

# TDSEMIC

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電源管理



顯示驅動



二三極管



LDO穩壓器



觸摸芯片



MOS管



運算放大器



存儲芯片



MCU



串口通信

## 70HFR100-TD

產品規格說明書

## Standard Recovery Diodes, (Stud Version), 70 A

## 70HF(R)



DO-5 (DO-203AB)

### FEATURES

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



RoHS  
COMPLIANT

### PRIMARY CHARACTERISTICS

|                       |                 |
|-----------------------|-----------------|
| $I_{F(AV)}$           | 70 A            |
| Package               | DO-5 (DO-203AB) |
| Circuit configuration | China           |

### TYPICAL APPLICATIONS

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

### MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER    | TEST CONDITIONS | 70HF(R)     |              | UNITS            |
|--------------|-----------------|-------------|--------------|------------------|
|              |                 | 10 TO 120   | 140/160      |                  |
| $I_{F(AV)}$  |                 | 70          | 70           | A                |
|              | $T_C$           | 140         | 110          | °C               |
| $I_{F(RMS)}$ |                 | 110         | 110          | A                |
| $I_{FSM}$    | 50 Hz           | 1200        | 1200         | A                |
|              | 60 Hz           | 1250        | 1250         |                  |
| $I^2t$       | 50 Hz           | 7100        | 7100         | A <sup>2</sup> s |
|              | 60 Hz           | 6450        | 6450         |                  |
| $V_{RRM}$    | Range           | 100 to 1200 | 1400 to 1600 | V                |
| $T_J$        |                 | -65 to +180 | -65 to +150  | °C               |

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

| TYPE NUMBER | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{R(BR)}$ , MINIMUM AVALANCHE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM<br>mA |
|-------------|--------------|----------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------|------------------------------------------------|
| 70HF(R)     | 10           | 100                                                      | 200                                                          | 200                                          | 15                                             |
|             | 20           | 200                                                      | 300                                                          | 300                                          |                                                |
|             | 30           | 300                                                      | 400                                                          | 400                                          |                                                |
|             | 40           | 400                                                      | 500                                                          | 500                                          |                                                |
|             | 60           | 600                                                      | 720                                                          | 725                                          | 9                                              |
|             | 80           | 800                                                      | 960                                                          | 950                                          |                                                |
|             | 100          | 1000                                                     | 1200                                                         | 1150                                         |                                                |
|             | 120          | 1200                                                     | 1440                                                         | 1350                                         |                                                |
|             | 140          | 1400                                                     | 1650                                                         | 1550                                         | 4.5                                            |
|             | 160          | 1600                                                     | 1900                                                         | 1750                                         |                                                |

| FORWARD CONDUCTION                                            |               |                                                                                         |                            |           |                   |
|---------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------|----------------------------|-----------|-------------------|
| PARAMETER                                                     | SYMBOL        | TEST CONDITIONS                                                                         |                            | 70HF(R)   | UNITS             |
|                                                               |               |                                                                                         |                            | 10 to 120 | 140/160           |
| Maximum average forward current at case temperature           | $I_{F(AV)}$   | 180° conduction, half sine wave                                                         |                            | 70        | A                 |
| Maximum RMS forward current                                   | $I_{F(RMS)}$  |                                                                                         |                            | 140       | 110 °C            |
| Maximum peak, one cycle forward, non-repetitive surge current | $I_{FSM}$     | t = 10 ms<br>t = 8.3 ms                                                                 | No voltage reappplied      | 1200      | A                 |
|                                                               |               | t = 10 ms<br>t = 8.3 ms                                                                 | 100 % $V_{RRM}$ reappplied | 1250      |                   |
|                                                               |               | t = 10 ms<br>t = 8.3 ms                                                                 | 100 % $V_{RRM}$ reappplied | 1000      |                   |
|                                                               |               | t = 10 ms<br>t = 8.3 ms                                                                 | 100 % $V_{RRM}$ reappplied | 1050      |                   |
| Maximum $I^2t$ for fusing                                     | $I^2t$        | t = 10 ms<br>t = 8.3 ms                                                                 | No voltage reappplied      | 7100      | A <sup>2</sup> s  |
|                                                               |               | t = 10 ms<br>t = 8.3 ms                                                                 | 100 % $V_{RRM}$ reappplied | 6450      |                   |
|                                                               |               | t = 10 ms<br>t = 8.3 ms                                                                 | 100 % $V_{RRM}$ reappplied | 5000      |                   |
|                                                               |               | t = 10 ms<br>t = 8.3 ms                                                                 | 100 % $V_{RRM}$ reappplied | 4550      |                   |
| Maximum $I^2\sqrt{t}$ for fusing                              | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reappplied                                              |                            | 71 000    | A <sup>2</sup> √s |
| Low level value of threshold voltage                          | $V_{F(TO)1}$  | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum |                            | 0.79      | V                 |
| High level value of threshold voltage                         | $V_{F(TO)2}$  | (I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum                                      |                            | 1.00      |                   |
| Low level value of forward slope resistance                   | $r_{f1}$      | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum |                            | 2.33      | mΩ                |
| High level value of forward slope resistance                  | $r_{f2}$      | (I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum                                      |                            | 1.53      |                   |
| Maximum forward voltage drop                                  | $V_{FM}$      | $I_{pk} = 220$ A, $T_J = 25$ °C, $t_p = 400$ μs rectangular wave                        |                            | 1.35      | 1.46 V            |

| THERMAL AND MECHANICAL SPECIFICATIONS           |                |                                                             |  |                 |                |
|-------------------------------------------------|----------------|-------------------------------------------------------------|--|-----------------|----------------|
| PARAMETER                                       | SYMBOL         | TEST CONDITIONS                                             |  | 70HF(R)         | UNITS          |
|                                                 |                |                                                             |  | 10 to 120       | 140/160        |
| Maximum junction and storage temperature range  | $T_J, T_{Stg}$ |                                                             |  | -65 to +180     | -65 to +150 °C |
| Maximum thermal resistance, junction to case    | $R_{thJC}$     | DC operation                                                |  | 0.45            | K/W            |
| 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 <sup>(1)</sup>     |  | 3.4 (30)        | N · m          |
|                                                 |                | Lubricated thread, tightening on nut <sup>(1)</sup>         |  | 2.3 (20)        | (lbf · in)     |
|                                                 |                | Not lubricated thread, tightening on hexagon <sup>(2)</sup> |  | 4.2 (37)        |                |
|                                                 |                | Lubricated thread, tightening on hexagon <sup>(2)</sup>     |  | 3.2 (28)        |                |
| Approximate weight                              |                |                                                             |  | 17              | g              |
|                                                 |                |                                                             |  | 0.6             | oz.            |
| Case style                                      |                | See dimensions - link at the end of datasheet               |  | DO-5 (DO-203AB) |                |

#### Notes

- <sup>(1)</sup> Recommended for pass-through holes
- <sup>(2)</sup> Recommended for holed threaded heatsinks

| $\Delta R_{thJC}$ CONDUCTION |                       |                        |                     |       |
|------------------------------|-----------------------|------------------------|---------------------|-------|
| CONDUCTION ANGLE             | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS     | UNITS |
| 180°                         | 0.08                  | 0.06                   | $T_J = T_J$ maximum | K/W   |
| 120°                         | 0.10                  | 0.11                   |                     |       |
| 90°                          | 0.13                  | 0.14                   |                     |       |
| 60°                          | 0.19                  | 0.20                   |                     |       |
| 30°                          | 0.30                  | 0.30                   |                     |       |

#### Note

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

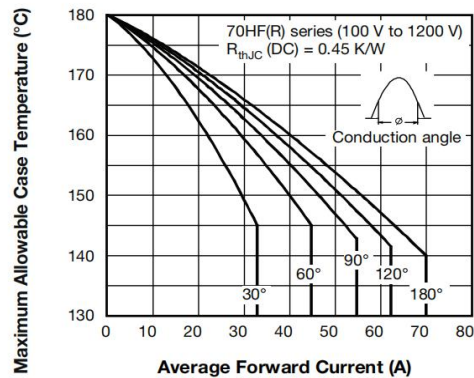


Fig. 1 - Current Ratings Characteristics

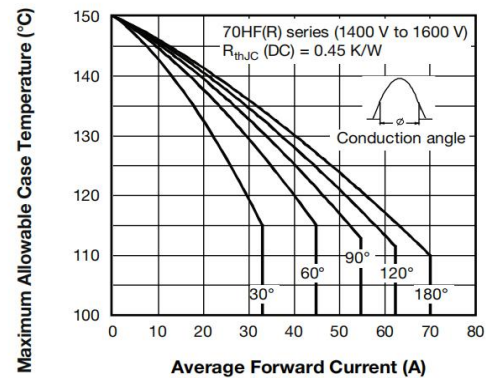


Fig. 3 - Current Ratings Characteristics

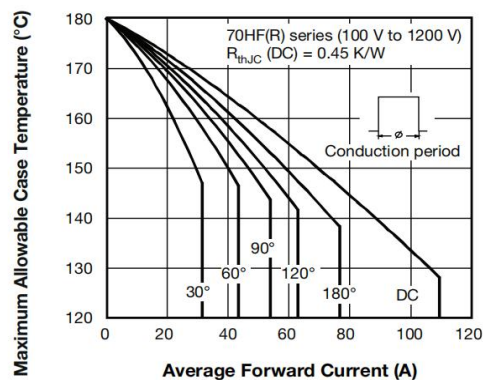


Fig. 2 - Current Ratings Characteristics

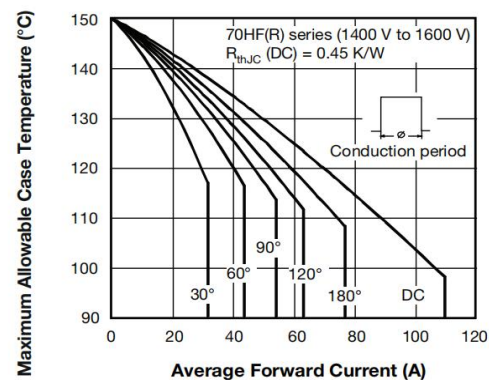


Fig. 4 - Current Ratings Characteristics

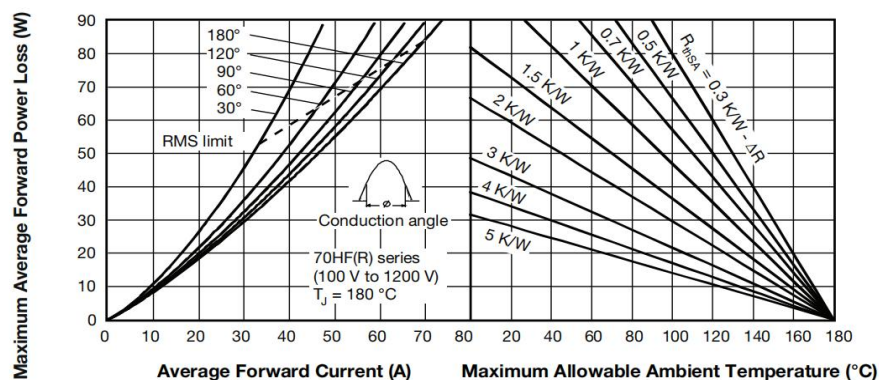


Fig. 5 - Forward Power Loss Characteristics

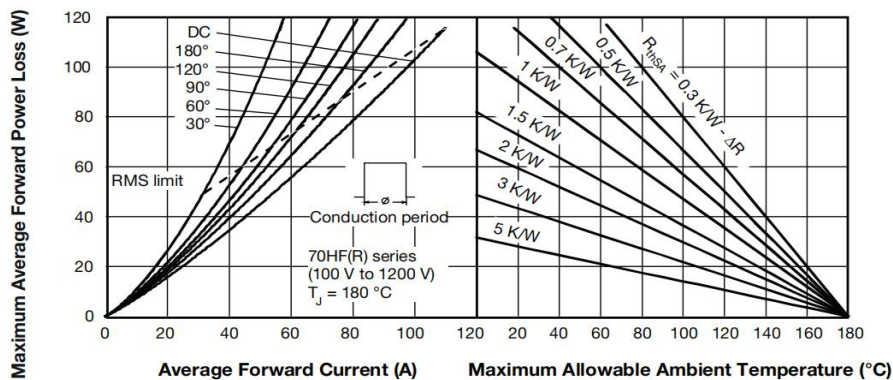


Fig. 6 - Forward Power Loss Characteristics

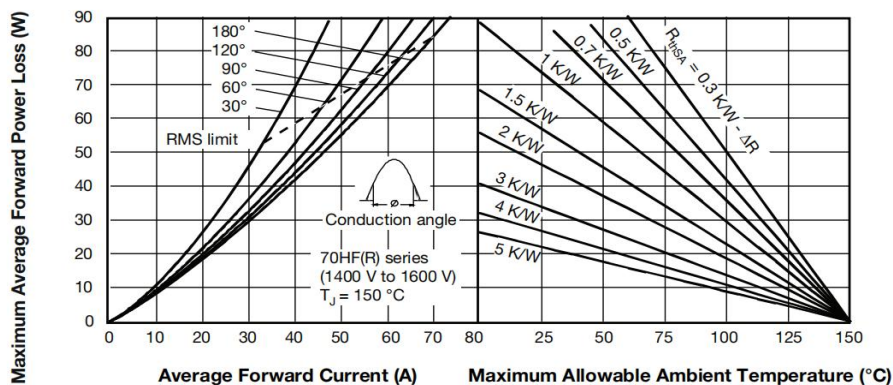


Fig. 7 - Forward Power Loss Characteristics

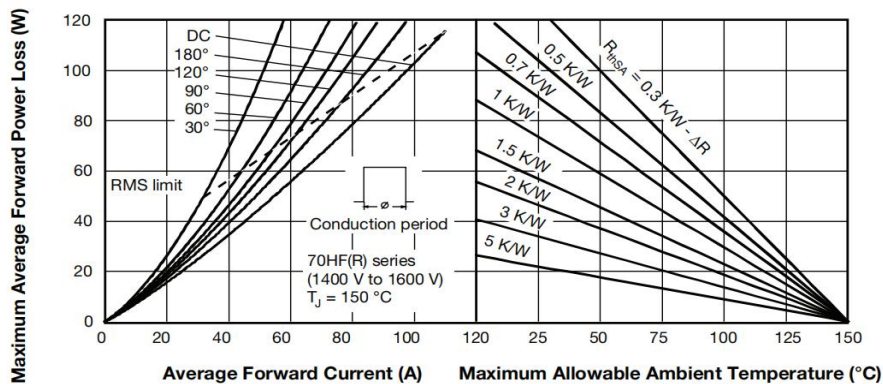


Fig. 8 - Forward Power Loss Characteristics

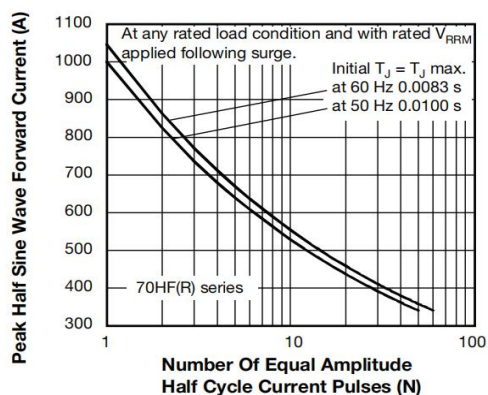


Fig. 9 - Maximum Non-Repetitive Surge Current

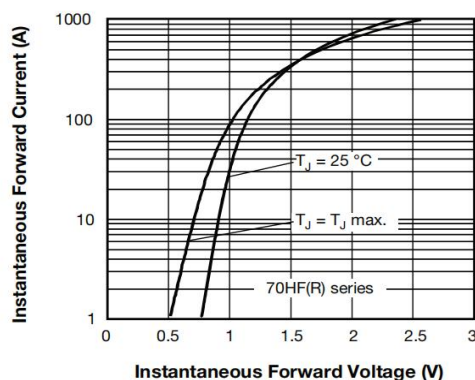


Fig. 11 - Forward Voltage Drop Characteristics

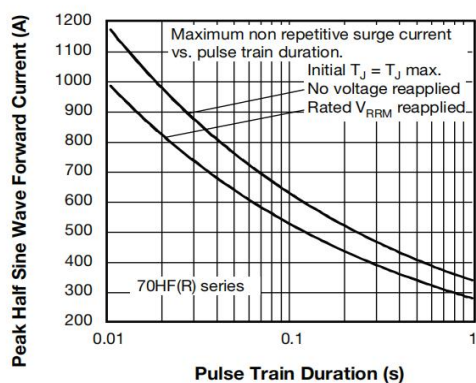


Fig. 10 - Maximum Non-Repetitive Surge Current

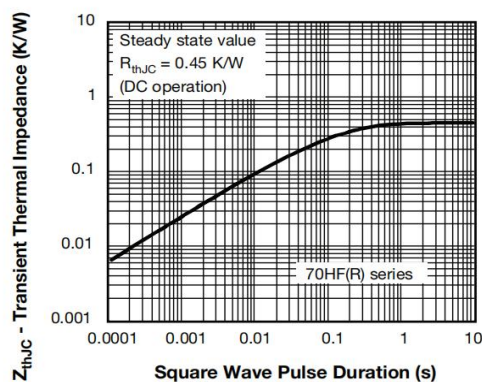


Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics

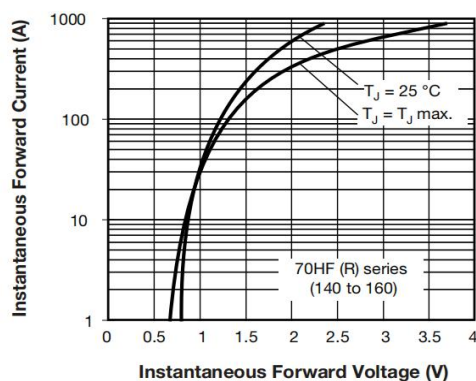
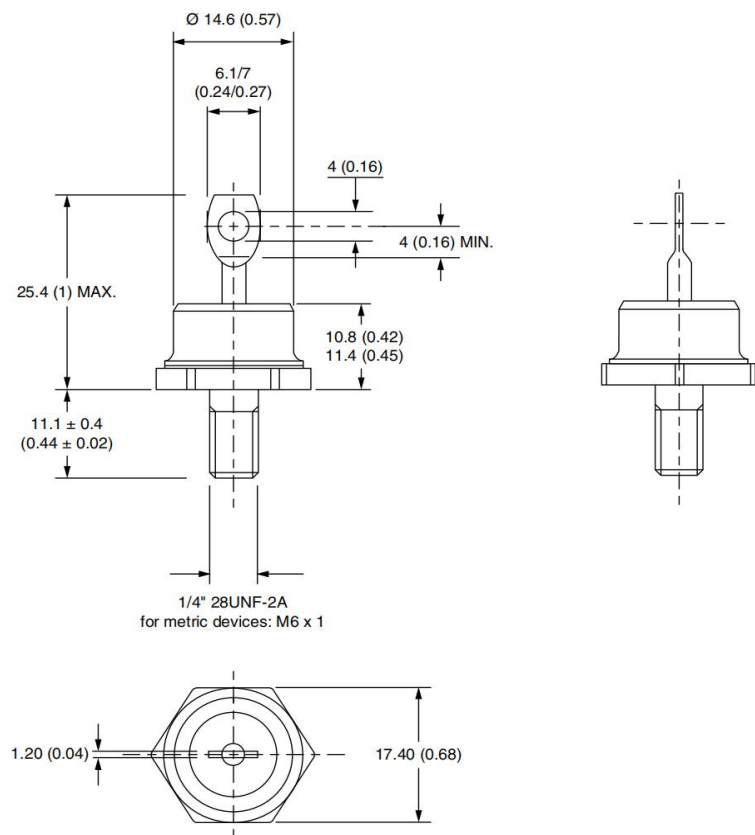


Fig. 13 - Forward Voltage Drop Characteristics

ORDERING INFORMATION TABLE

|             |                                                             |    |   |     |   |
|-------------|-------------------------------------------------------------|----|---|-----|---|
| Device code | 70                                                          | HF | R | 160 | M |
|             | 1                                                           | 2  | 3 | 4   | 5 |
| 1           | - 70 = standard device                                      |    |   |     |   |
| 2           | - 71 = not isolated lead                                    |    |   |     |   |
|             | - 72 = isolated lead with silicone sleeve                   |    |   |     |   |
|             | (red = reverse polarity)                                    |    |   |     |   |
|             | (blue = normal polarity)                                    |    |   |     |   |
|             | - HF = standard diode                                       |    |   |     |   |
| 3           | - • None = stud normal polarity (cathode to stud)           |    |   |     |   |
| 4           | - • R = stud reverse polarity (anode to stud)               |    |   |     |   |
|             | - Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table) |    |   |     |   |
| 5           | - • None = stud base DO-5 (DO-203AB) 1/4" 28UNF-2A          |    |   |     |   |
|             | - • M = stud base DO-5 (DO-203AB) M6 x 1                    |    |   |     |   |

**DO-203AB (DO-5) for 70HF(R)**



## DO-203AB (DO-5) for 70HF(R)

