

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

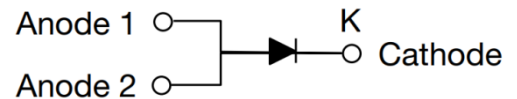
MECHANICAL DATA

- 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
$T_{J\ MAX}$	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	$V_{R(RMS)}$	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 = 10A, T _J = 25°C	V _F	-	0.95	V
	TPMR10GH			-	1.20	V
	TPMR10JH			-	1.80	V
	TPMR10DH	I _F = 10A, T _J = 125°C		-	0.86	V
	TPMR10GH			-	1.00	V
	TPMR10JH			-	-	V
Reverse current @ rated V _R ⁽²⁾	TPMR10DH	T _J = 25°C	I _R	-	5	μA
	TPMR10GH TPMR10JH			-	10	μA
	TPMR10DH	T _J = 125°C		-	250	μA
	TPMR10GH TPMR10JH			-	500	μA
Junction capacitance		1MHz, V _R = 4.0V	C _J	140	-	pF
Reverse recovery time	TPMR10DH TPMR10GH	I _F = 0.5A, I _R = 1.0A I _{rr} = 0.25A	t _{rr}	-	35	ns
	TPMR10JH			-	40	ns
	TPMR10DH TPMR10GH	I _F = 1A, di/dt = -50A/μs, V _R = 30V	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

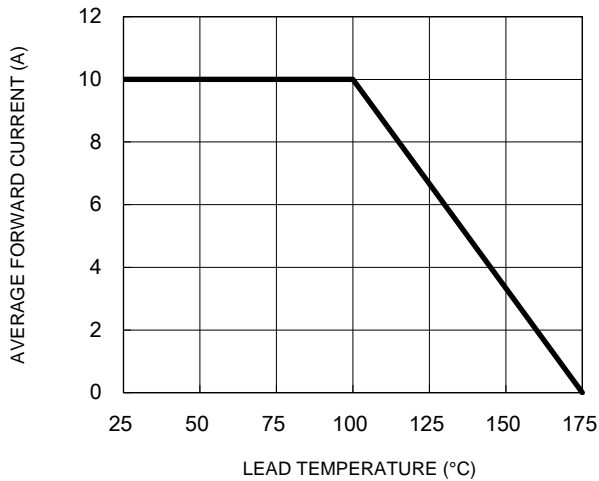


Fig.2 Typical Junction Capacitance

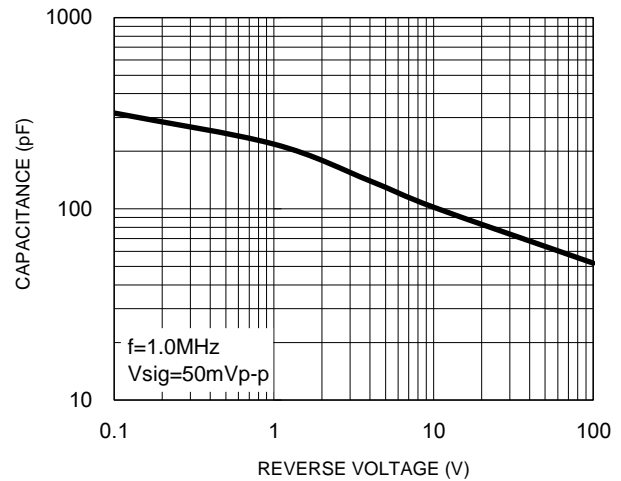


Fig.3 Typical Reverse Characteristics

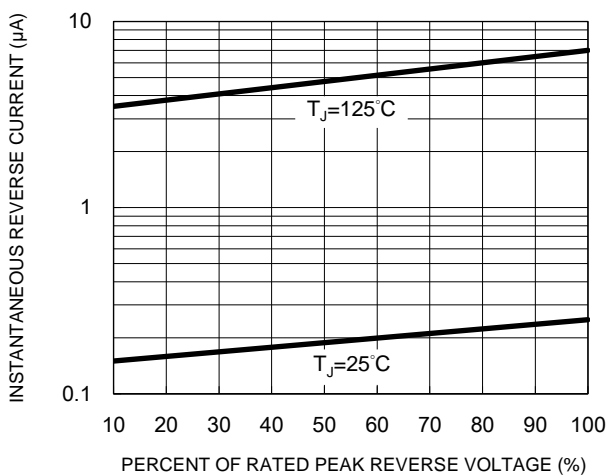


Fig.4 Typical Forward Characteristics

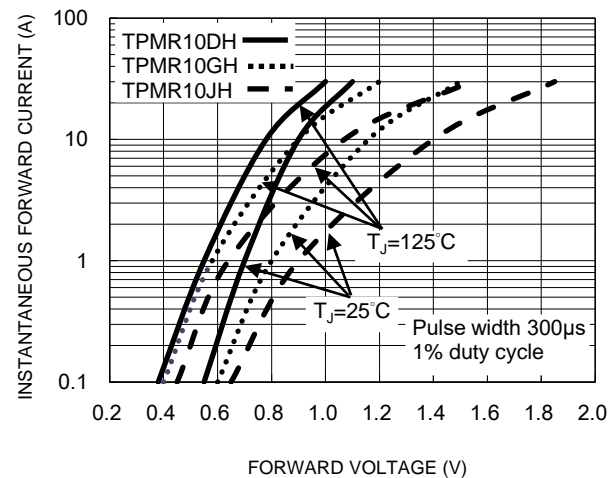
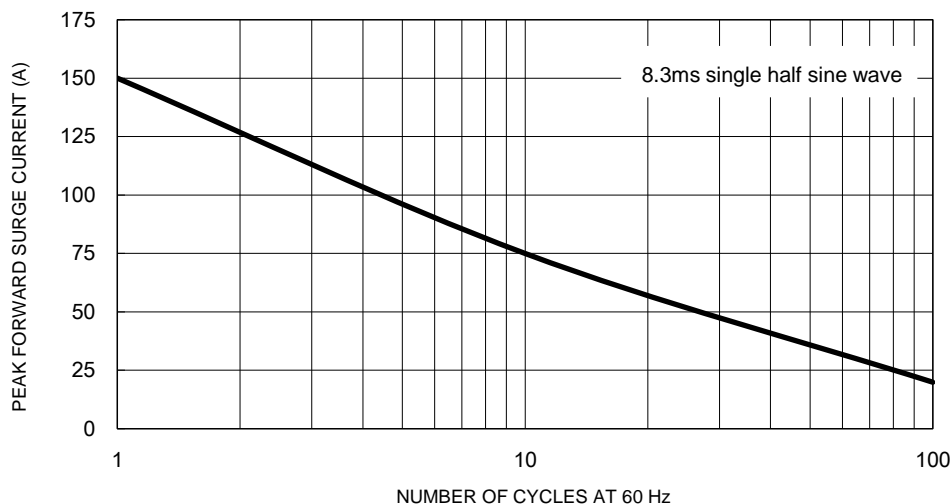


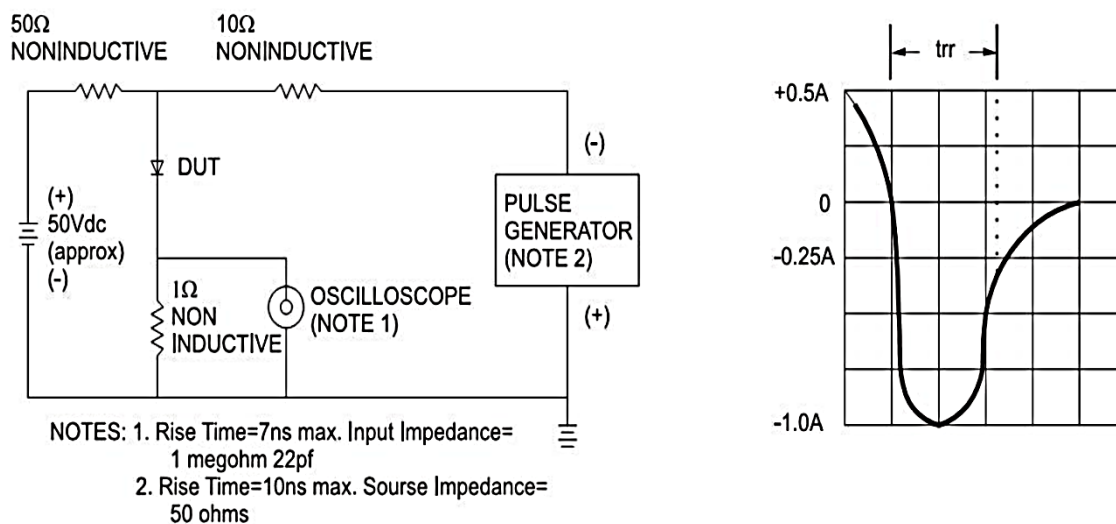
Fig.5 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

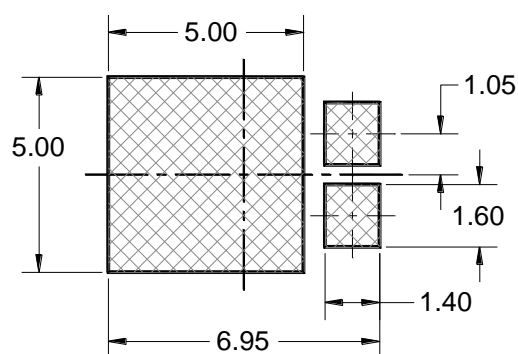
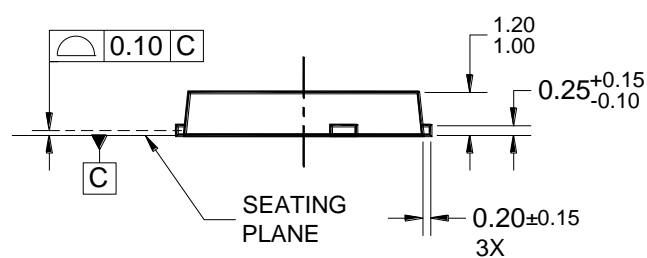
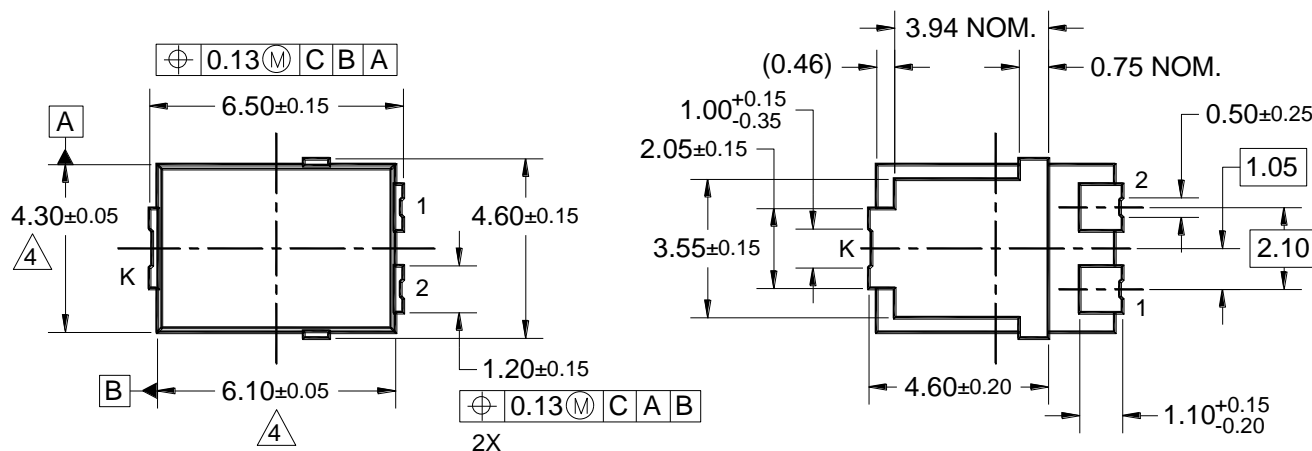
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram

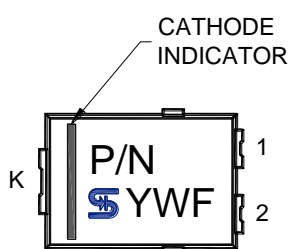


PACKAGE OUTLINE DIMENSIONS

TO-277A (SMPC4.6U)



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

P/N = MARKING CODE
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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