

650V/20A

SiC Schottky Barrier Diode

Characteristic

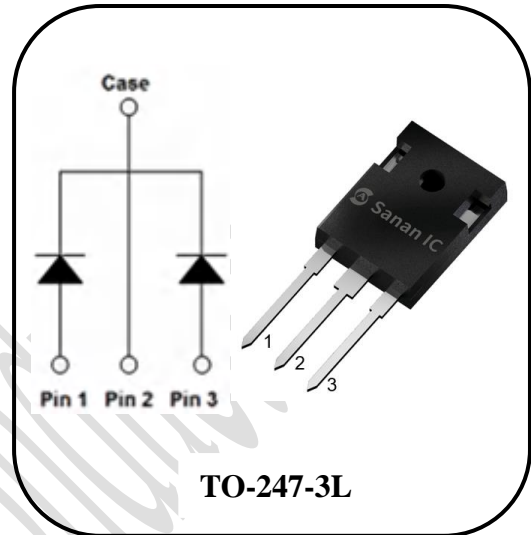
- Zero Reverse Recovery Current
- Positive temperature coefficient
- Temperature-independent performance
- High-speed switching
- Low switching loss
- Low heat dissipation requirements

Application

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

Product Description

|                     |     |    |
|---------------------|-----|----|
| $V_{RRM}$           | 650 | V  |
| $I_F(135^{\circ}C)$ | 12* | A  |
| $Q_C$               | 28* | nC |



| Device       | Package   | Marking    |
|--------------|-----------|------------|
| SDS065J020G2 | TO-247-3L | DS065020G2 |

Absolute Maximum Ratings

| Parameter                                      | Symbol        | Value   | Unit        | Test Conditions                                      |
|--|---------------|---------|-------------|--|
| Reverse voltage (Repetitive peak)              | $V_{RRM}$     | 650     | V           | $T_C=25^{\circ}C$                                    |
| Reverse Voltage (Surge peak)                   | $V_{RSM}$     | 650     |             | $T_C=25^{\circ}C$                                    |
| Reverse voltage (DC)                           | $V_{DC}$      | 650     |             | $T_C=25^{\circ}C$                                    |
| Continuous forward current<br>(Per Leg/Device) | $I_F$         | 25/50   | A           | $T_C=25^{\circ}C$                                    |
|  |               | 12/24   |             | $T_C=135^{\circ}C$                                   |
|  |               | 10/20   |             | $T_C=147^{\circ}C$                                   |
| Surge non-repetitive forward current           | $I_{FSM}$     | 80*     | A           | $T_C=25^{\circ}C, t_p=10ms, half\ Sine\ Pulse$       |
| Repetitive Peak Forward Surge Current          | $I_{FRM}$     | 50*     | A           | $T_C=25^{\circ}C, t_p=10ms, half\ Sine\ Wave\ D=0.1$ |
| Total power dissipation                        | $P_{TOT}$     | 91*     | W           | $T_C=25^{\circ}C$                                    |
| $i^2t$ value                                   | $\int i^2 dt$ | 32*     | $A^2s$      | $T_C=25^{\circ}C, t_p=10ms$                          |
| Operating temperature                          | $T_j$         | -55~175 | $^{\circ}C$ |  |
| storage temperature                            | $T_{stg}$     | -55~175 | $^{\circ}C$ |  |
| Mounting Torque                                | M             | 1       | Nm          | M3 Screw   |

### Thermal Characteristics

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

\*\* Per device \* Per leg

### Electrical Characteristics (Per Leg) $T_j=25^\circ\text{C}$

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

### Typical Electrical Characteristics Curves

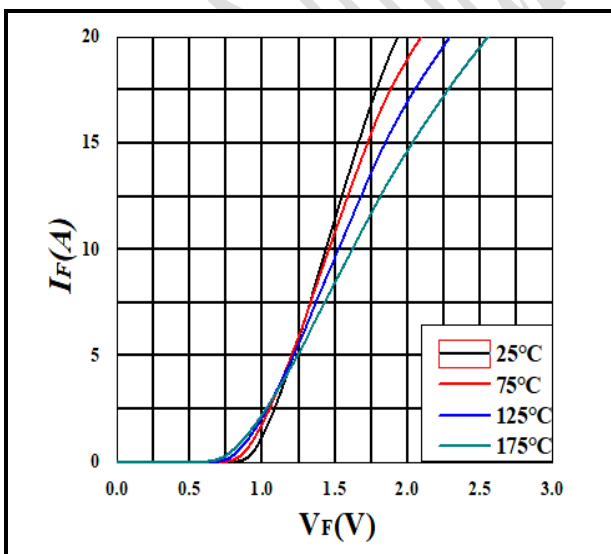


Figure 1. Forward Characteristics

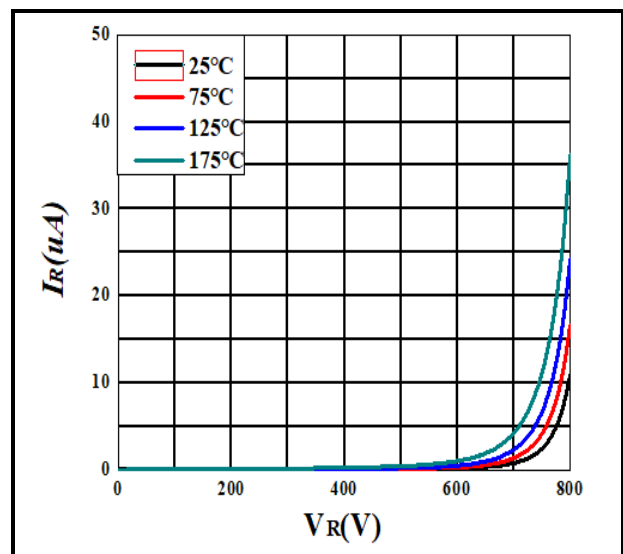


Figure 2. Reverse Characteristics

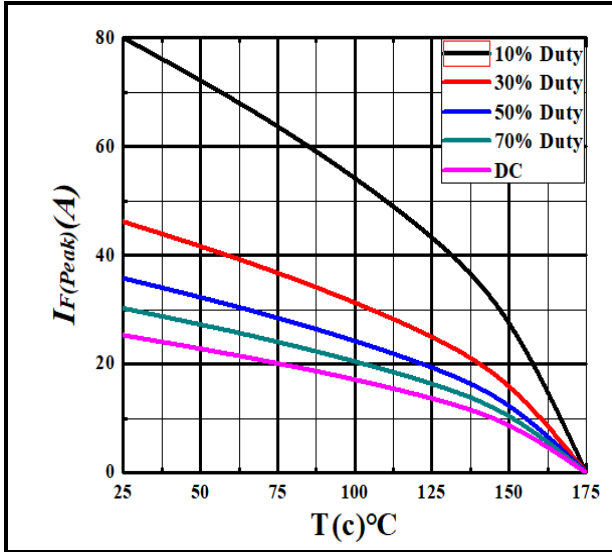


Figure 3. Current Derating

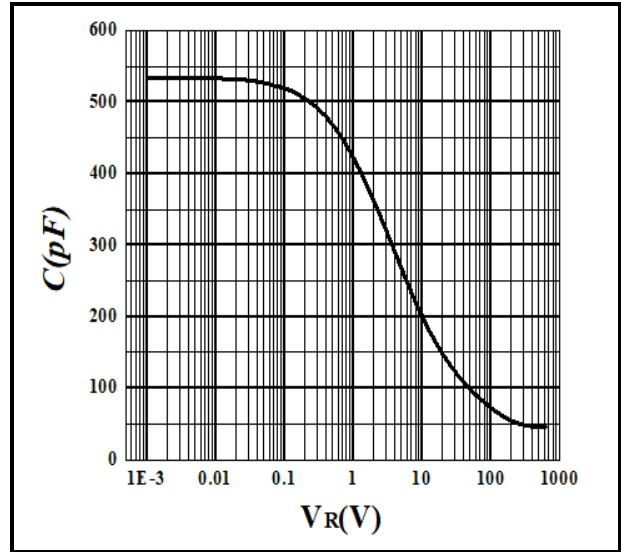


Figure 4. Capacitance vs. Reverse Voltage

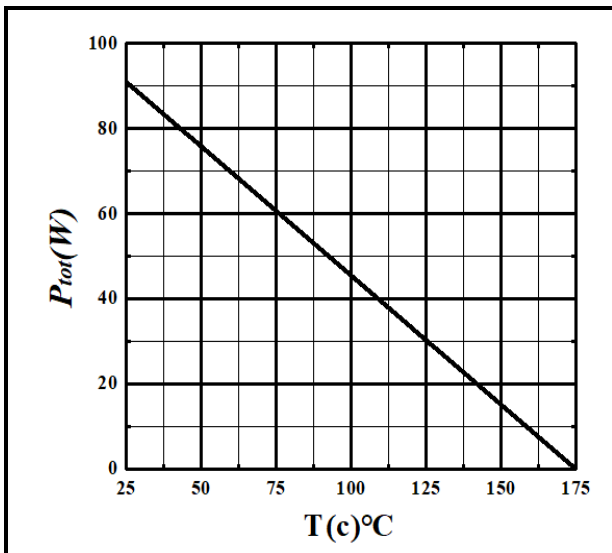


Figure 5. Power Derating

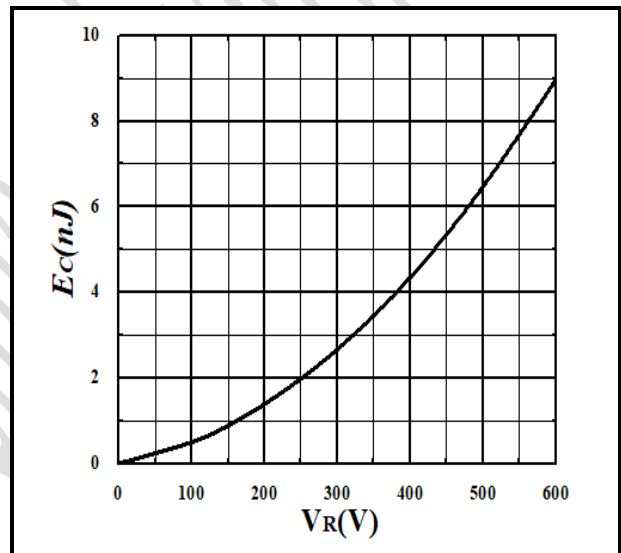


Figure 6. Capacitance Stored Energy

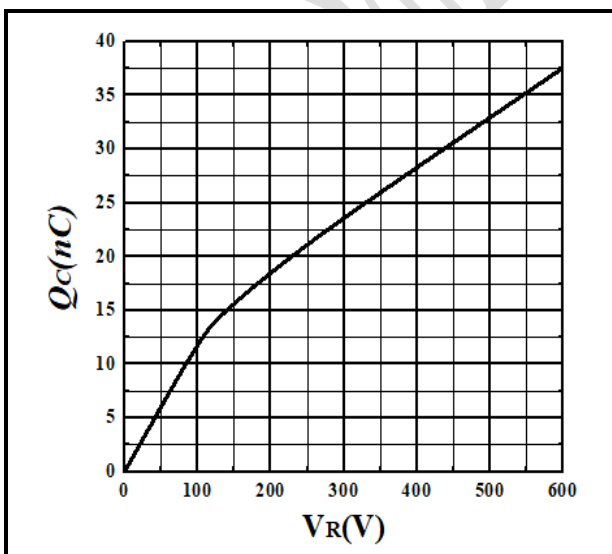
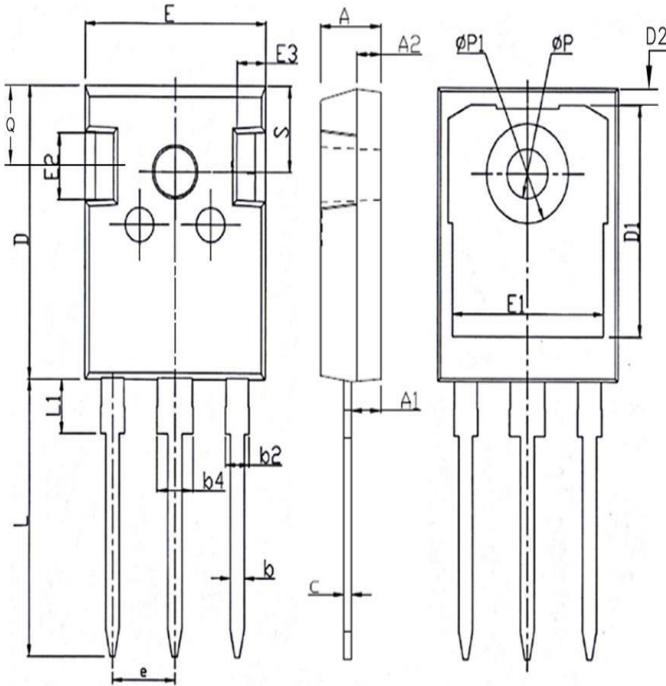


Figure 7. Total Capacitance Charge vs. Reverse Voltage

## 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 |       |       |

## Ordering information

|               |                    |
|---------------|--------------------|
| Part Number   | SDS065J020G2-ISATH |
| Package       | TO-247-3L          |
| Unit Quantity | 300 EA             |
| Packing Type  | Tube               |
| RoHS          | Yes                |