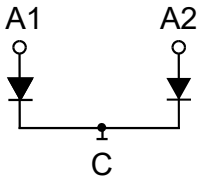
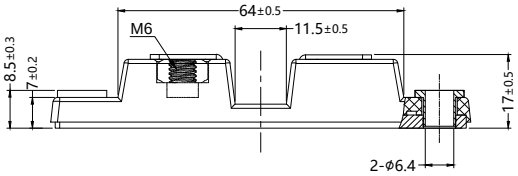
# SRUD20040CTD2

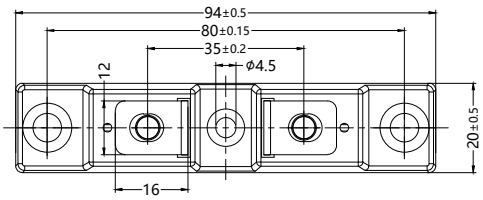
## Soft Recovery Behaviour Ultra Fast Recovery Epitaxial Diode Modules

Dimensions in mm (1mm=0.0394")




| | $V_{RSM}$ V | $V_{RRM}$ V |
|---|---|---|
| **SRUD20040CTD2** | 400 | 400 |




| Symbol | Test Conditions | Maximum Ratings | Unit |
|---|---|---|---|
| $I_{FAVM}$ | $T_C$=100°C , Per Module<br>$T_C$=100°C, Per Diode | 200<br>100 | A |
| $I_{FSM}$ | Non-Repetitive Surge Forward Current, 1/2 Cycle, 50Hz | 1100 | A |
| $I_{FRM}$ | $T_C$ =100°C Per Diode | 150 | A |
| $E_{AS}$ | L=100uH, Duty cycle limited by maximum $T_j$ | 1.40 | mJ |
| $I_{AS}$ | L=100uH, Duty cycle limited by maximum $T_j$ | 5.0 | A |
| $T_{VJ}$<br>$T_{stg}$ | | -40...+150<br>-40...+125 | °C |
| $P_D$ | $T_{case}$=25°C<br>$T_{case}$=100 °C | 658<br>263 | W |
| $M_d$ | Mounting torque (M6) Terminal<br>connection torque (M6) | 3.40-4.6/30-40<br>3.40-4.6/30-40 | Nm/lb.in. |
| | Vertical pull<br>2” lever pull | 9.2/80<br>4.0/35 | Nm/lb.in<br>Nm/lb.in. |
| a | Maximum allowable acceleration | 50 | $m/s^2$ |
| Weight | | 69 | g |



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| Symbol | Test Conditions | Characteristic Values typ. | Characteristic Values max. | Unit |
|---|---|---|---|---|
| $I_R$ | $T_{VJ}$=25°C; $V_R$=400V | | 0.01 | mA |
| | $T_{VJ}$=25°C; $V_R$=0.8·$V_{RRM}$ | | 0.01 | |
| | $T_{VJ}$=125°C; $V_R$=0.8·$V_{RRM}$ | | 12 | |
| $V_F$ | $I_F$=100A; $T_{VJ}$=125°C | 1.00 | | V |
| | $T_{VJ}$=25°C | 1.10 | 1.30 | |
| | $I_F$=200A; $T_{VJ}$=25°C | 1.50 | 1.70 | |
| $I_{RM}$ | -di/dt=200A/us;$I_F$=100A; $V_R$=200V $T_{VJ}$= 25 °C | 7.5 | 14 | A |
| | $T_{VJ}$=125°C | 16 | 30 | |
| $R_{thJC}$ | DC current per leg | | 0.190 | K/W |
| | per module | | 0.095 | |
| $t_{rr}$ | $I_F$=100A $T_{VJ}$= 25°C | 80 | 120 | ns |
| | $V_R$=30V; -di/dt=200A/us $T_{VJ}$=125 °C | 290 | 440 | |

### *FEATURES*

* International standard package
* Copper base plate
* Planar passivated chips
* Short recovery time
* Low switching losses
* RoHS compliant

### *APPLICATIONS*

* Antiparallel diode for high frequency switching devices
* Free wheeling diode in converters and motor control circuits
* Inductive heating and melting
* Uninterruptible power supplies (UPS)
* Ultrasonic cleaners and welders

### *ADVANTAGES*

* High reliability circuit operation
* Low voltage peaks for reduced protection circuits
* Low noise switching
* Low losses



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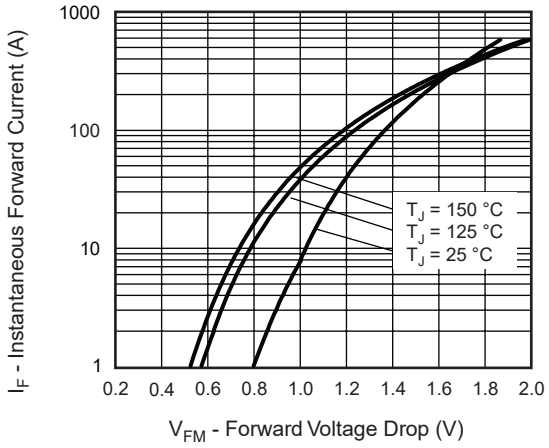


Fig. 1 Maximum Forward Voltage Drop vs. Instantaneous Forward Current (Per Leg)

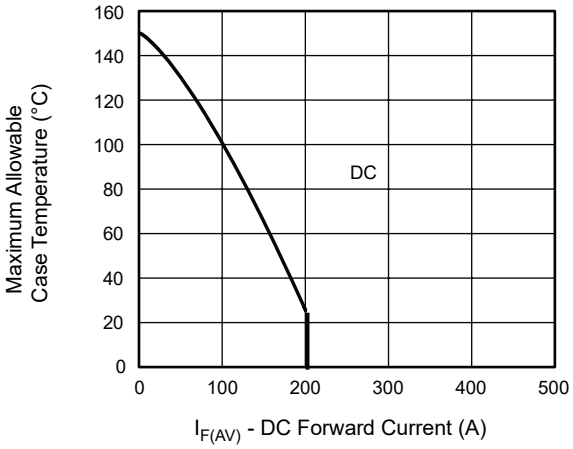


Fig. 4 Maximum Allowable Case Temperature vs. DC Forward Current (Per Leg)

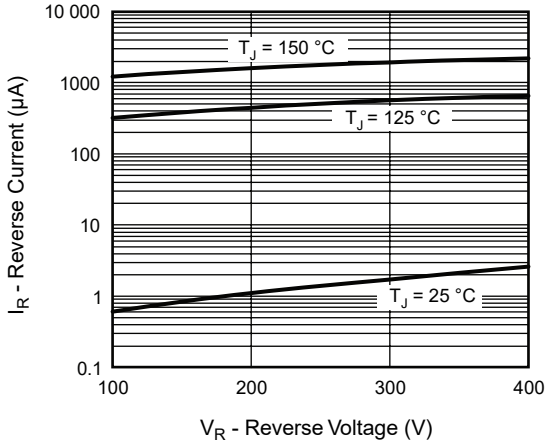


Fig. 2 Typical Reverse Current vs. Reverse Voltage (Per Leg)

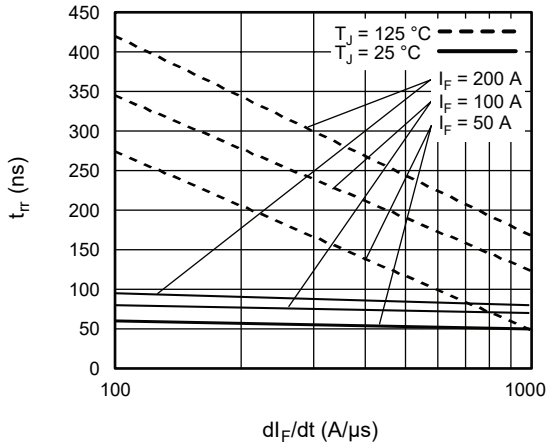


Fig. 5 Typical Reverse Recovery Time vs. $dI_F/dt$ (Per Leg)

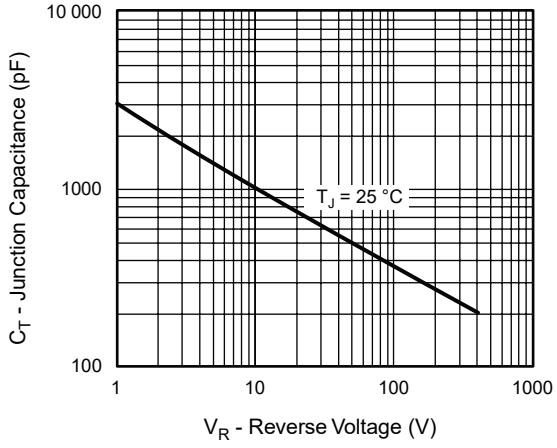


Fig. 3 Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

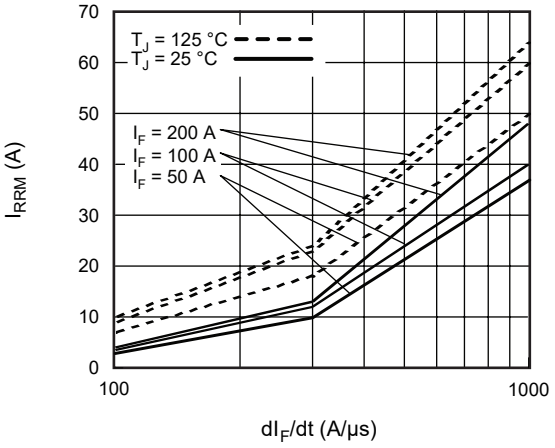


Fig. 6 Typical Recovery Current vs. $dI_F/dt$ (Per Leg)



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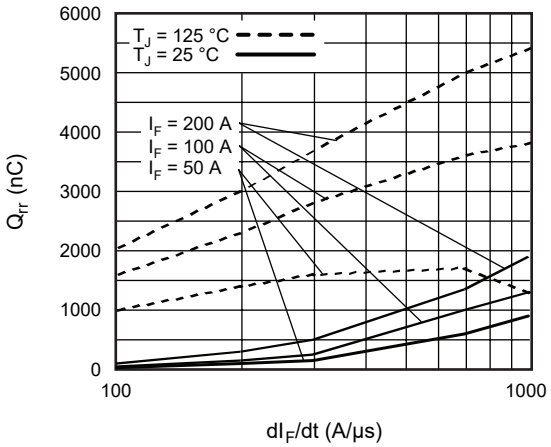


Fig. 7 Typical Stored Charge vs. $dI_F/dt$ (Per Leg)

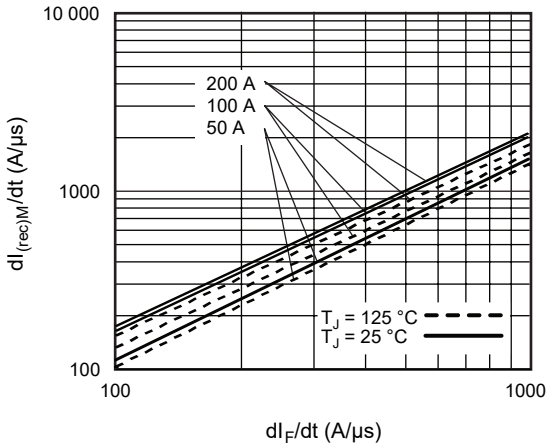


Fig. 8 Typical $dI_{(rec)M}/dt$ vs. $dI_F/dt$ (Per Leg)

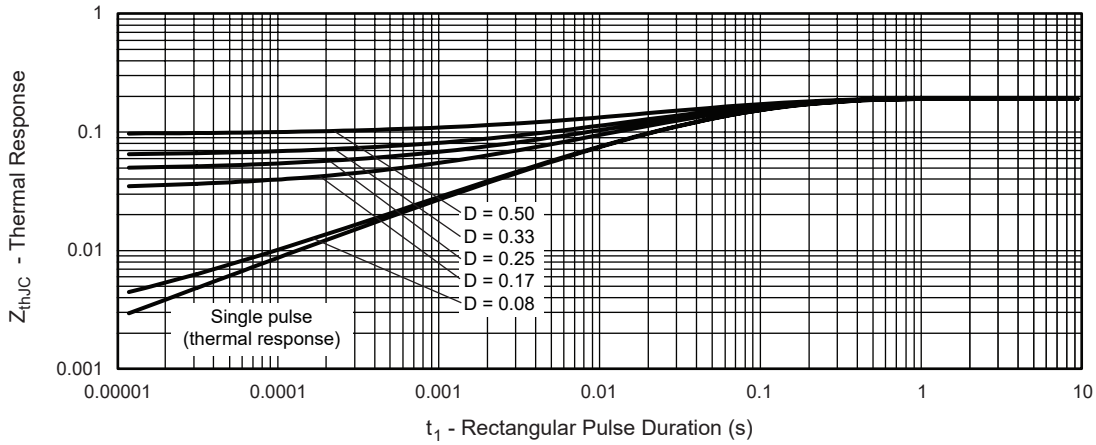


Fig. 9 Maximum Thermal Impedance $Z_{thJC}$ Characteristics (Per Leg)





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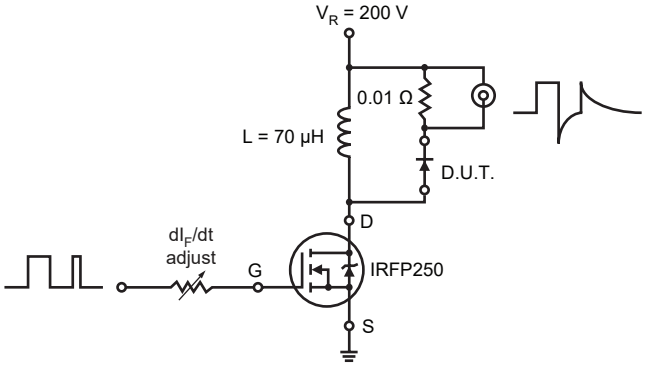
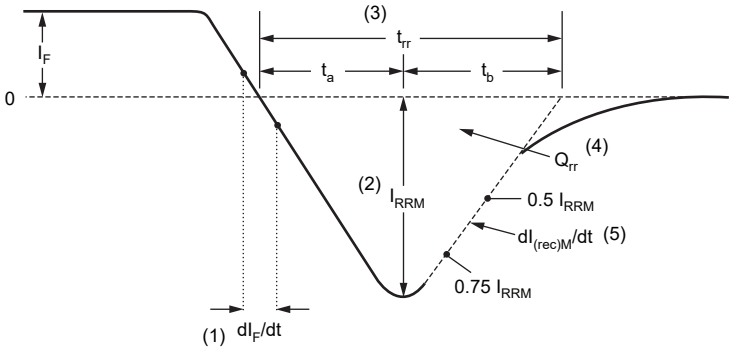



Fig. 10 - Reverse Recovery Parameter Test Circuit




(1) $dI_F/dt$ - rate of change of current through zero crossing

(2) $I_{RRM}$ - peak reverse recovery current

(3) $t_{rr}$ - reverse recovery time measured from zero crossing point of negative going $I_F$ to point where a line passing through 0.75 $I_{RRM}$ and 0.50 $I_{RRM}$ extrapolated to zero current.

(4) $Q_{rr}$ - area under curve defined by $t_{rr}$ and $I_{RRM}$

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

(5) $dI_{(rec)M}/dt$ - peak rate of change of current during $t_b$ portion of $t_{rr}$

Fig. 11 - Reverse Recovery Waveform and Definitions

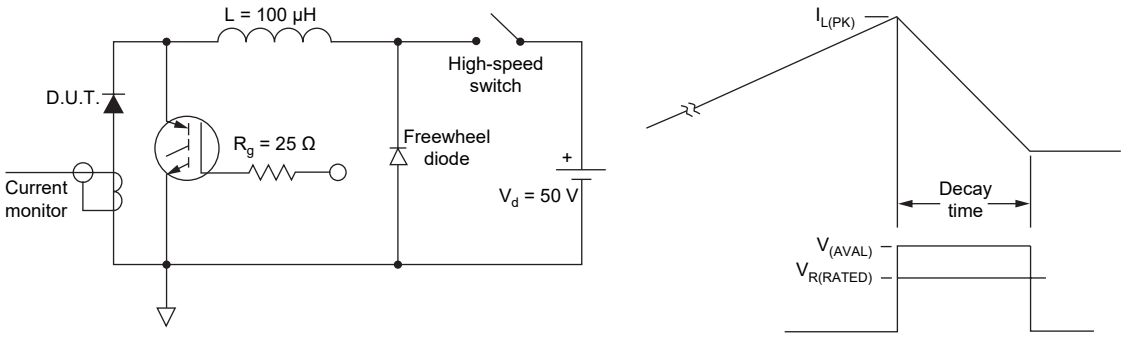



Fig. 12 - Avalanche Test Circuit and Waveforms



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