

## Features

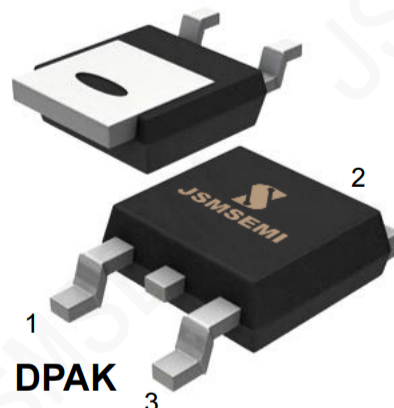
- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on  $V_F$
- Temperature Independent Switching Behavior
- High surge current capability

## Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

## Applications

- Motor Drives
- Solar / Wind Inverters
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies



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

| Parameter                             | Symbol    | Test conditions                                                                                                                                                                            | Value           | Unit             |
|---------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| Peak Repetitive Reverse Voltage       | $V_{RRM}$ |                                                                                                                                                                                            | 650             | V                |
| Peak Reverse Surge Voltage            | $V_{RSM}$ |                                                                                                                                                                                            | 650             | V                |
| DC Blocking Voltage                   | $V_R$     |                                                                                                                                                                                            | 650             | V                |
| Continuous Forward Current            | $I_F$     | $T_C=25^\circ\text{C}$<br>$T_C=135^\circ\text{C}$<br>$T_C=150^\circ\text{C}$                                                                                                               | 38<br>16<br>10  | A                |
| Non repetitive Forward Surge Current  | $I_{FSM}$ | $T_C = 25^\circ\text{C}$ , $t_p=10$ ms,<br>Half Sine Pulse<br>$T_C = 110^\circ\text{C}$ , $t_p=10$ ms,<br>Half Sine Pulse<br>$T_C = 25^\circ\text{C}$ , $t_p=10$ $\mu\text{s}$ ,<br>Square | 65<br>55<br>520 | A                |
| Repetitive peak Forward Surge Current | $I_{FRM}$ | $T_C = 25^\circ\text{C}$ , $t_p=10$ ms,<br>Freq = 0.1Hz, 100 cycles,<br>Half Sine Pulse<br>$T_C = 110^\circ\text{C}$ , $t_p=10$ ms,<br>Freq = 0.1Hz, 100 cycles,<br>Half Sine Pulse        | 55<br>45        | A                |
| Total power dissipation               | $P_D$     | $T_C=25^\circ\text{C}$                                                                                                                                                                     | 107             | W                |
| Operating Junction Temperature        | $T_J$     |                                                                                                                                                                                            | -55 to 175      | $^\circ\text{C}$ |
| Storage Temperature                   | $T_{STG}$ |                                                                                                                                                                                            | -55 to 175      | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

## Electrical Characteristics

| Parameter               | Symbol   | Test conditions                                               | Min | Typ  | Max | Unit    |
|-------------------------|----------|---------------------------------------------------------------|-----|------|-----|---------|
| DC Blocking Voltage     | $V_{DC}$ | $I_R = 250\mu A, T_J = 25^\circ C$                            | 650 |      |     | V       |
| Forward Voltage         | $V_F$    | $I_F = 10A, T_J = 25^\circ C$                                 |     | 1.45 | 1.8 | V       |
|                         |          | $I_F = 10A, T_J = 125^\circ C$                                |     | 1.55 |     |         |
|                         |          | $I_F = 10A, T_J = 175^\circ C$                                |     | 1.7  |     | V       |
| Reverse Current         | $I_R$    | $V_R = 650V, T_J = 25^\circ C$                                |     | 12   | 80  | $\mu A$ |
|                         |          | $V_R = 650V, T_J = 125^\circ C$                               |     | 68   |     | $\mu A$ |
|                         |          | $V_R = 650V, T_J = 175^\circ C$                               |     | 190  |     | $\mu A$ |
| Total Capacitive Charge | $Q_C$    | $V_R = 400V, I_F = 10A, di/dt = 200A/\mu s, T_J = 25^\circ C$ |     | 23   |     | nC      |
| Total Capacitance       | C        | $V_R = 1V, T_J = 25^\circ C, Freq = 1MHz$                     |     | 380  |     | pF      |
|                         |          | $V_R = 300V, T_J = 25^\circ C, Freq = 1MHz$                   |     | 38   |     |         |
|                         |          | $V_R = 550V, T_J = 25^\circ C, Freq = 1MHz$                   |     | 31   |     |         |

Note: This is a majority carrier diode, so there is no reverse recovery charge

## Thermal Characteristics

| Parameter          | Symbol        | Condition     | Min | Typ | Max | Unit         |
|--------------------|---------------|---------------|-----|-----|-----|--------------|
| Thermal Resistance | $R_{th(j-c)}$ | junction-case |     | 1.4 |     | $^\circ C/W$ |

## Ordering Information

| Order number | Package | Marking    | Operation Temperature Range | MSL Grade | Ship,Quantity | Green |
|--------------|---------|------------|-----------------------------|-----------|---------------|-------|
| SC6D10065E   | TO-252  | SC6D10065E | -55 to 175 $^\circ C$       | 1         | T&R,2500      | RoHS  |

## Typical Electrical Curves

Figure 1. Forward Characteristics

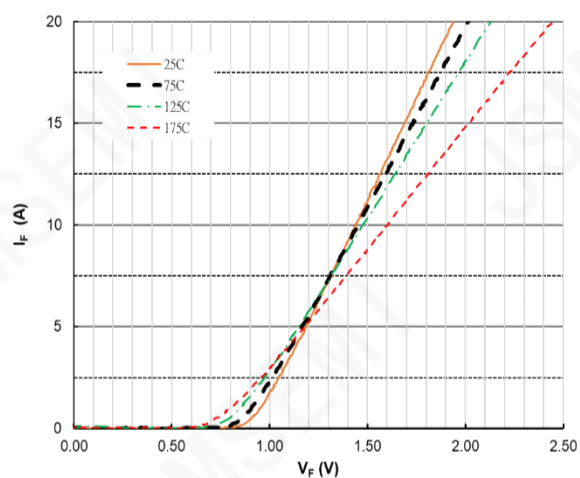


Figure 2. Forward Characteristics

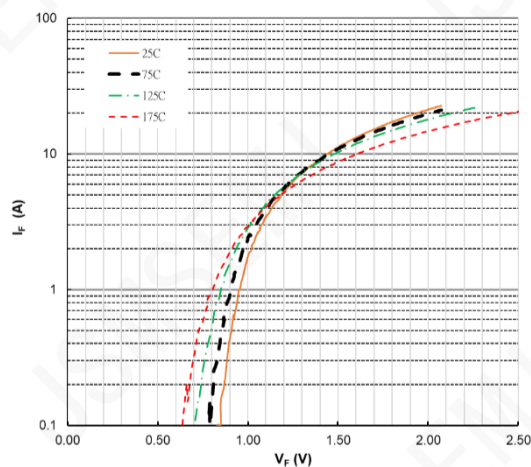


Figure 3. Reverse Characteristics

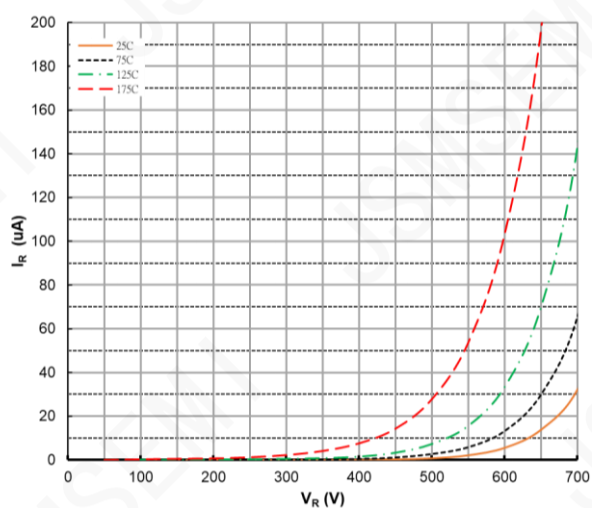


Figure 4. Power Derating

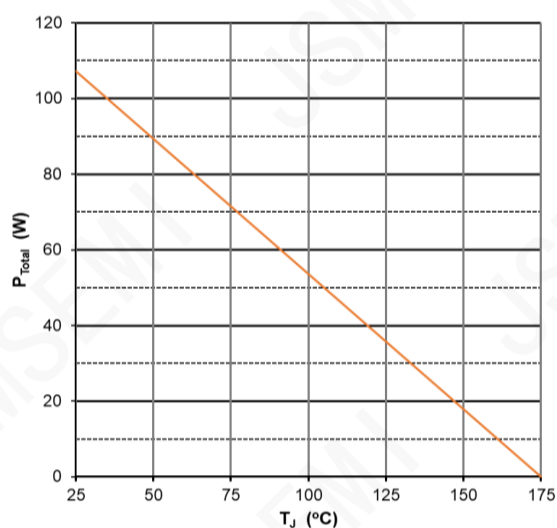


Figure 5. Capacitance vs Reverse Voltage

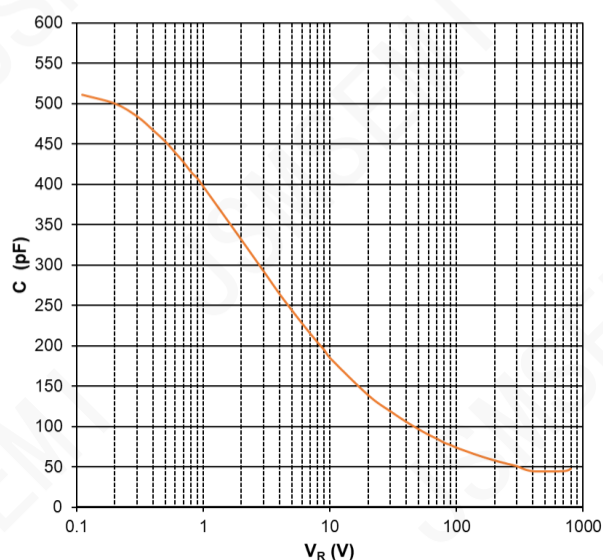
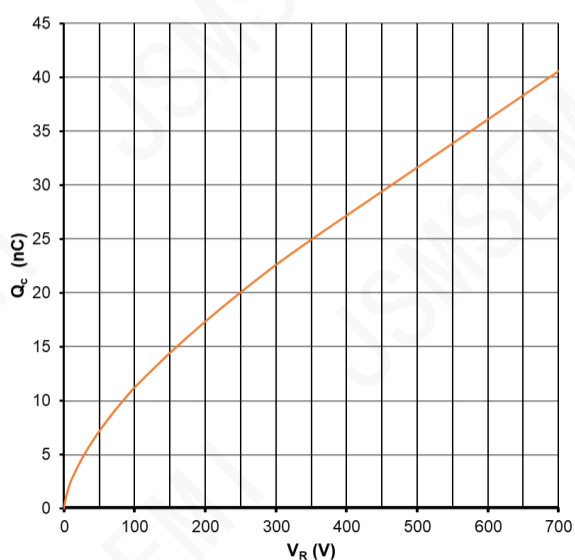
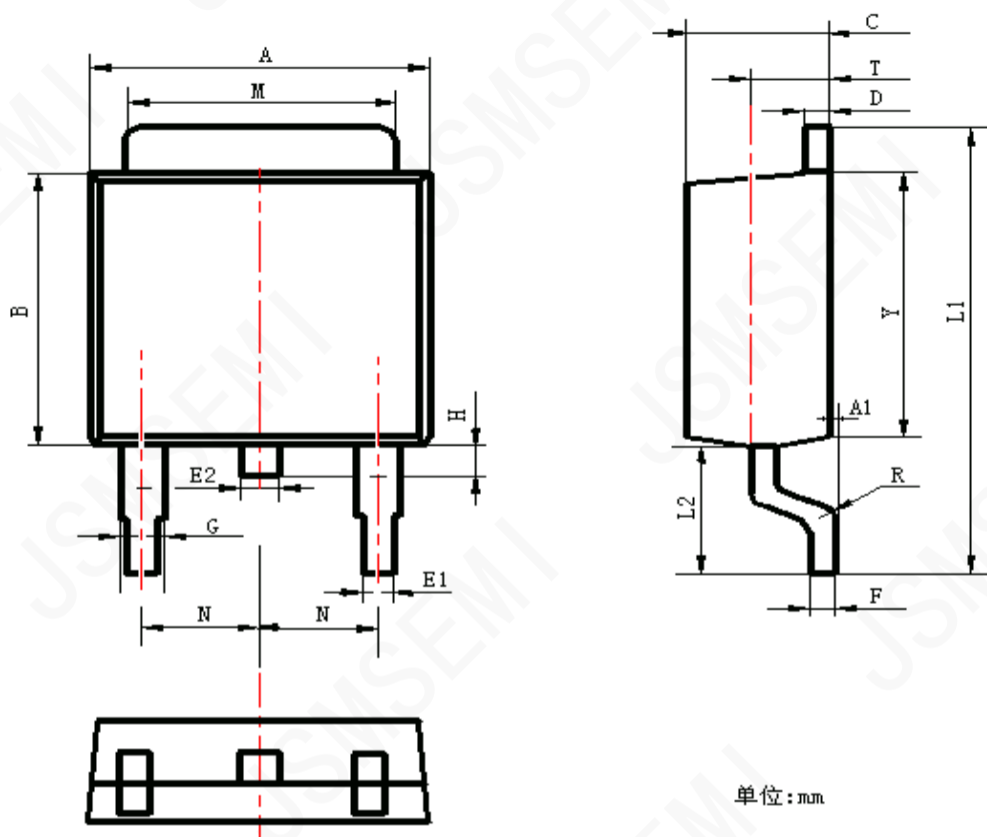


Figure 6. Recovery Charge vs Reverse Voltage



TO-252 Package Information



单位:mm

| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 6.30                      | 6.90  | 0.248                | 0.272 |
| A1     | 0.00                      | 0.16  | 0.000                | 0.006 |
| B      | 5.70                      | 6.30  | 0.224                | 0.248 |
| C      | 2.10                      | 2.50  | 0.083                | 0.098 |
| D      | 0.30                      | 0.70  | 0.012                | 0.028 |
| E1     | 0.60                      | 0.90  | 0.024                | 0.035 |
| E2     | 0.70                      | 1.00  | 0.028                | 0.039 |
| F      | 0.30                      | 0.60  | 0.012                | 0.024 |
| G      | 0.70                      | 1.20  | 0.028                | 0.047 |
| L1     | 9.60                      | 10.50 | 0.378                | 0.413 |
| L2     | 2.70                      | 3.10  | 0.106                | 0.122 |
| H      | 0.40                      | 1.00  | 0.016                | 0.039 |
| M      | 5.10                      | 5.50  | 0.201                | 0.217 |
| N      | 2.09                      | 2.49  | 0.082                | 0.098 |
| R      | 0.30                      |       | 0.012                |       |
| T      | 1.40                      | 1.60  | 0.055                | 0.063 |
| Y      | 5.10                      | 6.30  | 0.201                | 0.248 |

## Revision History

| Rev. | Change          | Date      |
|------|-----------------|-----------|
| V1.0 | Initial version | 2/23/2022 |
|      |                 |           |

## Important Notice

JSMSEMI Semiconductor (JSMSEMI) PRODUCTS ARE NEITHER DESIGNED NOR INTENDED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS UNLESS THE SPECIFIC JSMSEMI PRODUCTS ARE SPECIFICALLY DESIGNATED BY JSMSEMI FOR SUCH USE. BUYERS ACKNOWLEDGE AND AGREE THAT ANY SUCH USE OF JSMSEMI PRODUCTS WHICH JSMSEMI HAS NOT DESIGNATED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS IS SOLELY AT THE BUYER' S RISK.

JSMSEMI assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using JSMSEMI products.

Resale of JSMSEMI products or services with statements diferent from or beyond the parameters stated by JSMSEMI for that product or service voids all express and any implied warranties for the associated JSMSEMI product or s ervice. JSMSEMI is not responsible or liable for any such statements.

JSMSEMI All Rights Reserved. Information and data in this document are owned by JSMSEMI wholly and may not be edited, reproduced, or redistributed in any way without the express written consent from JSMSEMI.

Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the JSMSEMI product that you intend to use.

For additional information please contact Kevin@jsmsemi.com or visit www.jsmsemi.com