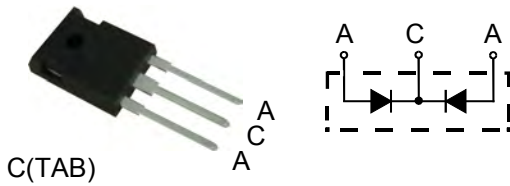


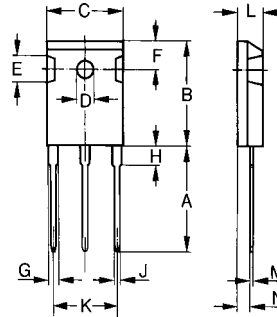
# SUR3020PT thru SUR3060PT

## Soft Recovery Behaviour Ultra Fast Recovery Epitaxial Diodes



A=Anode, C=Cathode, TAB=Cathode

Dimensions TO-247AD



| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | Min.       | Max.  | Min.   | Max.  |
| A    | 19.81      | 20.32 | 0.780  | 0.800 |
| B    | 20.80      | 21.46 | 0.819  | 0.845 |
| C    | 15.75      | 16.26 | 0.610  | 0.640 |
| D    | 3.55       | 3.65  | 0.140  | 0.144 |
| E    | 4.32       | 5.49  | 0.170  | 0.216 |
| F    | 5.4        | 6.2   | 0.212  | 0.244 |
| G    | 1.65       | 2.13  | 0.065  | 0.084 |
| H    | -          | 4.5   | -      | 0.177 |
| J    | 1.0        | 1.4   | 0.040  | 0.055 |
| K    | 10.8       | 11.0  | 0.426  | 0.433 |
| L    | 4.7        | 5.3   | 0.185  | 0.209 |
| M    | 0.4        | 0.8   | 0.016  | 0.031 |
| N    | 1.5        | 2.49  | 0.087  | 0.102 |

|                  | $V_{RSM}$ | $V_{RRM}$ |
|------------------|-----------|-----------|
|                  | V         | V         |
| <b>SUR3020PT</b> | 200       | 200       |
| <b>SUR3030PT</b> | 300       | 300       |
| <b>SUR3040PT</b> | 400       | 400       |
| <b>SUR3060PT</b> | 600       | 600       |

| Symbol     | Test Conditions                                                 | Maximum Ratings        | Unit        |
|------------|-----------------------------------------------------------------|------------------------|-------------|
| $I_{FRMS}$ | $T_{VJ}=T_{VJM}$                                                | 25                     | A           |
| $I_{FAVM}$ | $T_C=100^{\circ}C$ ; rectangular, $d=0.5$                       | 15                     |             |
| $I_{FRM}$  | $t_p < 10\mu s$ ; rep. rating, pulse width limited by $T_{VJM}$ | 150                    |             |
| $I_{FSM}$  | $T_{VJ}=45^{\circ}C$                                            | $t=10ms$ (50Hz), sine  | A           |
|            |                                                                 | $t=8.3ms$ (60Hz), sine |             |
|            | $T_{VJ}=150^{\circ}C$                                           | $t=10ms$ (50Hz), sine  |             |
|            |                                                                 | $t=8.3ms$ (60Hz), sine |             |
| $I^2t$     | $T_{VJ}=45^{\circ}C$                                            | $t=10ms$ (50Hz), sine  | $A^2s$      |
|            |                                                                 | $t=8.3ms$ (60Hz), sine |             |
|            | $T_{VJ}=150^{\circ}C$                                           | $t=10ms$ (50Hz), sine  |             |
|            |                                                                 | $t=8.3ms$ (60Hz), sine |             |
| $T_{VJ}$   |                                                                 | -40...+150             | $^{\circ}C$ |
| $T_{VJM}$  |                                                                 | 150                    |             |
| $T_{stg}$  |                                                                 | -40...+150             |             |
| $P_{tot}$  | $T_C=25^{\circ}C$                                               | 62                     | W           |
| $M_d$      | Mounting torque                                                 | 0.4...0.6              | Nm          |
| Weight     |                                                                 | 6                      | g           |

**Sirectifier®**

# SUR3020PT thru SUR3060PT

## Soft Recovery Behaviour Ultra Fast Recovery Epitaxial Diodes

| Symbol                                                                        | Test Conditions                                                                                                         | Characteristic Values |            | Unit             |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------|------------|------------------|
|                                                                               |                                                                                                                         | typ.                  | max.       |                  |
| <b>I<sub>R</sub></b>                                                          | $T_{VJ}=25^{\circ}\text{C}; V_R=V_{RRM}$                                                                                |                       | 50         | $\mu\text{A}$    |
|                                                                               | $T_{VJ}=25^{\circ}\text{C}; V_R=0.8 \cdot V_{RRM}$                                                                      |                       | 25         | $\mu\text{A}$    |
|                                                                               | $T_{VJ}=125^{\circ}\text{C}; V_R=0.8 \cdot V_{RRM}$                                                                     |                       | 3          | $\text{mA}$      |
| <b>V<sub>F</sub></b>                                                          | $I_F=16\text{A}; T_{VJ}=150^{\circ}\text{C}$<br>$T_{VJ}=25^{\circ}\text{C}$                                             |                       | 1.5<br>1.7 | V                |
| <b>V<sub>TO</sub></b>                                                         | For power-loss calculations only                                                                                        |                       | 1.12       | V                |
| <b>r<sub>T</sub></b>                                                          | $T_{VJ}=T_{VJM}$                                                                                                        |                       | 23.2       | $\text{m}\Omega$ |
| <b>R<sub>thJC</sub></b><br><b>R<sub>thCK</sub></b><br><b>R<sub>thJA</sub></b> |                                                                                                                         | 0.5                   | 2<br>60    | K/W              |
| <b>t<sub>rr</sub></b>                                                         | $I_F=1\text{A}; -di/dt=200\text{A}/\mu\text{s}; V_R=30\text{V}; T_{VJ}=25^{\circ}\text{C}$                              | 35                    | 50         | ns               |
| <b>I<sub>RM</sub></b>                                                         | $V_R=100\text{V}; I_F=60\text{A}; -di_F/dt=200\text{A}/\mu\text{s}; L \leq 0.05\mu\text{H}; T_{VJ}=100^{\circ}\text{C}$ | 4                     | 4.4        | A                |

### FEATURES

- \* International standard package JEDEC TO-247AD
- \* Glass passivated chips
- \* Very short recovery time
- \* Extremely low switching losses
- \* Low I<sub>RM</sub>-values
- \* Soft recovery behaviour
- \* RoHS compliant

### APPLICATIONS

- \* Antiparallel diode for high frequency switching devices
- \* Antisaturation diode
- \* Snubber diode
- \* Free wheeling diode in converters and motor control circuits
- \* Rectifiers in switch mode power supplies (SMPS)
- \* 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
- \* Operating at lower temperature or space saving by reduced cooling

**Sirectifier®**

# SUR3020PT thru SUR3060PT

## Soft Recovery Behaviour Ultra Fast Recovery Epitaxial Diodes

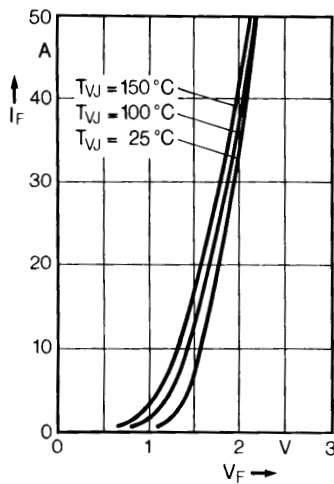


Fig. 1 Forward current versus voltage drop.

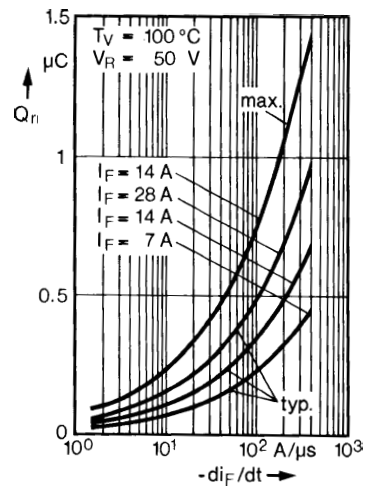


Fig. 2 Recovery charge versus  $-di_F/dt$ .

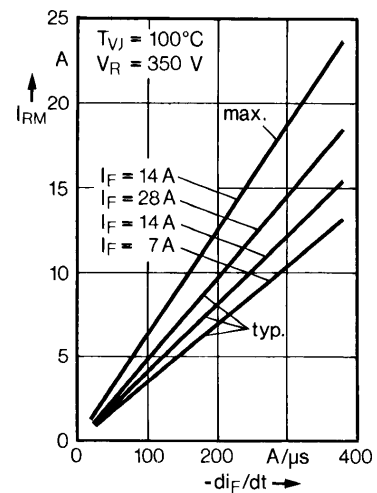


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

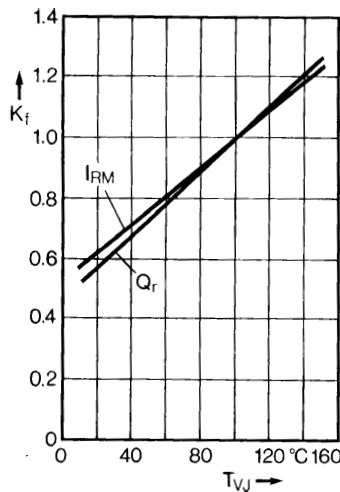


Fig. 4 Dynamic parameters versus junction temperature.

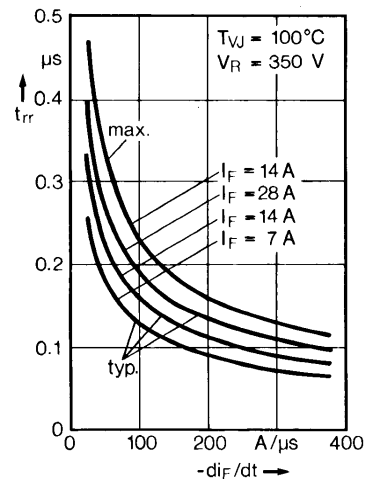


Fig. 5 Recovery time versus  $-di_F/dt$ .

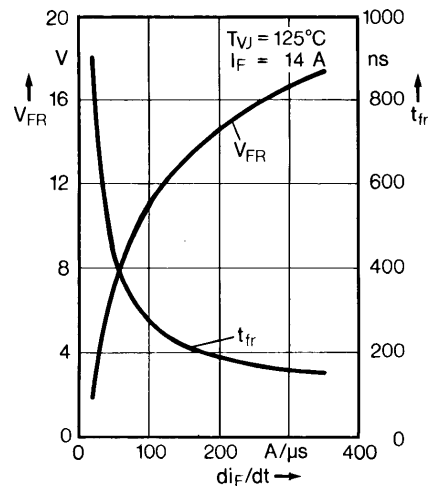


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

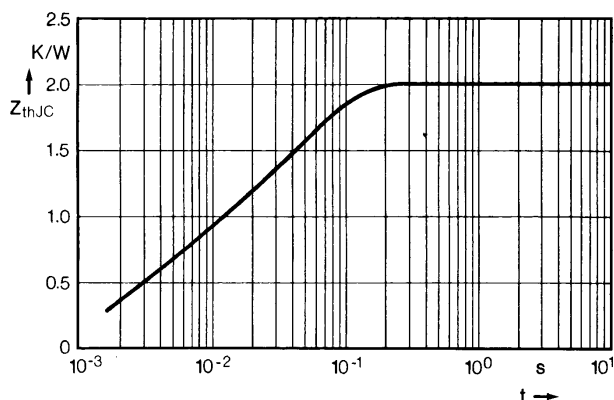


Fig. 7 Transient thermal impedance junction to case.

**Sirectifier®**