



## 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

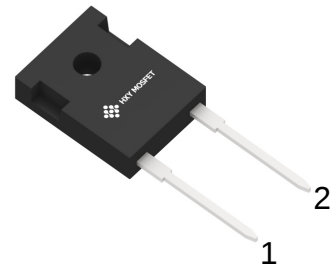
- Low conduction loss due to low  $V_F$
- Extremely low switching loss by tiny  $Q_C$
- Highly rugged due to better surge current
- Industrial standard quality and reliability

## Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction



| Ordering Part Number | Package | Qty(PCS) |
|----------------------|---------|----------|
| STPSC20065W          | TO-247  | 30       |



TO-247-2L



## Maximum Ratings

| 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 Peak Reverse Voltage                   | 650            | V                    |                                                                                                                                                 |
| $I_F$         | Continuous Forward Current                | 26             | A                    | $T_C=135^{\circ}\text{C}$                                                                                                                       |
| $I_{FRM}$     | Repetitive Peak Forward Surge Current     | 102<br>63      | A                    | $T_C=25^{\circ}\text{C}$ , $t_p=10\text{ ms}$ , Half Sine Wave, $D=1$<br>$T_C=110^{\circ}\text{C}$ , $t_p=10\text{ ms}$ , Half Sine Wave, $D=1$ |
| $I_{FSM}$     | Non-Repetitive Peak Forward Surge Current | 150<br>120     | A                    | $T_C=25^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave, $D=1$<br>$T_C=110^{\circ}\text{C}$ , $t_p=10\text{ ms}$ , Half Sine Wave, $D=1$  |
| $P_{tot}$     | Power Dissipation                         | 150<br>65      | W                    | $T_C=25^{\circ}\text{C}$<br>$T_C=110^{\circ}\text{C}$                                                                                           |
| $\int i^2 dt$ | $i^2 dt$ value                            | 112<br>72      | $\text{A}^2\text{s}$ | $T_C = 25^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse<br>$T_C = 110^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse           |
| $T_J$         | Operating Junction Range                  | -55 to<br>+175 | $^{\circ}\text{C}$   |                                                                                                                                                 |
| $T_{stg}$     | Storage Temperature Range                 | -55 to<br>+150 | $^{\circ}\text{C}$   |                                                                                                                                                 |



## Electrical Characteristics

| Parameter               | Symbol | Value |      |      | Unit    | Test Condition                                                    |
|-------------------------|--------|-------|------|------|---------|-------------------------------------------------------------------|
|                         |        | min.  | typ. | max. |         |                                                                   |
| Forward Voltage         | $V_F$  | -     | 1.35 | 1.5  | V       | $I_F=20A$<br>$T_J=25^{\circ}C$<br>$T_J=175^{\circ}C$              |
| Reverse Current         | $I_R$  | -     | 2    | 40   | $\mu A$ | $V_R=650V$<br>$T_J=25^{\circ}C$<br>$T_J=175^{\circ}C$             |
| Total Capacitive Charge | $Q_C$  | -     | 52   | -    | nC      | $V_R=400V, T_J=25^{\circ}C$<br>$Q_C = \int_0^{V_R} C(V)dV$        |
| Total Capacitance       | C      | -     | 1018 | -    | 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 | 1.00 | $^{\circ}C/W$ |

## Typical Performance

Fig 1: Forward Characteristics

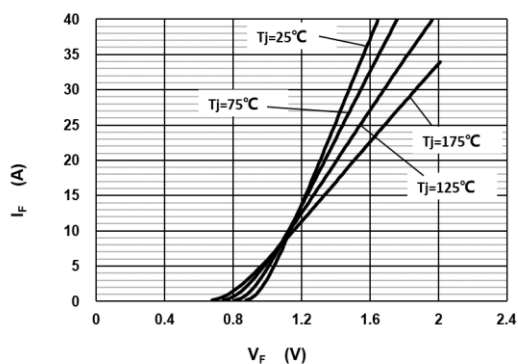


Fig 2: Reverse Characteristics

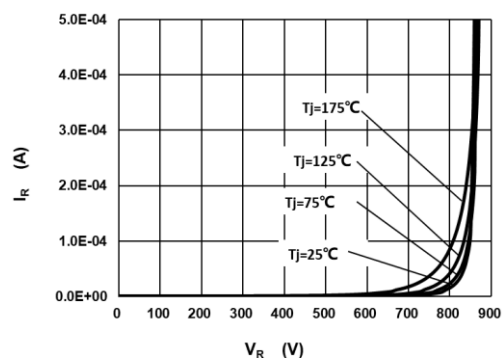




Fig 3: Current Derating

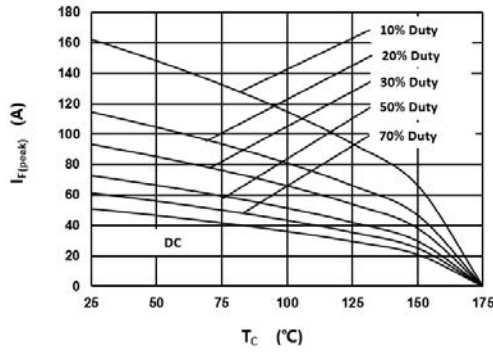


Fig 4: Power Derating

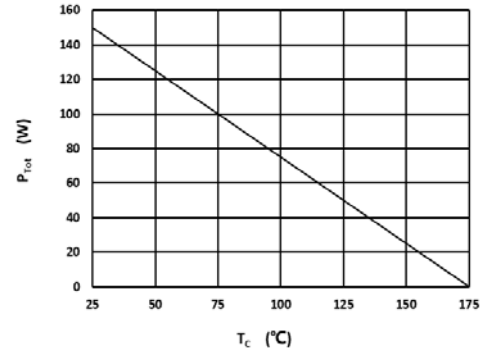


Fig 5: Capacitance vs. Reverse Voltage

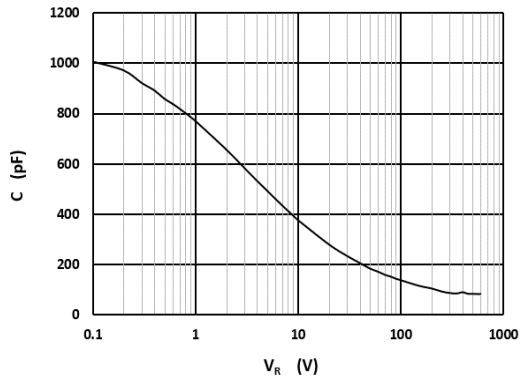


Fig 6: Reverse Charge vs. Reverse Voltage

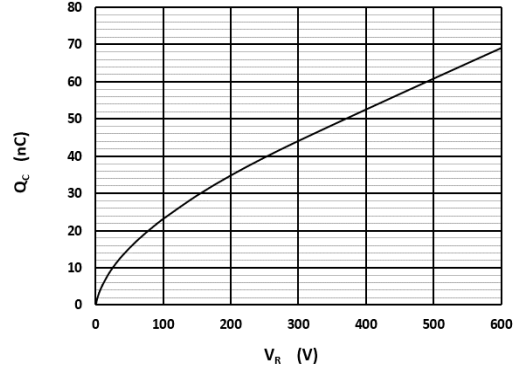


Fig 7: Typical Capacitance Stored Energy

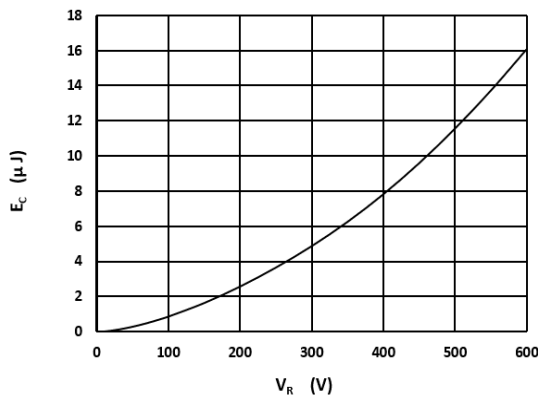
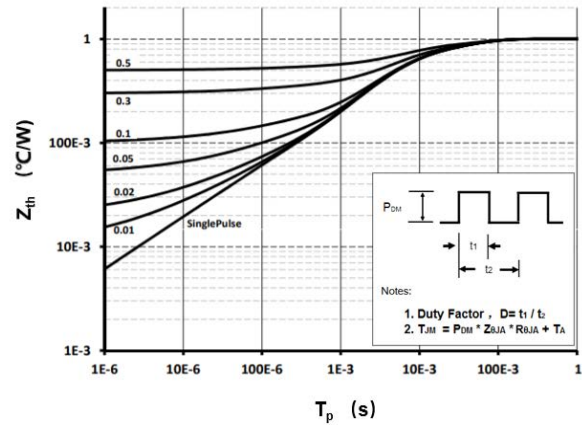


Fig 8: Transient Thermal Impedance

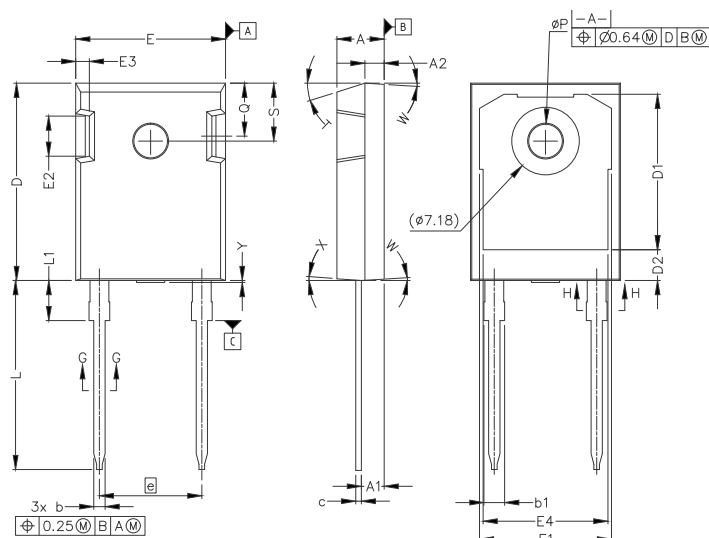




## Package Dimensions

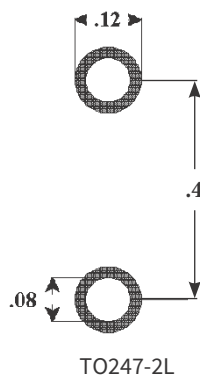
Package: TO247-2L

All dimensions in mm.



| SYM | MILLIMETERS |       | INCHES   |       |
|-----|-------------|-------|----------|-------|
|     | MIN         | MAX   | MIN      | MAX   |
| A   | 4.83        | 5.21  | .190     | .205  |
| A1  | 2.29        | 2.54  | .090     | .100  |
| A2  | 1.91        | 2.16  | .075     | .085  |
| b'  | 1.07        | 1.28  | .042     | .050  |
| b   | 1.07        | 1.33  | .042     | .052  |
| b1  | 1.91        | 2.41  | .075     | .095  |
| b2  | 1.91        | 2.16  | .075     | .085  |
| c'  | 0.55        | 0.65  | .022     | .026  |
| c   | 0.55        | 0.68  | .022     | .027  |
| D   | 20.80       | 21.10 | .819     | .831  |
| D1  | 16.25       | 17.35 | .640     | .683  |
| D2  | 2.86        | 3.16  | .112     | .124  |
| E   | 15.75       | 16.13 | .620     | .635  |
| E1  | 13.10       | 14.15 | .516     | .557  |
| E2  | 3.68        | 5.10  | .145     | .201  |
| E3  | 1.00        | 1.90  | .039     | .075  |
| E4  | 12.38       | 13.43 | .487     | .529  |
| e   | 10.88 BSC   |       | .428 BSC |       |
| L   | 19.81       | 20.32 | .780     | .800  |
| L1  | 4.10        | 4.40  | .161     | .173  |
| øP  | 3.51        | 3.65  | .138     | .144  |
| Q   | 5.49        | 6.00  | .216     | .236  |
| S   | 6.04        | 6.30  | .238     | .248  |
| T   | 17.5° REF.  |       |          |       |
| W   | 3.5° REF.   |       |          |       |
| X   | 4° REF.     |       |          |       |
| Y   | 0           | 0.50  | 0        | 0.020 |

## Recommended Solder Pad Layout



*all units are in inches*



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