## 1. General description:

Silicon Carbide Schottky diode in a TO247-3L plastic package, designed for high frequency switched-mode power supplies.

## 2. Features and benefits:

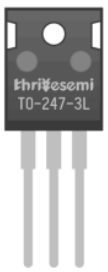
- Zero Reverse Recovery Current
- Positive temperature coefficient
- Temperature-independent performance
- High-speed switching
- Low switching loss
- Low heat dissipation requirements

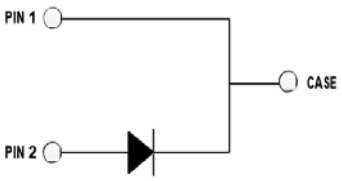
## 3. Applications:

- Switching power supply
- Power factor correction
- Motor drive，traction
- Charging pile
- PC Silverbox

## 4. Typical Performance Diagrams and Package:

| | | |
|---|---|---|
| $V_{RRM}$ | 650 | V |
| $I_F$(135℃) | 12* | A |
| $Q_C$ | 28* | nC |




## 5. Ordering information:

| Parts Number | Marking | Package | Vde min | IF max(A) | Pins | SPQ | Packaging |
|---|---|---|---|---|---|---|---|
| TSSiC065S020G | TSSiC065S020G | TO-247-3L | 650V | 20A | 3 | 600 | Tube |
| | | | | | | | |

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## 6. Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit | Test Conditions |
|---|---|---|---|---|
| Reverse voltage (Repetitive peak) | $V_{RRM}$ | 650 | | $T_C$ =25℃ |
| Reverse Voltage (Surge peak) | $V_{RSM}$ | 650 | V | $T_C$ =25℃ |
| Reverse voltage (DC) | $V_{DC}$ | 650 | | $T_C$ =25℃ |
| Continuous forward current (Per Leg/Device) | IF | 25/50 | | $T_C$ =25℃ |
| | | 12/24 | A | $T_C$ =135℃ |
| | | 10/20 | | $T_C$ =147℃ |
| Surge non-repetitive forward current | $I_{FSM}$ | 80* | A | $T_C$=25℃,$t_p$=10ms,half Sine Pulse |
| Total power dissipation | $P_{TOT}$ | 91* | W | $T_C$=25℃ |
| $i^2t$ value | $\int i^2dt$ | 32* | $A^2s$ | $T_C$=25℃, $t_P$=10ms |
| Operating temperature | $T_j$ | -55~175 | ℃ | |
| storage temperature | $T_{stg}$ | -55~175 | ℃ | |
| Mounting Torque | M | 1 | Nm | M3 Screw |

## 7. Thermal Characteristics

| Parameter | Symbol | Values | | | Unit | Test Condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Thermal resistance | $R_{th(j-c)}$ | / | 1.65*/0.82** | / | ℃/W | |

## 8. Electrical Characteristics $T_j$ = 25℃

| Parameter | Symbol | Values | | | Unit | Test Condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| DC blocking voltage | $V_{DC}$ | 650 | / | / | V | $I_R$=100 μA |
| Forward voltage | $V_F$ | / | 1.45 | 1.70 | V | $I_F$=10A, $T_j$ =25℃ |
| | | / | 1.75 | 2.50 | | $I_F$=10A, $T_j$ =175℃ |
| Reverse current | $I_R$ | / | 1 | 40 | μA | $V_R$=650V, $T_j$ =25℃ |
| | | / | 5 | 200 | | $V_R$=650V, $T_j$ =175℃ |
| Total capacitance | C | / | 534 | / | pF | $V_R$=0V, f=1MHz |
| | | / | 53 | / | | $V_R$=200V, f=1MHz |
| | | / | 46 | / | | $V_R$=400V, f=1MHz |
| Total capacitive charge | $Q_C$ | / | 28 | / | nC | $V_R$=400V |
| Capacitance Stored Energy | $E_C$ | / | 4.3 | / | μJ | $V_R$=400V |

## 9. Typical Electrical Characteristics Curves

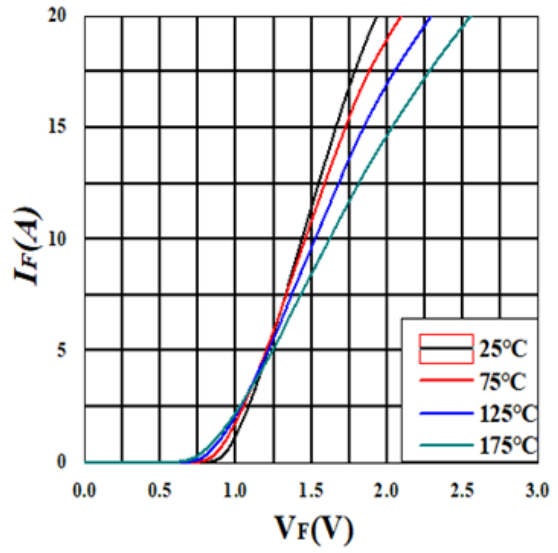



Figure 1. Forward Characteristics

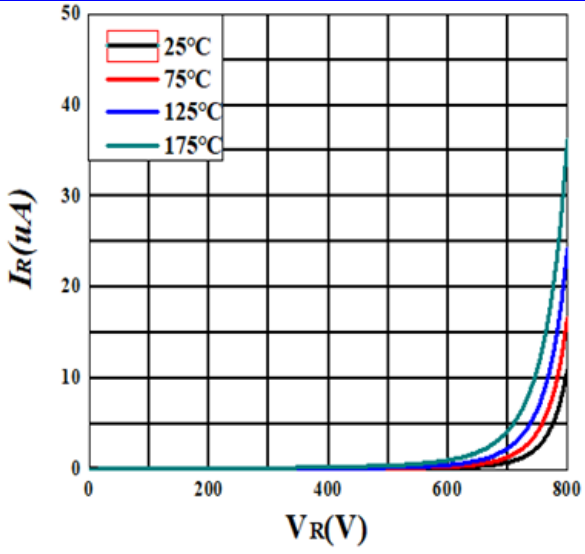



Figure 2. Reverse Characteristics

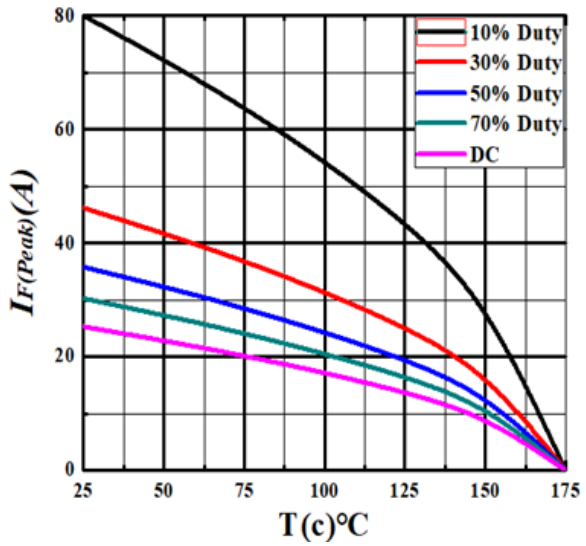



Figure 3. Current Derating

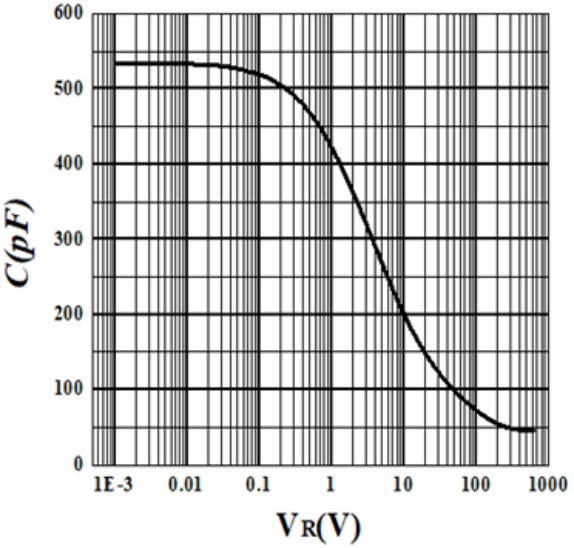



Figure 4. Capacitance vs. Reverse Voltag

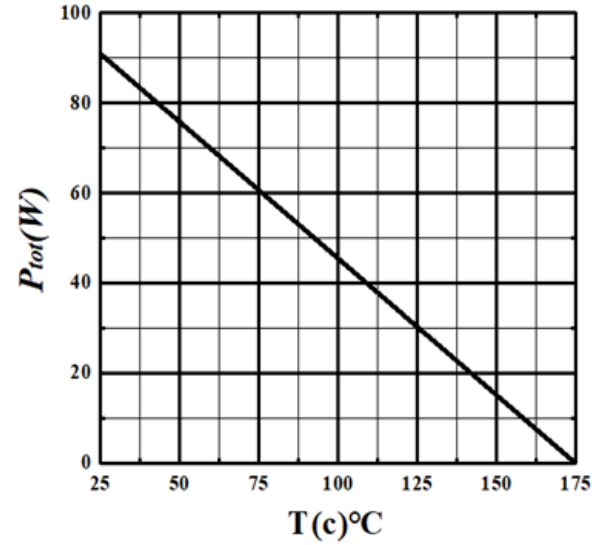



Figure 5. Power Derating

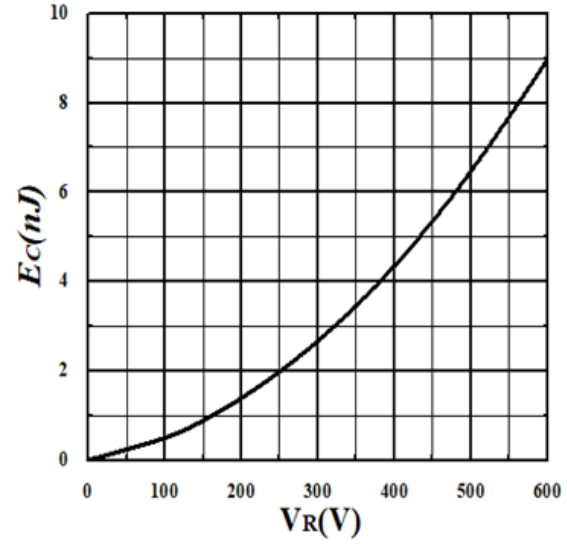



Figure 6. Capacitance Stored Energy

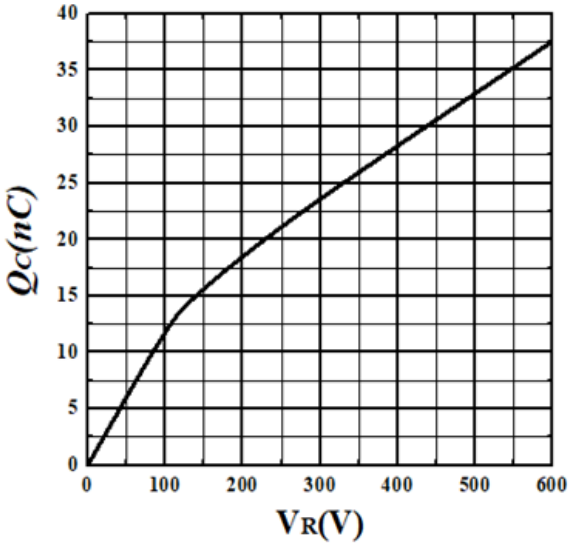
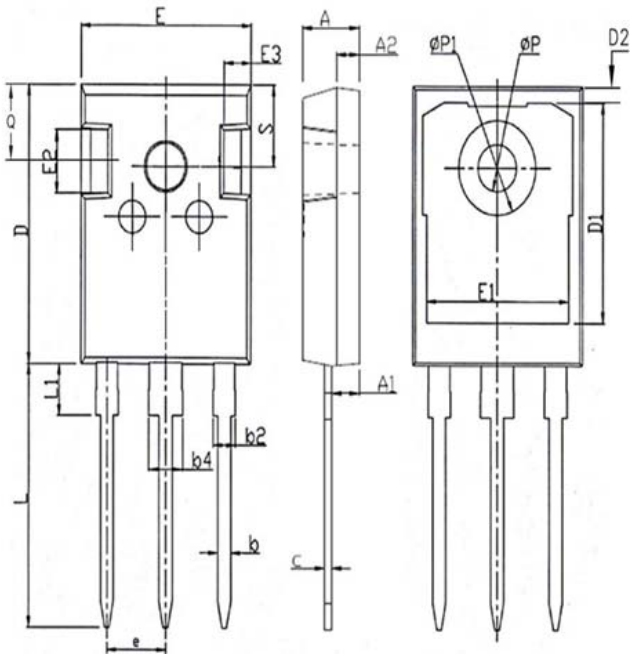



**Figure 7. Total Capacitance Charge vs. Reverse Voltage**

## 10. Package




| SYMBOL | mm | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 4.8 | 5 | 5.2 |
| A1 | 2.21 | 2.41 | 2.61 |
| A2 | 1.85 | 2 | 2.15 |
| b | 1.11 | 1.21 | 1.36 |
| b2 | 1.91 | 2.01 | 2.21 |
| b4 | 2.91 | 3.01 | 3.21 |
| c | 0.51 | 0.6 | 0.75 |
| D | 20.7 | 21 | 21.3 |
| D1 | 16.25 | 16.55 | 16.85 |
| D2 | 1 | 1.2 | 1.35 |
| E | 15.5 | 15.8 | 16.1 |
| E1 | 13 | 13.3 | 13.6 |
| E2 | 4.8 | 5 | 5.2 |
| E3 | 2.3 | 2.5 | 2.7 |
| e | 5.44 BSC | | |
| L | 19.62 | 19.92 | 20.22 |
| L1 | - | - | 4.3 |
| øP | 3.4 | 3.6 | 3.8 |
| øP1 | - | - | 7.3 |
| Q | 5.4 | 5.8 | 6.2 |
| S | 6.20 BSC | | |

## 11. Ordering information

| | |
|---|---|
| Part Number | TSSiC065S020G |
| Package | TO-247-3L |
| Marking | TSSiC065S020G |
| Unit Quantity | 600 EA |
| Packing Type | Tube |
| RoHS | Yes |

## 12. Notes

SiC Schottky diode portfolio: http://www.thrivesemi.com/