

## 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.

Silicon Carbide Schottky Diode 650 V, 16A

### Product Summary

|                          |       |
|--------------------------|-------|
| $V_{RRM}$                | 650 V |
| $I_F (T_C 159^{\circ}C)$ | 16A   |
| $V_F (T_j 25^{\circ}C)$  | 1.3 V |

## 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



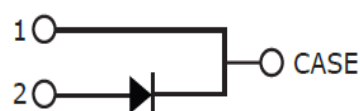
## Applications

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

### TO-247-2



### Equivalent circuit



## Package Marking and Ordering Information

| Part #    | Marking  | Package  |
|-----------|----------|----------|
| T1D16065H | 1D16065H | TO-247-2 |

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

| Parameter  | Symbol        | Value          | Unit                 |
|--|---------------|----------------|----------------------|
| Repetitive Peak Reverse Voltage  | $V_{RRM}$     | 650            | V                    |
| Surge Peak Reverse Voltage   | $V_{RSM}$     | 650            | V                    |
| DC Peak Reverse Voltage  | $V_R$         | 650            | V                    |
| Continuous Forward Current<br>$T_C = 25^{\circ}\text{C}$<br>$T_C = 135^{\circ}\text{C}$<br>$T_C = 159^{\circ}\text{C}$   | $I_F$         | 49<br>25<br>16 | A                    |
| Repetitive Peak Forward Surge Current<br>$T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ | $I_{FRM}$     | 70<br>56       | A                    |
| Non-Repetitive Forward Surge Current<br>$T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$  | $I_{FSM}$     | 128<br>98      | A                    |
| $i^2dt$ value<br>$T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$                         | $\int i^2 dt$ | 81<br>48       | $\text{A}^2\text{s}$ |
| Power dissipation<br>$T_C = 25^{\circ}\text{C}$<br>$T_C = 110^{\circ}\text{C}$   | $P_{tot}$     | 125<br>54      | W                    |
| Operating junction Range   | $T_j$         | -55 to +175    | $^{\circ}\text{C}$   |
| Storage temperature Range  | $T_{stg}$     | -55 to +150    | $^{\circ}\text{C}$   |

**Thermal Resistance**

| Parameter                            | Symbol     | Typ. | Unit                 |
|--------------------------------------|------------|------|----------------------|
| Thermal resistance, junction – case. | $R_{thJC}$ | 1.20 | $^{\circ}\text{C/W}$ |

Electrical Characteristic (at Tc = 25 °C, unless otherwise specified)

| Parameter               | Symbol         | Value |      |      | Unit | Test Condition   |
|-------------------------|----------------|-------|------|------|------|--|
|                         |                | min.  | typ. | max. |      |  |
| Forward Voltage         | V <sub>F</sub> | -     | 1.3  | 1.5  | V    | I <sub>F</sub> =16A<br>T <sub>j</sub> =25°C<br>T <sub>j</sub> =175°C                               |
| Reverse Current         | I <sub>R</sub> | -     | -    | 100  | μA   | V <sub>R</sub> =650V<br>T <sub>j</sub> =25°C<br>T <sub>j</sub> =175°C                              |
| Total Capacitive Charge | Q <sub>C</sub> | -     | 52   | -    | nC   | V <sub>R</sub> =400V, T <sub>j</sub> =25°C<br>$Q_C = \int_0^{V_R} C(V)dV$                          |
| Total Capacitance       | C              | -     | 993  | -    | pF   | T <sub>j</sub> =25°C, f=1MHz<br>V <sub>R</sub> =0V<br>V <sub>R</sub> =200V<br>V <sub>R</sub> =400V |

Characteristics Curve:

Fig 1: Forward Characteristics

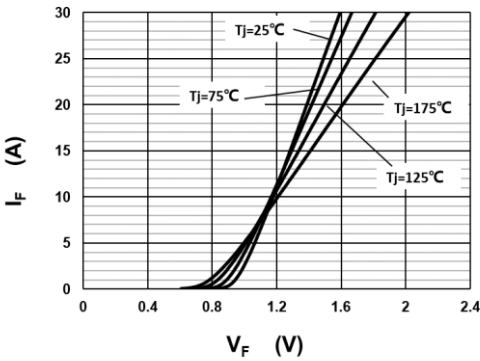


Fig 2: Reverse Characteristics

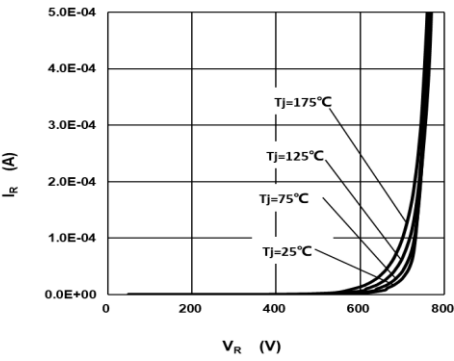


Fig 3: Current Derating

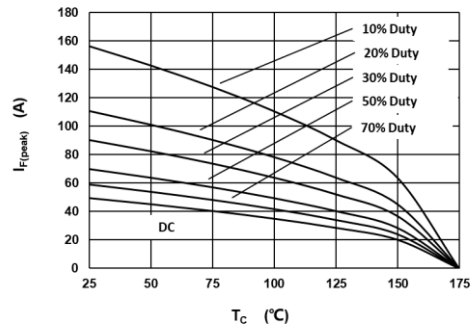


Fig 4: Power Derating

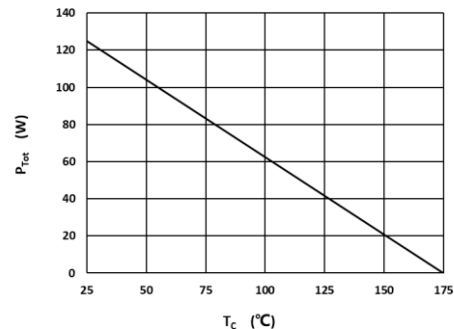


Fig 5: Capacitance vs. Reverse Voltage

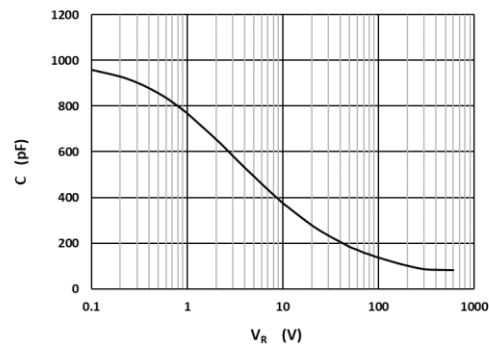


Fig 6: Reverse Charge vs. Reverse Voltage

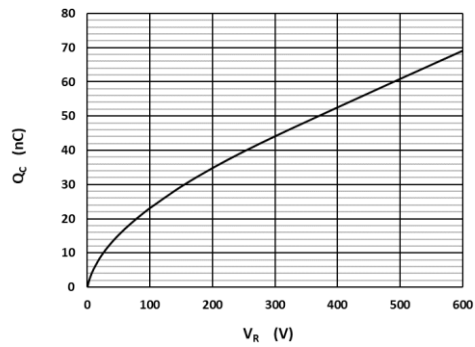


Fig 7: Typical Capacitance Stored Energy

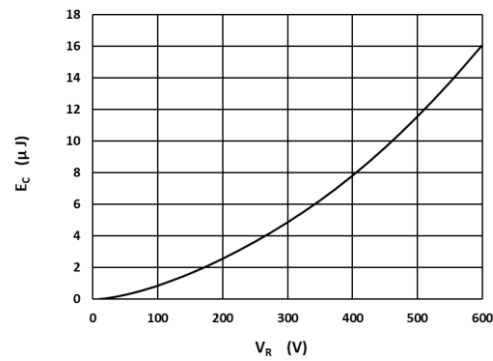
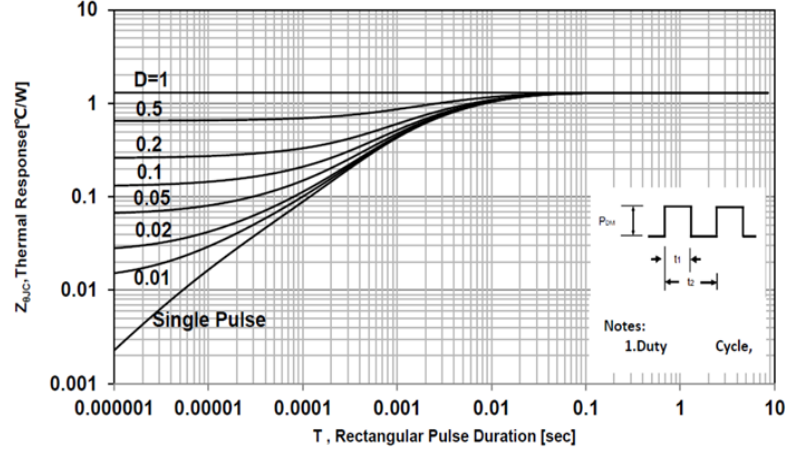
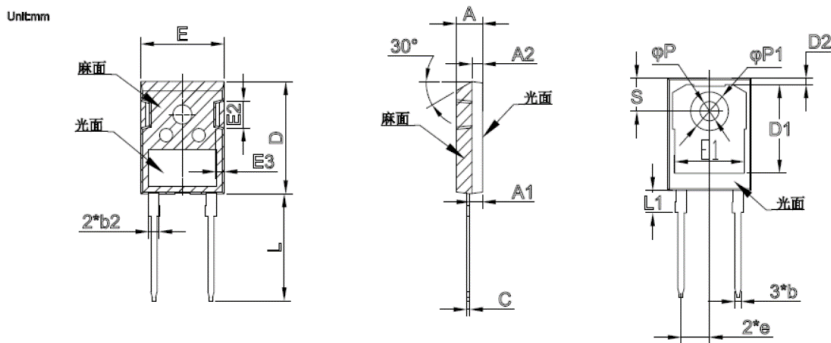


Fig 8: Transient Thermal Impedance




Mechanical Dimensions:



| TO247-2L |       |       |       |    |       |       |       |
|----------|-------|-------|-------|----|-------|-------|-------|
|          | Min   | Nom   | Max   |    | Min   | Nom   | Max   |
| A        | 4.70  | 5.00  | 5.20  | E1 | 13.06 | 13.26 | 13.56 |
| A1       | 2.30  |       | 2.50  | E2 | 4.90  | 5.00  | 5.10  |
| A2       | 1.90  | 2.00  | 2.10  | E3 | 1.50  | 1.60  | 1.70  |
| b        | 1.10  | 1.20  | 1.30  | e  | 5.34  | 5.44  | 5.54  |
| b2       |       | 2.00  |       | L  | 19.80 | 20.00 | 20.32 |
|          |       |       |       | L1 |       | 4.17  | 4.50  |
| C        | 0.5   | 0.6   | 0.7   | P  | 3.50  | 3.60  | 3.70  |
| D        | 20.8  | 20.95 | 21.1  | P1 | 7.00  | 7.19  | 7.40  |
| D1       |       | 16.55 |       | S  | 6.04  | 6.15  | 6.3   |
| D2       | 0.95  | 1.17  | 1.35  |    |       |       |       |
| E        | 15.48 | 15.88 | 16.28 |    |       |       |       |

Contact Information

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Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

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