# 2A TRENCH SCHOTTKY BARRIER RECTIFIER CHIP-SCALE PACKAGE

## Product Summary

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ Max (V) | $I_R$ Max (µA) |
|---|---|---|---|
| 60 | 2.0 | 0.58 | 100 |

## Features and Benefits

- Low-Forward Voltage ($V_F$) Minimizes Conduction Losses and Improves Efficiency
- Reduced High-Temperature Reverse Leakage; Increased Reliability Against Thermal Runaway Failure in High-Temperature Operation
- **Totally Lead-Free & Fully 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/**

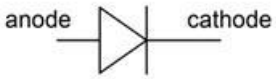
## Description and Applications

The SDT2U60CP3 is a 60-volt 2A trench Schottky barrier rectifier that is optimized for low-forward voltage drop and low-leakage current, housed in a compact chip-scale package (CSP) that occupies only 0.84mm$^2$ board space with low profile. The low thermal resistance enables designers to meet design challenges of increasing efficiency whilst at the same time reducing board space. The SDT2U60CP3 are ideally suited for use in portable applications as:

- Blocking diodes
- Boost diodes
- Switching diodes
- Reverse protection diodes

## Mechanical Data

- Package: X3-DSN1406-2
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiAu Bump. Solderable per MIL-STD-202, Method 208 e4
- Polarity: Cathode Dot
- Weight: 0.001 grams (Approximate)




Device Schematic


## Ordering Information (Note 4)

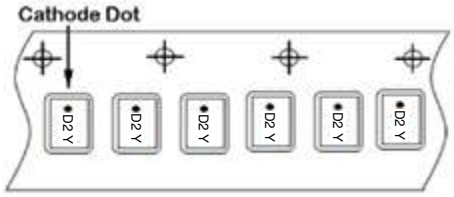
| Part Number | Package | Packing | |
|---|---|---|---|
| | | Qty. | Carrier |
| SDT2U60CP3-7 | X3-DSN1406-2 | 5000 | Tape & Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
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/.

## Marking Information

Pin 1


D2 = Product Type Marking Code
Y = Date Code Marking
Y or $\overline{Y}$ = Year (ex: K = 2023)
Dot Denotes Cathode Pin




Date Code Key

| Year | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | K | L | M | N | P | R | S | T | U | V | W | X |

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

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage | $V_{RRM}$ | 60 | V |
| Average Rectified Output Current | $I_O$ | 2.0 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine Wave Superimposed on Rated Load | $I_{FSM}$ | 18 | A |
| ESD (Human Body Model)<br>ESD (Machine Model) | ESD | 8<br>0.4 | kV |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance Junction to Ambient (Note 5) | $R_{\theta JA}$ | 165 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 6) | $R_{\theta JA}$ | 60 | °C/W |
| Typical Thermal Resistance Junction to Case (Note 5) | $R_{\theta JC}$ | 20 | °C/W |
| Typical Thermal Resistance Junction to Case (Note 6) | $R_{\theta JC}$ | 7 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Forward Voltage Drop | $V_F$ | — | 0.51 | 0.58 | V | $I_F$ = 2.0A, $T_J$ = +25°C |
| | | — | 0.45 | — | | $I_F$ = 2.0A, $T_J$ = +125°C |
| Reverse Current (Note 7) | $I_R$ | — | 7 | 100 | µA | $V_R$ = 60V, $T_J$ = +25°C |
| Junction Capacitance | $C_T$ | — | 110 | — | pF | $V_R$ = 10V, f = 1.0MHz |

Notes: 5. Device mounted on FR-4 PCB, 2oz copper, minimum recommended pad layout per http://www.diodes.com/package-outlines.html.
6. Device mounted on 1inch sq copper pad, 2oz.
7. Short duration pulse test used to minimize self-heating effect.

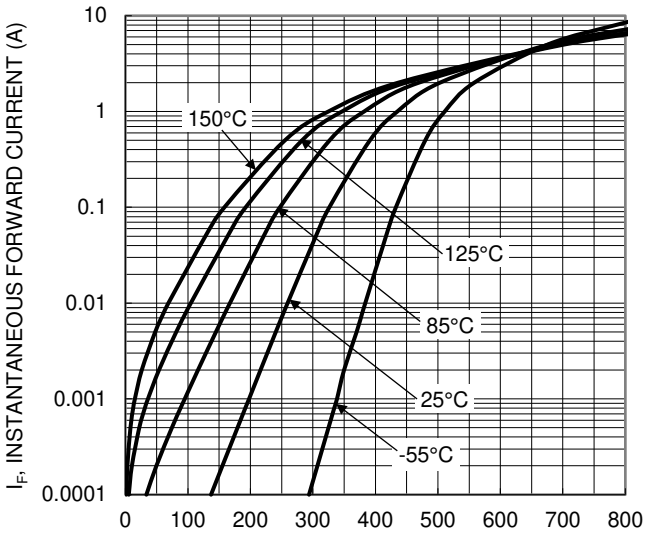



Figure 1. Typical Forward Characteristics

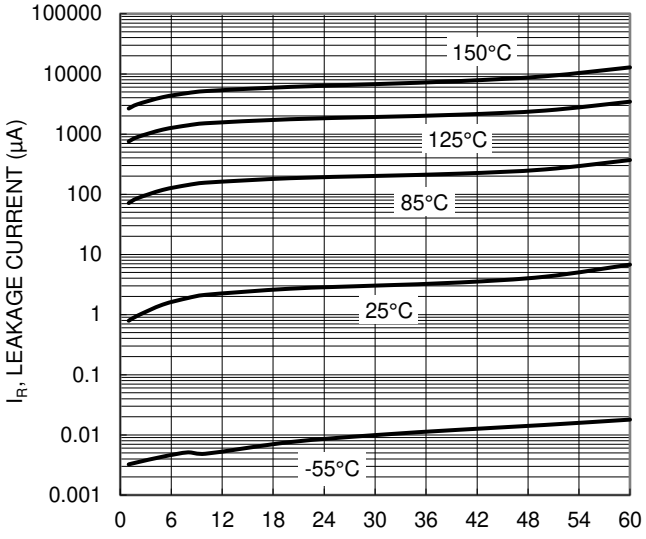



Figure 2. Typical Reverse Characteristics

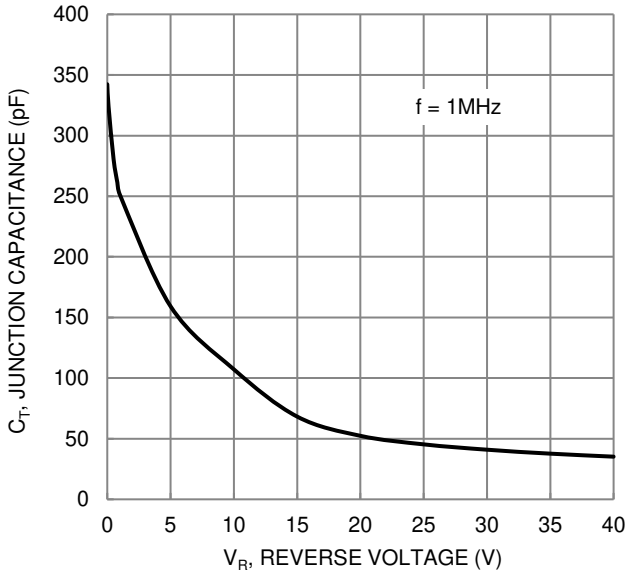



Figure 3. Typical Junction Capacitance

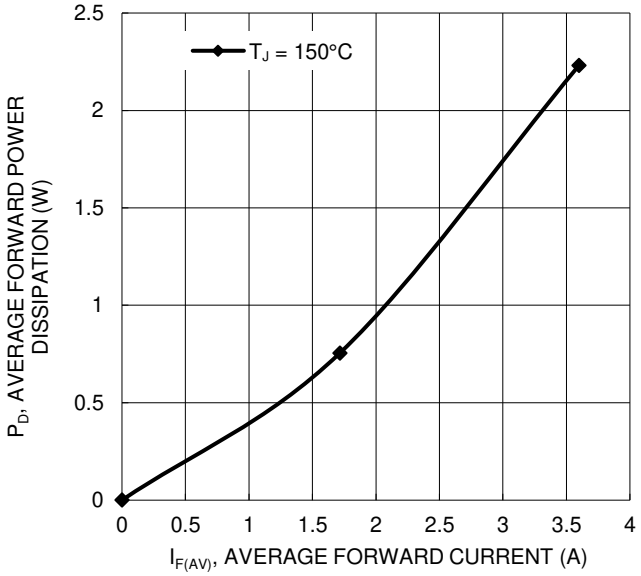
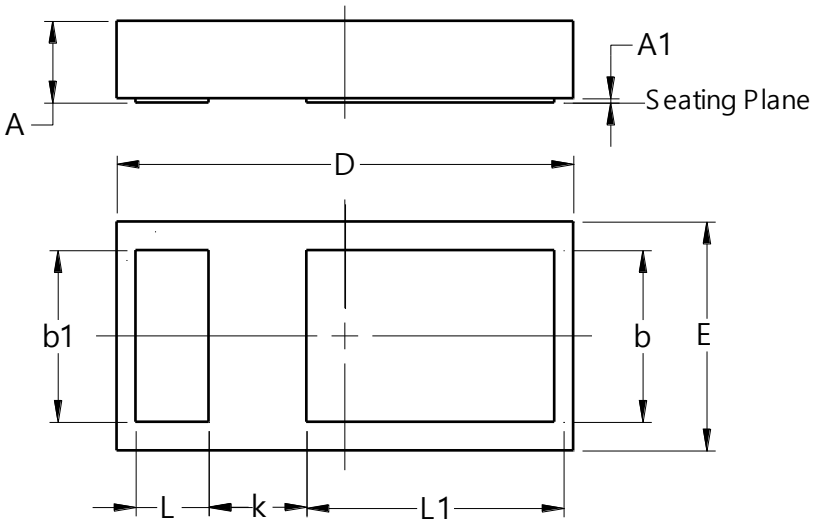



Figure 4. Forward Power Dissipation

## Package Outline Dimensions (Note 8)

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

**X3-DSN1406-2**



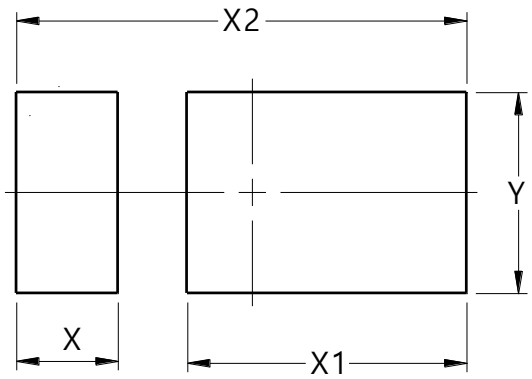

| X3-DSN1406-2 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.225 | 0.275 | 0.250 |
| **A1** | -- | 0.02 | -- |
| **b** | 0.495 | 0.535 | 0.510 |
| **b1** | 0.495 | 0.535 | 0.510 |
| **D** | 1.36 | 1.44 | 1.40 |
| **E** | 0.56 | 0.64 | 0.60 |
| **k** | -- | -- | 0.30 |
| **L** | 0.204 | 0.244 | 0.224 |
| **L1** | 0.740 | 0.780 | 0.760 |
| **All Dimensions in mm** | | | |

Note 8: Device side walls are electrically active bare silicon. Avoid contact of solder or flux on the side walls during the PCB assembly process.

## Suggested Pad Layout

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

**X3-DSN1406-2**




| Dimensions | Value (in mm) |
|---|---|
| **X** | 0.304 |
| **X1** | 0.840 |
| **X2** | 1.352 |
| **Y** | 0.580 |

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