

## 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

- Server/Telecom Power Supplies
- Solar Inverters
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies



TO-220-2



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

| Parameter                                  | Symbol         | Test Conditions                                                  | Value      | Unit             |
|--------------------------------------------|----------------|------------------------------------------------------------------|------------|------------------|
| Repetitive Peak Reverse Voltage            | $V_{RRM}$      | $T_J = 25^\circ\text{C}$                                         | 1200       | V                |
| Surge Peak Reverse Voltage                 | $V_{RSM}$      | $T_J = 25^\circ\text{C}$                                         | 1300       | V                |
| DC Blocking Voltage                        | $V_R$          | $T_C = 25^\circ\text{C}$                                         | 1200       | V                |
| Forward Current                            | $I_F$          | $T_C \leq 135^\circ\text{C}$<br>$T_C \leq 150^\circ\text{C}$     | 17<br>10   | A                |
| Non-Repetitive Forward Surge Current       | $I_{FSM}$      | $T_C = 25^\circ\text{C}$ , $t_p = 8.3\text{ms}$ , Half Sine Wave | 96         | A                |
| Power Dissipation                          | $P_{tot}$      | $T_C = 25^\circ\text{C}$                                         | 185        | W                |
| Maximum Case Temperature                   | $T_C$          |                                                                  | 143        | $^\circ\text{C}$ |
| Operating Junction and Storage Temperature | $T_J, T_{STG}$ |                                                                  | -55 to 175 | $^\circ\text{C}$ |
| TO-220 Mounting Torque                     |                | M3 Screw                                                         | 1          | Nm               |

## Ordering Information

| Order number | Package  | Marking    | Operation Temperature Range | MSL Grade | Ship,Quantity | Green |
|--------------|----------|------------|-----------------------------|-----------|---------------|-------|
| SDSC10120    | TO-220-2 | SC4D10120A | -55 to $175^\circ\text{C}$  | 1         | TUBE,1000     | Rohs  |

## Electrical Characteristics

| Parameter               | Symbol | Test Conditions                                                                                                                   | Typ.            | Max.        | Unit    |
|-------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|---------|
| Forward Voltage         | $V_F$  | $I_F = 10A, T_J = 25^{\circ}C$<br>$I_F = 10A, T_J = 175^{\circ}C$                                                                 | 1.45<br>2.0     | 1.75<br>2.6 | V       |
| Reverse Current         | $I_R$  | $V_R = 1200V, T_J = 25^{\circ}C$<br>$V_R = 1200V, T_J = 175^{\circ}C$                                                             | 5<br>30         | 100<br>300  | $\mu A$ |
| Total Capacitance       | C      | $V_R = 0V, T_J = 25^{\circ}C, f = 1MHz$<br>$V_R = 400V, T_J = 25^{\circ}C, f = 1MHz$<br>$V_R = 800V, T_J = 25^{\circ}C, f = 1MHz$ | 805<br>56<br>42 | /           | pF      |
| Total Capacitive Charge | $Q_C$  | $V_R = 800V, I_F = 10A$<br>$di/dt = 200A/\mu s, T_J = 25^{\circ}C$                                                                | 61              | /           | nC      |

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

## Thermal Characteristics

| Parameter                                | Symbol          | Typ. | Unit          |
|------------------------------------------|-----------------|------|---------------|
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ | 0.81 | $^{\circ}C/W$ |

## Typical Performance

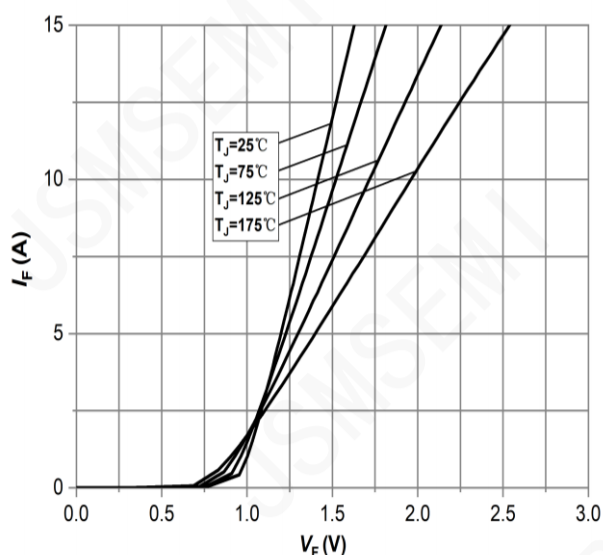


Figure 1: Forward Characteristics

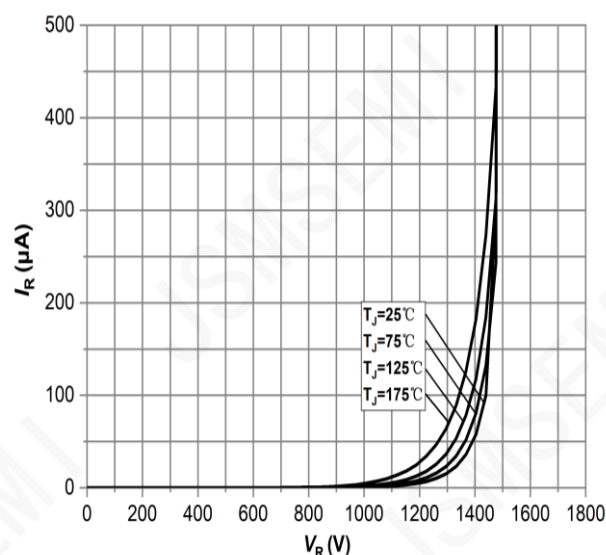


Figure 2: Reverse Characteristics

## Typical Performance

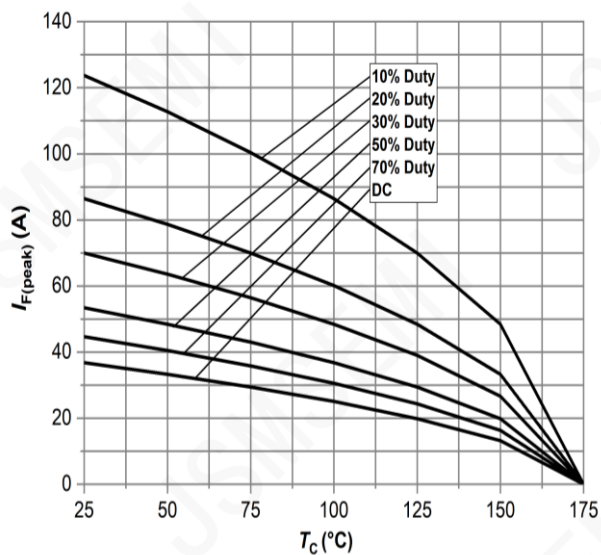


Figure 3: Current Derating

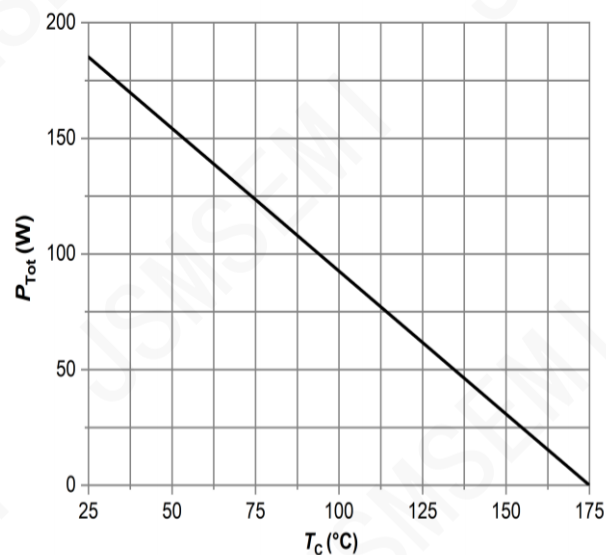


Figure 4: Power Derating

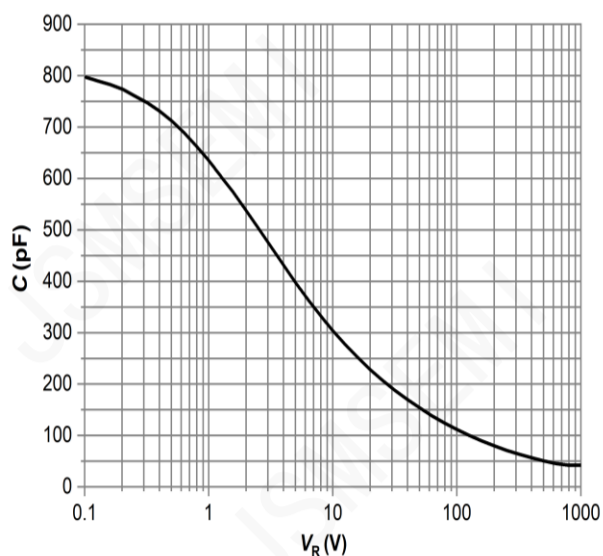


Figure 5: Capacitance vs. Reverse Voltage

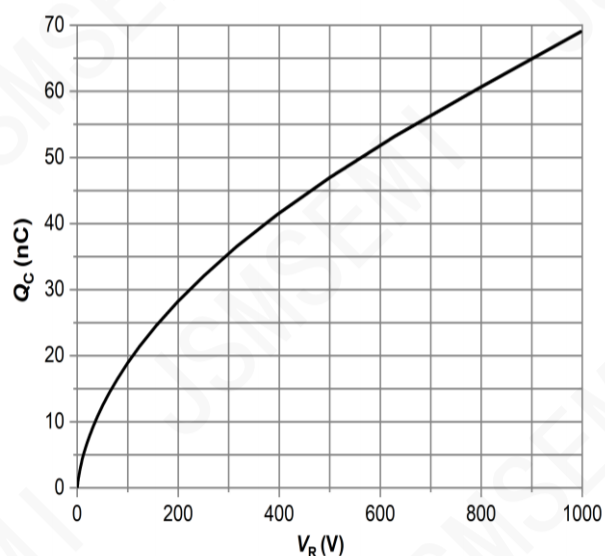


Figure 6: Total Capacitance Charge vs. Reverse

## Typical Performance

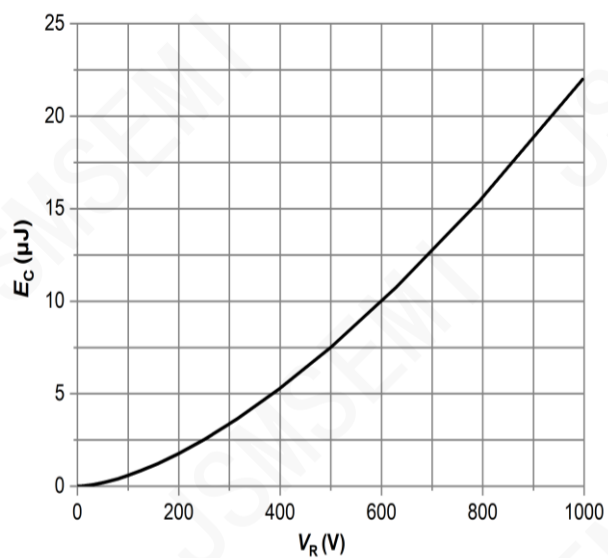


Figure 7: Typical Capacitance Stored Energy

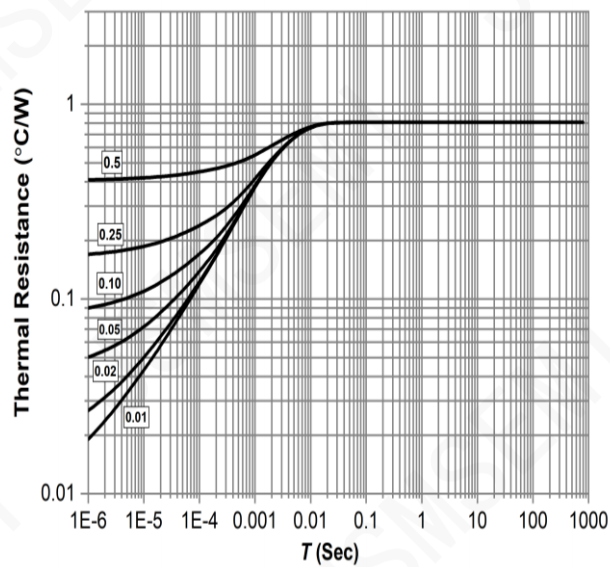
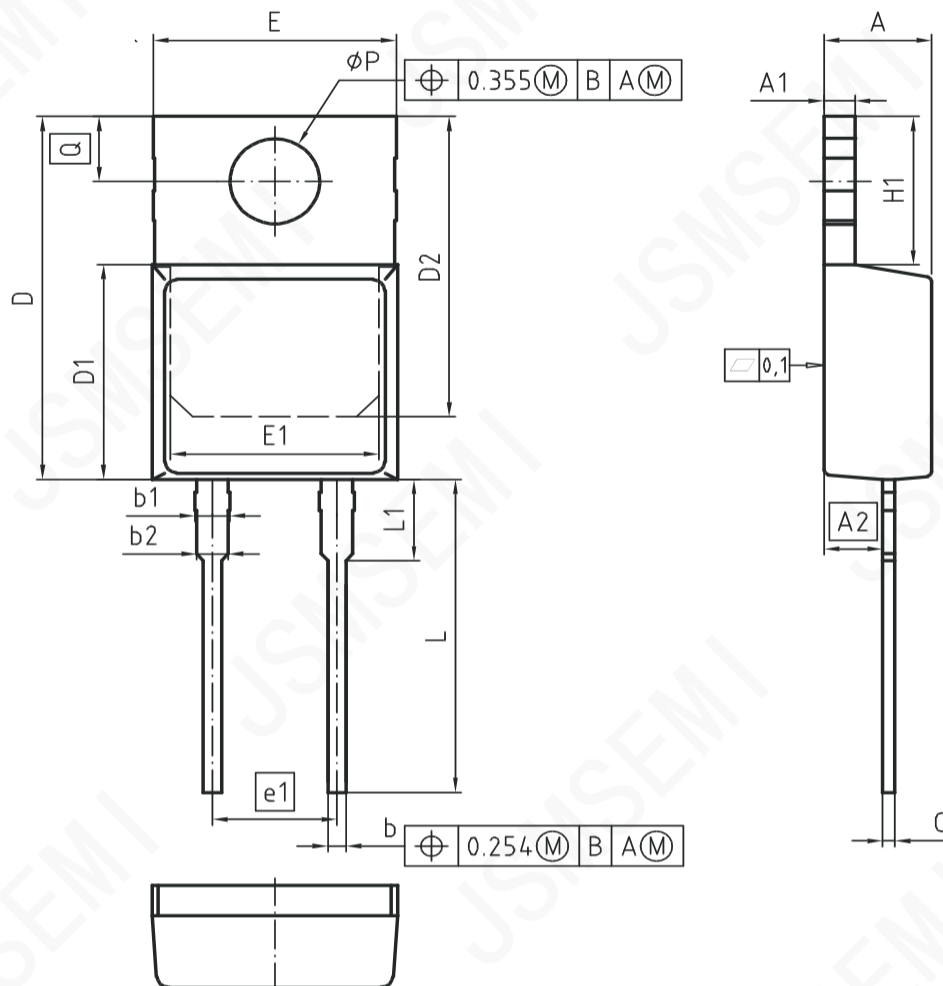


Figure 8: Transient Thermal Impedance

## Package Dimensions

(TO-220-2 Package)



| DIM      | MILLIMETERS |       | INCHES |       |
|----------|-------------|-------|--------|-------|
|          | MIN         | MAX   | MIN    | MAX   |
| A        | 4.30        | 4.50  | 0.169  | 0.177 |
| A1       | 1.17        | 1.37  | 0.046  | 0.054 |
| A2       | 2.30        | 2.50  | 0.091  | 0.098 |
| b        | 0.65        | 0.85  | 0.026  | 0.033 |
| b1       | 1.19        | 1.69  | 0.047  | 0.066 |
| b2       | 1.19        | 1.39  | 0.047  | 0.055 |
| c        | 0.40        | 0.60  | 0.016  | 0.024 |
| D        | 15.35       | 15.95 | 0.604  | 0.628 |
| D1       | 9.05        | 9.45  | 0.356  | 0.372 |
| D2       | 12.30       | 13.05 | 0.484  | 0.514 |
| E        | 9.80        | 10.20 | 0.386  | 0.402 |
| E1       | 7.25        | 8.60  | 0.285  | 0.339 |
| e1       | 5.08        |       | 0.200  |       |
| N        | 2           |       | 2      |       |
| H1       | 5.90        | 6.90  | 0.232  | 0.272 |
| L        | 13.00       | 14.00 | 0.512  | 0.551 |
| L1       | 3.30        | 3.70  | 0.130  | 0.146 |
| $\phi P$ | 3.55        | 3.90  | 0.140  | 0.146 |
| Q        | 2.60        | 3.00  | 0.102  | 0.118 |

## Revision History

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

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