

3A, 200V - 600V High Efficient Surface Mount Rectifier

FEATURES

- Very low profile, typical height of 1.1mm
- Excellent high temperature stability
- Glass passivated chip junction
- Controlled avalanche characteristics
- Low leakage current
- High forward surge capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- DC to DC converter
- Switching mode converters and inverters
- Freewheeling application

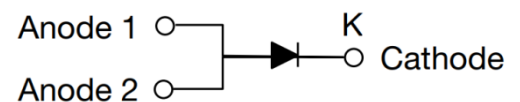
MECHANICAL DATA

- Case: TO-277A (SMPC)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: Indicated by cathode band
- Weight: 0.095g (approximately)

| KEY PARAMETERS | | |
|----------------|----------------|------|
| PARAMETER | VALUE | UNIT |
| I_F | 3 | A |
| V_{RRM} | 200 - 600 | V |
| I_{FSM} | 50 | A |
| $T_{J\ MAX}$ | 175 | °C |
| Package | TO-277A (SMPC) | |
| Configuration | Single die | |



TO-277A (SMPC)



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | |
|--|----------------------------|-------------|--------|--------|------|
| PARAMETER | SYMBOL | TPAU3D | TPAU3G | TPAU3J | UNIT |
| Marking code on the device | | AU3D | AU3G | AU3J | |
| Repetitive peak reverse voltage | V_{RRM} | 200 | 400 | 600 | V |
| Reverse voltage, total rms value | $V_{R(RMS)}$ | 140 | 280 | 420 | V |
| Forward current | I_F | 3 | | | A |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | I_{FSM} | 50 | | | A |
| Non-repetitive avalanche energy | $I_{AS} = 2.5\text{A Max}$ | 20 | | | mJ |
| | $I_{AS} = 1.0\text{A Typ}$ | 30 | | | mJ |
| 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 ⁽¹⁾ | $R_{\theta JL}$ | 6 | °C/W |
| Junction-to-ambient thermal resistance ⁽²⁾ | $R_{\theta JA}$ | 78 | °C/W |

Notes:

1. Mounted on FR4 PCB with 16mm x 16mm Cu pad area
2. Free air, mounted on recommended pad

| ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | |
|---|---|---------------|------------|------------|---------------|
| PARAMETER | CONDITIONS | SYMBOL | TYP | MAX | UNIT |
| Forward voltage ⁽¹⁾ | $I_F = 3\text{A}, T_J = 25^\circ\text{C}$ | V_F | 1.50 | 1.88 | V |
| | $I_F = 3\text{A}, T_J = 125^\circ\text{C}$ | | 1.10 | 1.35 | V |
| Reverse current @ rated V_R ⁽²⁾ | $T_J = 25^\circ\text{C}$ | I_R | - | 10 | μA |
| | $T_J = 125^\circ\text{C}$ | | - | 250 | μA |
| Junction capacitance | 1MHz, $V_R = 4.0\text{V}$ | C_J | 60 | - | pF |
| Reverse recovery time | $I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$ | t_{rr} | - | 75 | ns |

Notes:

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

| ORDERING INFORMATION | | |
|------------------------------------|----------------|---------------------|
| ORDERING CODE⁽¹⁾ | PACKAGE | PACKING |
| TPAU3x | TO-277A (SMPC) | 6,000 / Tape & Reel |

Notes:

1. "x" defines voltage from 200V(TPAU3D) to 600V(TPAU3J)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

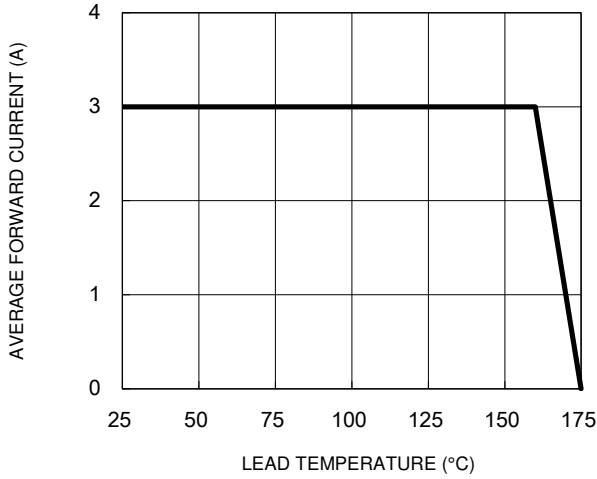


Fig.2 Typical Junction Capacitance

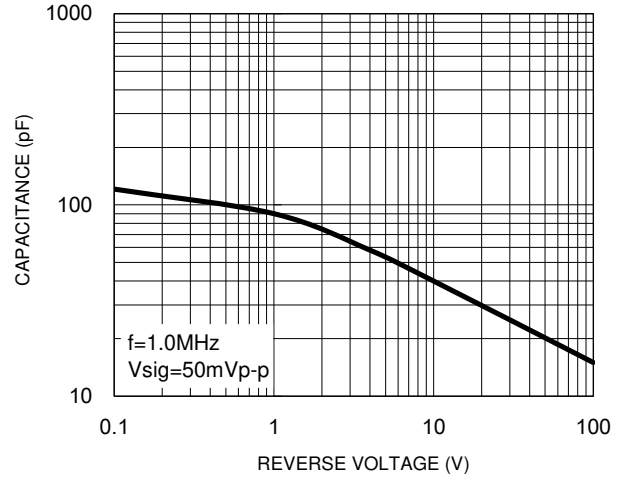


Fig.3 Typical Reverse Characteristics

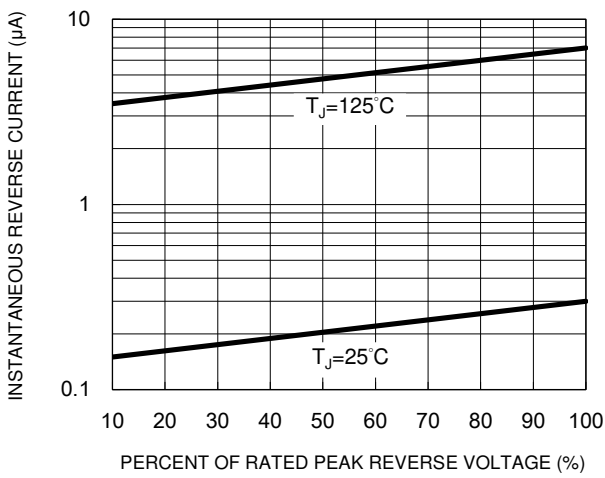


Fig.4 Typical Forward Characteristics

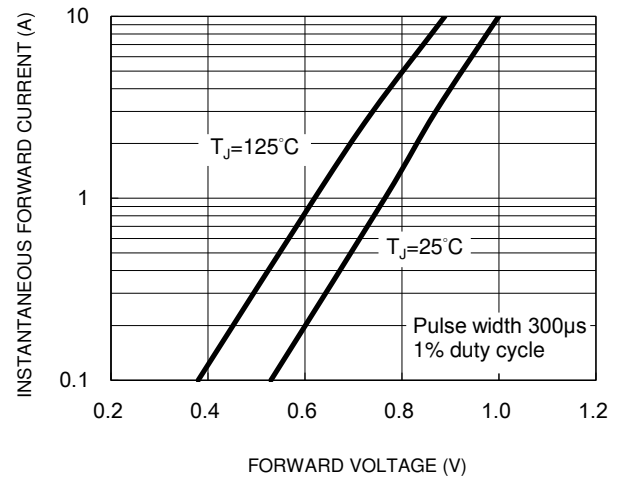
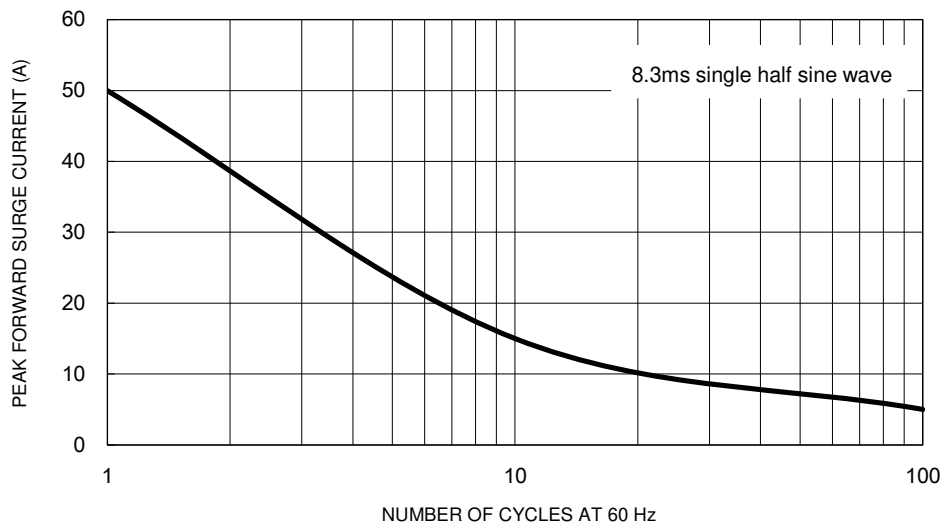


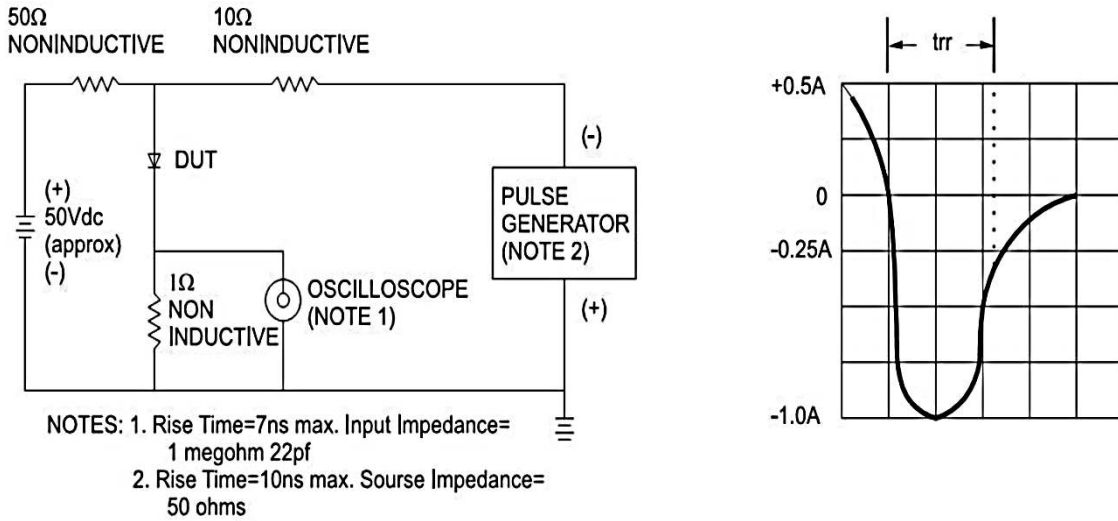
Fig.5 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

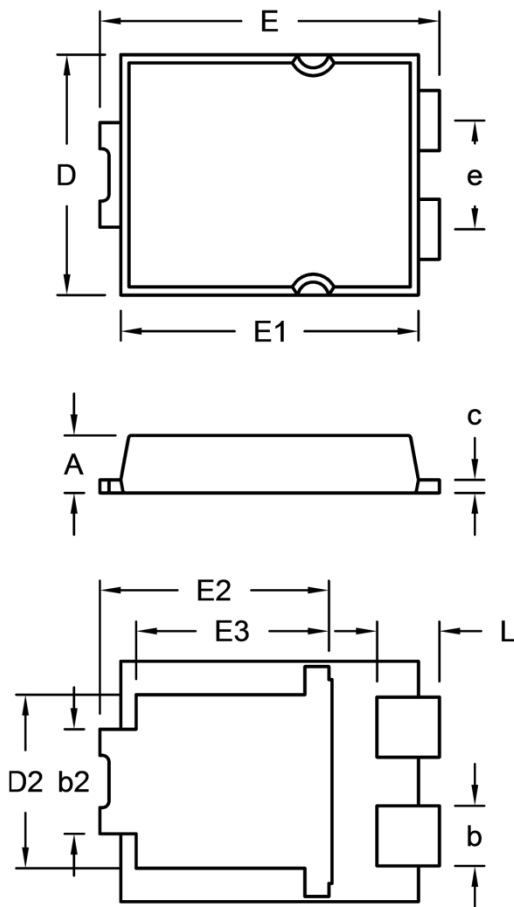
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram



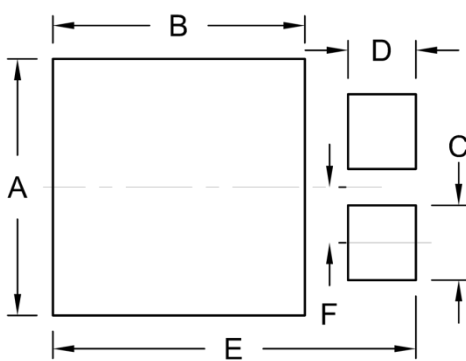
PACKAGE OUTLINE DIMENSIONS

TO-277A (SMPC)



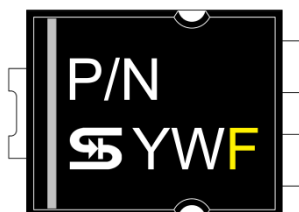
| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|-------|-------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.000 | 1.200 | 0.039 | 0.047 |
| b | 1.000 | 1.300 | 0.039 | 0.051 |
| b2 | 1.850 | 2.150 | 0.073 | 0.085 |
| c | 0.175 | 0.325 | 0.007 | 0.013 |
| D | 4.550 | 4.650 | 0.179 | 0.183 |
| D2 | 3.170 | 3.470 | 0.125 | 0.137 |
| E | 6.350 | 6.650 | 0.250 | 0.262 |
| E1 | 5.650 | 5.750 | 0.222 | 0.226 |
| E2 | 4.235 | 4.535 | 0.167 | 0.179 |
| E3 | 3.540 | 3.840 | 0.139 | 0.151 |
| e | 1.930 | 2.230 | 0.076 | 0.088 |
| L | 1.043 | 1.343 | 0.041 | 0.053 |

SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 4.80 | 0.189 |
| B | 4.72 | 0.186 |
| C | 1.40 | 0.055 |
| D | 1.27 | 0.050 |
| E | 6.80 | 0.268 |
| F | 1.04 | 0.041 |

MARKING DIAGRAM



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

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