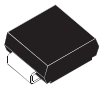
STPR120A

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



SMA
(JEDEC DO-214AC)
STPR120A

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°C δ = 0.5	1	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	30	A
T_{stg}	Storage temperature range		-65 to + 150	°C
T_j	Maximum operating junction temperature		150	°C

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°C	$V_R = V_{RRM}$			3	µA
		T_j = 125°C			180	400	
V_F **	Forward voltage drop	T_j = 25°C	I_F = 1A			0.94	V
		T_j = 150°C	I_F = 1A		0.69	0.74	

Pulse test: * tp = 5 ms, δ < 2%

** tp = 380 µs, δ < 2%

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

Table 6: Recovery Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25°C	I_F = 0.5A Irr = 0.25A I_R =1A			25	ns
			I_F = 1A dI_F/dt = 50 A/µs $V_R = V_{RRM}$		25	35	
t_{fr}	Forward recovery time	T_j = 25°C	I_F = 1A dI_F/dt = 100 A/µs Measured at 1V			25	ns
V_{FP}	Forward recovery voltage		I_F = 1A dI_F/dt = 100 A/µs			5	V

Figure 1: Average forward power dissipation versus average forward current

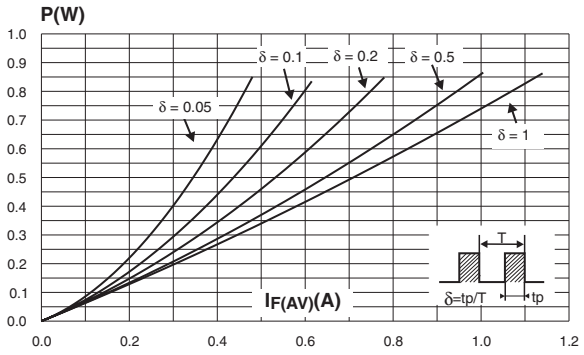


Figure 2: Peak current versus form factor

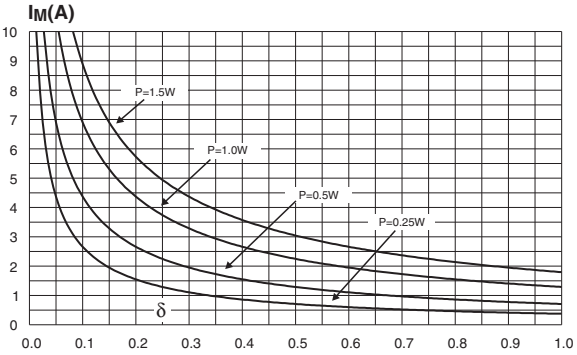


Figure 3: Average forward current versus ambient temperature (δ = 0.5)

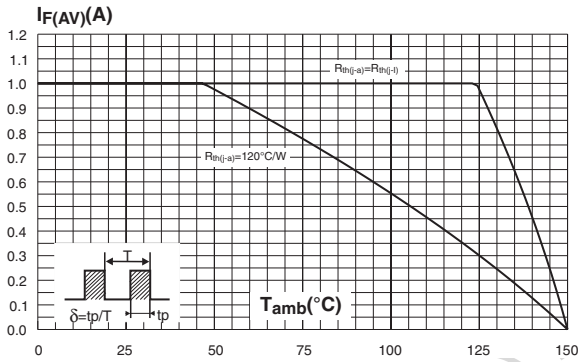


Figure 4: Non repetitive surge peak forward current versus overload duration

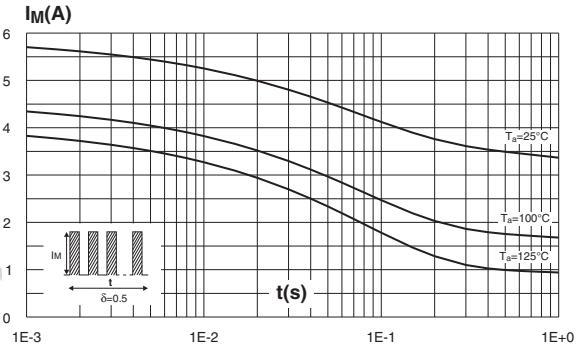


Figure 5: Variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout)

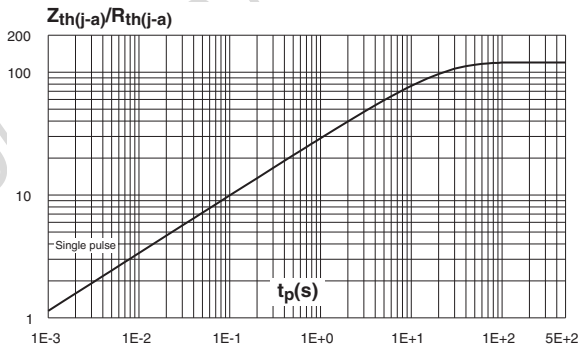


Figure 6: Forward voltage drop versus forward current (maximum values)

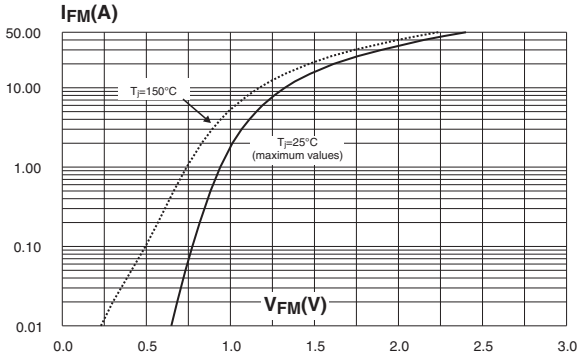


Figure 7: Junction capacitance versus reverse voltage applied (typical values)

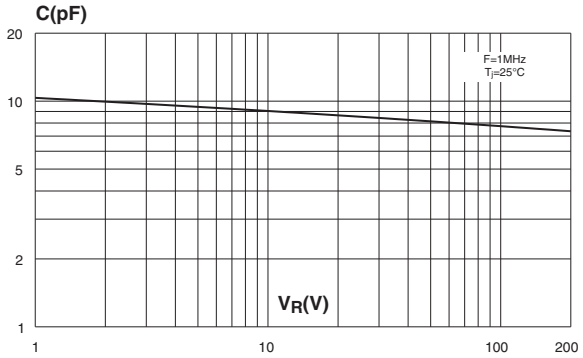


Figure 8: Recovery charges versus dI_F/dt

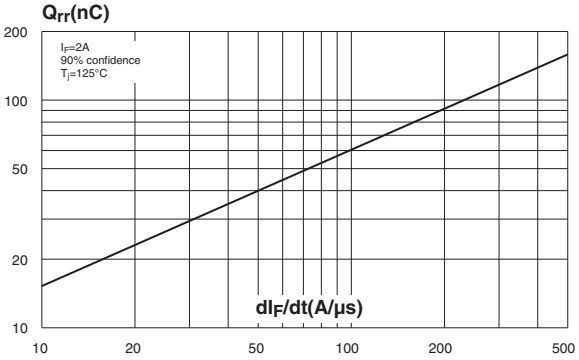


Figure 9: Peak recovery current versus dI_F/dt

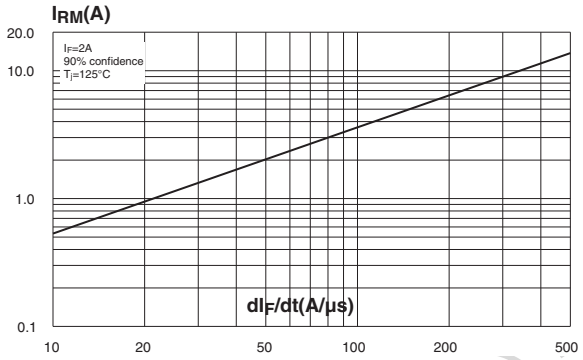


Figure 10: Dynamic parameters versus junction temperature

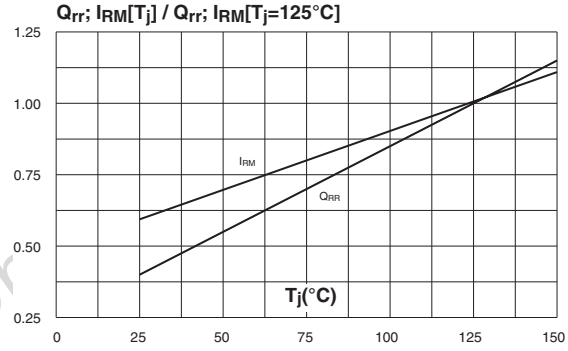
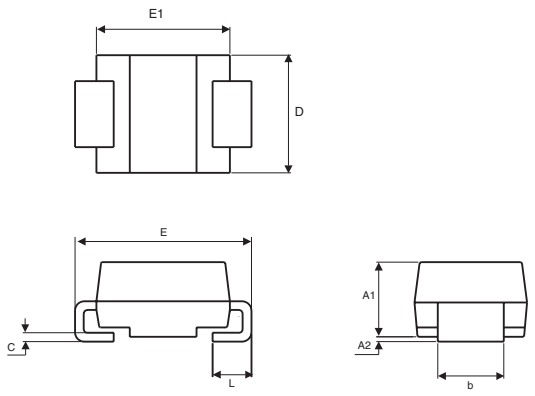


Figure 11: SMA Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.03	0.075	0.080
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

Figure 12: SMA Foot Print Dimensions
(in millimeters)

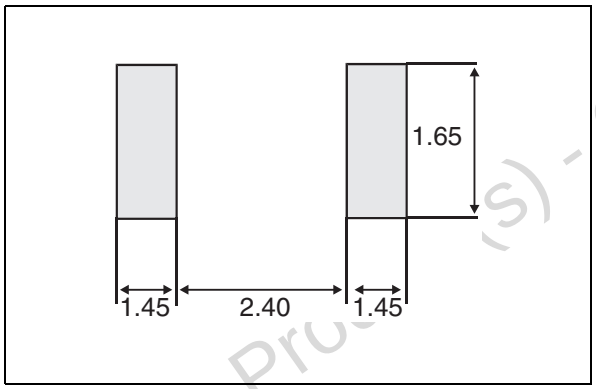


Table 7: Ordering Information

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).