

10A, 45V Trench Schottky Rectifiers

FEATURES

- AEC-Q101 qualified
- Patented Trench Schottky technology
- Low power loss, high efficiency
- Ideal for automated placement
- Wettable flank
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

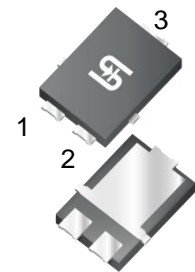
APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter
- Automotive

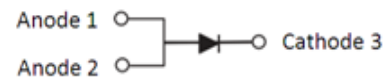
MECHANICAL DATA

- Case: SMPC4.6U
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 104mg (approximately)

| KEY PARAMETERS | | |
|----------------|----------|------|
| PARAMETER | VALUE | UNIT |
| I_F | 10 | A |
| V_{RRM} | 45 | V |
| I_{FSM} | 220 | A |
| T_{JMAX} | 175 | °C |
| Package | SMPC4.6U | |



SMPC4.6U



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | |
|---|------------------------------------|-------------|------|
| PARAMETER | SYMBOL | TSUP10M45SH | UNIT |
| Marking code on the device | | 10M45 | |
| Repetitive peak reverse voltage | V_{RRM} | 45 | V |
| Reverse voltage, total rms value | $V_{R(RMS)}$ | 32 | V |
| Forward current | I_F | 10 | A |
| Surge peak forward current single half sine-wave superimposed on rated load | 8.3 ms at $T_A = 25^\circ\text{C}$ | 220 | A |
| | 1.0 ms at $T_A = 25^\circ\text{C}$ | 330 | |
| Junction temperature | T_J | -55 to +175 | °C |
| Storage temperature | T_{STG} | -55 to +175 | °C |

| THERMAL PERFORMANCE | | | |
|--|-----------------|------------|-------------|
| PARAMETER | SYMBOL | TYP | UNIT |
| Junction-to-lead thermal resistance | $R_{\theta JL}$ | 6 | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 45 | °C/W |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 9 | °C/W |

Thermal Performance Note: Units mounted on PCB (16mm x 16mm Cu pad test board)

| ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | |
|---|---|---------------|------------|------------|---------------|
| PARAMETER | CONDITIONS | SYMBOL | TYP | MAX | UNIT |
| Forward voltage ⁽¹⁾ | $I_F = 5.0\text{A}, T_J = 25^\circ\text{C}$ | V_F | 0.50 | - | V |
| | $I_F = 10.0\text{A}, T_J = 25^\circ\text{C}$ | | 0.54 | 0.60 | V |
| | $I_F = 5.0\text{A}, T_J = 125^\circ\text{C}$ | | 0.39 | - | V |
| | $I_F = 10.0\text{A}, T_J = 125^\circ\text{C}$ | | 0.46 | 0.54 | V |
| Reverse current @ rated V_R ⁽²⁾ | $T_J = 25^\circ\text{C}$ | I_R | - | 200 | μA |
| | $T_J = 125^\circ\text{C}$ | | - | 9 | mA |
| Junction capacitance | 1 MHz, $V_R = 4.0\text{V}$ | C_J | 1099 | - | pF |

Notes:

1. Pulse test with $PW = 0.3\text{ ms}$
2. Pulse test with $PW = 30\text{ ms}$

| ORDERING INFORMATION | | |
|-----------------------------|----------------|------------------------|
| ORDERING CODE | PACKAGE | PACKING |
| TSUP10M45SH S1G | SMPC4.6U | 1,500/7" Plastic reel |
| TSUP10M45SH S2G | SMPC4.6U | 6,000/13" Plastic reel |

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 Forward Current Derating Curve

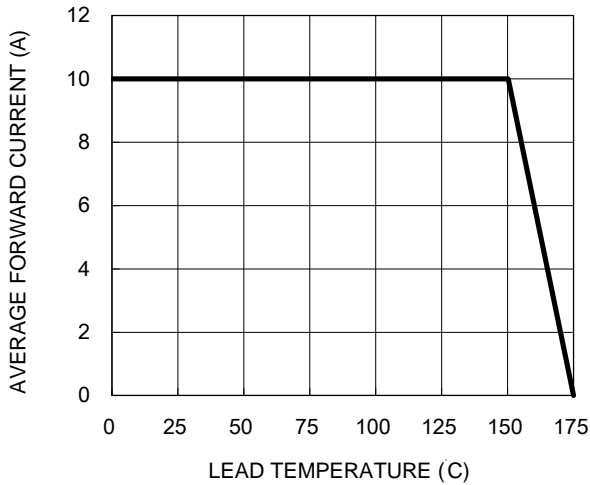


Fig.2 Typical Junction Capacitance

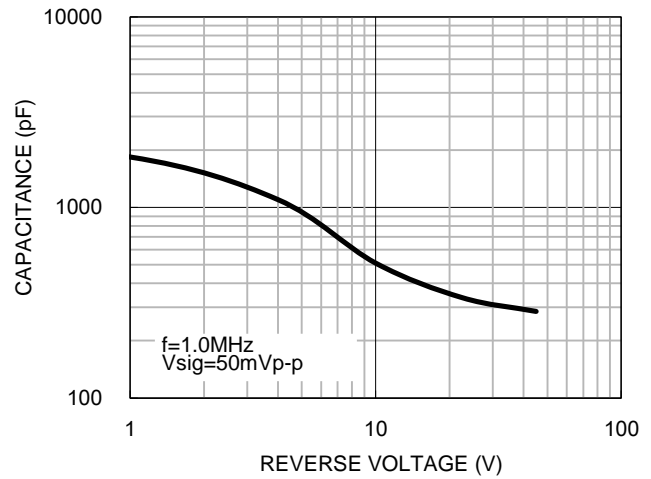


Fig.3 Typical Reverse Characteristics

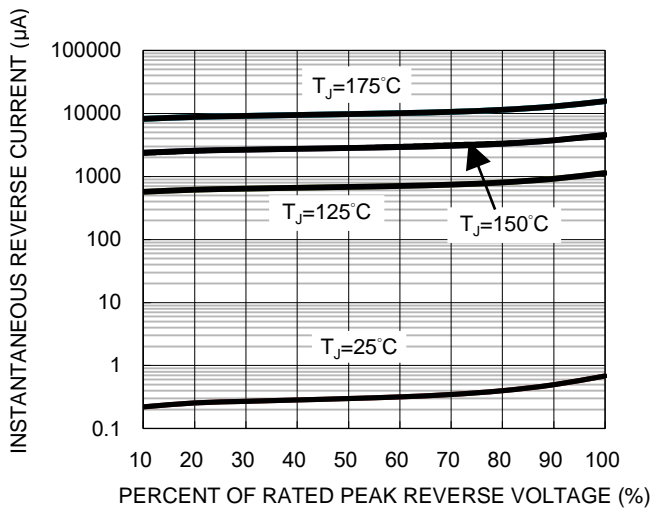


Fig.4 Typical Forward Characteristics

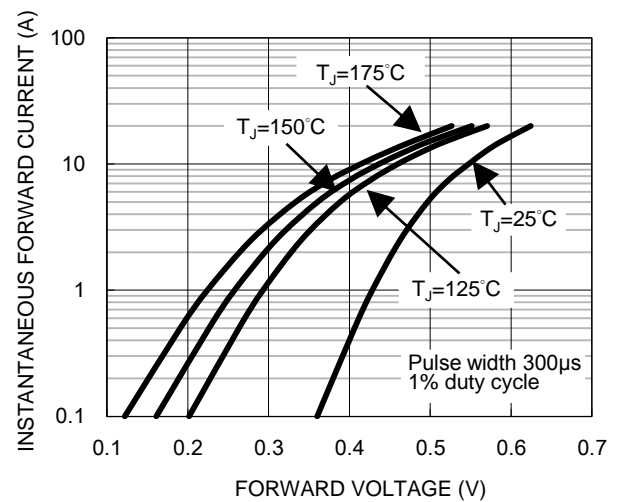
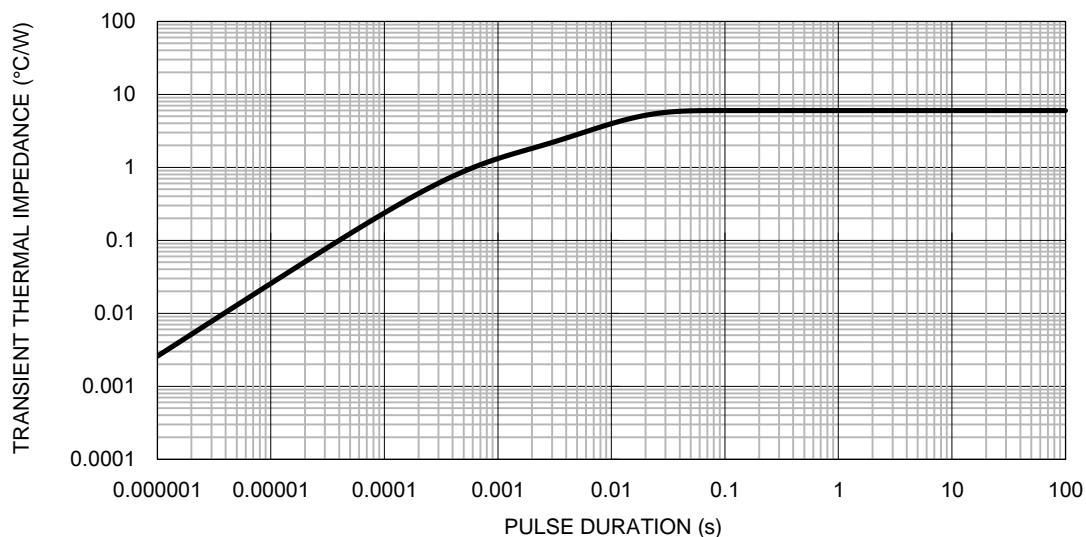
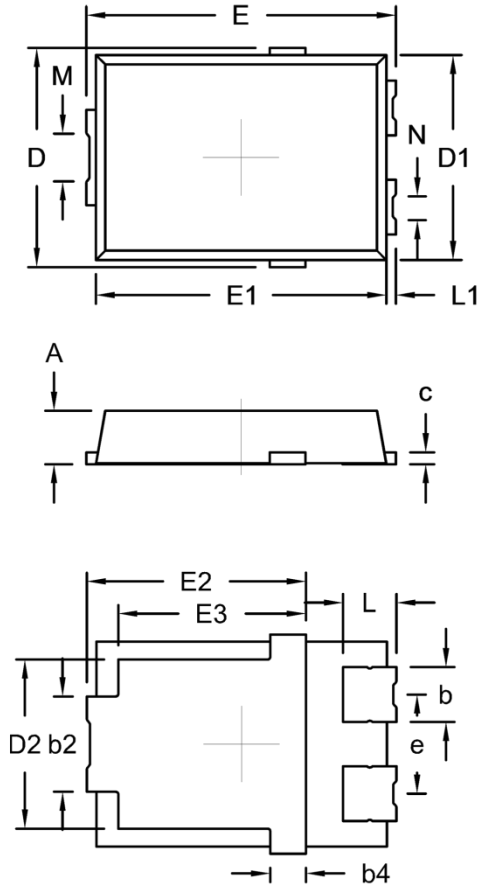


Fig.5 Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

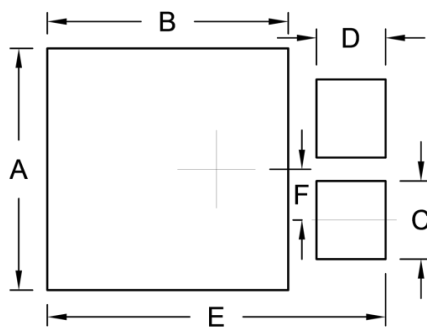
SMPC4.6U



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-------------|------|--------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.00 | 1.20 | 0.039 | 0.047 |
| b | 1.05 | 1.35 | 0.041 | 0.053 |
| b2 | 1.90 | 2.20 | 0.075 | 0.087 |
| b4 | 0.75 (NOM.) | | 0.030 (NOM.) | |
| c | 0.15 | 0.40 | 0.006 | 0.016 |
| D | 4.45 | 4.75 | 0.175 | 0.187 |
| D1 | 4.25 | 4.35 | 0.167 | 0.171 |
| D2 | 3.40 | 3.70 | 0.134 | 0.146 |
| E | 6.35 | 6.65 | 0.250 | 0.262 |
| E1 | 6.05 | 6.15 | 0.238 | 0.242 |
| E2 | 4.40 | 4.80 | 0.173 | 0.189 |
| E3 | 3.94 (NOM.) | | 0.155 (NOM.) | |
| e | 2.08 (NOM.) | | 0.082 (NOM.) | |
| L | 0.94 | 1.24 | 0.037 | 0.049 |
| L1 | 0.05 | 0.35 | 0.002 | 0.014 |
| M | 0.65 | 1.15 | 0.026 | 0.045 |
| N | 0.25 | 0.75 | 0.010 | 0.030 |

Package body size D1 and E1 do not include mold flash
Mold flash shall not exceed 0.1mm per side

SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 4.95 | 0.195 |
| B | 4.95 | 0.195 |
| C | 1.60 | 0.063 |
| D | 1.42 | 0.056 |
| E | 6.95 | 0.274 |
| F | 1.04 | 0.041 |

MARKING DIAGRAM



P/N = Marking Code
YW = Date Code
F = Factory Code

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