



## STPR120A

### HIGH EFFICIENCY FAST RECOVERY DIODE

#### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1 A
$V_{RRM}$	200 V
$t_{rr} (max)$	35 ns

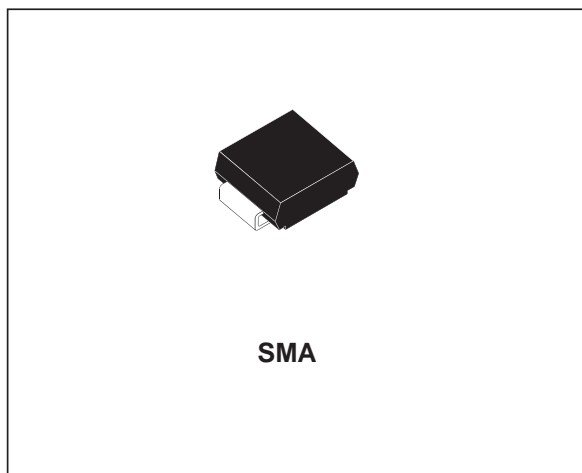
#### FEATURES AND BENEFITS

- VERY LOW SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- SURFACE MOUNT DEVICE
- FAST RECTIFIER EPITAXIAL DIODE

#### DESCRIPTION

Single chip rectifier suited to Switched Mode Power Supplies and high frequency DC/DC converters.

Packaged in SMA, this surface mount device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



#### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		200	V
$I_{F(RMS)}$	RMS forward current		8	A
$I_{F(AV)}$	Average forward current	$T_{Lead} = 125^{\circ}C$ $\delta = 0.5$	1	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal	30	A
$T_{stg}$	Storage temperature range		- 65 to + 150	$^{\circ}C$
$T_j$	Maximum junction temperature		150	$^{\circ}C$

#### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to lead	30	$^{\circ}C/W$

## STPR120A

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R$ *	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			3	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			180	400	
$V_F$ **	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$			0.94	V
		$T_j = 150^\circ\text{C}$	$I_F = 1\text{ A}$		0.69	0.74	

Pulse test : \*  $t_p = 5\text{ms}$ ,  $\delta < 2\%$

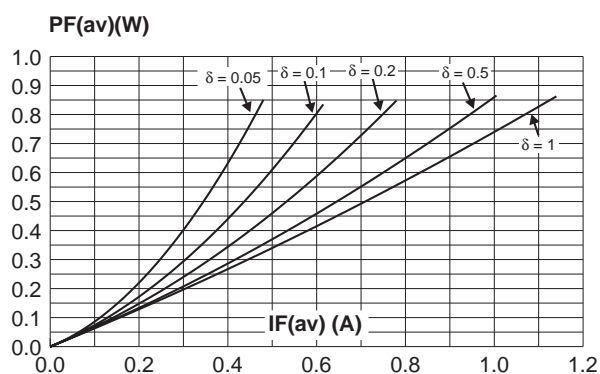
\*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

### RECOVERY CHARACTERISTICS

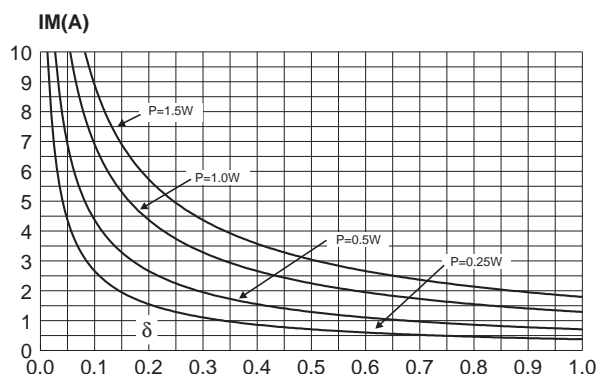
Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 0.50\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			25	ns
		$I_F = 1\text{ A}$ $di_F/dt = 50\text{ A}/\mu\text{s}$ $V_R = V_{RRM}$		25	35	
$t_{FR}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ Measured at 1 V			25	
$V_{FP}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$			5	V

To evaluate the maximum conduction losses use the following equation :  
 $P = 0.62 \times I_{F(AV)} + 0.12 \times I_F^2_{(RMS)}$

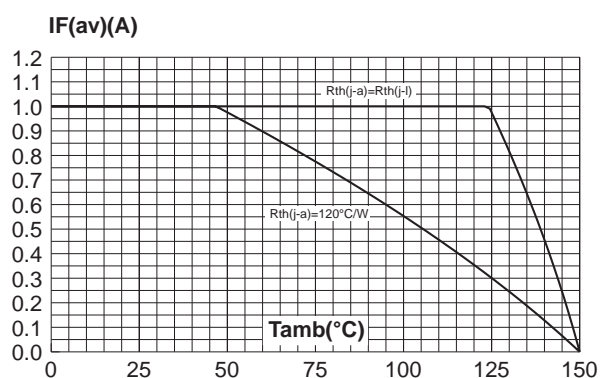
**Fig. 1:** Average forward power dissipation versus average forward current.



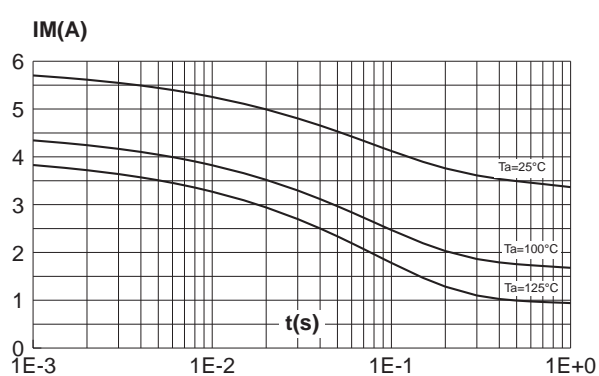
**Fig. 2:** Peak current versus form factor.



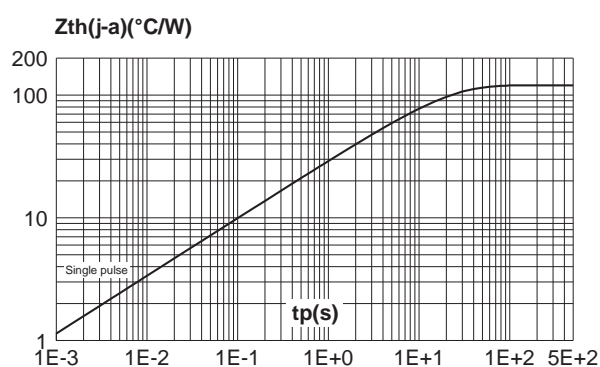
**Fig. 3:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



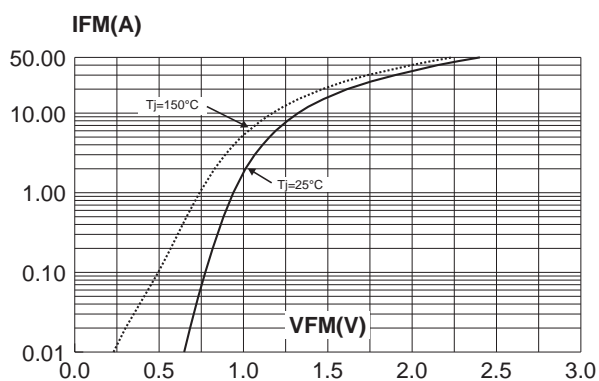
**Fig. 4:** Non repetitive surge peak forward current versus overload duration.



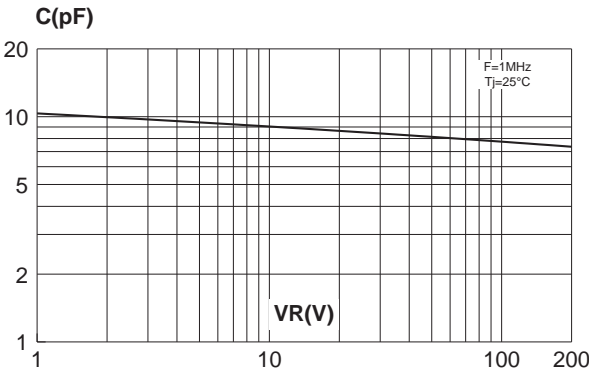
**Fig. 5:** Variation of thermal impedance junction to ambient versus pulse duration (Recommended pad layout, epoxy FR4,  $e(Cu)=35\mu m$ ).



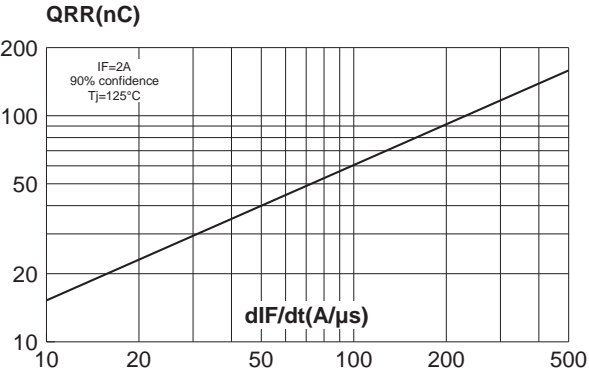
**Fig. 6:** Forward voltage drop versus forward current (maximum values).



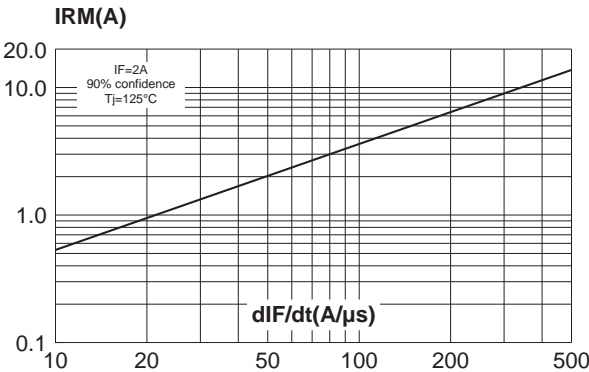
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values).



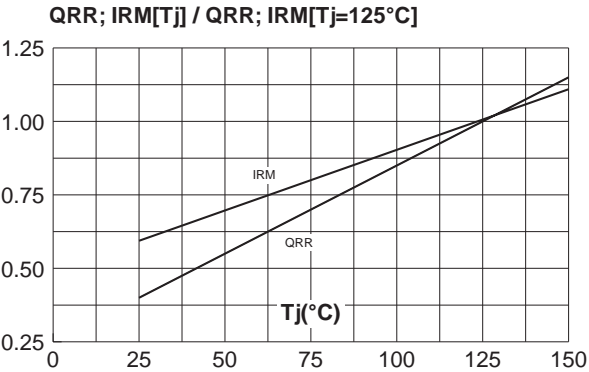
**Fig. 8:** Recovery charges versus  $dI_F/dt$



**Fig. 9:** Peak reverse recovery current versus  $dI_F/dt$ .



**Fig. 10:** Dynamic parameters versus junction temperature.

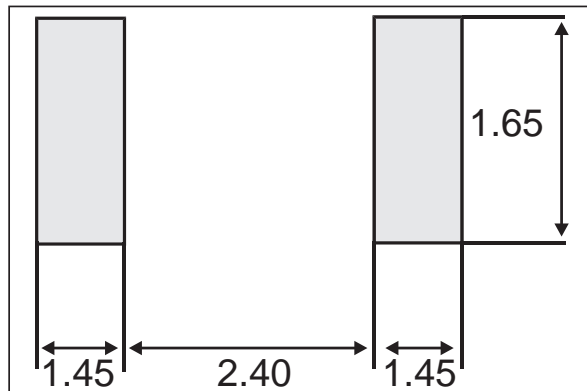


## PACKAGE MECHANICAL DATA

## SMA

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

## FOOT PRINT (in millimeters)



- **Marking** : R12
- Cathode band is inked
- Epoxy meets UL94-V0
- Weight: 0.06g

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