



## General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

## Features

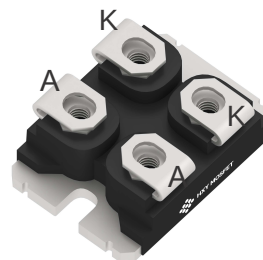
- Low conduction loss due to low  $V_F$
- Extremely low switching loss by tiny  $Q_c$
- Highly rugged due to better surge current
- Industrial standard quality and reliability

## Applications

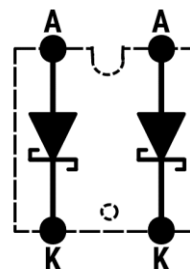
- Solar Inverters
- EV Fast Chargers
- High performance SMPS
- Induction Heating and Welding

## Ordering Information

| Part Number | Package | Qty(PCS) |
|-------------|---------|----------|
| STTH6006TV1 | SOT-227 | 120      |



SOT-227



## Maximum Ratings ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

| Symbol        | Parameter                                 | Value                         | Unit                 | Test Conditions                                                                                                                   |
|---------------|-------------------------------------------|-------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| $V_{RRM}$     | Repetitive Peak Reverse Voltage           | 650                           | V                    |                                                                                                                                   |
| $V_{RSM}$     | Surge Peak Reverse Voltage                | 650                           | V                    |                                                                                                                                   |
| $V_R$         | DC Blocking Voltage                       | 650                           | V                    |                                                                                                                                   |
| $I_F$         | Continuous Forward Current                | 182/364<br>149/298<br>125/250 | A                    | $T_C=25^\circ\text{C}$<br>$T_C=75^\circ\text{C}$<br>$T_C=103^\circ\text{C}$                                                       |
| $I_{FRM}$     | Repetitive Peak Forward Surge Current     | 360<br>252                    | A                    | $T_C=25^\circ\text{C}$ , $t_p = 10$ ms, Half Sine Wave<br>$T_C=110^\circ\text{C}$ , $t_p=10$ ms, Half Sine Wave                   |
| $I_{FSM}$     | Non-Repetitive Peak Forward Surge Current | 600<br>480                    | A                    | $T_C=25^\circ\text{C}$ , $t_p = 10$ ms, Half Sine Wave<br>$T_C=110^\circ\text{C}$ , $t_p = 10$ ms, Half Sine Wave                 |
| $\int i^2 dt$ | $i^2 dt$ value                            | 1800<br>1152                  | $\text{A}^2\text{s}$ | $T_C = 25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse<br>$T_C = 110^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse |
| $P_{tot}$     | Power Dissipation                         | 300<br>120                    | W                    | $T_C=25^\circ\text{C}$<br>$T_C=110^\circ\text{C}$                                                                                 |
| $T_{stg}$     | Storage temperature Range                 | -55 to<br>+150                | $^\circ\text{C}$     |                                                                                                                                   |
| $T_J$         | Operating junction Range                  | -55 to<br>+175                | $^\circ\text{C}$     |                                                                                                                                   |



## Electrical Characteristics

| Parameter               | Symbol | Value |      |      | Unit    | Test Condition                                                    |
|-------------------------|--------|-------|------|------|---------|-------------------------------------------------------------------|
|                         |        | min.  | typ. | max. |         |                                                                   |
| Forward Voltage         | $V_F$  | -     | 1.4  | 1.8  | V       | $I_F=125A$<br>$T_j=25^{\circ}C$<br>$T_j=175^{\circ}C$             |
| Reverse Current         | $I_R$  | -     | -    | 100  | $\mu A$ | $V_R=650V$<br>$T_j=25^{\circ}C$<br>$T_j=175^{\circ}C$             |
| Total Capacitive Charge | $Q_C$  | -     | 340  | -    | nC      | $V_R=400V, T_j=25^{\circ}C$<br>$Q_C = \int_0^{V_R} C(V) dV$       |
| Total Capacitance       | C      | -     | 6420 | -    | pF      | $T_j=25^{\circ}C, f=1MHz$<br>$V_R=0V$<br>$V_R=200V$<br>$V_R=400V$ |

## Thermal Characteristics

| Symbol          | Parameter                                | Typ. | Unit          |
|-----------------|------------------------------------------|------|---------------|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 0.5  | $^{\circ}C/W$ |

## Characteristics Curve

Fig 1: Forward Characteristics

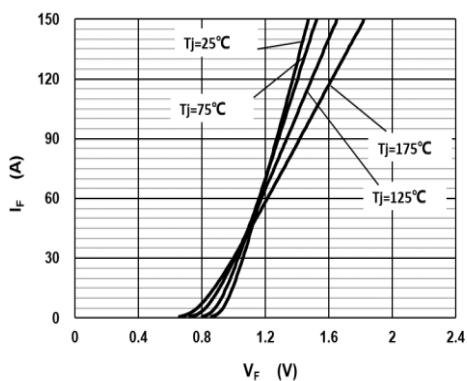


Fig 2: Reverse Characteristics

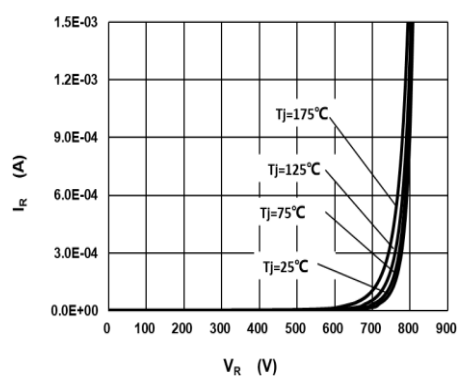




Fig 3: Current Derating

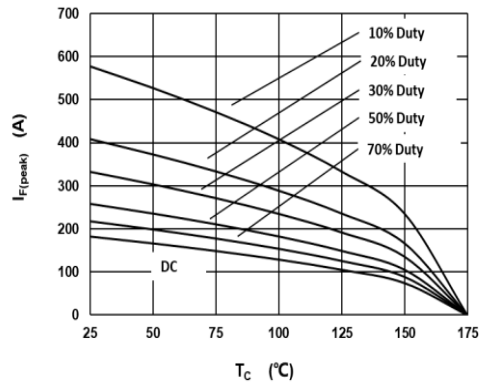


Fig 4: Power Derating

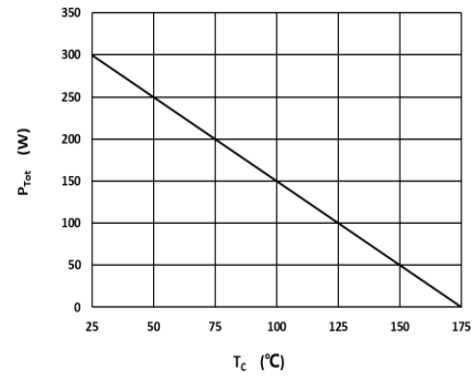


Fig 5: Capacitance vs. Reverse Voltage

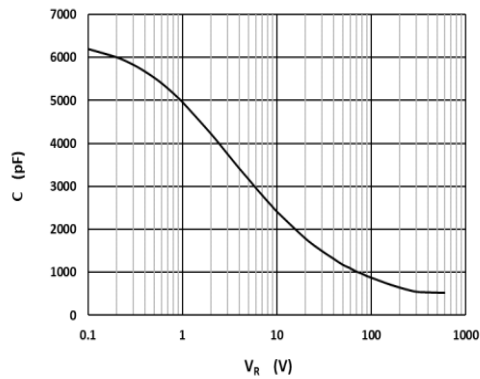


Fig 6: Reverse Charge vs. Reverse Voltage

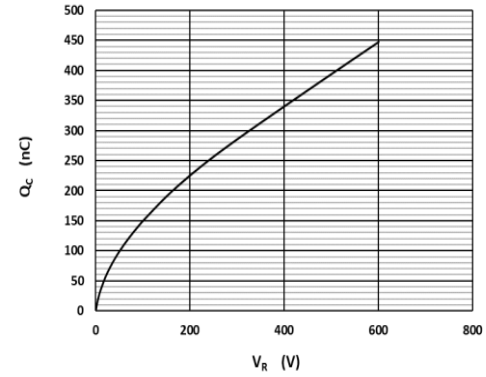


Fig 7: Typical Capacitance Stored Energy

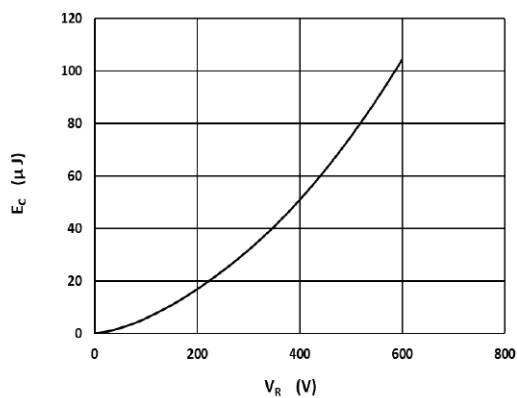
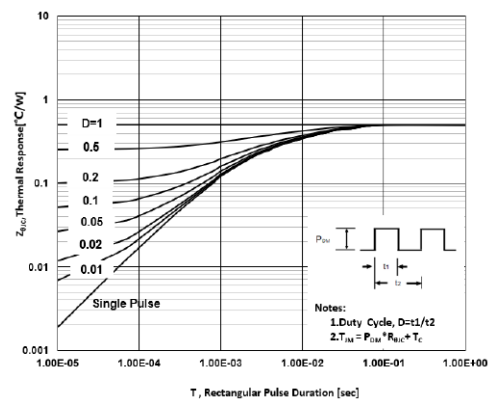
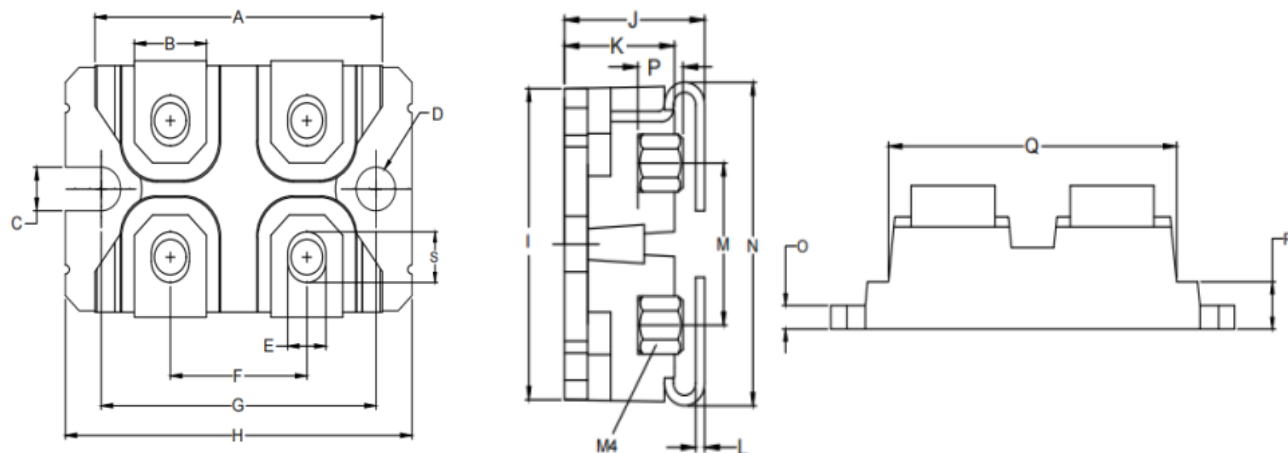


Fig 8: Transient Thermal Impedance





## Package Information SOT-227



| DiM | Millimeter |       |
|-----|------------|-------|
|     | Min        | Max   |
| A   | 31.40      | 31.60 |
| B   | 7.70       | 8.10  |
| C   | 4.20       | 4.40  |
| D   | 4.20       | 4.40  |
| E   | 4.10       | 4.30  |
| F   | 14.90      | 15.10 |
| G   | 30.10      | 30.20 |
| H   | 38.00      | 38.40 |
| I   | 23.80      | 24.20 |
| J   | 12.20      | 12.70 |
| K   | 9.40       | 9.60  |
| L   | 0.75       | 0.85  |
| M   | 12.40      | 12.80 |
| N   | 24.50      | 25.40 |
| O   | 1.90       | 2.10  |
| P   | 3.10       | 3.95  |
| Q   | 26.60      | 27.00 |
| R   | 3.80       | 4.20  |
| S   | 5.10       | 5.40  |



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