

STANDARD RECOVERY DIODES

Stud Version

Features

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600V V_{RRM}

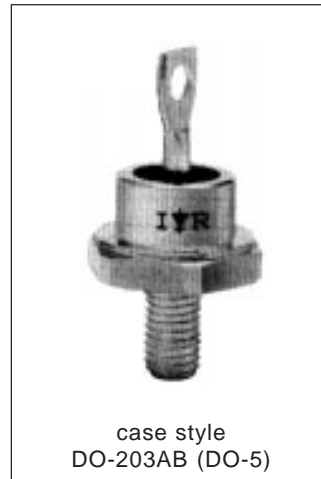
40 A

Typical Applications

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

Major Ratings and Characteristics

| Parameters | 40HF(R) | | Units | |
|--------------|-----------|-------------|------------------|----|
| | 10 to 120 | 140 to 160 | | |
| $I_{F(AV)}$ | 40 | 40 | A | |
| @ T_C | 140 | 110 | °C | |
| $I_{F(RMS)}$ | 62 | | A | |
| I_{FSM} | @ 50Hz | 570 | A | |
| | @ 60Hz | 595 | A | |
| I^2t | @ 50Hz | 1600 | A ² s | |
| | @ 60Hz | 1450 | A ² s | |
| V_{RRM} | range | 100 to 1200 | 1400 to 1600 | V |
| T_J | range | - 65 to 190 | - 65 to 160 | °C |



40HF(R) Series

Bulletin I20201 rev. A 09/98

International
IR Rectifier

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 | $V_{R(BR)}$, minimum avalanche voltage V (1) | I_{RRM} max. @ $T_J = T_J$ max. mA |
|-------------|--------------|--|--|--|--|
| 40HF(R) | 10 | 100 | 200 | -- | 15 |
| | 20 | 200 | 300 | -- | |
| | 40 | 400 | 500 | 500 | 9 |
| | 60 | 600 | 720 | 725 | |
| | 80 | 800 | 960 | 950 | |
| | 100 | 1000 | 1200 | 1150 | |
| | 120 | 1200 | 1440 | 1350 | 4.5 |
| | 140 | 1400 | 1650 | 1550 | |
| 160 | 1600 | 1900 | 1750 | | |

(1) Avalanche version only available from V_{RRM} 400V to 1600V.

Forward Conduction

| Parameter | 40HF(R) | | Units | Conditions |
|--|-----------|-------------------|-------------------|--|
| | 10 to 120 | 140 to 160 | | |
| $I_{F(AV)}$ Max. average forward current @ Case temperature | 40 | 40 | A | 180° conduction, half sine wave |
| $I_{F(RMS)}$ Max. RMS forward current | 140 | 110 | A | |
| P_R Maximum non-repetitive peak reverse power | 11 | | K · W | 10µs square pulse, $T_J = T_J$ max. see note (2) |
| I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current | 570 | A | A | t = 10ms No voltage |
| | 595 | | | t = 8.3ms reappplied |
| | 480 | | | t = 10ms 100% V_{RRM} |
| | 500 | | | t = 8.3ms reappplied |
| I^2t Maximum I^2t for fusing | 1600 | A ² s | A ² s | t = 10ms No voltage |
| | 1450 | | | t = 8.3ms reappplied |
| | 1150 | | | t = 10ms 100% V_{RRM} |
| | 1050 | | | t = 8.3ms reappplied |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing | 16000 | A ² √s | A ² √s | t = 0.1 to 10ms, no voltage reappplied |
| $V_{F(TO)1}$ Low level value of threshold voltage | 0.65 | V | V | (16.7% × π × $I_{F(AV)}$) < I < π × $I_{F(AV)}$, $T_J = T_J$ max. |
| $V_{F(TO)2}$ High level value of threshold voltage | 0.70 | | | (I > π × $I_{F(AV)}$), $T_J = T_J$ max. |
| r_{f1} Low level value of forward slope resistance | 4.29 | mΩ | mΩ | (16.7% × π × $I_{F(AV)}$) < I < π × $I_{F(AV)}$, $T_J = T_J$ max. |
| r_{f2} High level value of forward slope resistance | 3.98 | | | (I > π × $I_{F(AV)}$), $T_J = T_J$ max. |
| V_{FM} Max. forward voltage drop | 1.30 | V | V | $I_{pK} = 125A$, $T_J = 25^\circ C$, $t_p = 400\mu s$ rectangular wave |

(2) Available only for Avalanche version, all other parameters the same as 40HF.

Thermal and Mechanical Specifications

| Parameter | 40HF(R) | | Units | Conditions |
|---|----------------|------------|--------|--|
| | 10 to 120 | 140 to 160 | | |
| T _J Max. junction operating temperature range | -65 to 190 | -65 to 160 | °C | |
| T _{stg} Max. storage temperature range | -65 to 190 | -65 to 160 | | |
| R _{thJC} Max. thermal resistance, junction to case | 1.0 | | K/W | DC operation |
| R _{thCS} Max. thermal resistance, case to heatsink | 0.25 | | | Mounting surface, smooth, flat and greased |
| T Max. allowed mounting torque ±10% | 2.3 - 3.4 | | Nm | Not lubricated threads |
| | 20 - 30 | | lbf·in | |
| wt Approximate weight | 17 (0.6) | | g (oz) | |
| Case style | DO-203AB (DO5) | | | See Outline Table |

ΔR_{thJC} Conduction

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

| Conduction angle | Sinusoidal conduction | Rectangular conduction | Units | Conditions |
|------------------|-----------------------|------------------------|-------|--------------------------------------|
| 180° | 0.14 | 0.10 | K/W | T _J = T _J max. |
| 120° | 0.16 | 0.17 | | |
| 90° | 0.21 | 0.22 | | |
| 60° | 0.30 | 0.31 | | |
| 30° | 0.50 | 0.50 | | |

Ordering Information Table

Device Code

| | | | | |
|-----------|-----------|----------|------------|----------|
| 40 | HF | R | 160 | M |
|-----------|-----------|----------|------------|----------|

①
②
③
④
⑤

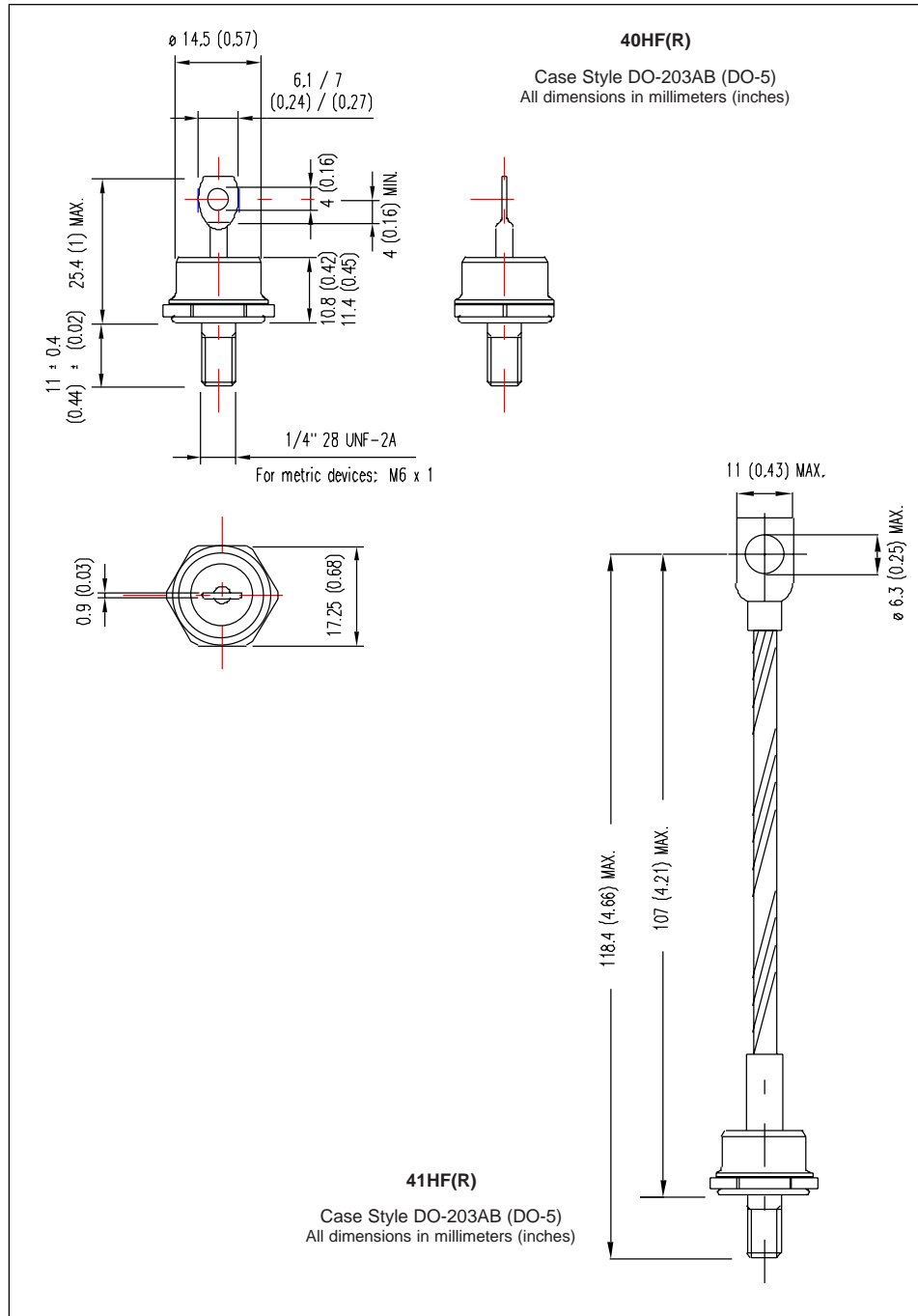
- 1** - 40 = Standard device
 41 = Not isolated lead
 42 = Isolated lead with silicone sleeve
 (Red = Reverse polarity)
 (Blue = Normal polarity)
- 2** - HF = Standard diode
 HA = Avalanche diode
- 3** - None = Stud Normal Polarity (Cathode to Stud)
 R = Stud Reverse Polarity (Anode to Stud)
- 4** - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)
- 5** - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A
 M = Stud base DO-203AB (DO-5) M6 X 1 - (Not available for Avalanche diodes)

40HF(R) Series

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International
IRF Rectifier

Outlines Table



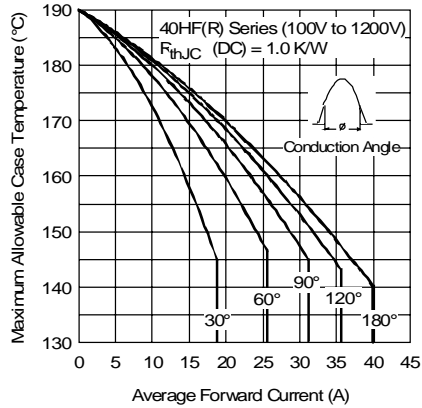


Fig. 1 - Current Ratings Characteristics

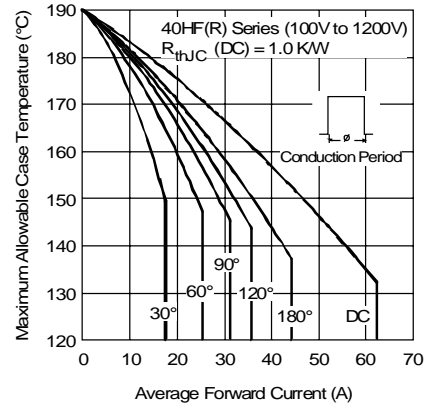


Fig. 2 - Current Ratings Characteristics

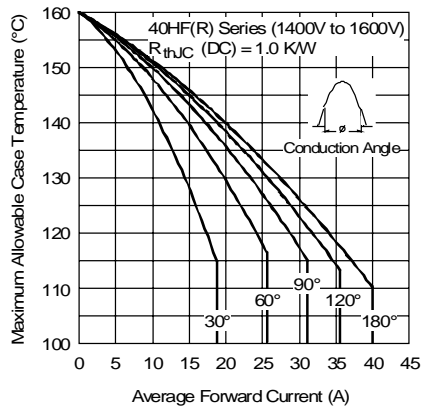


Fig. 3 - Current Ratings Characteristics

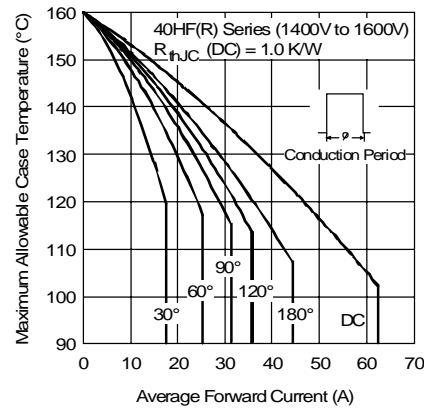


Fig. 4 - Current Ratings Characteristics

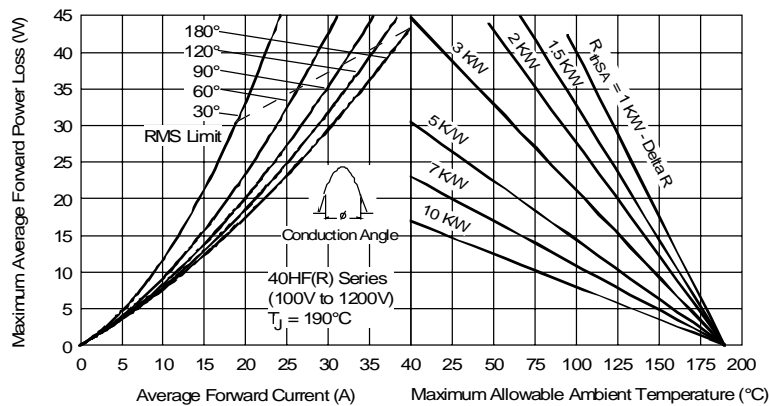


Fig. 5 - Forward Power Loss Characteristics

40HF(R) Series

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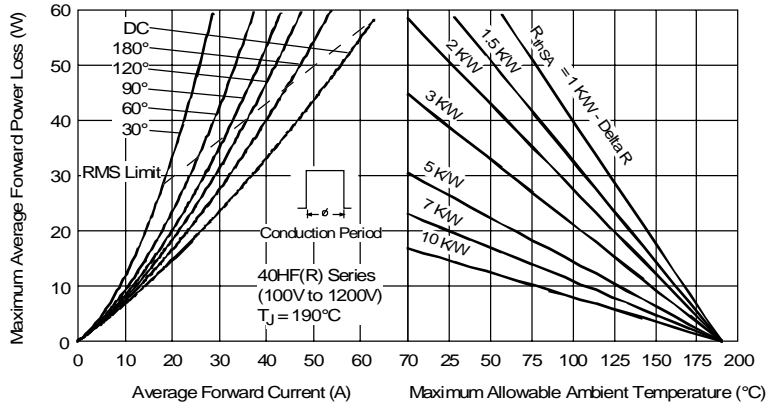


Fig. 6 - Forward Power Loss Characteristics

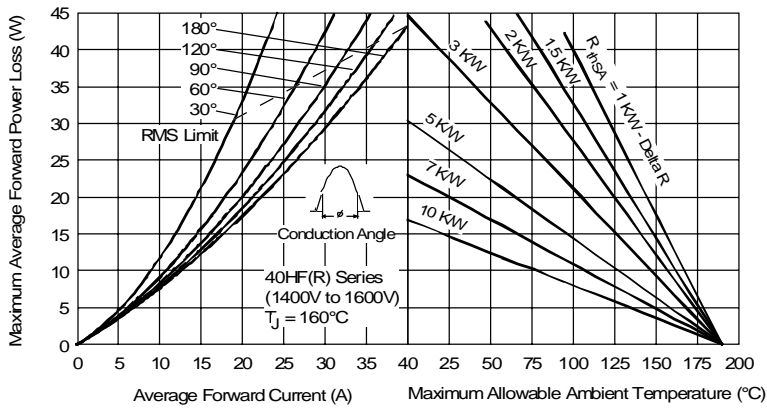


Fig. 7 - Forward Power Loss Characteristics

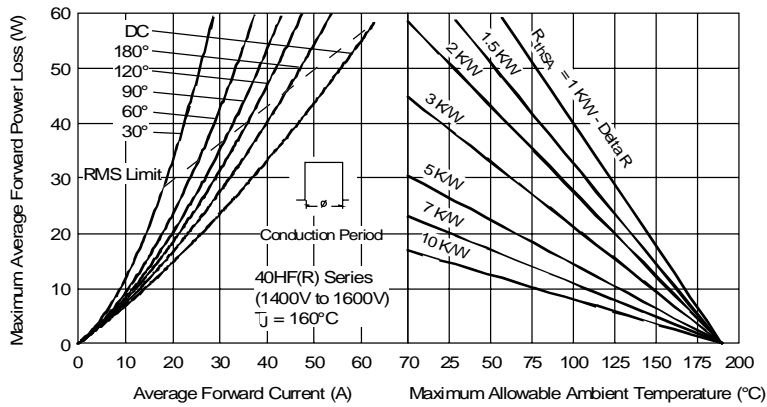


Fig. 8 - Forward Power Loss Characteristics

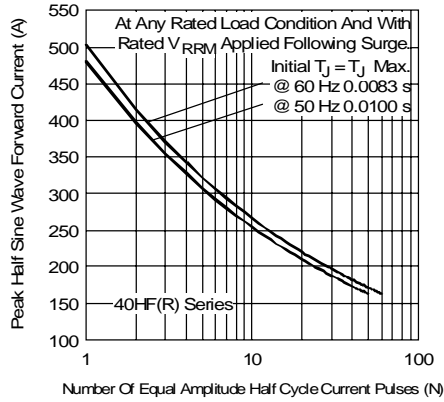


Fig. 9 - Maximum Non-Repetitive Surge Current

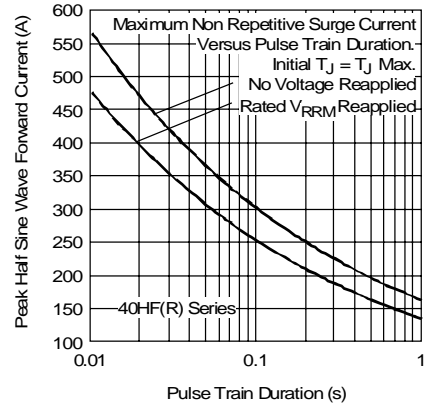


Fig. 10 - Maximum Non-Repetitive Surge Current

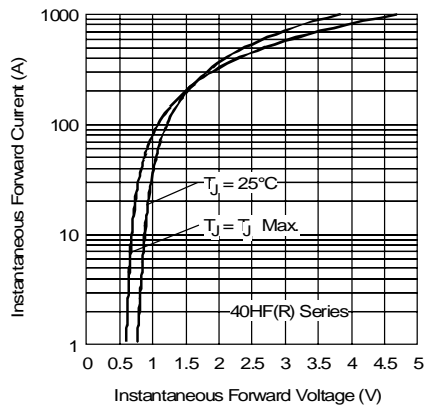


Fig. 11 - Forward Voltage Drop Characteristics

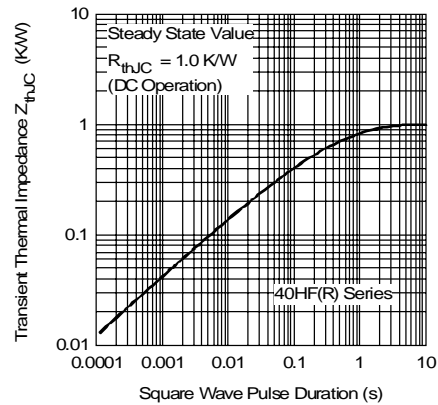


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics