

## 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 according to IEC 61249-2-21

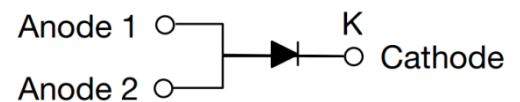
### APPLICATIONS

- DC to DC converter
- Automotive application
- Car lighting
- Snubber
- 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 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 (SMPC)	
Configuration	Single die	


**TO-277A (SMPC)**


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

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>UNIT</b>
Junction-to-lead thermal resistance <sup>(1)</sup>	$R_{\theta JL}$	8.4	°C/W
Junction-to-ambient thermal resistance <sup>(2)</sup>	$R_{\theta JA}$	78	°C/W

**Notes:**

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

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Forward voltage <sup>(1)</sup>	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 $V_R$ <sup>(2)</sup>	TPMR10DH	$T_J = 25^\circ\text{C}$	$I_R$	-	5	$\mu\text{A}$
	TPMR10GH TPMR10JH			-	10	$\mu\text{A}$
	TPMR10DH	$T_J = 125^\circ\text{C}$		-	250	$\mu\text{A}$
	TPMR10GH TPMR10JH			-	500	$\mu\text{A}$
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 = 0.3ms
2. Pulse test with PW = 30ms

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b> <sup>(1)</sup>	<b>PACKAGE</b>	<b>PACKING</b>
TPMR10xH	TO-277A (SMPC)	6,000 / Tape & Reel

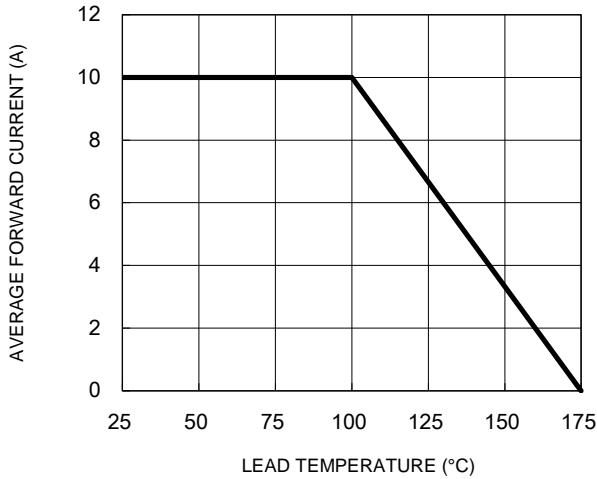
**Notes:**

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

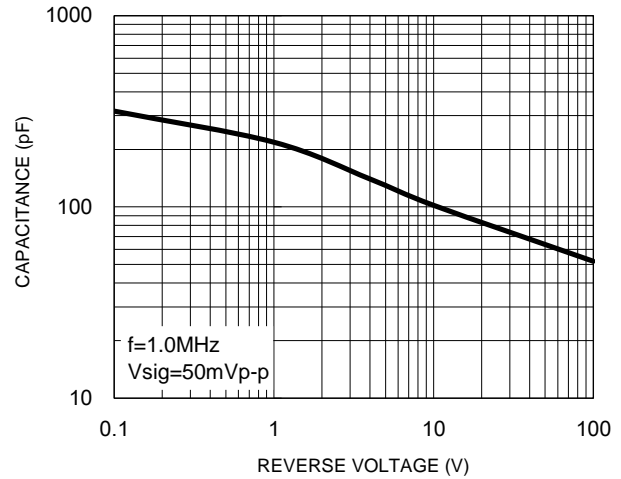
**CHARACTERISTICS CURVES**

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

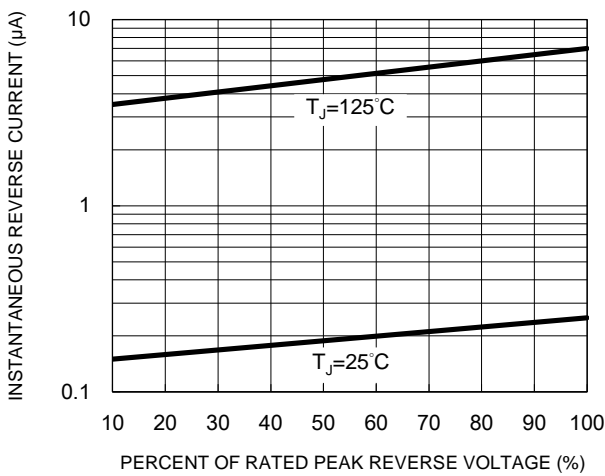
**Fig.1 Forward Current Derating Curve**



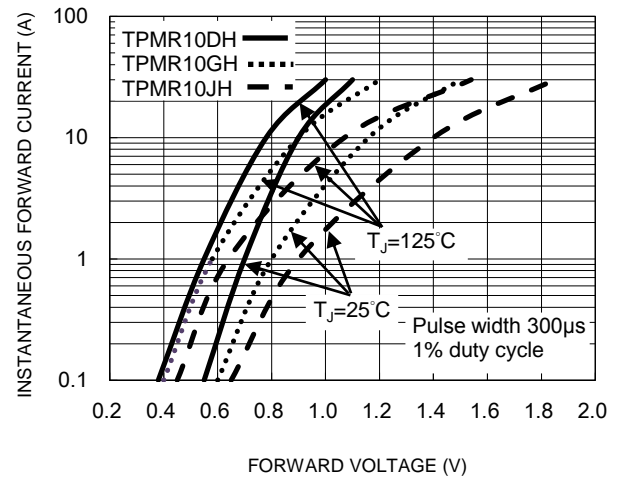
**Fig.2 Typical Junction Capacitance**



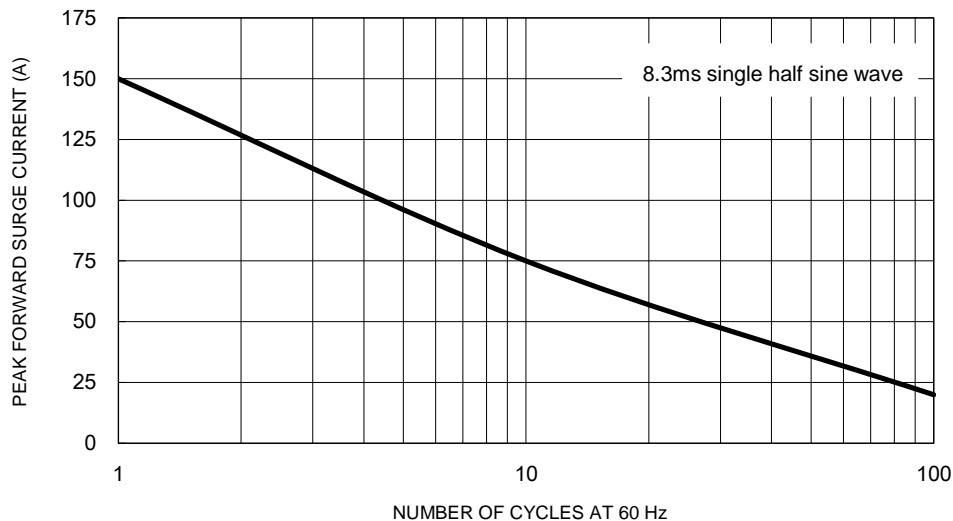
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



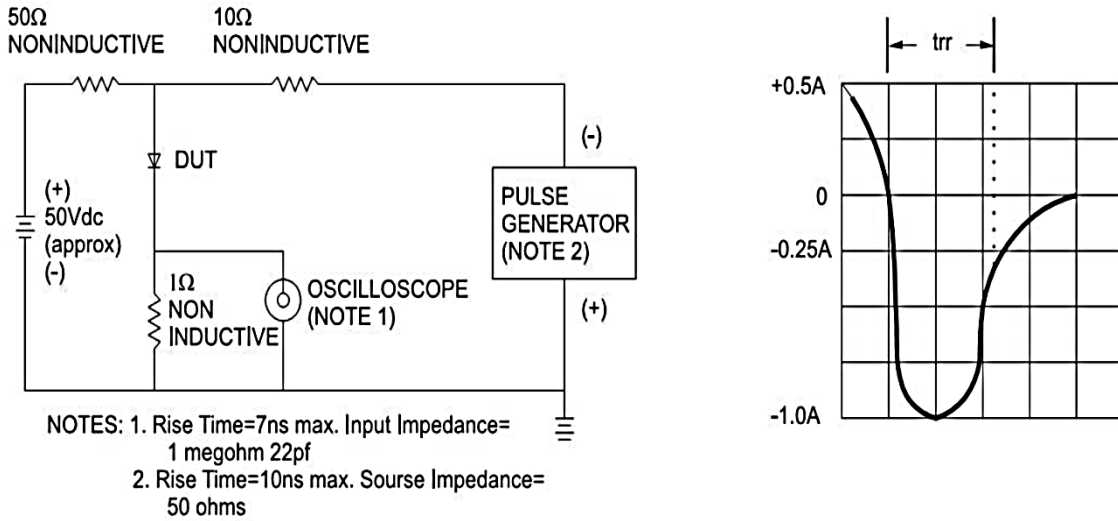
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



**CHARACTERISTICS CURVES**

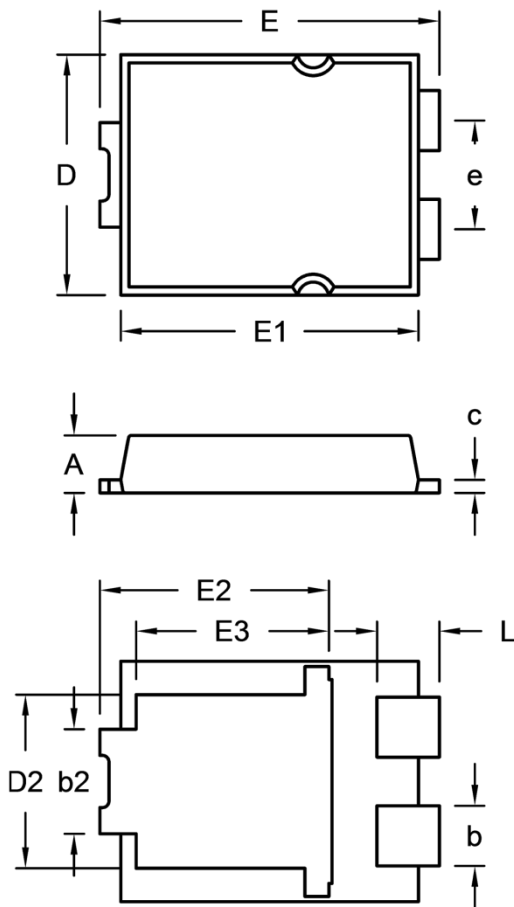
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram**



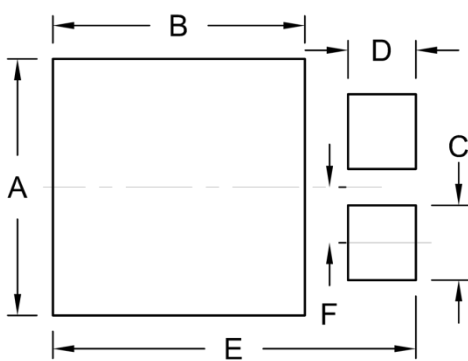
**PACKAGE OUTLINE DIMENSIONS**

TO-277A (SMPC)



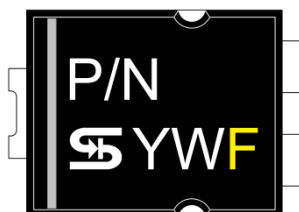
DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.000	1.200	0.039	0.047
b	1.000	1.300	0.039	0.051
b2	1.850	2.150	0.073	0.085
c	0.175	0.325	0.007	0.013
D	4.550	4.650	0.179	0.183
D2	3.170	3.470	0.125	0.137
E	6.350	6.650	0.250	0.262
E1	5.650	5.750	0.222	0.226
E2	4.235	4.535	0.167	0.179
E3	3.540	3.840	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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