

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

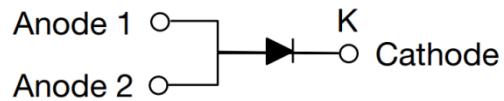
MECHANICAL DATA

- 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
$T_J \text{ MAX}$	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	$V_{R(\text{RMS})}$	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 TPMR10GH TPMR10JH	$I_F = 10\text{A}, T_J = 25^\circ\text{C}$	V_F	-	0.95	V	
				-	1.20	V	
				-	1.80	V	
	TPMR10DH TPMR10GH TPMR10JH	$I_F = 10\text{A}, T_J = 125^\circ\text{C}$		-	0.86	V	
				-	1.00	V	
				-	-	V	
Reverse current @ rated V_R ⁽²⁾	TPMR10DH TPMR10GH TPMR10JH	$T_J = 25^\circ\text{C}$	I_R	-	5	μA	
				-	10	μA	
	TPMR10DH	$T_J = 125^\circ\text{C}$		-	250	μA	
	TPMR10GH TPMR10JH			-	500	μA	
Junction capacitance	$1\text{MHz}, V_R = 4.0\text{V}$		C_J	140	-	pF	
Reverse recovery time	TPMR10DH TPMR10GH TPMR10JH	$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$	t_{rr}	-	35	ns	
				-	40	ns	
	TPMR10DH TPMR10GH TPMR10JH	$I_F = 1\text{A},$ $di/dt = -50\text{A}/\mu\text{s},$ $V_R = 30\text{V}$	t_{rr}	-	60	ns	
				-	-	ns	

Notes:

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

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

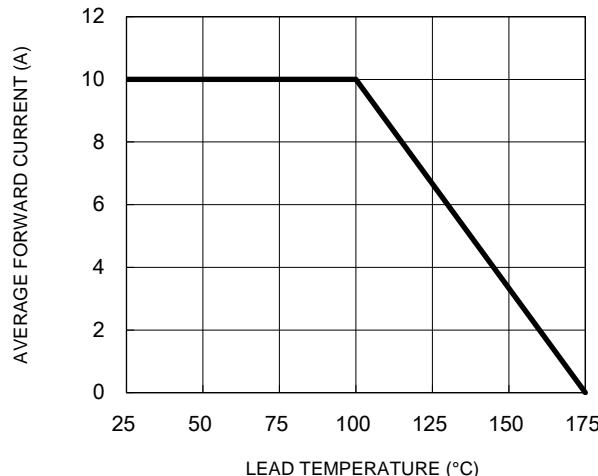


Fig.2 Typical Junction Capacitance

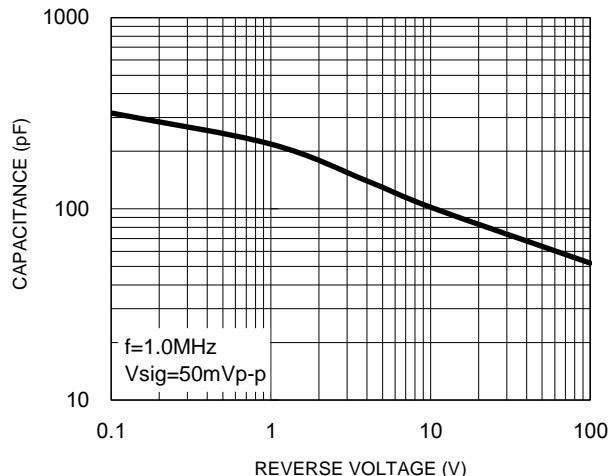


Fig.3 Typical Reverse Characteristics

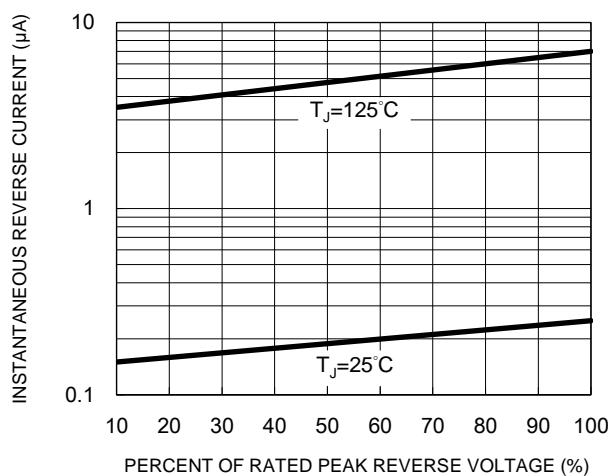


Fig.4 Typical Forward Characteristics

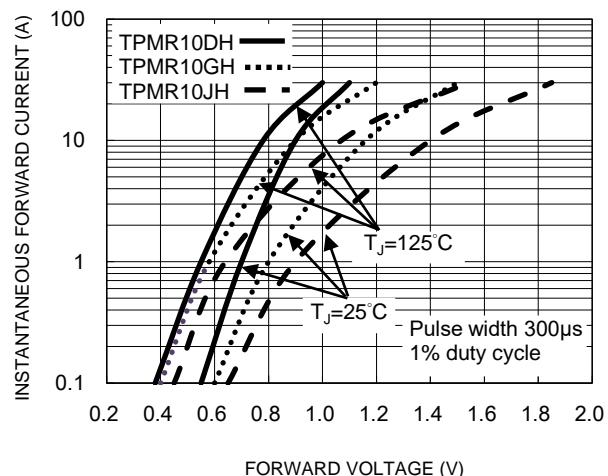
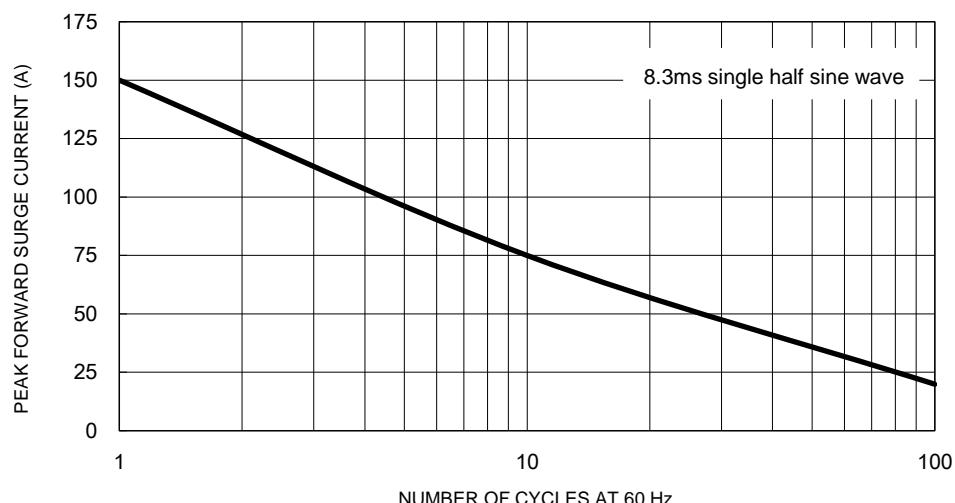


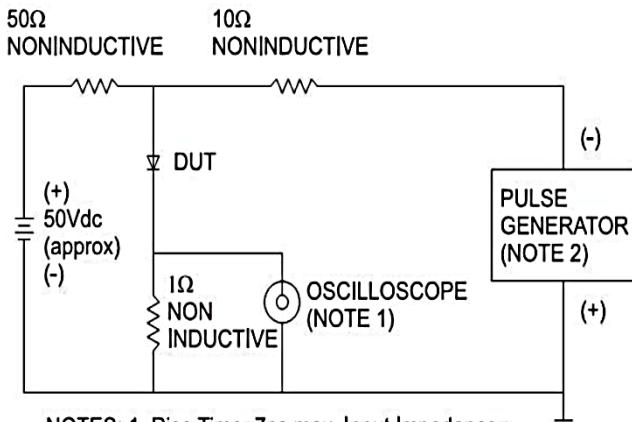
Fig.5 Maximum Non-Repetitive Forward Surge Current



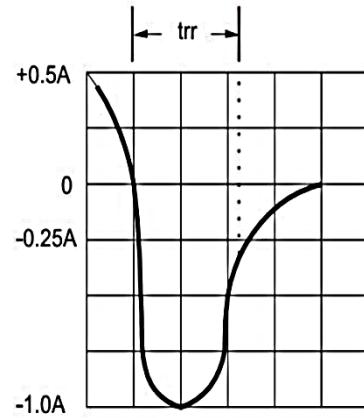
CHARACTERISTICS CURVES

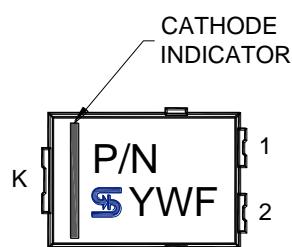
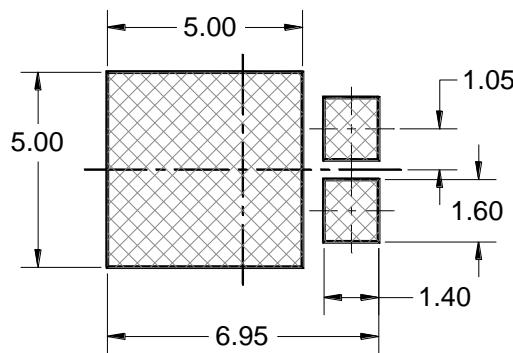
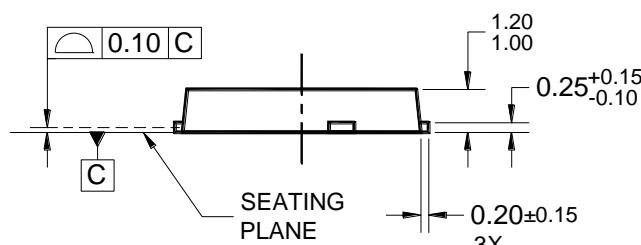
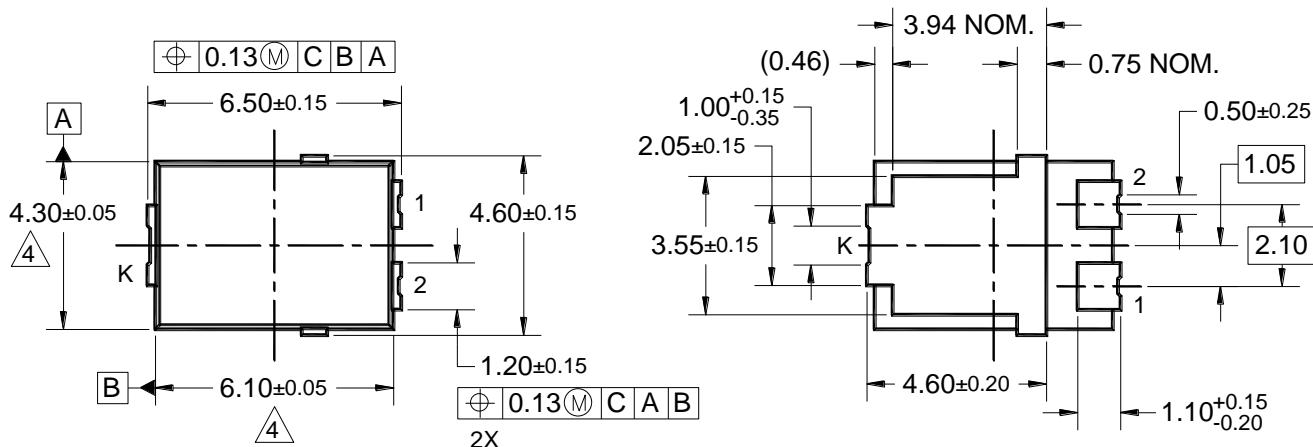
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram



NOTES: 1. Rise Time=7ns max. Input Impedance= 1 megohm 22pf
2. Rise Time=10ns max. Source Impedance= 50 ohms



PACKAGE OUTLINE DIMENSIONS
TO-277A (SMPC4.6U)

MARKING DIAGRAM

P/N = MARKING CODE
YW = 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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