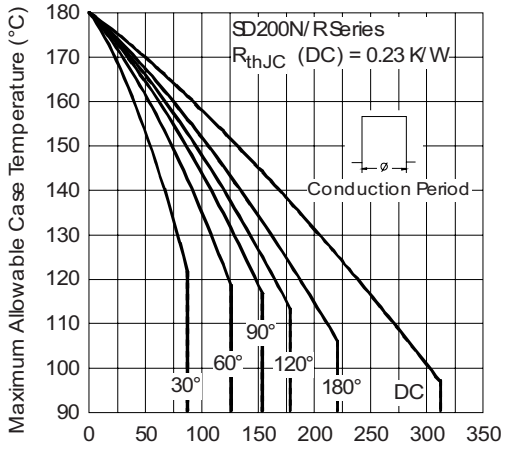



Fig. 2 - Current Ratings Characteristics

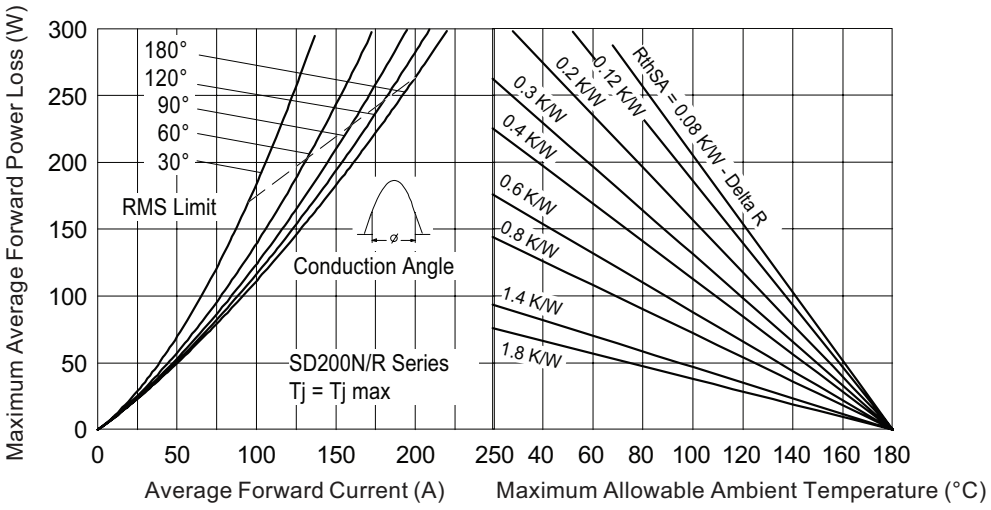



Fig. 3 - Forward Power Loss Characteristics

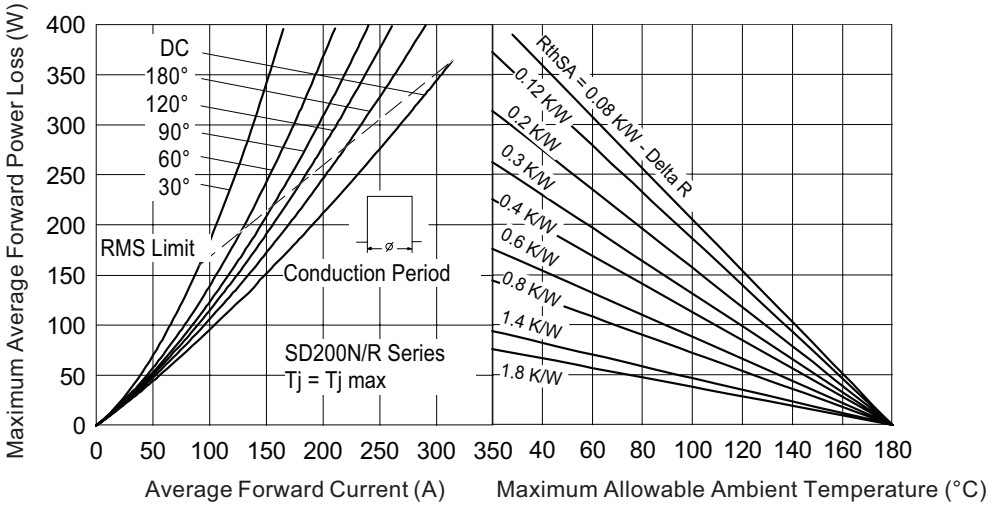



Fig. 4 - Forward Power Loss Characteristics

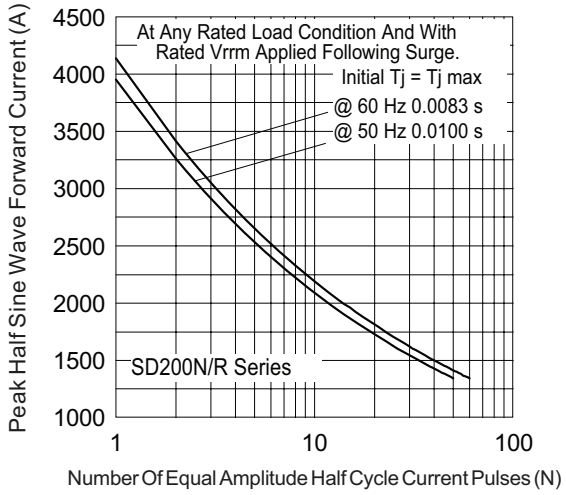



Fig. 5 - Maximum Non-Repetitive Surge Current

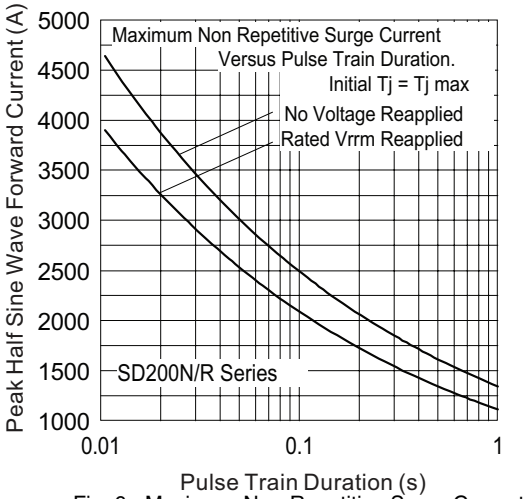



Fig. 6 - Maximum Non-Repetitive Surge Current

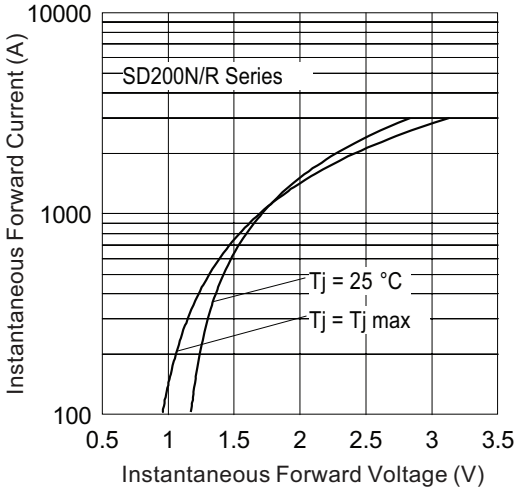



Fig. 7 - Forward Voltage Drop Characteristics

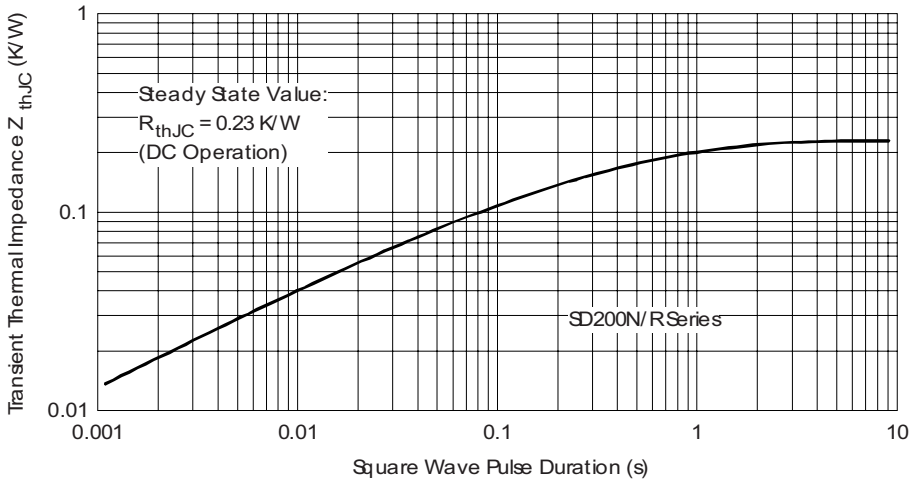



Fig. 8 - Thermal Impedance $Z_{thJC}$ Characteristic

## ORDERING INFORMATION TABLE

**Device code**

| SD | 20 | 0 | N | 24 | P | C |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

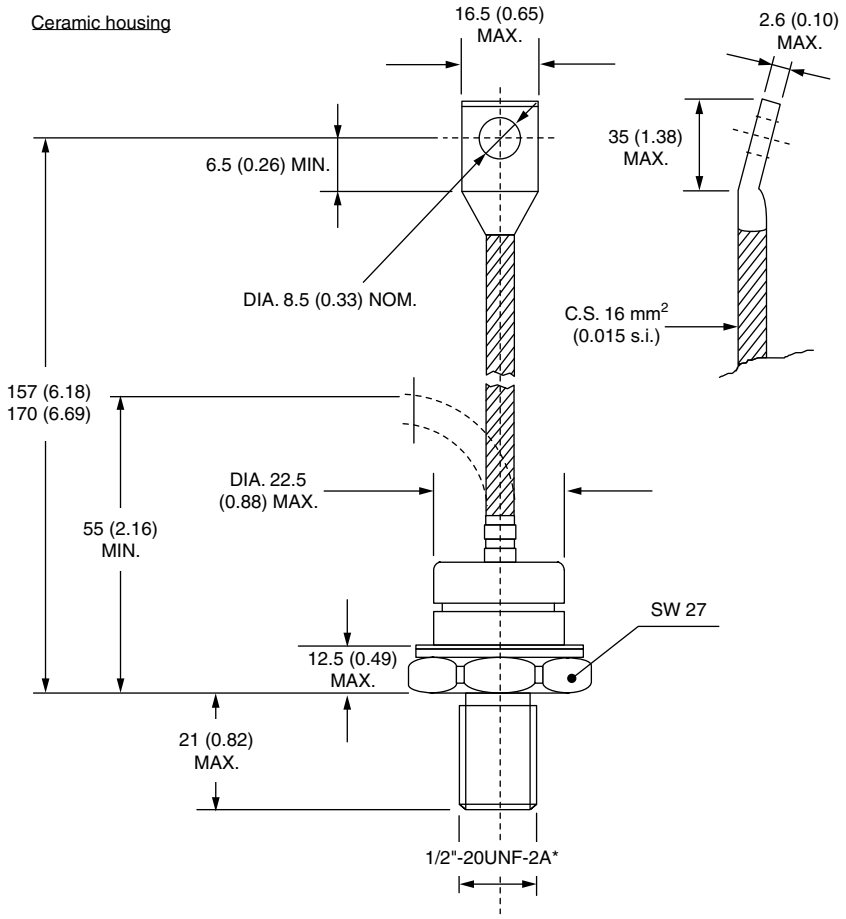
- **1** - Diode
- **2** - Essential part number
- **3** - 0 = Standard recovery
- **4** - • N = Stud normal polarity (cathode to stud)
  • R = Stud reverse polarity (anode to stud)
- **5** - Voltage code x 100 = $V_{RRM}$ (see Voltage Ratings table)
- **6** - • P = Stud base DO-205AC (DO-30) 1/2" 20UNF-2A
  • M = Stud base DO-205AC (DO-30) M12 x 1.75
- **7** - C = Ceramic housing

For metric device M12 x 1.75 contact factory

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | http://www.vishay.com/doc?95302 |

# DO-205AC (DO-30)

**DIMENSIONS** in millimeters (inches)




*For metric device: M12 x 1.75
contact factory

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