



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.

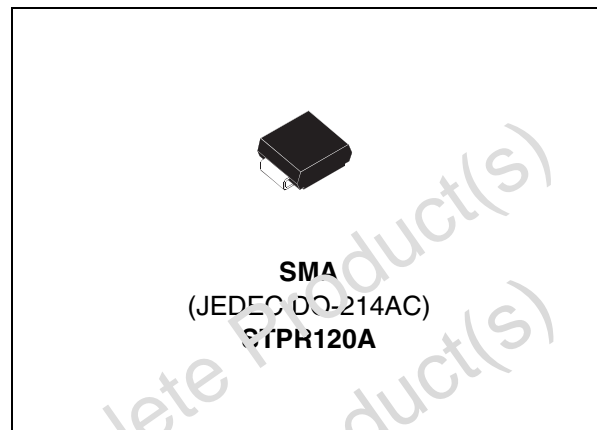


Table 2: Order Code

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	$T_L = 125^\circ\text{C} \quad \delta = 0.5$	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms Sinusoidal}$	A
T_{stg}	Storage temperature range	-65 to + 150	°C
T_j	Maximum operating junction temperature	150	°C

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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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			3	μA
		$T_j = 125^\circ\text{C}$			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: * $t_p = 5\text{ ms}$, $\delta < 2\%$

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

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	35	
t_{fr}	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ Measured at 1V			25	ns
V_{FP}	Forward recovery voltage		$I_F = 1\text{A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$			5	V

Figure 1: Average forward power dissipation versus average forward current

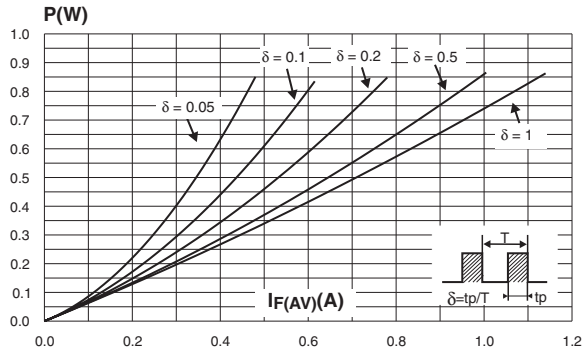


Figure 2: Peak current versus form factor

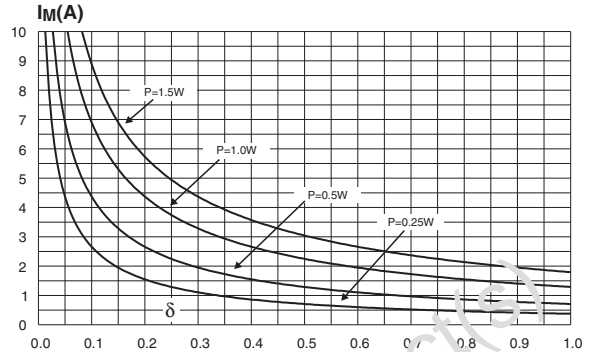


Figure 3: Average forward current versus ambient temperature (delta = 0.5)

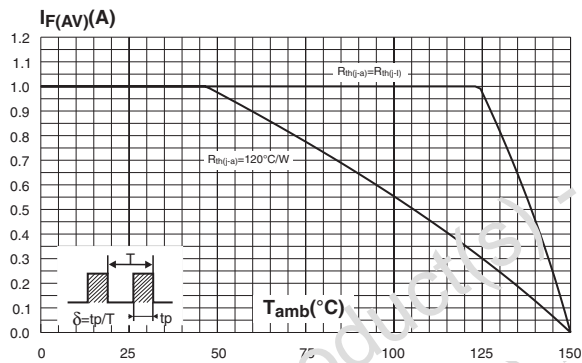


Figure 4: Non repetitive surge peak forward current versus overload duration

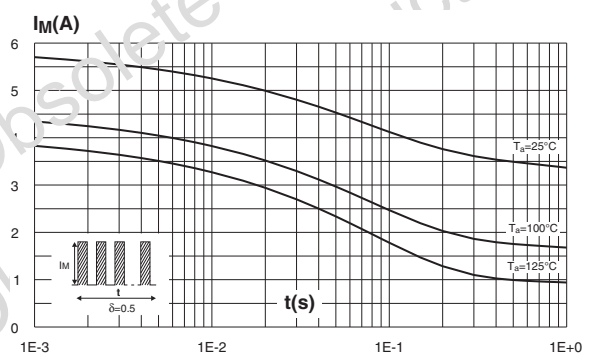


Figure 5: Variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35um, recommended pad layout)

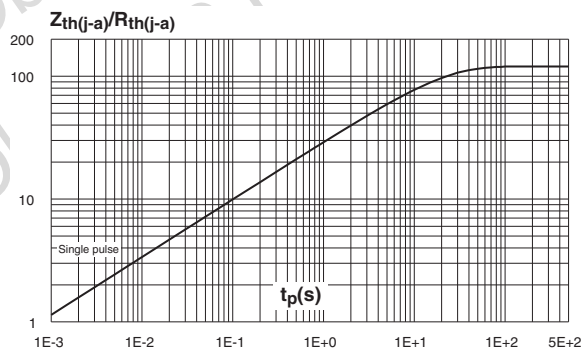


Figure 6: Forward voltage drop versus forward current (maximum values)

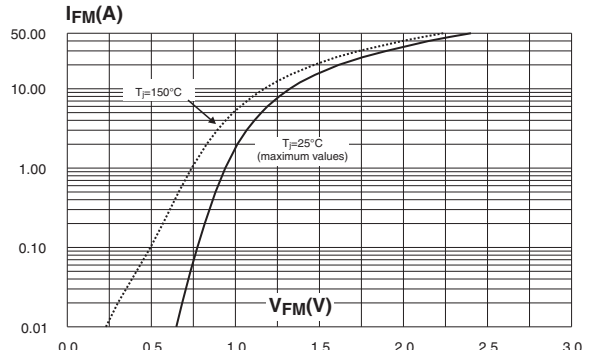


Figure 7: Junction capacitance versus reverse voltage applied (typical values)

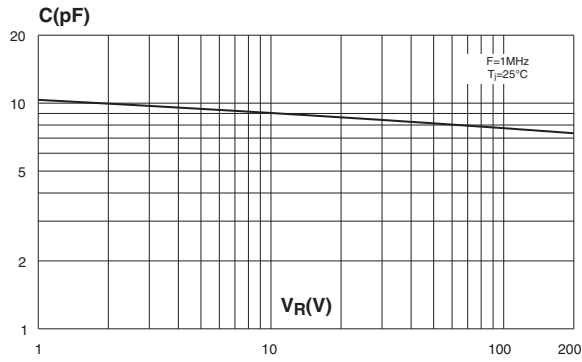


Figure 8: Recovery charges versus di_F/dt

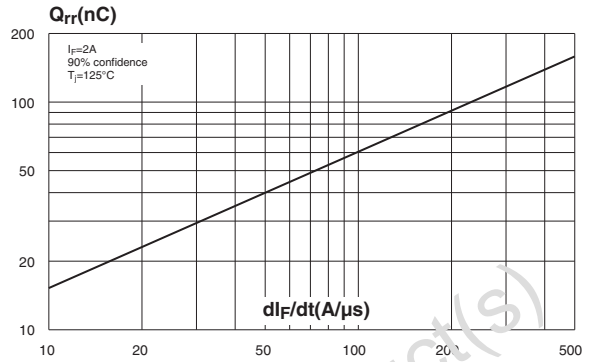


Figure 9: Peak recovery current versus di_F/dt

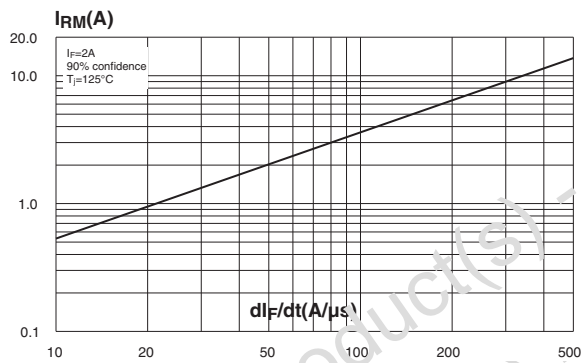


Figure 10: Dynamic parameters versus junction temperature

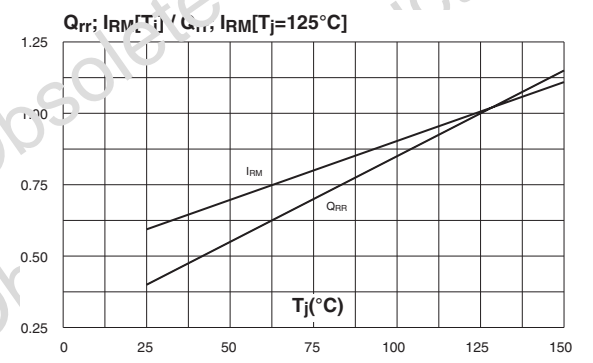
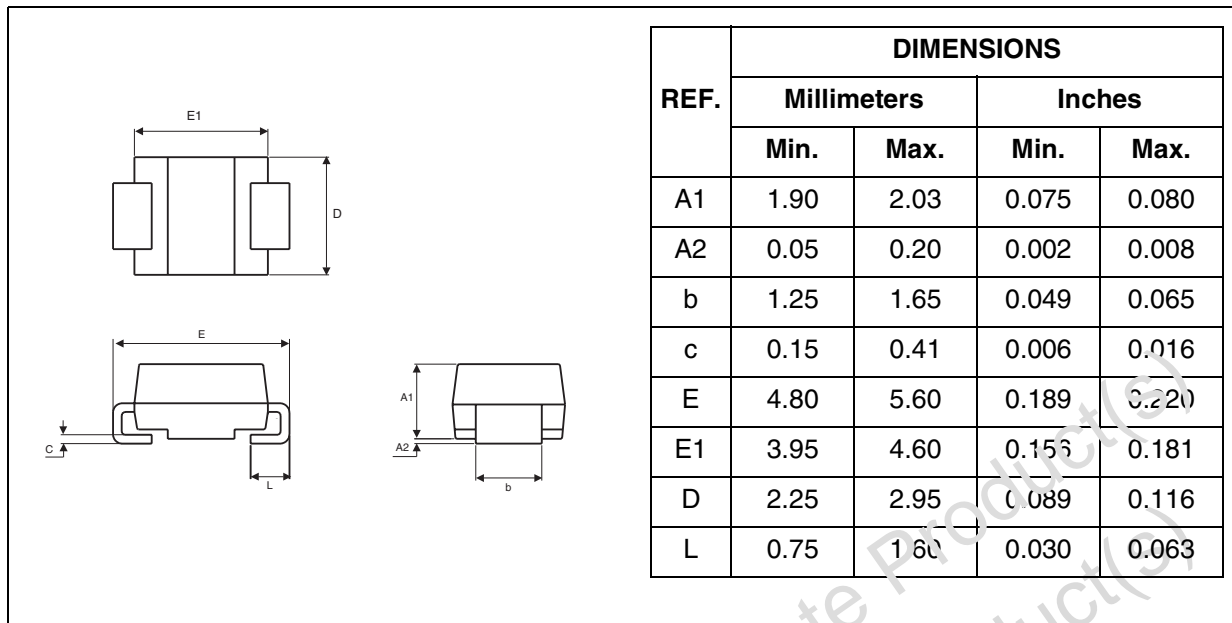
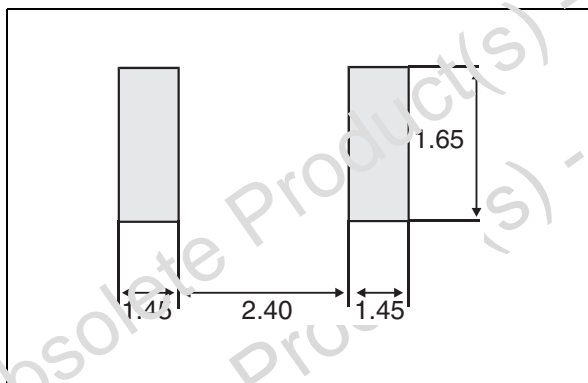


Figure 11: SMA Package Mechanical Data

Figure 12: SMA Foot Print Dimensions
(in millimeters)

STPR120A

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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