

10A, 200V - 600V Super Fast Surface Mount Rectifier

FEATURES

- AEC-Q101 qualified
- Very low profile, typical height of 1.1mm
- 175°C operating junction temperature
- Glass passivated chip junction
- Low conduction loss
- Low leakage current
- High forward surge capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

APPLICATIONS

- DC to DC converter
- Automotive application
- Car lighting
- Snubber
- Freewheeling application

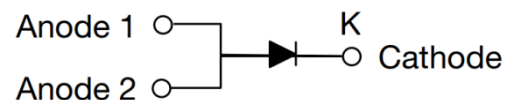
MECHANICAL DATA

- Case: TO-277A (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: Indicated by cathode band
- Weight: 0.095g (approximately)

| KEY PARAMETERS | | |
|----------------|--------------------|------|
| PARAMETER | VALUE | UNIT |
| I_F | 10 | A |
| V_{RRM} | 200 - 600 | V |
| I_{FSM} | 150 | A |
| T_{JMAX} | 175 | °C |
| Package | TO-277A (SMPC4.6U) | |
| Configuration | Single die | |



TO-277A (SMPC4.6U)



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | |
|---|--------------|-------------|----------|----------|------|
| PARAMETER | SYMBOL | TPMR10DH | TPMR10GH | TPMR10JH | UNIT |
| Marking code on the device | | MR10D | MR10G | MR10J | |
| 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 | 10 | | | A |
| Surge peak forward current 8.3ms single half sine wave superimposed on rated load | I_{FSM} | 150 | | | A |
| 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⁾ | $R_{\theta JL}$ | 8.4 | °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⁾ | TPMR10DH | $I_F = 10\text{A}, T_J = 25^\circ\text{C}$ | V_F | - | 0.95 | V |
| | TPMR10GH | | | - | 1.20 | V |
| | TPMR10JH | | | - | 1.80 | V |
| | TPMR10DH | $I_F = 10\text{A}, T_J = 125^\circ\text{C}$ | | - | 0.86 | V |
| | TPMR10GH | | | - | 1.00 | V |
| | TPMR10JH | | | - | - | V |
| Reverse current @ rated V_R ⁽²⁾ | TPMR10DH | $T_J = 25^\circ\text{C}$ | I_R | - | 5 | μA |
| | TPMR10GH TPMR10JH | | | - | 10 | μA |
| | TPMR10DH | $T_J = 125^\circ\text{C}$ | | - | 250 | μA |
| | TPMR10GH TPMR10JH | | | - | 500 | μA |
| Junction capacitance | | 1MHz, $V_R = 4.0\text{V}$ | C_J | 140 | - | pF |
| Reverse recovery time | TPMR10DH TPMR10GH | $I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$ | t_{rr} | - | 35 | ns |
| | TPMR10JH | | | - | 40 | ns |
| | TPMR10DH TPMR10GH | $I_F = 1\text{A},$ $di/dt = -50\text{A}/\mu\text{s},$ $V_R = 30\text{V}$ | t_{rr} | - | 60 | ns |
| | TPMR10JH | | | - | - | ns |

Notes:

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

| ORDERING INFORMATION | | |
|-------------------------------------|--------------------|---------------------|
| ORDERING CODE ⁽¹⁾ | PACKAGE | PACKING |
| TPMR10xH | TO-277A (SMPC4.6U) | 6,000 / Tape & Reel |

Notes:

1. "x" defines voltage from 200V(TPMR10DH) to 600V(TPMR10JH)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

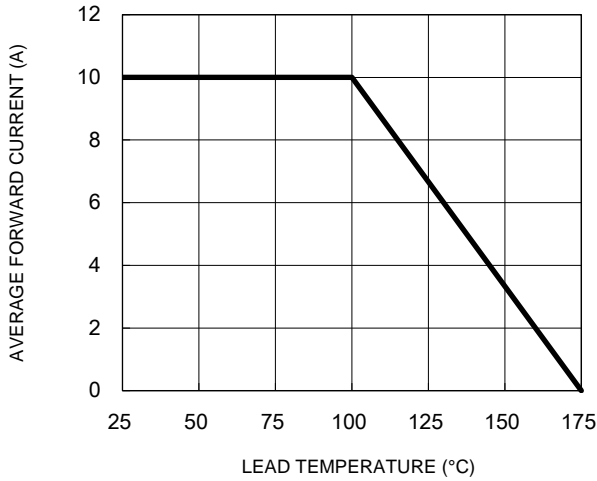


Fig.2 Typical Junction Capacitance

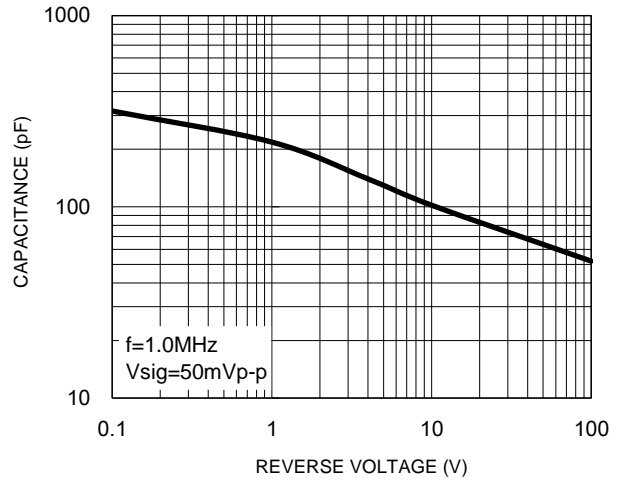


Fig.3 Typical Reverse Characteristics

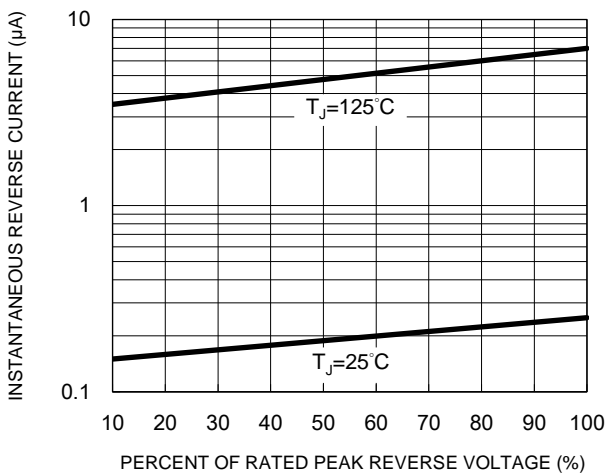


Fig.4 Typical Forward Characteristics

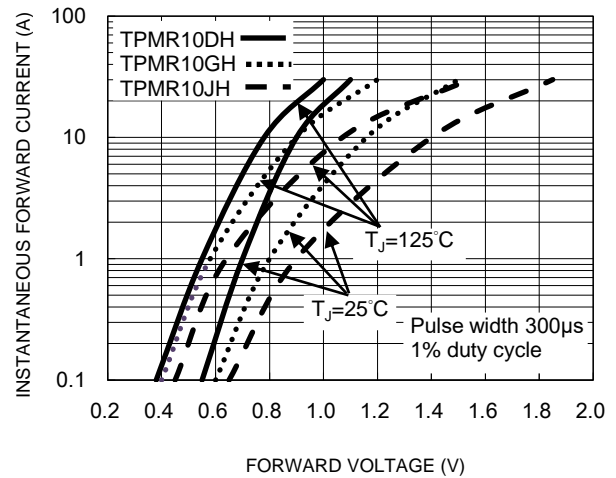
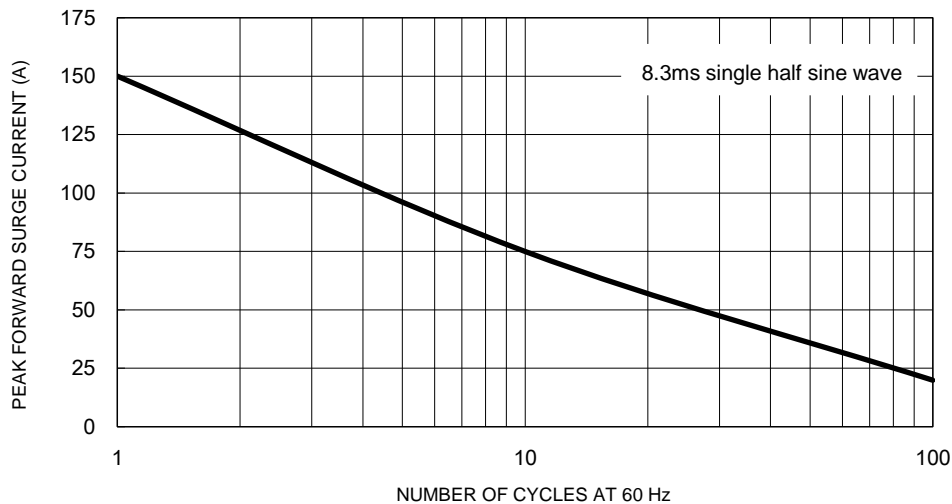


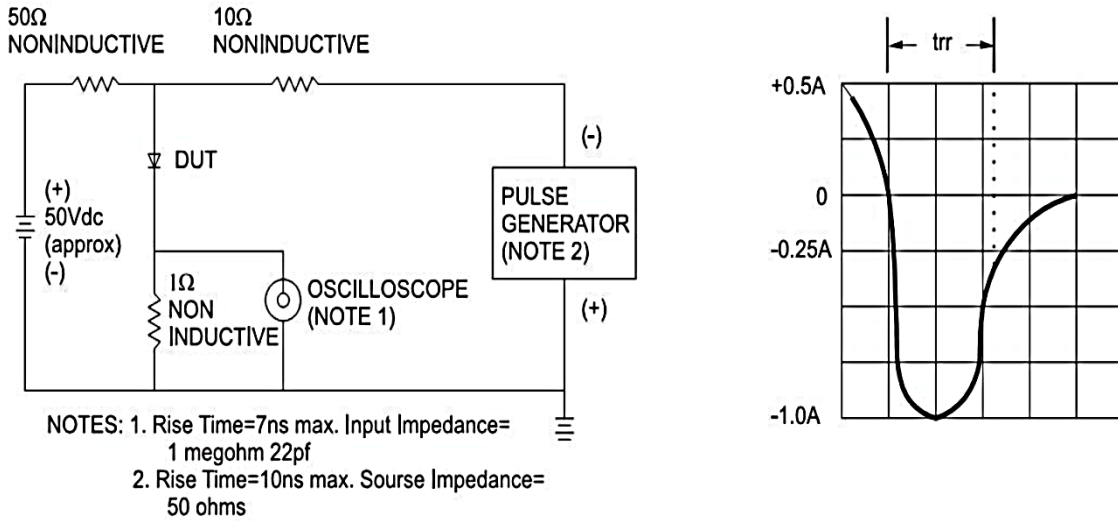
Fig.5 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

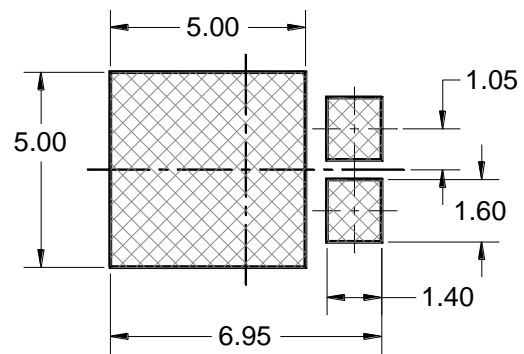
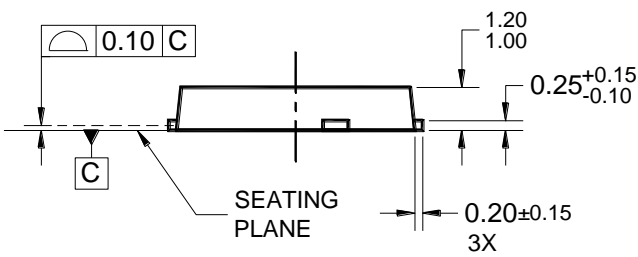
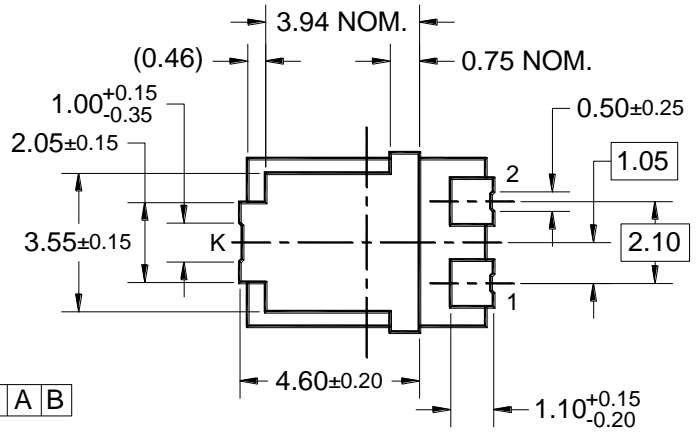
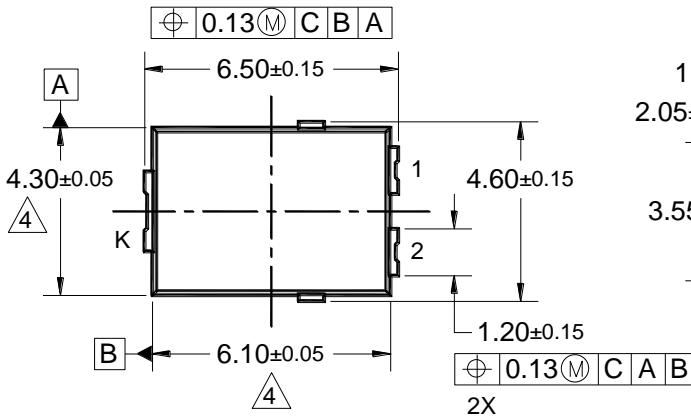
(T_A = 25°C unless otherwise noted)

Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram

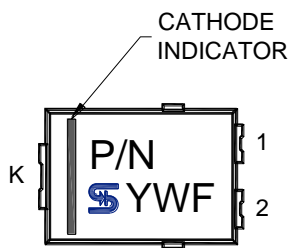


PACKAGE OUTLINE DIMENSIONS

TO-277A (SMPC4.6U)



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

P/N = MARKING CODE
YWF = DATE CODE
F = FACTORY CODE

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-277 ISSUE A.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD LASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SMPC4.6U-031 REV A.

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