

Standard Recovery Diodes Stud Version, 400A

FEATURES

- Alloy diode
- Glass passivated chip
- Popular series for rough service
- Stud cathode and stud anode version
- RoHS compliant
- Designed and qualified for industrial level

TYPICAL APPLICATIONS

- Welders
- Power supplies
- Motor controls
- Battery chargers
- General industrial current rectification



DO-205AB(DO-9)

PRODUCT SUMMARY

| | |
|-------------|------|
| $I_{F(AV)}$ | 400A |
|-------------|------|

MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER | TEST CONDITIONS | VALUE | UNIT |
|-------------|-----------------|-------------|-------------------|
| $I_{F(AV)}$ | T_C | 400 | A |
| | | 120 | °C |
| I_{FSM} | 50 HZ | 8000 | A |
| | 60 HZ | 8380 | |
| I^2t | 50 HZ | 320 | kA ² s |
| | 60 HZ | 291 | |
| V_{RRM} | Range | 800 to 1600 | V |
| T_J | | -40 to 200 | °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 $T_J = 200\text{ °C}$ mA |
|-------------|--------------|--|--|--|
| 400D(R) | 08 | 800 | 900 | 15 |
| | 12 | 1200 | 1300 | |
| | 16 | 1600 | 1700 | |

| FORWARD CONDUCTION | | | | | |
|---|---------------|---|--------------------------|---|----------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | 400D(R) | UNIT |
| Maximum average forward current at maximum case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | 400 | A |
| | | | | 120 | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | DC at 110°C case temperature | | 628 | A |
| Maximum peak, one cycle forward, non-repetitive surge current | I_{FSM} | t = 10ms | No voltage reapplied | Sinusoidal half wave, initial $T_J = T_J$ maximum | 8000 |
| | | t = 8.3ms | No voltage reapplied | | 8380 |
| | | t = 10ms | 100% V_{RRM} reapplied | | 6720 |
| | | t = 8.3ms | 100% V_{RRM} reapplied | | 7039 |
| Maximum I^2t for fusing | I^2t | t = 10ms | No voltage reapplied | Sinusoidal half wave, initial $T_J = T_J$ maximum | 320 |
| | | t = 8.3ms | No voltage reapplied | | 291 |
| | | t = 10ms | 100% V_{RRM} reapplied | | 226 |
| | | t = 8.3ms | 100% V_{RRM} reapplied | | 206 |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reapplied | | 3200 | $kA^2\sqrt{s}$ |
| Maximum value of threshold voltage | $V_{F(TO)}$ | $T_J = T_J$ Maximum | | 0.85 | V |
| Maximum value of forward slope resistance | r_F | | | 0.50 | mΩ |
| Maximum forward voltage drop | V_{FM} | $I_{pk} = 1500A, T_J = 25^\circ C$ | | 1.60 | V |

| FORWARD CONDUCTION | | | | |
|--|----------------|---|-----------------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUE | UNIT |
| Maximum junction operating and storage temperature range | T_J, T_{stg} | | - 40 to 200 | °C |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation | 0.15 | K/W |
| Maximum thermal resistance case to heatsink | R_{thCS} | Mounting surface, smooth, flat and greased | 0.04 | |
| Maximum allowable mounting torque (+0% , -20%) | | Not lubricated threads | 37 | Nm |
| | | Lubricated threads | 28 | |
| Approximate weight | | Ceramic housing | 240 | g |
| | | Glass-metal seal | 220 | |
| Case style | | (JEDEC) see dimensions - link at the end of datasheet | DO-205AB (DO-9) | |

| △ R_{thJC} CONDUCTION | | | | |
|-------------------------|-----------------------|------------------------|---------------------|-------|
| CONDUCTION ANGEL | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDUCTIONS | UNITS |
| 180° | 0.020 | 0.013 | $T_J = T_J$ maximum | K/W |
| 120° | 0.023 | 0.023 | | |
| 90° | 0.029 | 0.031 | | |
| 60° | 0.042 | 0.044 | | |
| 30° | 0.073 | 0.074 | | |

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

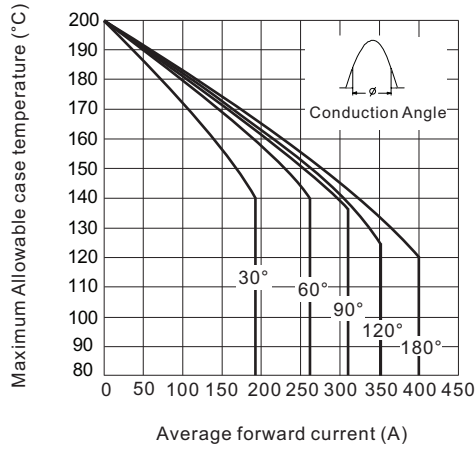


Fig.2 Current ratings characteristics

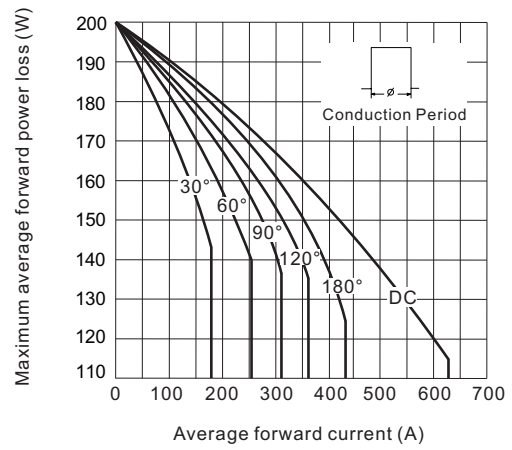


Fig.3 Forward power loss characteristics

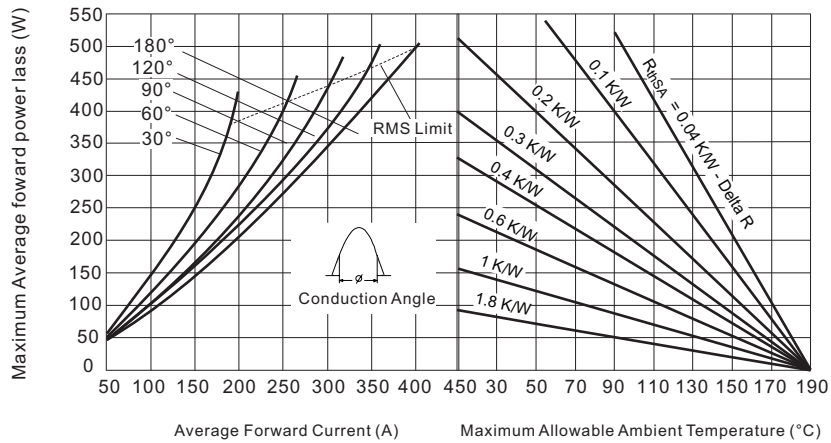


Fig.4 Forward power loss characteristics

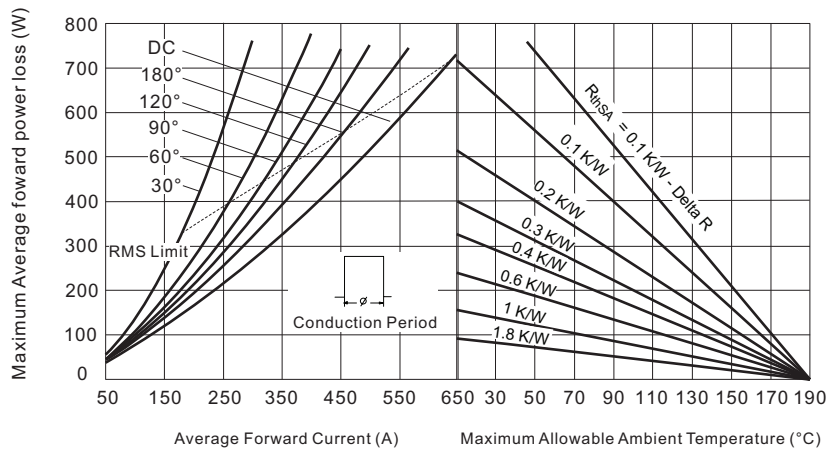


Fig.5 Maximum non-repetitive surge current

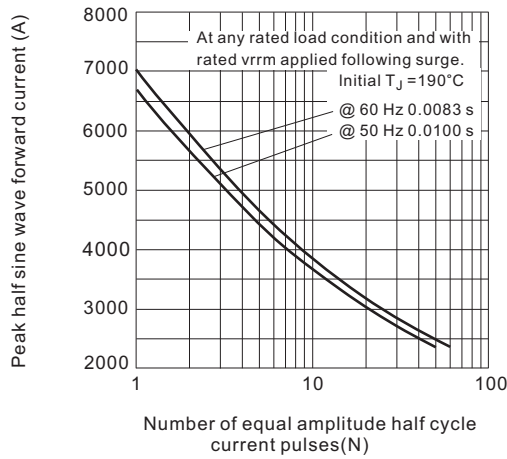


Fig.6 Maximum non-repetitive surge current

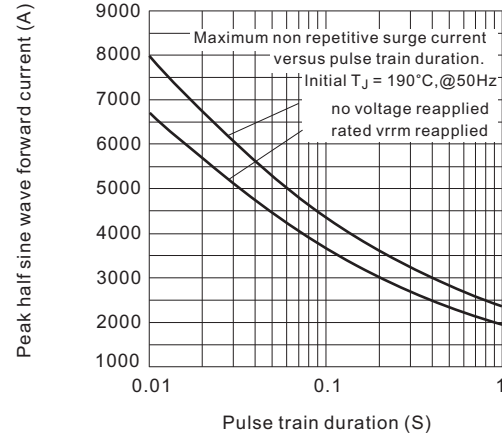


Fig.7 Forward voltage drop characteristics

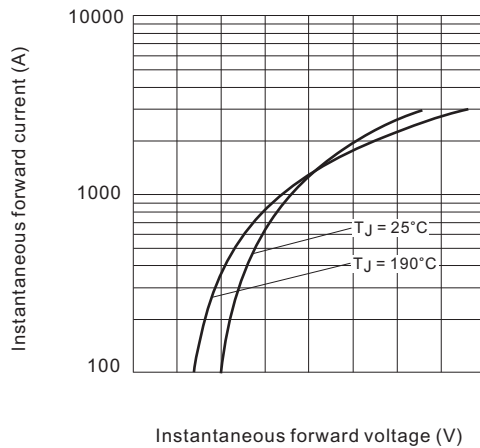
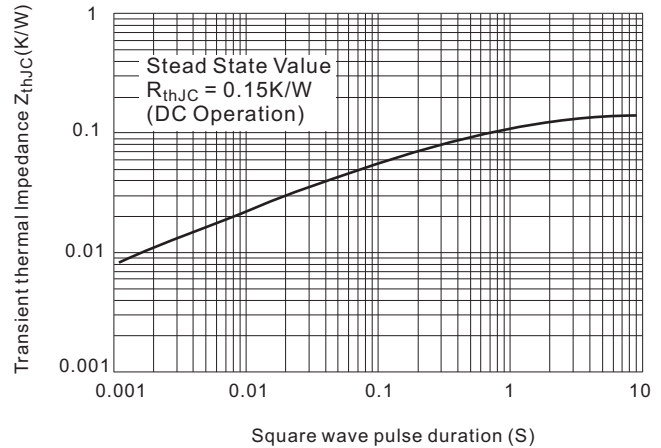


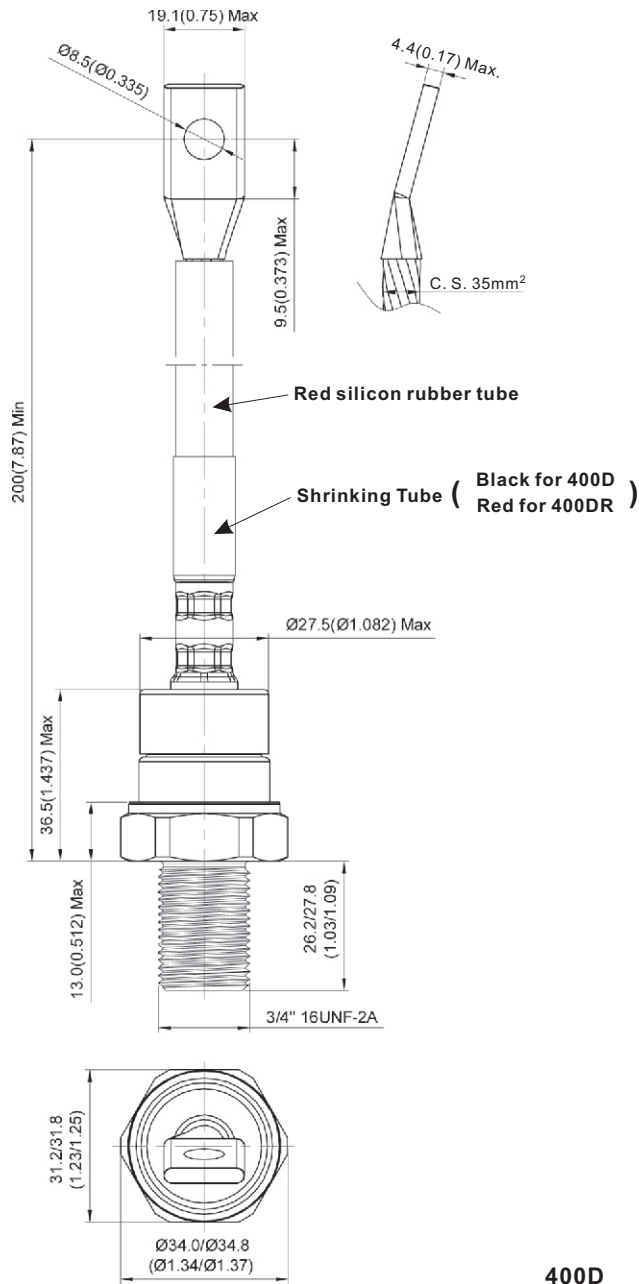
Fig.8 Thermal Impedance Z_{thJC} characteristic



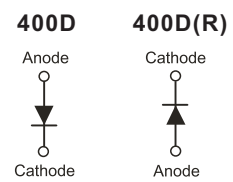
ORDERING INFORMATION TABLE

| | | | | | | |
|-------------|------------|---|--|--|----------|----------|
| Device code | 400 | D | R | 12 | B | M |
| | ① | ② | ③ | ④ | ⑤ | ⑥ |
| ① | - | Current rating, 400 = 400A | | | | |
| ② | - | D = Standard Recovery Diode | | | | |
| ③ | - | None = Stud normal polarity (cathode to stud) | R = Stud reverse polarity (anode to stud) | | | |
| ④ | - | Voltage code $\times 100 = V_{RRM}$ (see Voltage Ratings table) | | | | |
| ⑤ | - | None = DO-9, Ceramic housing type with insulated tube | B = DO-9, Glass-Metal Seal Type | C = DO-9, Ceramic housing type with insulated tube, "inner pressure contact structure" | | |
| ⑥ | - | None = standard device, 3/4"-16UNF-2A | M = Metric device, M20 x 1.5 , with insulated tube | | | |

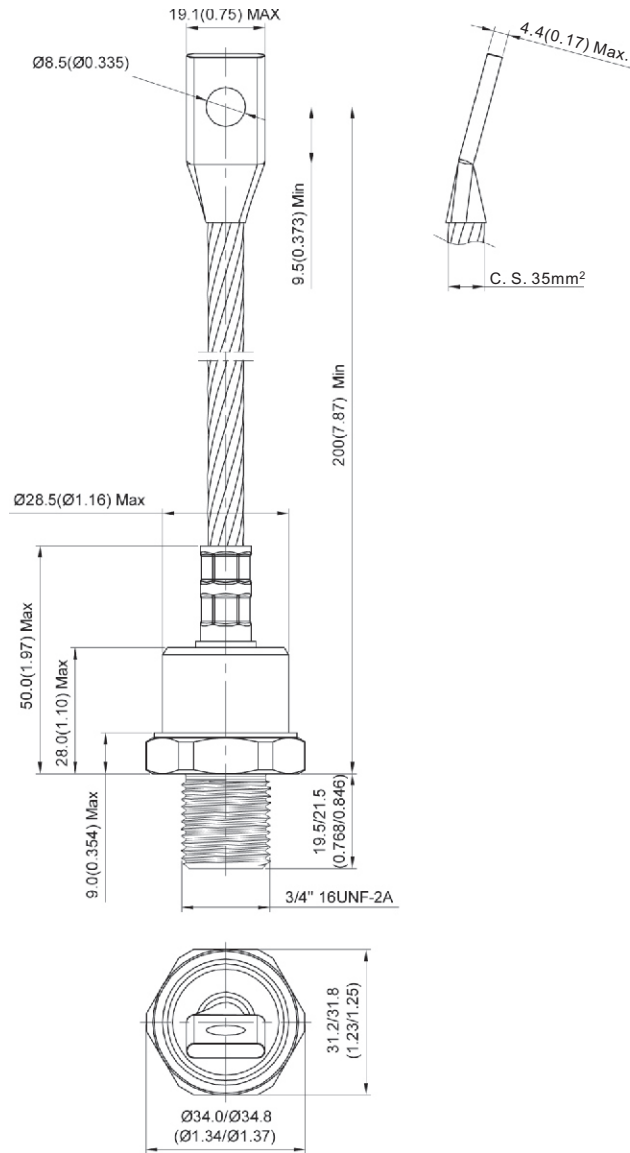
DO-205AB (DO-9), Ceramic housing



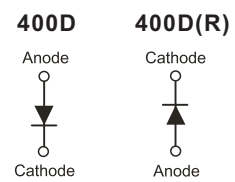
All dimensions in millimeters (inches)



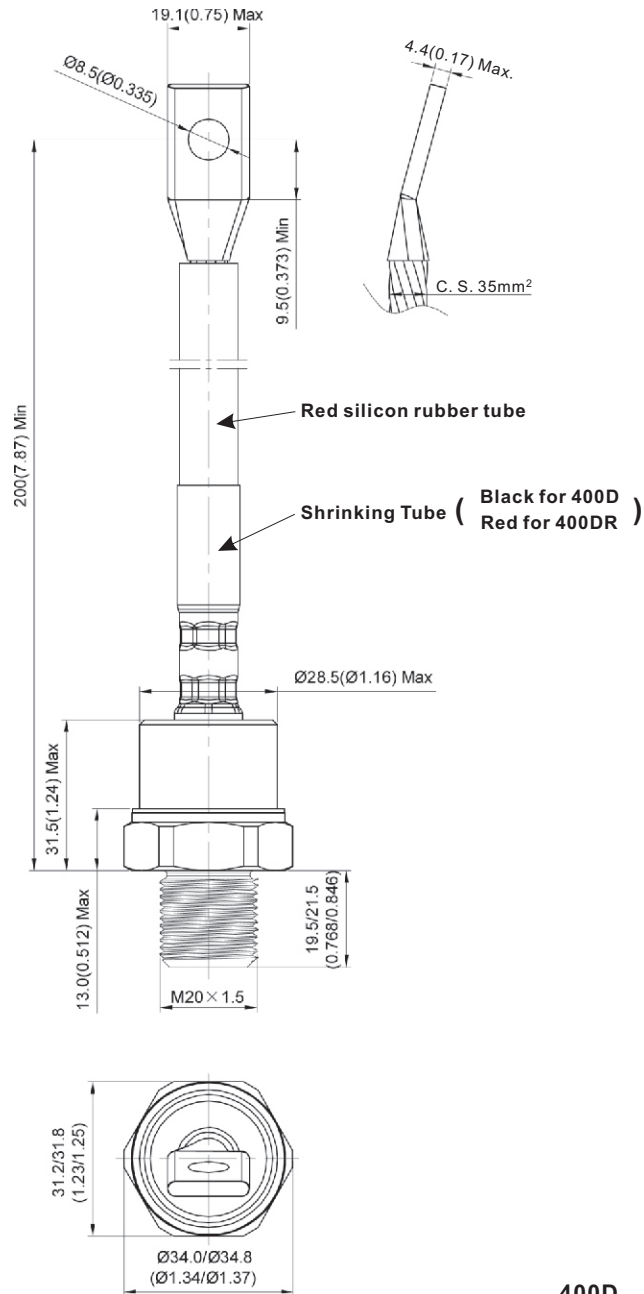
DO-205AB (DO-9), GLASS - METAL SEAL



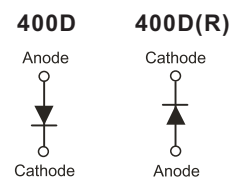
All dimensions in millimeters (inches)



DO-205AB (DO-9), GLASS - METAL SEAL (Metric stud)



All dimensions in millimeters (inches)



**DO-205AB (DO-9), Ceramic housing
(Inner Pressure Contact Structure)**

