



# STPR120A

## HIGH EFFICIENCY FAST RECOVERY DIODE

**Table 1: Main Product Characteristics**

$I_{F(AV)}$	1 A
$V_{RRM}$	200 V
$T_j$ (max)	150°C
$V_F$ (max)	0.74 V
$t_{rr}$ (max)	35 ns

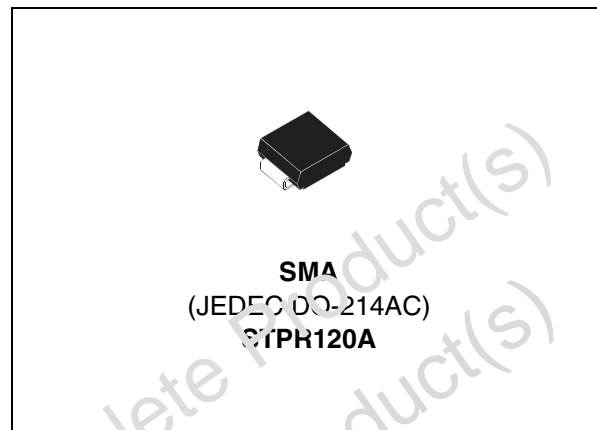
### FEATURES AND BENEFITS

- Very low switching losses
- Low forward voltage drop
- Fast rectifier Epitaxial diode
- Surface mount package

### 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.



**Table 2: Order Code**

Part Number	Marking
STPR120A	R12

**Table 3: 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	1	A
$I_{FSM}$	Surge non repetitive forward current	30	A
$T_{stg}$	Storage temperature range	-65 to + 150	°C
$T_j$	Maximum operating junction temperature	150	°C

## STPR120A

**Table 4: Thermal Resistance**

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

**Table 5: Static Electrical Characteristics**

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$			3	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			180	
$V_F^{**}$	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: \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

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

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

**Table 6: Recovery Characteristics**

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit	
$t_{rr}$	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{A}$	$I_{rr} = 0.25\text{A}$	$I_{r1} = 1\text{A}$	25	ns
			$I_F = 1\text{A}$	$di_F/dt = 50\text{ A}/\mu\text{s}$	$V_R = V_{RRM}$	25	
$t_{fr}$	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$	$di_F/dt = 100\text{ A}/\mu\text{s}$		25	ns
$V_{FP}$	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$	$di_F/dt = 100\text{ A}/\mu\text{s}$		5	V

Figure 1: Average forward power dissipation versus average forward current

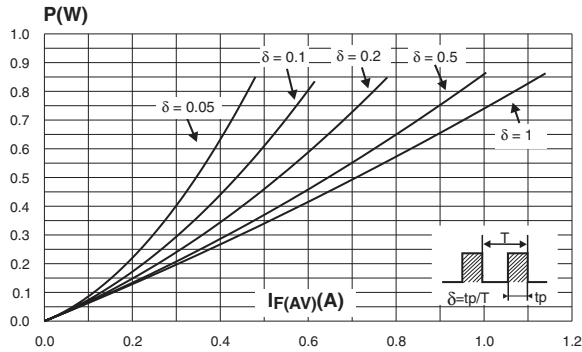


Figure 2: Peak current versus form factor

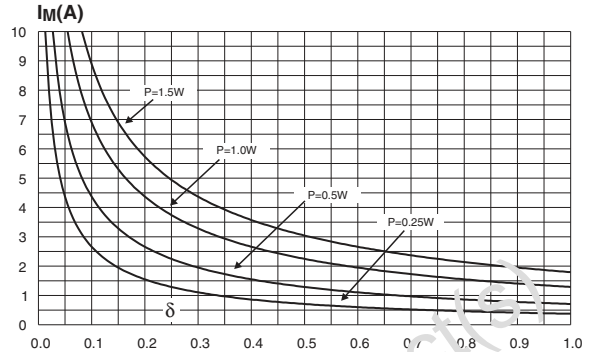


Figure 3: Average forward current versus ambient temperature (delta = 0.5)

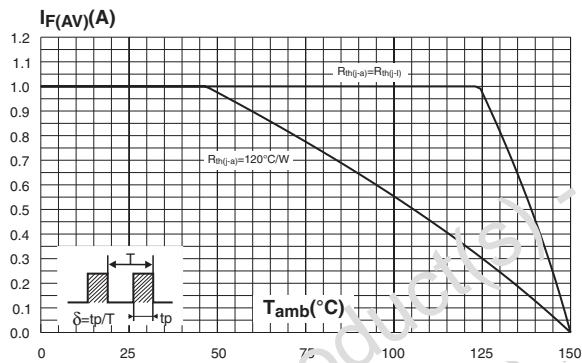


Figure 4: Non repetitive surge peak forward current versus overload duration

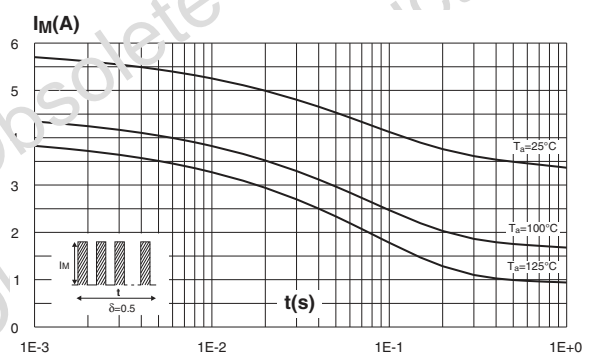


Figure 5: Variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35um, recommended pad layout)

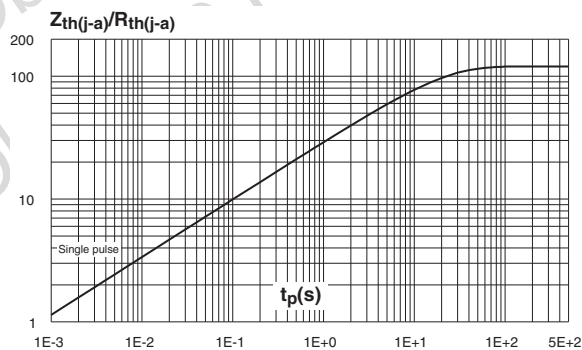


Figure 6: Forward voltage drop versus forward current (maximum values)

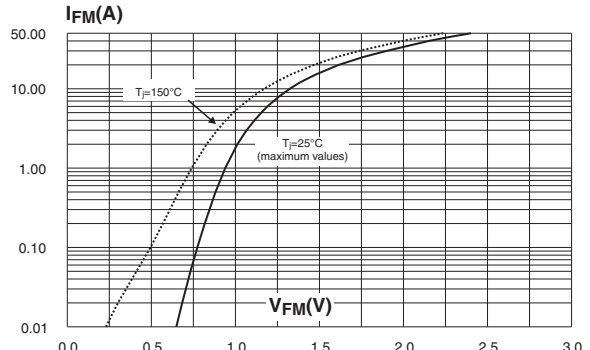


Figure 7: Junction capacitance versus reverse voltage applied (typical values)

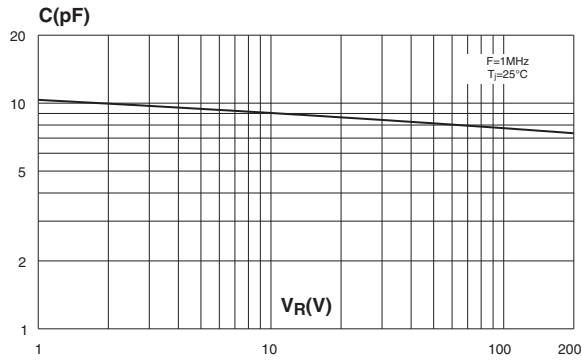


Figure 8: Recovery charges versus  $di_f/dt$

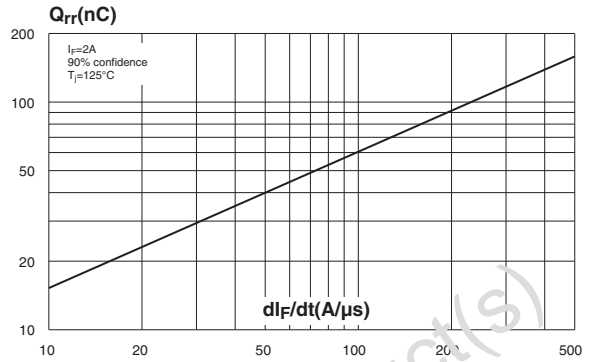


Figure 9: Peak recovery current versus  $di_f/dt$

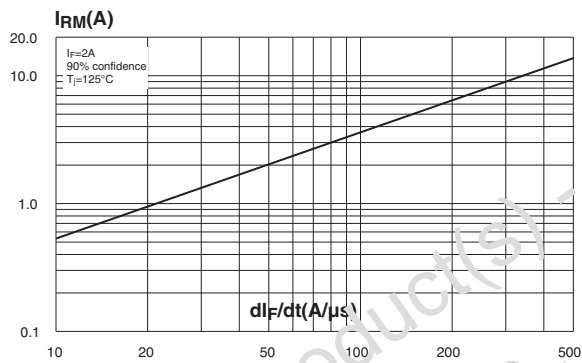


Figure 10: Dynamic parameters versus junction temperature

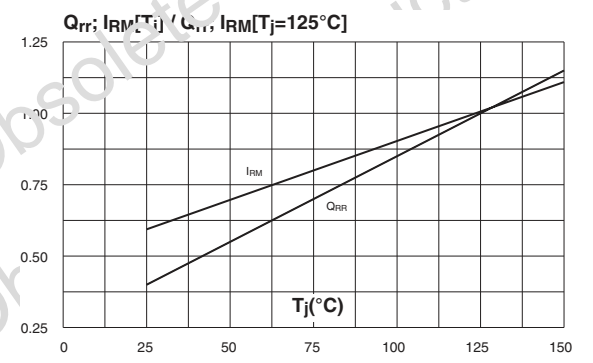
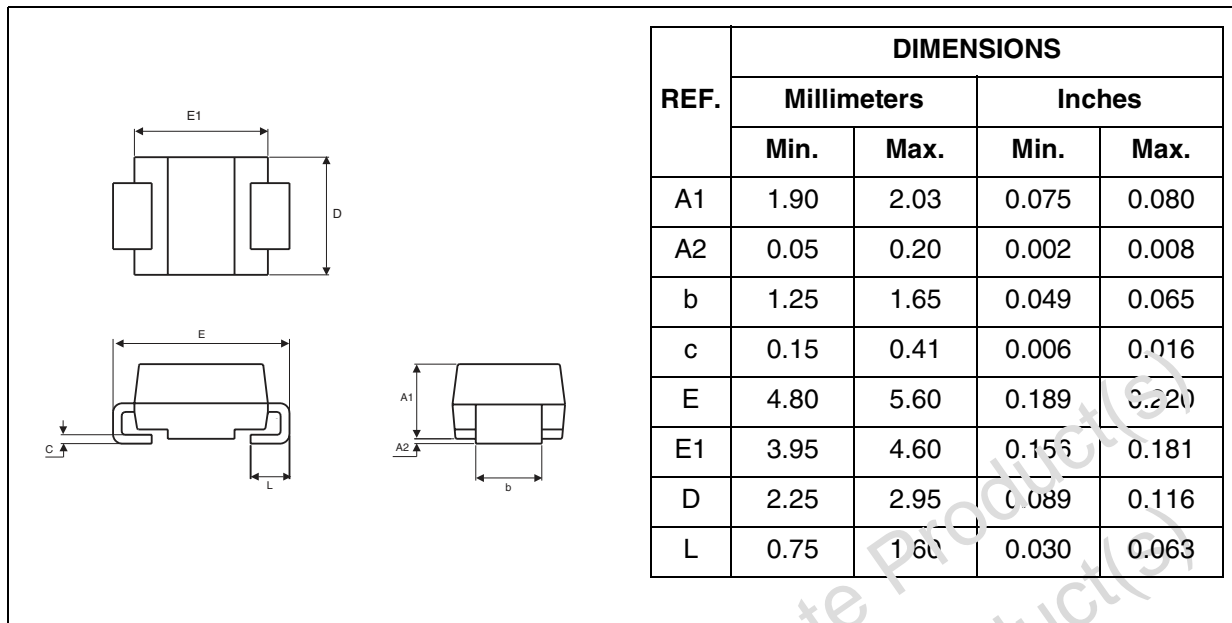
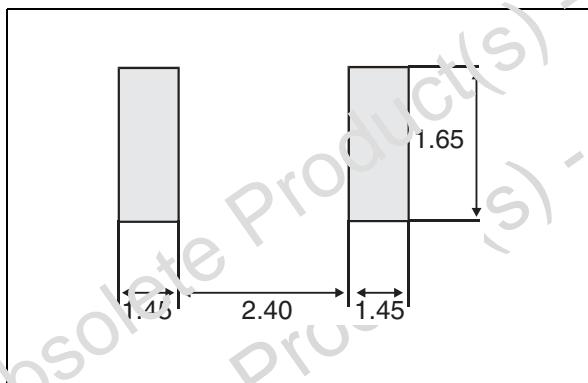


Figure 11: SMA Package Mechanical Data

Figure 12: SMA Foot Print Dimensions  
(in millimeters)

## STPR120A

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**Table 7: Ordering Information**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPR120A	R12	SMA	0.068 g	5000	Tape & reel

- Band indicates cathode
- Epoxy meets UL94, V0

**Table 8: Revision History**

Date	Revision	Description of Changes
Jul-2003	3	Last update.
Aug-2004	4	SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106inc.) to 2.03mm (0.080).

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