

Product Summary

| V _{RRM} (V) | I _o (A) | V _{F(MAX)} (mV) @ +25°C | I _{R(MAX)} (μA) @ +25°C |
|----------------------|--------------------|-------------------------------------|-------------------------------------|
| 45 | 5 | 580 | 140 |

Description and Applications

The SDM5U45EP3 is a 45V 5A Schottky Barrier Rectifier that is optimized for low forward voltage drop and low leakage current, housed in a small surface mount package that occupies only 2mm² board space with very low profile. The low thermal resistance enables designers to meet design challenges of increasing efficiency while at the same time reducing board space. It is ideally suited for use in portable applications such as:

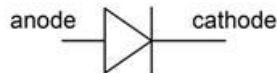
- Blocking Diode
- Boost Diode
- Switching Diode
- Reverse Protection Diode

Features

- 2mm² Footprint – 67% Smaller Than PowerDI123
- Off Board Profile of 0.3mm – 70% Thinner Than PowerDI123
- Low Forward Voltage Drop Reduces Power Dissipation
- Soft Switching Characteristic Ensures That EMI and EMI Are Minimized
- Guard Ring Die Construction for Transient Protection
- **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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**

Mechanical Data

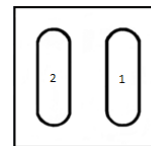
- Case: X3-TSN1616-2
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiAu, Solderable per MIL-STD-202, Method 208 (e4)
- Polarity: Cathode Dot
- Weight: 1.4mg (Approximate)



X3-TSN1616-2



Top View



Pin #1

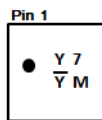
Bottom View

Ordering Information (Note 4)

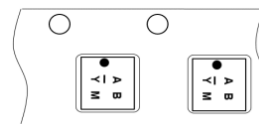
| Part Number | Case | Packaging |
|--------------|--------------|-------------------|
| SDM5U45EP3-7 | X3-TSN1616-2 | 5,000/Tape & Reel |

- 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



Y7 = Product Type Marking Code
 Y M = Date Code Marking
 Y = Year (ex: 1 = 2021)
 M = Month (ex: 9 = September)
 Dot denotes Cathode Pin



Date Code Key

| Year | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | H | I | J | K | L | M | N | O | P | R | S | T |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

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} | 45 | V |
| Average Rectified Output Current | I _o | 5 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I _{FSM} | 50 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 5) | R _{θJA} | 180 | °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 | — | 370 | 450 | mV | I _F = 1.0A, T _J = +25°C |
| | | | 405 | 480 | | I _F = 2.0A, T _J = +25°C |
| | | | 465 | 550 | | I _F = 4.0A, T _J = +25°C |
| | | | 490 | 580 | | I _F = 5.0A, T _J = +25°C |
| Leakage Current (Note 6) | I _R | — | 6 | — | μA | V _R = 10V, T _J = +25°C |
| | | | 30 | 100 | | V _R = 40V, T _J = +25°C |
| | | | 40 | 140 | | V _R = 45V, T _J = +25°C |
| Total Capacitance | C _T | — | 189 | — | pF | V _R = 5V, f = 1.0MHz |

Notes: 5. Device mounted on FR-4 substrate PC board, with minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
6. Short duration pulse test used to minimize self-heating effect.

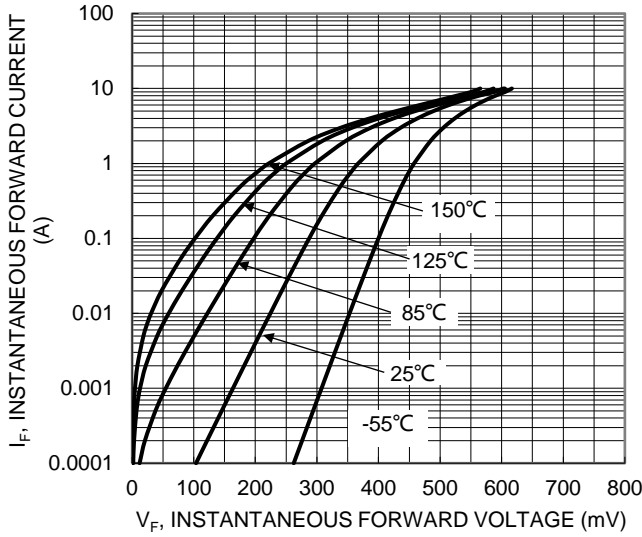


Figure 1. Typical Forward Characteristics

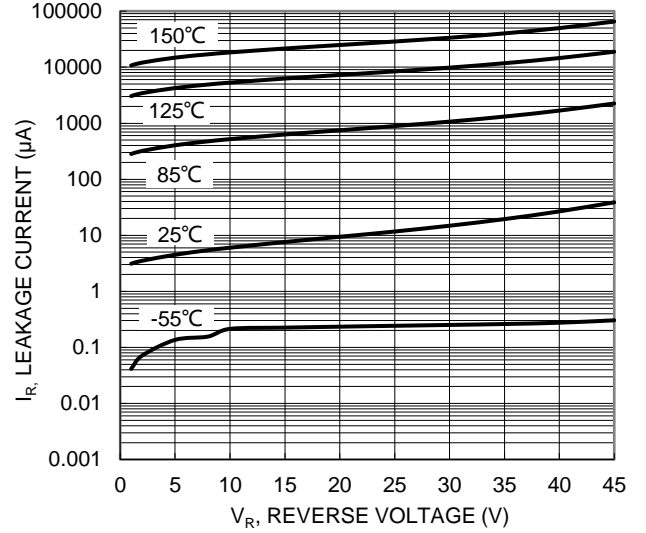


Figure 2. Typical Reverse Characteristics

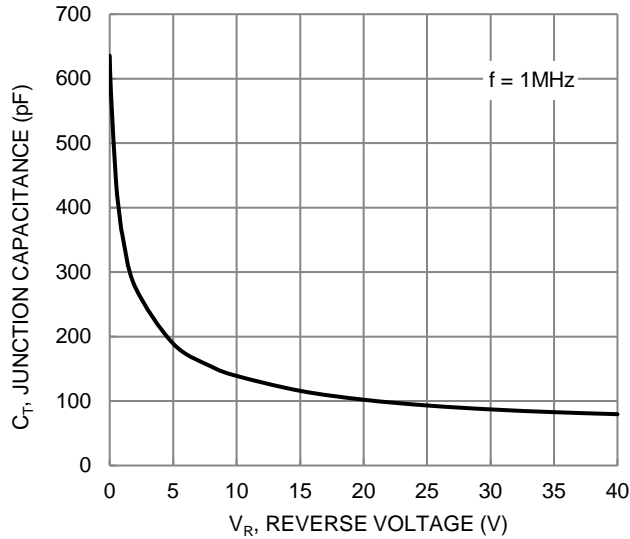
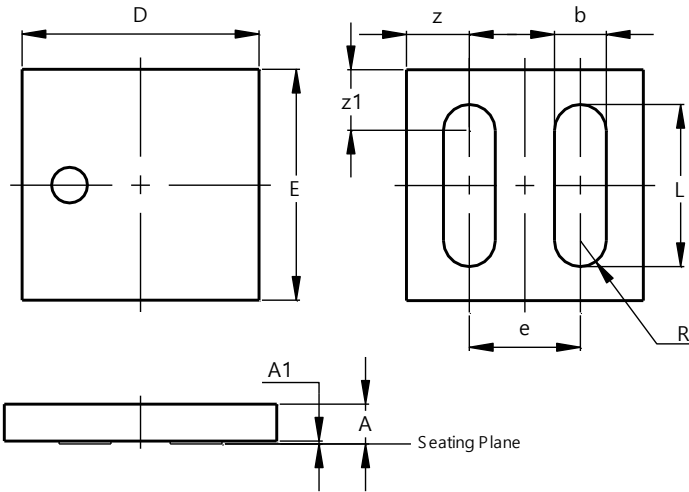


Figure 3. Typical Junction Capacitance

Package Outline Dimensions

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

X3-TSN1616-2

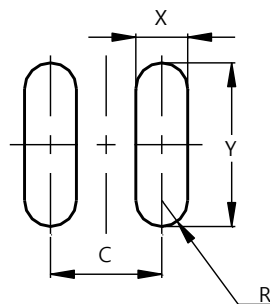


| X3-TSN1616-2 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.20 | 0.30 | 0.25 |
| A1 | -- | 0.02 | -- |
| b | 0.30 | 0.40 | 0.35 |
| D | 1.56 | 1.64 | 1.60 |
| E | 1.56 | 1.64 | 1.60 |
| e | -- | -- | 0.75 |
| L | 1.05 | 1.15 | 1.10 |
| z | -- | -- | 0.425 |
| z1 | -- | -- | 0.425 |
| R | -- | -- | 0.175 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

X3-TSN1616-2



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.75 |
| X | 0.35 |
| Y | 1.10 |

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