

International IOR Rectifier

10TQ... 10TQ...S

SCHOTTKY RECTIFIER

10 Amp

$$I_{F(AV)} = 10\text{Amp}$$

$$V_R = 35 - 45\text{V}$$

Major Ratings and Characteristics



| Characteristics | Values | Units |
|--|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 10 | A |
| V_{RRM} | 35 - 45 | V |
| I_{FSM} @tp = 5 μ s sine | 1050 | A |
| V_F @10 Apk, $T_J = 125^\circ\text{C}$ | 0.49 | V |
| T_J range | -55 to 175 | $^\circ\text{C}$ |

Description/ Features

The 10TQ.. Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

| | |
|--|---|
| <p>10TQ...</p>  <p>TO-220</p> | <p>10TQ... S</p>  <p>D²PAK</p> |
|--|---|

Voltage Ratings

| Part number | 10TQ035 | 10TQ045 |
|---|---------|---------|
| V_R Max. DC Reverse Voltage (V) | 35 | 45 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | | |

Absolute Maximum Ratings

| Parameters | 10TQ | Units | Conditions |
|---|------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 5 | 10 | A | 50% duty cycle @ $T_C = 151^\circ\text{C}$, rectangular wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 1050 | A | Following any rated load condition and with rated V_{RWM} applied |
| | 280 | | |
| E_{AS} Non-Repetitive Avalanche Energy | 13 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 2\text{Amps}$, $L = 6.5\text{mH}$ |
| I_{AR} Repetitive Avalanche Current | 2 | A | Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical |

Electrical Specifications

| Parameters | 10TQ | Units | Conditions |
|---|-------|------------------|---|
| V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1 | 0.57 | V | @ 10A $T_J = 25^\circ\text{C}$ |
| | 0.67 | V | @ 20A |
| | 0.49 | V | @ 10A $T_J = 125^\circ\text{C}$ |
| | 0.61 | V | @ 20A |
| I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2 | 2 | mA | $T_J = 25^\circ\text{C}$ |
| | 15 | mA | $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$ |
| C_T Max. Junction Capacitance | 900 | pF | $V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) 25°C |
| L_S Typical Series Inductance | 8.0 | nH | Measured lead to lead 5mm from package body |
| dv/dt Max. Voltage Rate of Change | 10000 | V/ μs | (Rated V_R) |

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

| Parameters | 10TQ | Units | Conditions |
|---|-------------|--------------------|--------------------------------------|
| T_J Max. Junction Temperature Range | -55 to 175 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -55 to 175 | $^\circ\text{C}$ | |
| R_{thJC} Max. Thermal Resistance Junction to Case | 2.0 | $^\circ\text{C/W}$ | DC operation * See Fig. 4 |
| R_{thCS} Typical Thermal Resistance, Case to Heatsink | 0.50 | $^\circ\text{C/W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight | 2(0.07) | g(oz.) | |
| T Mounting Torque | Min. 6(5) | Kg-cm (lbf-in) | |
| | Max. 12(10) | | |
| Marking Device | 10TQ045 | | Case Style TO-220 |
| | 10TQ045S | | Case Style D ² Pak |

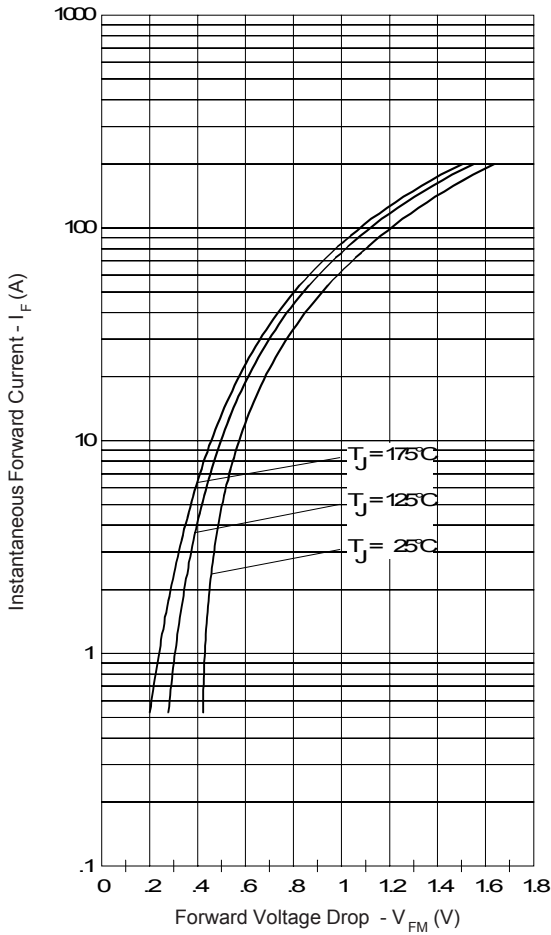


Fig. 1 - Maximum Forward Voltage Drop Characteristics

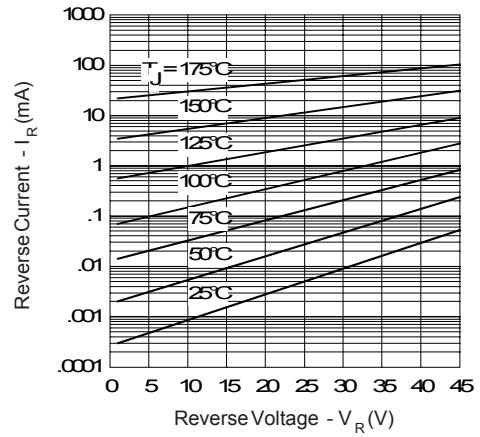


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

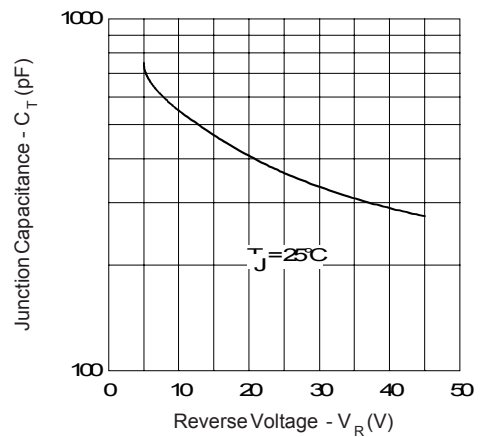


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

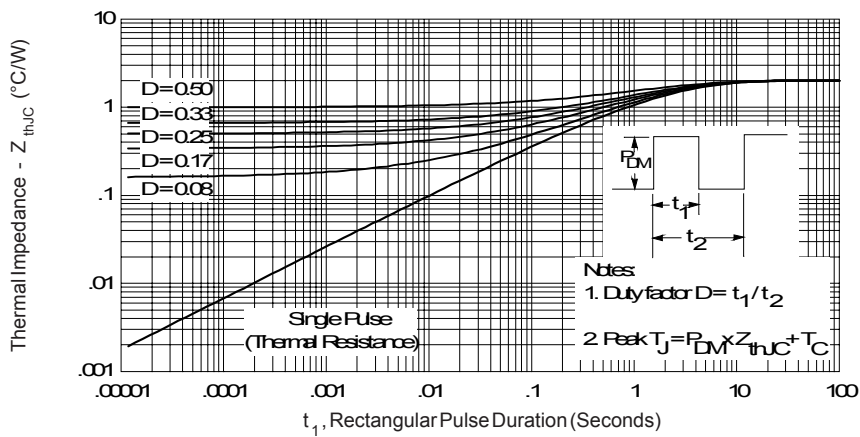


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

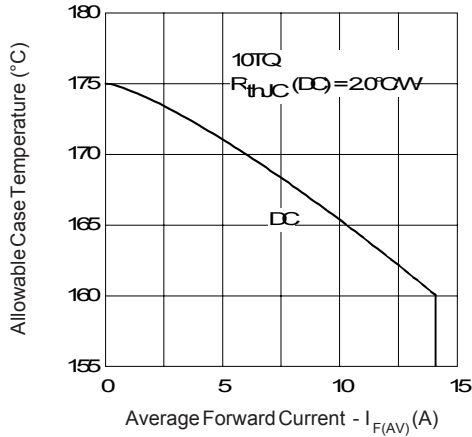


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

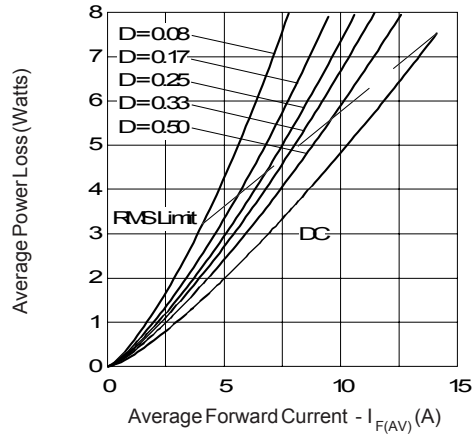


Fig. 6 - Forward Power Loss Characteristics

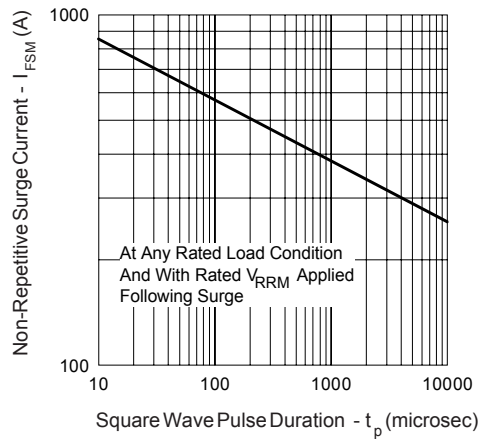


Fig. 7 - Maximum Non-Repetitive Surge Current

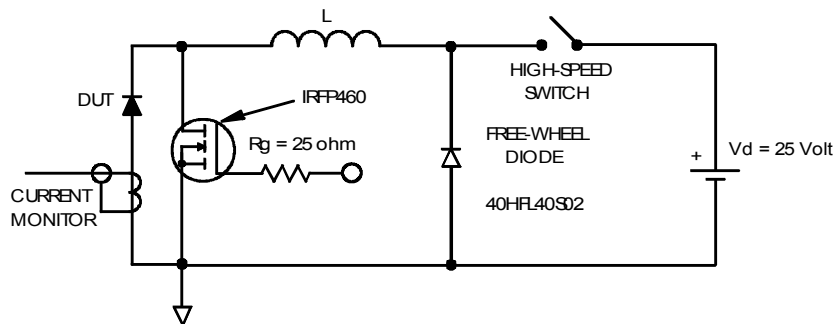
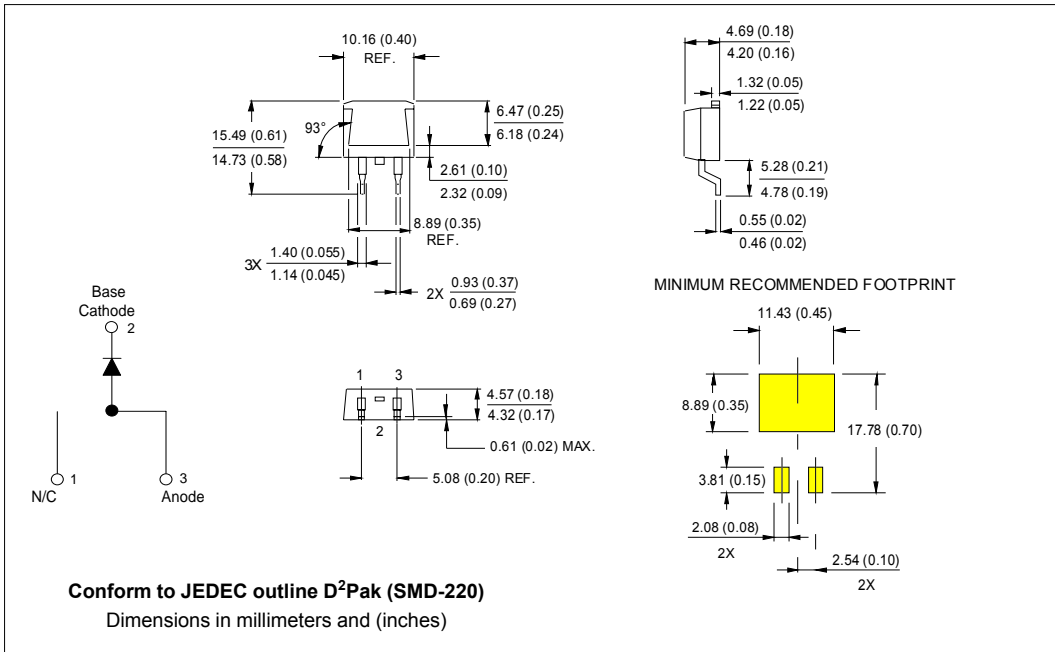
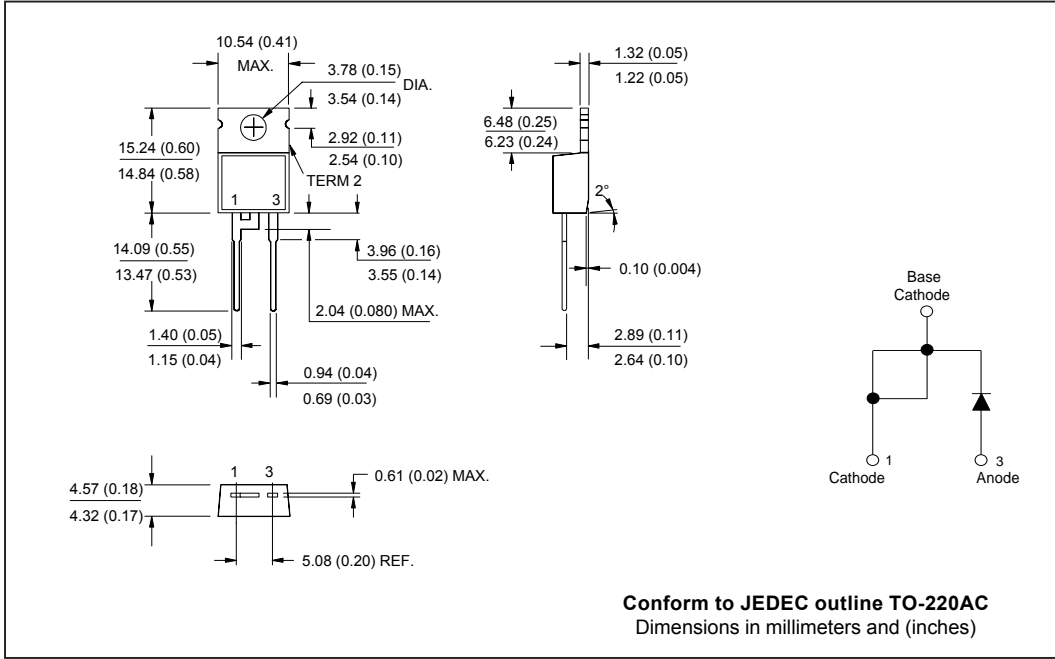


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Ordering Information Table

| Device Code | | | | |
|-------------|----------|------------------------|------------|----------|
| 10 | T | Q | 045 | S |
| ① | ② | ③ | ④ | ⑤ |
| 1 | - | Current Rating (10A) | | |
| 2 | - | T = TO-220 | | |
| 3 | - | Q = Schottky Q Series | | |
| 4 | - | Voltage Ratings | 035 = 35V | |
| 5 | - | S = D ² Pak | 045 = 45V | |

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.