

## 15CTQ... SERIES

### SCHOTTKY RECTIFIER

15 Amp

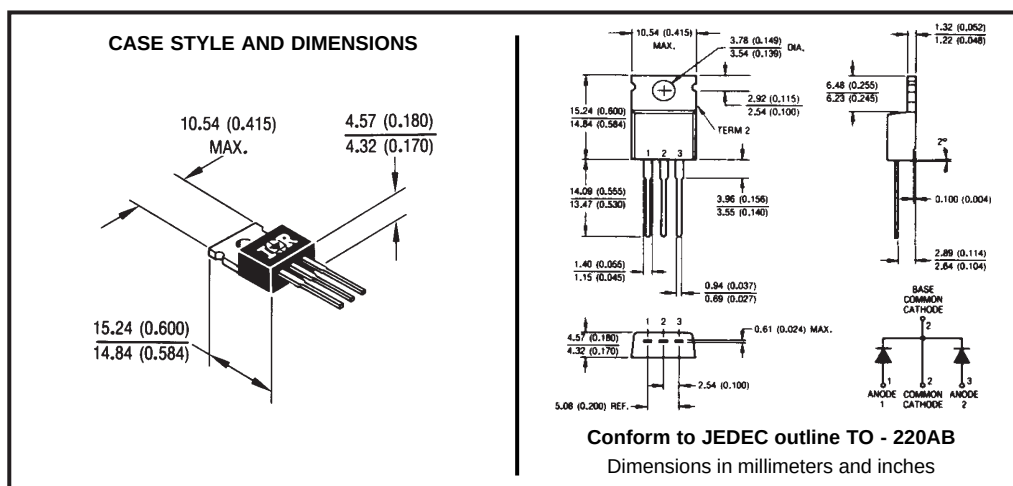
#### Major Ratings and Characteristics

| Characteristics                                | 15CTQ...   | Units      |
|------------------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform               | 15         | A          |
| $V_{RRM}$ range                                | 35 to 45   | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine               | 810        | A          |
| $V_F$ @ 7.5 Apk, $T_J = 125^\circ C$ (per leg) | 0.51       | V          |
| $T_J$ range                                    | -55 to 150 | $^\circ C$ |

#### Description/Features

The 15CTQ center tap Schottky rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to  $150^\circ C$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $175^\circ C$   $T_J$  operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



## Voltage Ratings

| Part number                                     | 15CTQ035 | 15CTQ040 | 15CTQ045 |
|-------------------------------------------------|----------|----------|----------|
| $V_R$ Max. DC Reverse Voltage (V)               | 35       | 40       | 45       |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |          |          |          |

## Absolute Maximum Ratings

| Parameters  |                                                                         | 15CTQ | Units | Conditions                                                                                                               |                                                                     |  |
|-------------|-------------------------------------------------------------------------|-------|-------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--|
| $I_{F(AV)}$ | Max. Average Forward Current<br>* See Fig. 5                            | 15    | A     | 50% duty cycle @ $T_C = 123^{\circ}\text{C}$ , rectangular waveform                                                      |                                                                     |  |
| $I_{FSM}$   | Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 810   | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse                                                                      | Following any rated load condition and with rated $V_{RRM}$ applied |  |
|             |                                                                         | 145   |       | 10ms Sine or 6ms Rect. pulse                                                                                             |                                                                     |  |
| $E_{AS}$    | Non-Repetitive Avalanche Energy (Per Leg)                               | 10    | mJ    | $T_J = 25^{\circ}\text{C}$ , $I_{AS} = 1.20$ Amps, $L = 11.10$ mH                                                        |                                                                     |  |
| $I_{AR}$    | Repetitive Avalanche Current (Per Leg)                                  | 1.5   | A     | Current decaying linearly to zero in 1 $\mu\text{sec}$<br>Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical |                                                                     |  |

## Electrical Specifications

| Parameters      |                                                            | 15CTQ  | Units | Conditions                                                                  |                                       |
|-----------------|------------------------------------------------------------|--------|-------|-----------------------------------------------------------------------------|---------------------------------------|
| V <sub>FM</sub> | Max. Forward Voltage Drop<br>(Per Leg) * See Fig. 1 (1)    | 0.55   | V     | @ 7.5A                                                                      | T <sub>J</sub> = 25 °C                |
|                 |                                                            | 0.70   | V     | @ 15A                                                                       |                                       |
|                 |                                                            | 0.51   | V     | @ 7.5A                                                                      | T <sub>J</sub> = 125 °C               |
|                 |                                                            | 0.65   | V     | @ 15A                                                                       |                                       |
| I <sub>RM</sub> | Max. Reverse Leakage Current<br>(Per Leg) * See Fig. 2 (1) | 0.8    | mA    | T <sub>J</sub> = 25 °C                                                      | V <sub>R</sub> = rated V <sub>R</sub> |
|                 |                                                            | 32     | mA    | T <sub>J</sub> = 125 °C                                                     |                                       |
| C <sub>T</sub>  | Max. Junction Capacitance (Per Leg)                        | 400    | pF    | V <sub>R</sub> = 5V <sub>DC</sub> , (test signal range 100Khz to 1Mhz) 25°C |                                       |
| L <sub>S</sub>  | Typical Series Inductance (Per Leg)                        | 8.0    | nH    | Measured lead to lead 5mm from package body                                 |                                       |
| dv/dt           | Max. Voltage Rate of Change<br>(Rated V <sub>R</sub> )     | 10,000 | V/ μs |                                                                             |                                       |

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

| Parameters        |                                                        | 15CTQ        | Units          | Conditions                            |
|-------------------|--------------------------------------------------------|--------------|----------------|---------------------------------------|
| T <sub>j</sub>    | Max. Junction Temperature Range                        | -55to150     | °C             |                                       |
| T <sub>stg</sub>  | Max. Storage Temperature Range                         | -55to150     | °C             |                                       |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case (Per Leg)     | 3.50         | °C/W           | DCoperation      * See Fig. 4         |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case (Per Package) | 1.75         | °C/W           | DC operation                          |
| R <sub>thCS</sub> | Typical Thermal Resistance, Case to Heatsink           | 0.50         | °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) |                |                                       |
| Case Style        |                                                        | TO-220AB     |                |                                       |

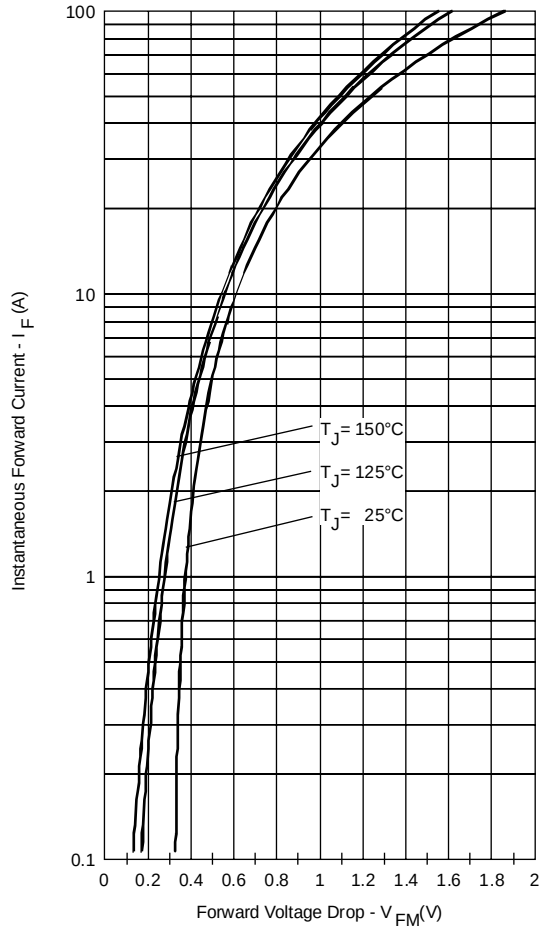


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

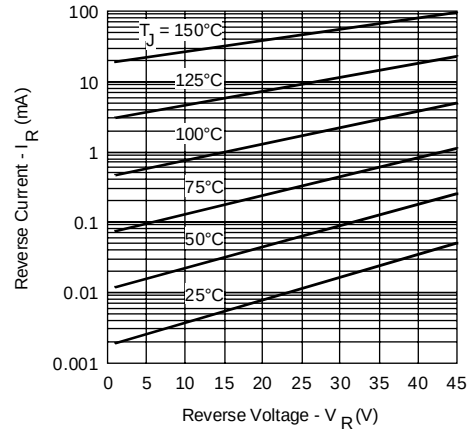


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

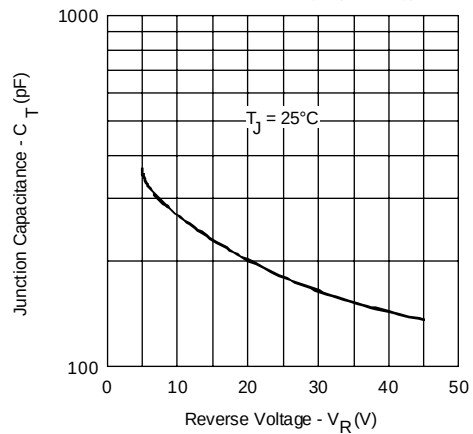


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

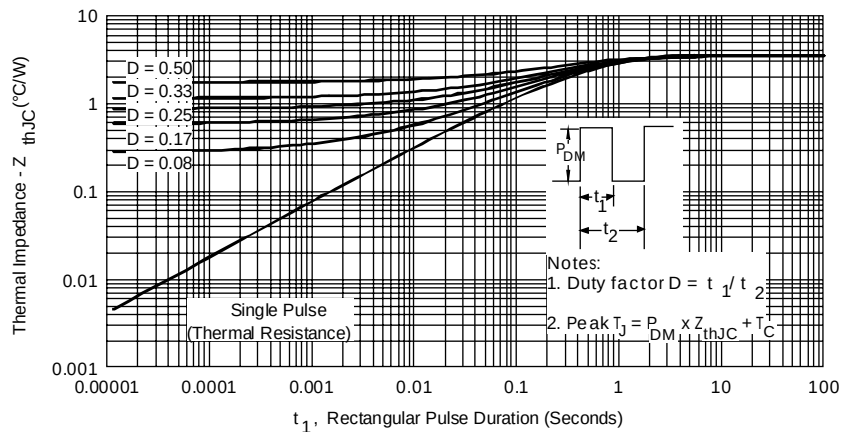


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

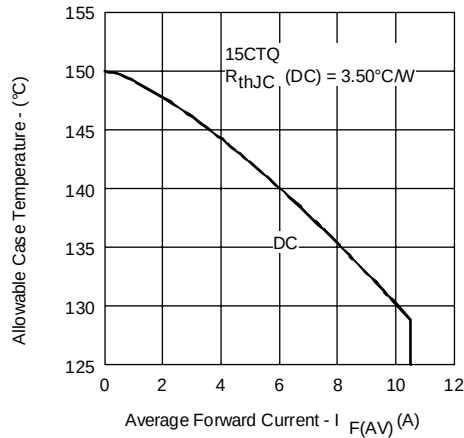


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

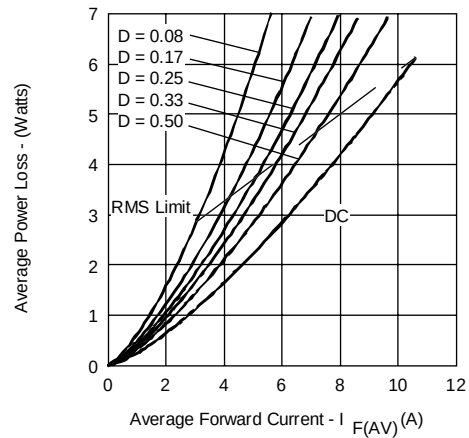


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

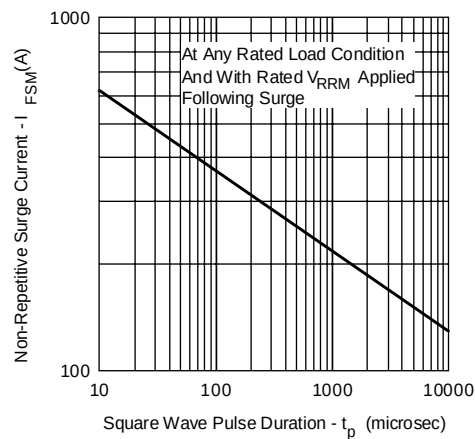


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

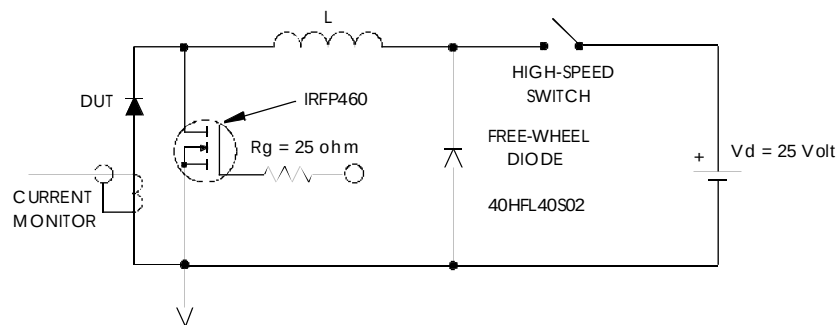


Fig. 8 - Unclamped Inductive Test Circuit