

HCW65D30D1A

SiC Automotive Silicon Carbide Schottky Diode

650V, 30A

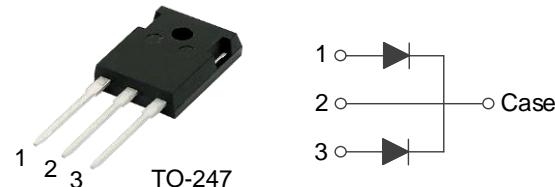
Description

The 650V SiC is an advanced Power Master Semiconductor's silicon carbide diode family. This technology combines the benefits of excellent low forward voltage and robustness. Consequently, the SiC family is suitable for application requiring high power efficiency.

Features

| V _{RRM} | I _F | T _{J,max} | Q _C |
|------------------|----------------|--------------------|----------------|
| 650 V | 16 / 30 A | 175 °C | 61 nC |

- No reverse recovery current
- Low forward voltage
- 175°C Max junction temperature
- High surge current capability
- Switching behavior independent of temperature
- AEC Q101 Qualified
- Pb-Free, Halogen Free and RoHS compliant



Applications

- OBC (On Board Charger)
- DC/DC Converter for EV/HEV
- Wireless Charger

Absolute Maximum Ratings (Per Leg / Device & Per Leg, T_C = 25°C unless otherwise noted)

| Symbol | Parameter | | Value | Unit |
|-----------------------------------|--|--|-------------|------------------|
| V _{RRM} | Repetitive Peak Reverse Voltage | | 650 | V |
| I _F | Forward Current | T _C =136°C | 16 / 30 | A |
| I _{F,SM} | Non-Repetitive Forward Surge Current | T _C =25°C, t _p =10 ms | 86 | A |
| | | T _C =150°C, t _p =10 ms | 68 | A |
| I _{F,Max} | Non-Repetitive Peak Forward Current | T _C =25°C, t _p =10 us | 880 | A |
| | | T _C =150°C, t _p =10 us | 750 | A |
| I ² dt value | $\int I^2 dt$ | T _C =25°C, t _p =10 ms | 37 | A ² s |
| | | T _C =150°C, t _p =10 ms | 23 | A ² s |
| P _{tot} | Power Dissipation | T _C =25°C | 107 | W |
| T _J , T _{STG} | Operating Junction and Storage Temperature | | -55 to +175 | °C |

Thermal Characteristics

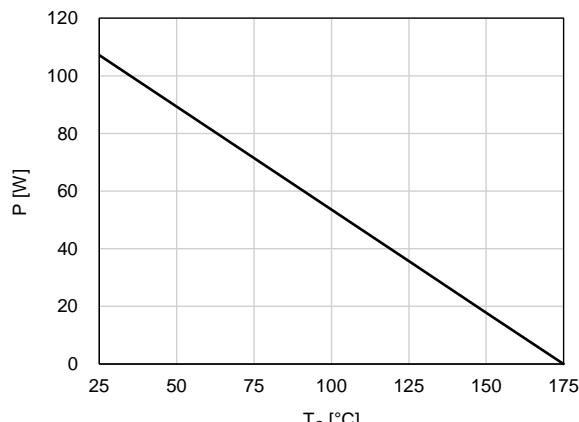
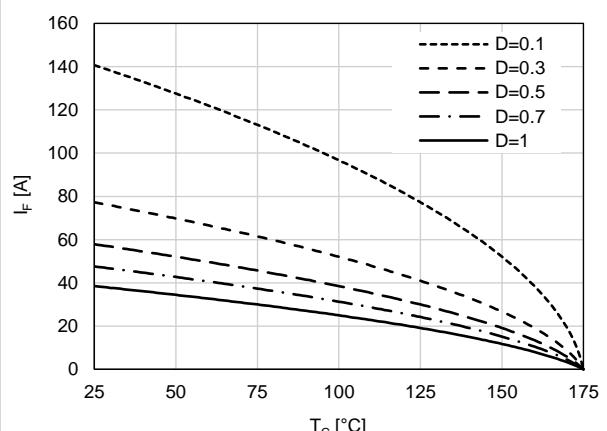
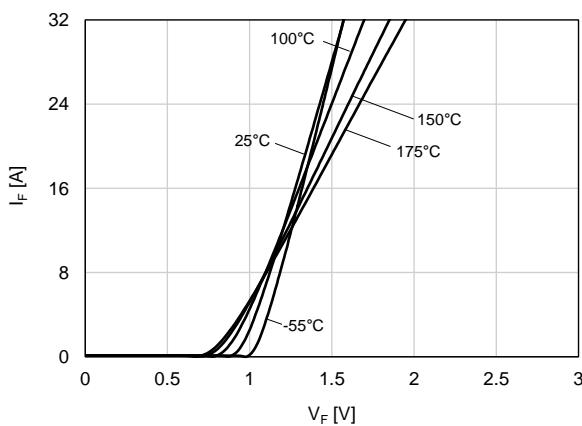
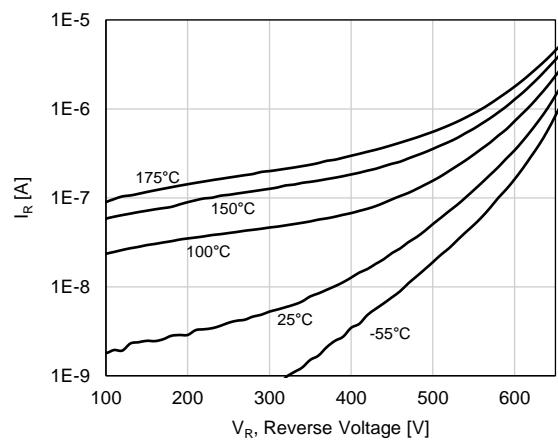
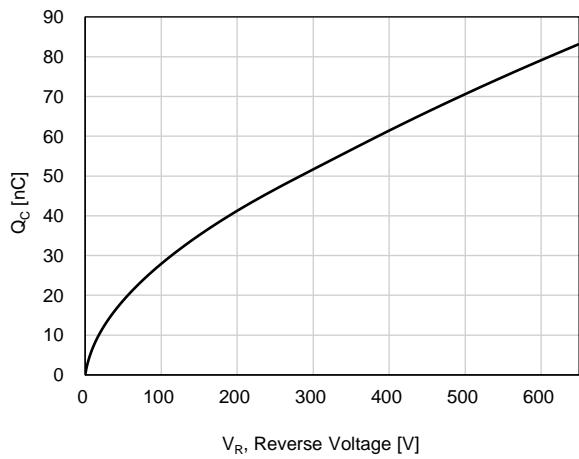
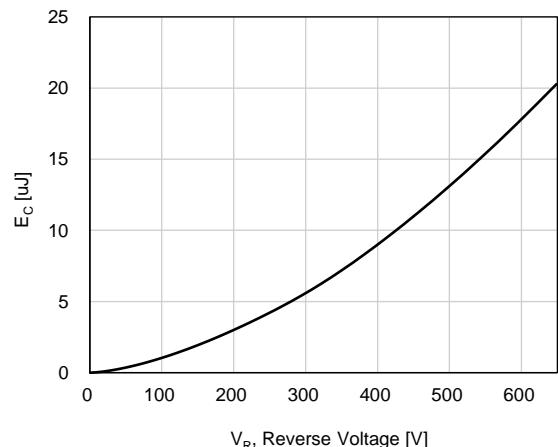
| Symbol | Parameter | Value | Unit |
|------------------|--|-----------|------|
| R _{θJC} | Thermal Resistance, Junction to Case, Max.(Per Leg / Per Device) | 1.4 / 0.7 | °C/W |

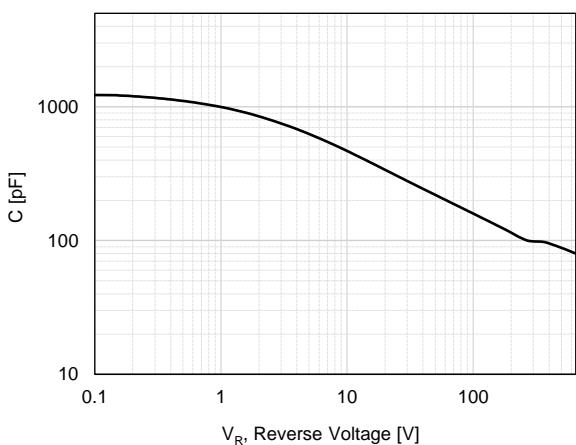
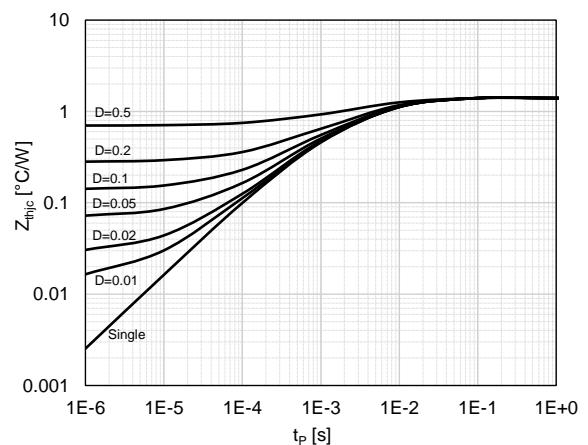
Package Marking and Ordering Information

| Part Number | Top Marking | Package | Packing Method | Quantity |
|-------------|-------------|---------|----------------|----------|
| HCW65D30D1A | HCW65D30D1A | TO-247 | Tube | 30 units |

Electrical Characteristics (Per Leg, $T_C = 25^\circ\text{C}$ unless otherwise noted)

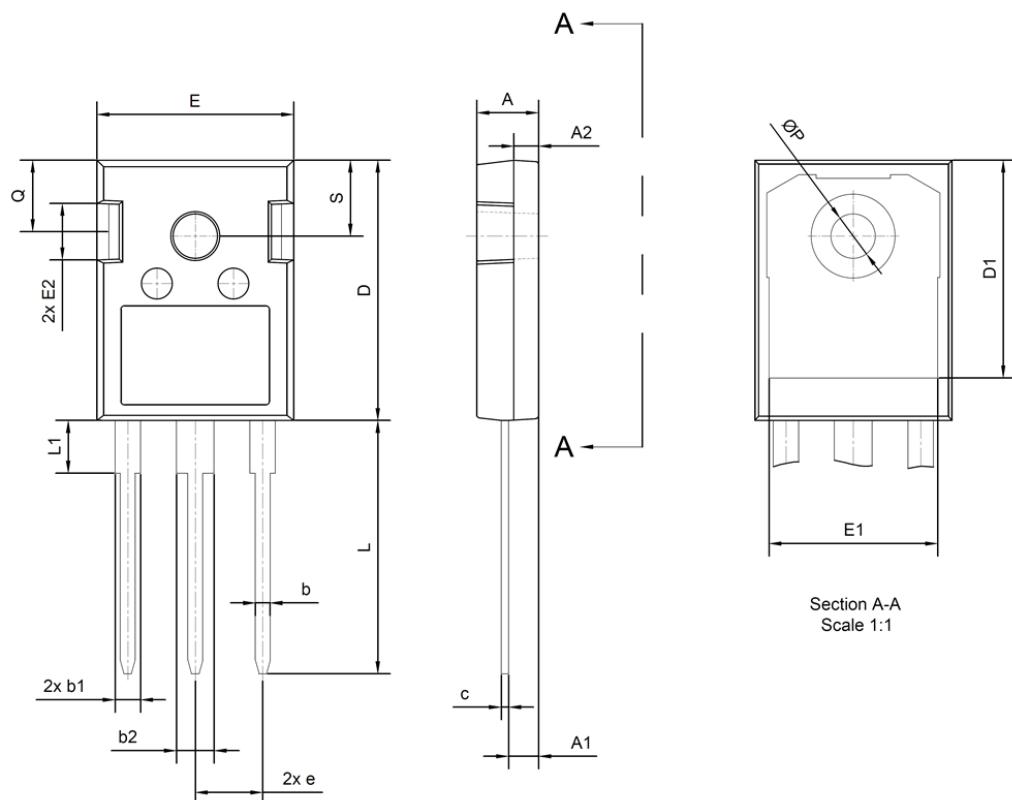
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--------|---------------------------|--|-----|------|-----|---------------|
| V_F | Forward Voltage | $I_F=16 \text{ A}, T_C=25^\circ\text{C}$ | | 1.30 | 1.6 | V |
| | | $I_F=16 \text{ A}, T_C=175^\circ\text{C}$ | | 1.45 | - | |
| I_R | Reverse Current | $V_R=650 \text{ V}, T_C=25^\circ\text{C}$ | | - | 100 | μA |
| | | $V_R=650 \text{ V}, T_C=175^\circ\text{C}$ | | - | 300 | |
| Q_C | Total Capacitive Charge | $V_R=400 \text{ V}, T_C=25^\circ\text{C}$ | | 61 | | nC |
| C | Total Capacitance | $V_R=1 \text{ V}, f=100 \text{ kHz}$ | | 997 | | pF |
| | | $V_R=400 \text{ V}, f=100 \text{ kHz}$ | | 95 | | |
| E_C | Capacitance Stored Energy | $V_R=400 \text{ V}, T_C=25^\circ\text{C}$ | | 9 | | μJ |

Typical Performance Characteristics (Per Leg)**Figure 1. Power Derating****Figure 2. Current Derating****Figure 3. Forward Characteristics****Figure 4. Reverse Characteristics****Figure 5. Capacitive Charge Characteristic****Figure 6. Capacitance Stored Energy**

Typical Performance Characteristics (Per Leg)**Figure 7. Capacitance Characteristic****Figure 8. Transient Thermal Response Curve**

Package Outlines

TO-247



Section A-A
Scale 1:1

| SYMBOL | Common | | |
|--------|--------------------------|-------|-------|
| | DIMENSIONS MILLIMETER | | |
| | MIN. | NOM. | MAX. |
| A | 4.80 | 5.00 | 5.20 |
| A1 | 2.29 | 2.42 | 2.54 |
| A2 | 1.90 | 2.00 | 2.10 |
| b | 1.10 | 1.20 | 1.30 |
| b1 | 1.91 | 2.06 | 2.20 |
| b2 | 2.92 | 3.06 | 3.20 |
| c | 0.50 | 0.60 | 0.70 |
| D | 20.80 | 21.07 | 21.34 |
| D1 | 17.23 | 17.63 | 18.03 |
| E | 15.75 | 15.94 | 16.13 |
| E1 | 13.46 | 13.66 | 13.86 |
| E2 | 4.32 | 4.58 | 4.83 |
| e | 5.46 BSC | | |
| L | 19.85 | 20.05 | 20.25 |
| L1 | 4.05 | 4.27 | 4.48 |
| ØP | 3.56 | 3.61 | 3.66 |
| Q | 5.38 | 5.79 | 6.20 |
| S | 6.15 BSC | | |