## Product Summary

| $V_{RRM}$ (V) | $I_O$ (A) | $V_{F\ (Max)}$ (V) @ +25°C | $I_{R\ (Typ)}$ (µA) @ +25°C |
|---|---|---|---|
| 650 | 10 | 1.7 | 1.2 |

## Features and Benefits

- Low Conduction and Switching Loss
- High-Temperature Application
- Positive Temperature Coefficient on $V_F$
- Fast Reverse Recovery
- High Surge Current Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

## Description and Applications

Packaged in the robust industry-standard TO252 (Type WX) package, the DIODES™ DSC10C065D1 provides excellent reverse leakage stability at high temperatures. It is ideal for use as a rectifier, freewheel diode, or blocking diode in:

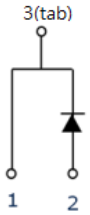
- Power factor correction
- Industrial motor drivers
- Power inverters
- SMPS
- UPS

## Mechanical Data

- Package: TO252
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.310 grams (Approximate)

TO252 (Type WX)






## Ordering Information (Note 4)

| Part Number | Package | Packing | |
|---|---|---|---|
| | | Qty. | Carrier |
| DSC10C065D1-13 | TO252 (Type WX) | 2,500 | Reel |

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.


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## Marking Information




= Manufacturer's Marking
DSC10C065 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 23 = 2023)
WW = Week (01 to 53)
AB = Fab and Assembly Code

## Maximum Ratings (@$T_C$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{DC}$ | 650 | V |
| Average Rectified Output Current | $I_O$ | 10 | A |
| Non-Repetitive Peak Forward Surge Current 10ms Half-Sine Wave Form | $I_{FSM}$ | 47 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance, Junction to Case (Notes 5, 6, 7) | $R_{\theta JC}$ | 3 | °C/W |
| Typical Thermal Resistance, Junction to Lead (Notes 5, 6, 7) | $R_{\theta JL}$ | 2 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +175 | °C |

Notes:
5. Thermal resistance test performed in accordance with JESD-51.
6. With aluminum fin heatsink–100mm×42mm×26mm.
7. Device mounted on 1inch$^2$ copper pad, 2oz. The heat generated must be less than the thermal conductivity from junction to case: $dP_D/dT_J < 1/R_{\theta JC}$ or junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

## Electrical Characteristics (@$T_C$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Voltage | $V_{BR}$ | 650 | — | — | V | $I_R$ = 0.1mA |
| Forward Voltage Drop | $V_F$ | —<br>— | 1.41<br>1.80 | 1.7<br>2.5 | V | $I_F$ = 10A, $T_J$ = +25°C<br>$I_F$ = 10A, $T_J$ = +175°C |
| Leakage Current | $I_R$ | —<br>— | 1.2<br>133 | 230<br>— | μA | $V_R$ = 650V, $T_J$ = +25°C<br>$V_R$ = 650V, $T_J$ = +175°C |
| Total Capacitive Charge | $Q_C$ | — | 27 | — | nC | $I_F$ = 10A, dI/dt = 200A/μs,<br>$V_R$ = 400V, $T_J$ = +25°C |
| Total Capacitance | $C_T$ | —<br>—<br>— | 348<br>273<br>68 | —<br>—<br>— | pF | $V_R$ = 0.1V, $T_J$ = +25°C, f = 1MHz<br>$V_R$ = 1V, $T_J$ = +25°C, f = 1MHz<br>$V_R$ = 40V, $T_J$ = +25°C, f = 1MHz |


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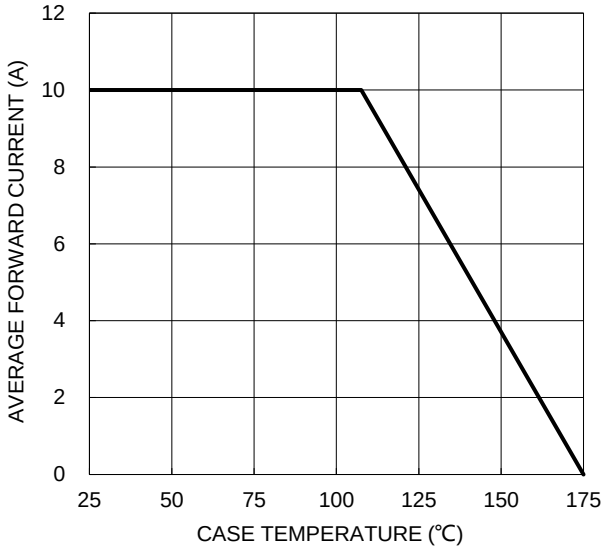



Figure 1. Forward Current Derating Curve

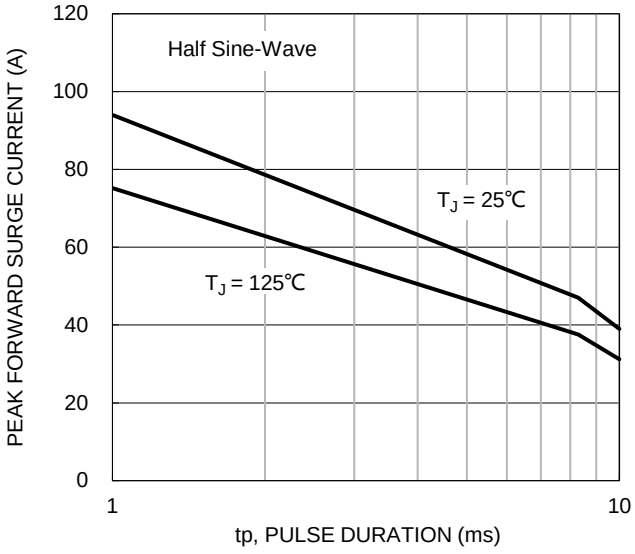



Figure 2. Non-Repetitive Peak Surge Forward Current

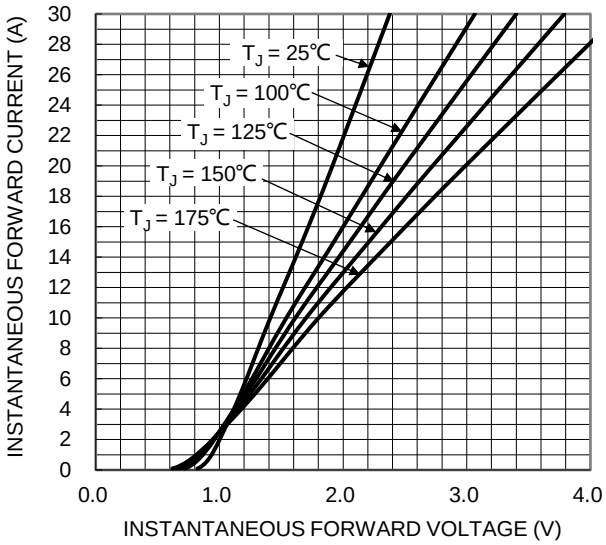



Figure 3. Typical Forward Characteristics

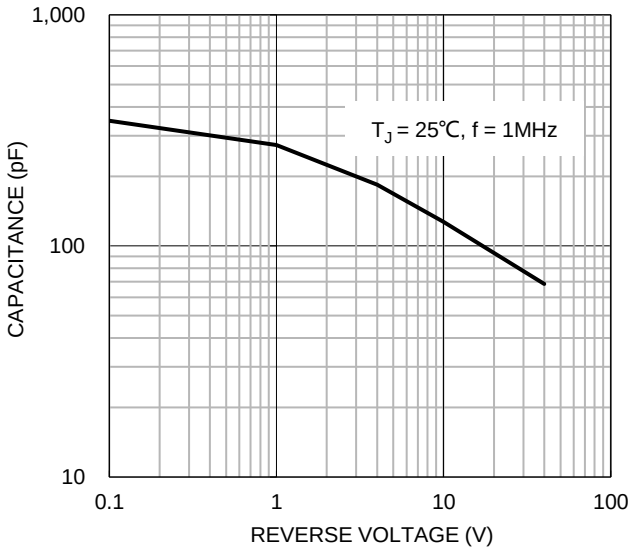



Figure 4. Typical Junction Capacitance

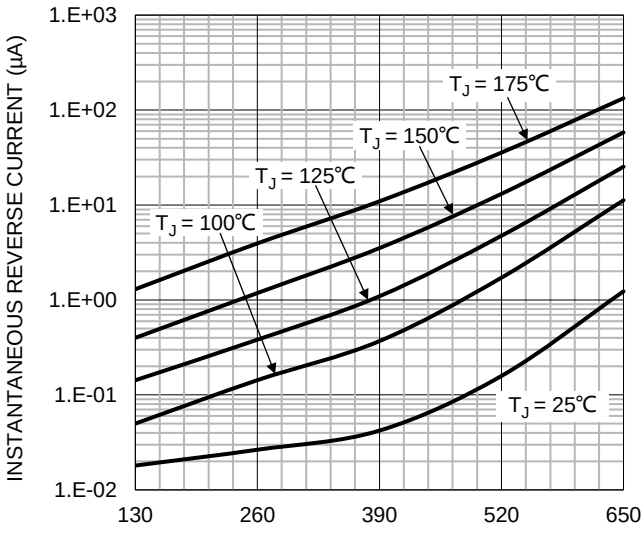



Figure 5. Typical Reverse Characteristics

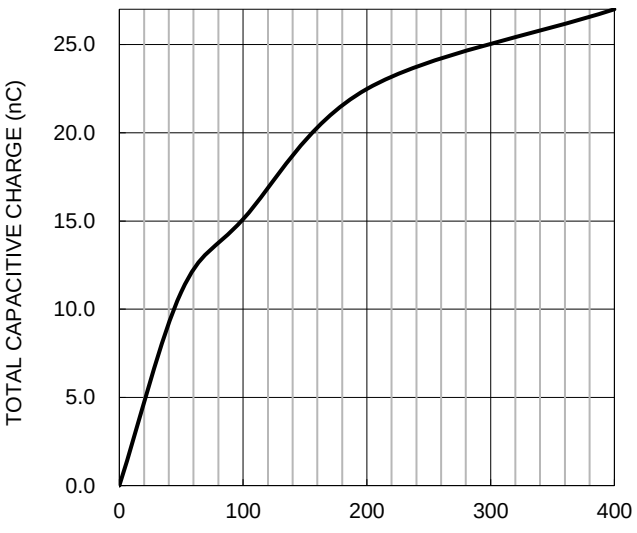


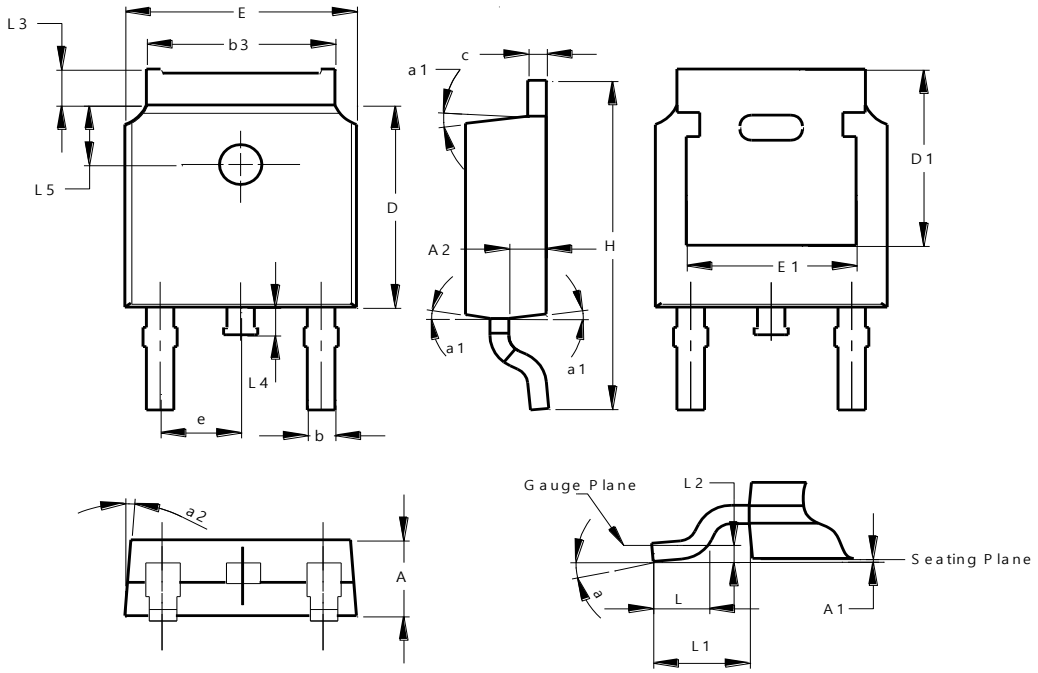

Figure 6. Typical Capacitive Charges


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## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

**TO252 (Type WX)**

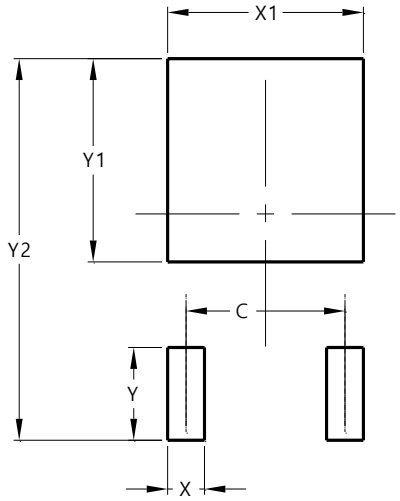



| TO252 (Type WX) | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 2.20 | 2.40 | 2.30 |
| **A1** | 0.00 | 0.15 | -- |
| **A2** | 0.97 | 1.17 | 1.07 |
| **b** | 0.68 | 0.90 | 0.78 |
| **b3** | 5.20 | 5.50 | 5.33 |
| **c** | 0.43 | 0.63 | 0.53 |
| **D** | 5.98 | 6.22 | 6.10 |
| **D1** | 5.30 REF | | |
| **e** | 2.286 REF | | |
| **E** | 6.40 | 6.80 | 6.60 |
| **E1** | 4.63 | 5.03 | 4.83 |
| **H** | 9.40 | 10.50 | 10.10 |
| **L** | 1.38 | 1.75 | 1.50 |
| **L1** | 2.90 REF | | |
| **L2** | 0.51 BSC | | |
| **L3** | 0.88 | 1.28 | -- |
| **L4** | -- | 1.00 | -- |
| **L5** | 1.65 | 1.95 | 1.80 |
| **a** | 0° | 8° | - |
| **a1** | 5° | 9° | 7° |
| **a2** | 5° | 9° | 7° |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**TO252 (Type WX)**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 4.572 |
| **X** | 1.060 |
| **X1** | 5.632 |
| **Y** | 2.600 |
| **Y1** | 5.700 |
| **Y2** | 10.700 |


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