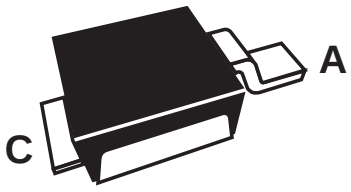
STPS120M

POWER SCHOTTKY RECTIFIERS

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1 A
V_{RRM}	20 V
Tj (max)	150°C
V_F (max)	0.41 V



ST Mite
(DO-216AA)

FEATURES AND BENEFITS

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop for higher efficiency & extended battery life
- Low thermal resistance

DESCRIPTION

Single Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in ST Mite, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications. Due to the small size of the package this device fits battery powered equipment (cellular, notebook, PDA's, printers) as well chargers and PCMCIA cards.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		20	V
$I_{F(RMS)}$	RMS forward current		2	A
$I_{F(AV)}$	Average forward current	Tc = 140°C δ = 0.5	1	A
I_{FSM}	Surge non repetitive forward current	tp = 8.3 ms sinusoidal	50	A
T_{stg}	Storage temperature range		- 65 to + 150	°C
Tj	Maximum operating junction temperature*		150	°C
dV/dt	Critical rate of rise of reverse voltage (rated Vr, Tj = 25°C)		10000	V/µs

* : $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th\ (j-c)}$	Junction to case	20	°C/W
$R_{th\ (j-a)}$	Junction to ambient with minimum recommended pad size, PC board FR4	250	°C/W

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Value			Unit
				Min.	Typ.	Max.	
I_R *	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$		1.3	3.9	µA
		Tj = 100°C			275	850	
		Tj = 25°C	V_R = 10 V		0.6	2.0	
		Tj = 100°C			145	450	
		Tj = 25°C	V_R = 5 V		0.4	1.0	
		Tj = 100°C			105	300	
V_F *	Forward voltage drop	Tj = 25°C	I_F = 1A		0.44	0.49	V
		Tj = 100°C			0.36	0.41	
		Tj = 25°C	I_F = 2 A		0.48	0.54	
		Tj=100°C			0.42	0.48	

Pulse test : * $tp \leq 380\ \mu s$, $\delta \leq 2\%$

To evaluate the conduction losses use the following equation :
$P = 0.34 \times I_{F(AV)} + 0.07\ I_F{}^2{}_{(RMS)}$

Fig. 1: Conduction losses versus average current.

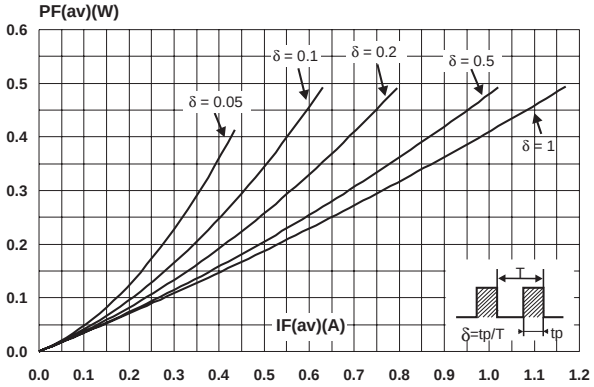


Fig. 2: Average forward current versus ambient temperature (δ = 0.5)

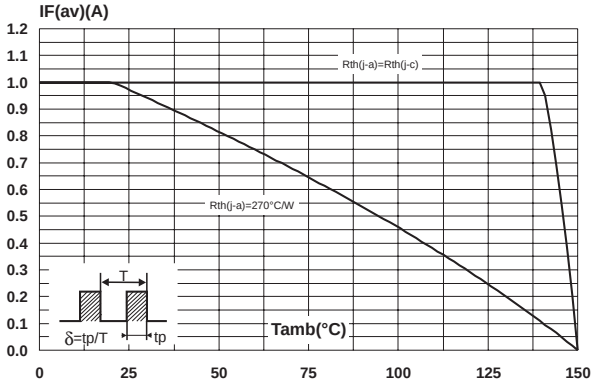


Fig. 3: Non repetitive surge peak forward current versus overload duration (maximum values).

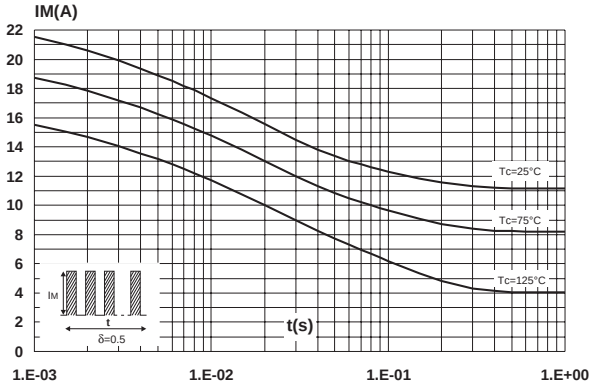


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

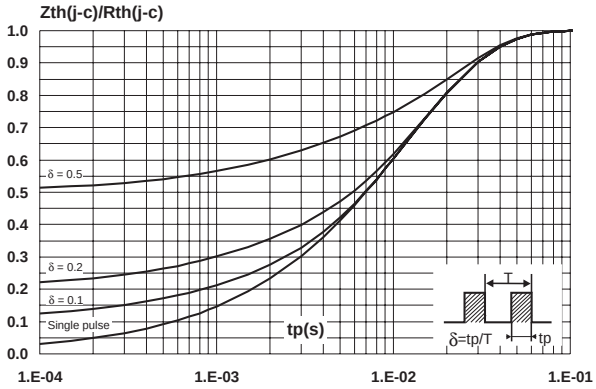


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values).

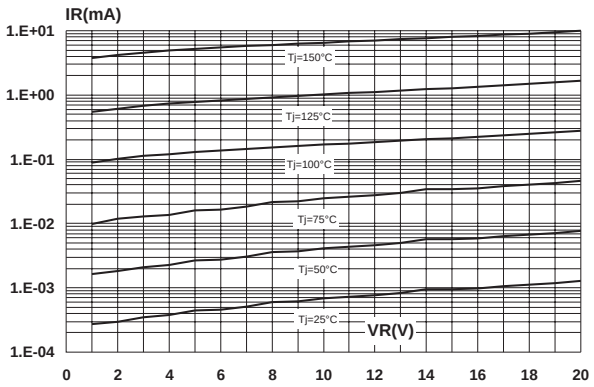


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

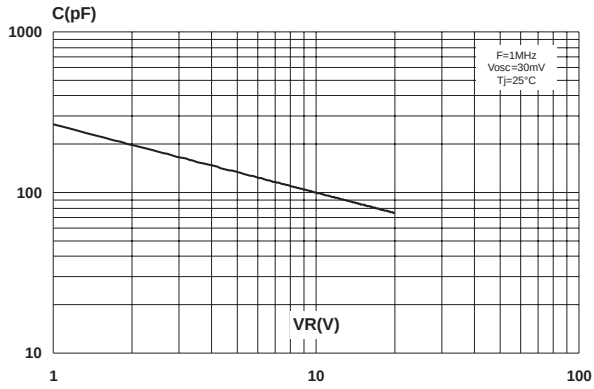


Fig. 7-1: Forward voltage drop versus forward current (low level).

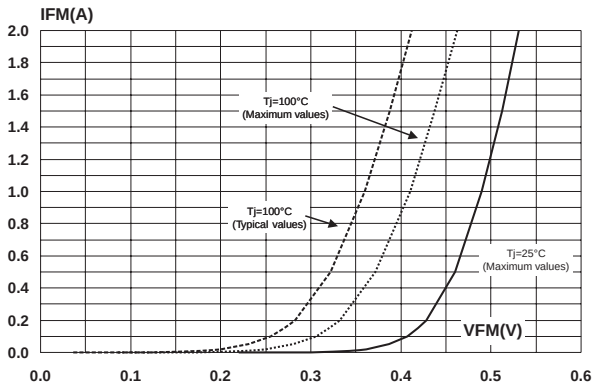


Fig. 7-2: Forward voltage drop versus forward current (high level)

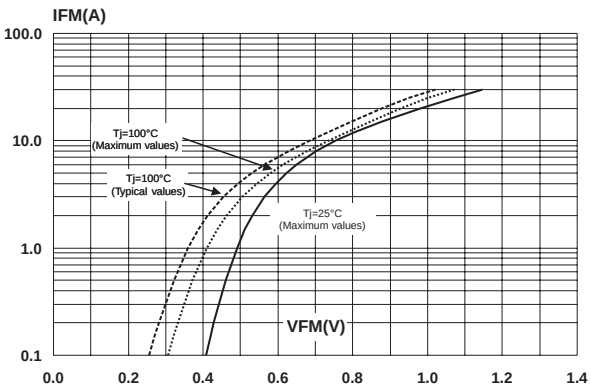
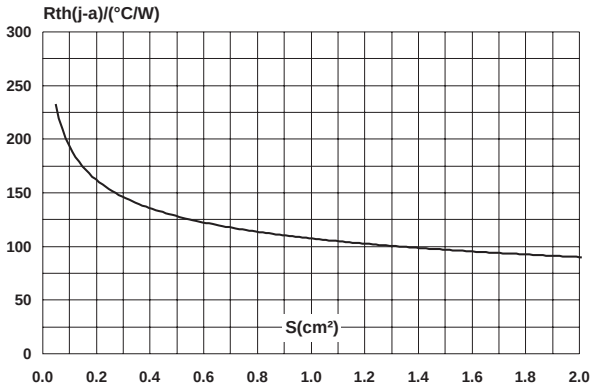
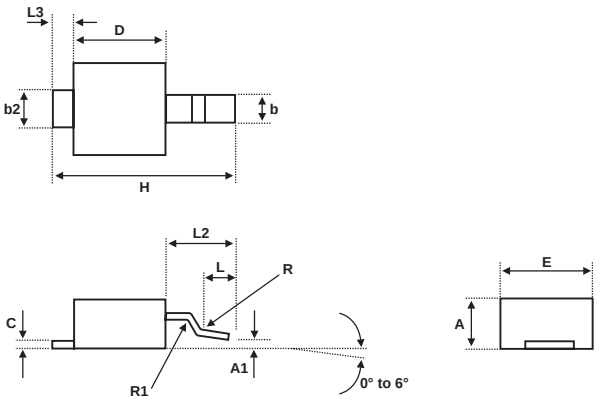


Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm).



PACKAGE MECHANICAL DATA

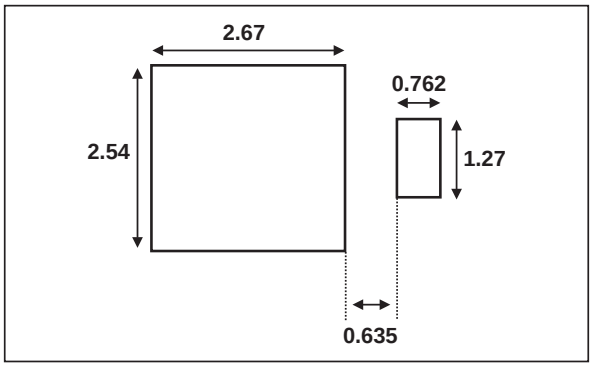
ST Mite



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.85	1.00	1.15	0.033	0.039	0.045
A1			0.10			0.004
b	0.40		0.65	0.016		0.025
b2	0.70		1.00	0.027		0.039
c	0.10		0.25	0.004		0.010
D	1.75	1.90	2.05	0.069	0.007	0.081
E	1.75	1.90	2.05	0.069	0.007	0.081
H	3.60	3.75	3.90	0.142	0.148	0.154
L	0.50	0.63	0.80	0.047	0.025	0.031
L2	1.20	1.35	1.50	0.047	0.053	0.059
L3	0.50 ref (Typ.)			0.019 ref (Typ.)		
R	0.07			0.003		
R1	0.07			0.003		

Note: The anode is connected to the longer tab
The cathode is connected to the shorter tab (heatsink)

FOOTPRINT (dimensions in mm)



Type	Marking	Package	Weight	Base qty	Delivery mode
STPS120M	120	ST Mite	15.5 mg	12000	Tape & reel