



STPS1L40M

LOW DROP POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	1 A
V_{RRM}	40 V
$T_j(max)$	150°C
$V_F(max)$	0.40 V

FEATURES AND BENEFITS

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

DESCRIPTION

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

Packaged in STmite, 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.

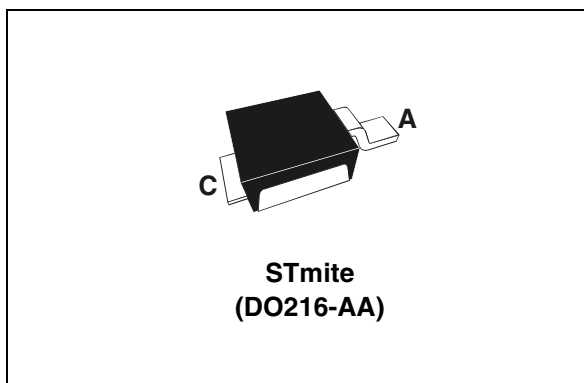


Table 2: Order Code

Part Number	Marking
STPS1L40M	1L4

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
$I_{F(RMS)}$	RMS forward voltage		2	A
$I_{F(AV)}$	Average forward current	$T_c = 140^\circ\text{C} \quad \delta = 0.5$	1	A
I_{FSM}	Surge non repetitive forward current	10 ms sinusoidal	50	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s} \quad T_j = 25^\circ\text{C}$	1200	W
T_{stg}	Storage temperature range		-65 to + 150	°C
T_j	Maximum operating junction temperature *		150	°C
dV/dt	Critical rate of rise of reverse voltage (rated V_R , $T_j = 25^\circ\text{C}$)		10000	V/ μs

* : $\frac{dP_{tot}}{dT_j} > \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

Table 4: Thermal Resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}^*$	Junction to case	20	°C/W
$R_{th(j-l)}^*$	Junction to ambient	250	°C/W

* Mounted with minimum recommended pad size, PC board FR4.

Table 5: Static Electrical Characteristics

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		0.021	0.063	mA
		$T_j = 85^\circ\text{C}$			1.3	4.0	
		$T_j = 25^\circ\text{C}$	$V_R = 20\text{V}$		0.007	0.021	
		$T_j = 85^\circ\text{C}$			0.49	1.5	
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$		0.40	0.46	V
		$T_j = 85^\circ\text{C}$			0.35	0.40	
		$T_j = 25^\circ\text{C}$	$I_F = 3\text{A}$		0.52	0.60	
		$T_j = 85^\circ\text{C}$			0.50	0.58	

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

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

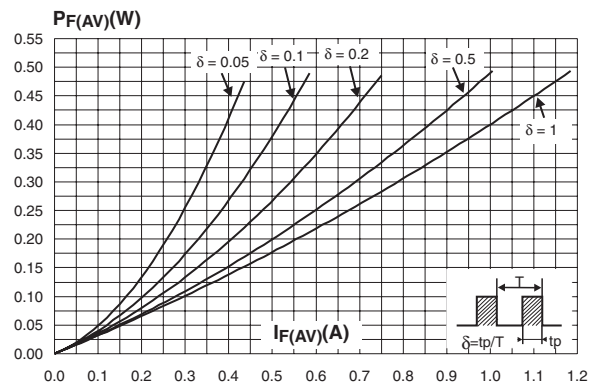
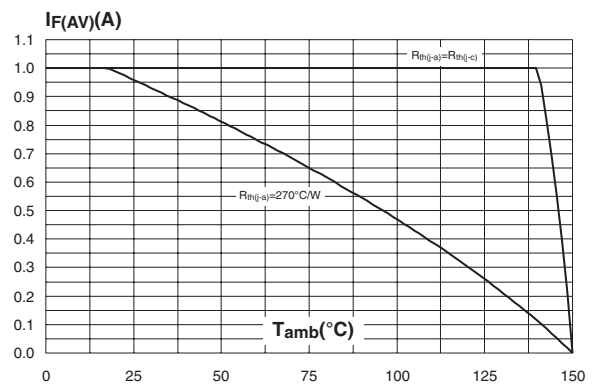
Figure 1: Conduction losses versus average current

Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$)


Figure 3: Normalized avalanche power derating versus pulse duration

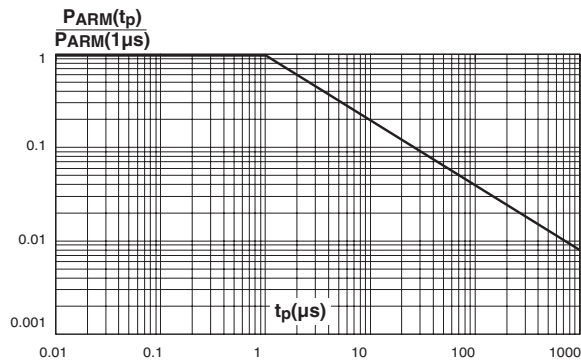


Figure 4: Normalized avalanche power derating versus junction temperature

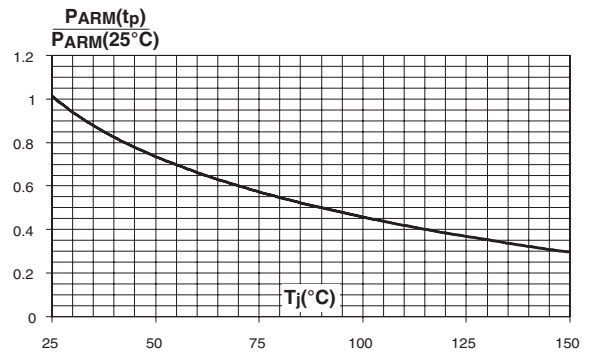


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

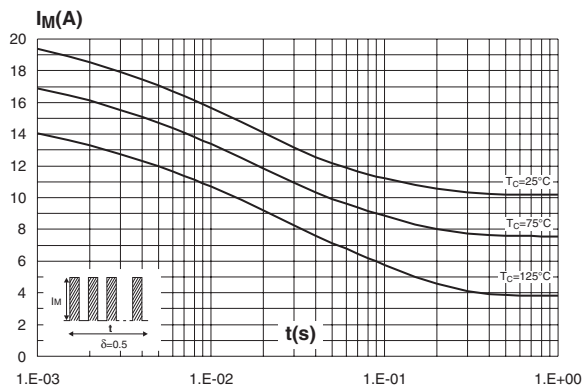


Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration

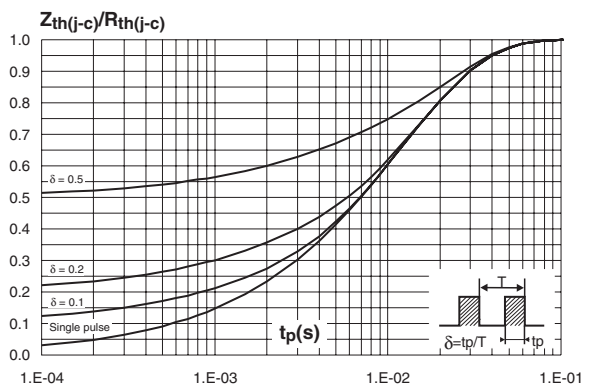


Figure 7: Reverse leakage current versus reverse voltage applied (typical values)

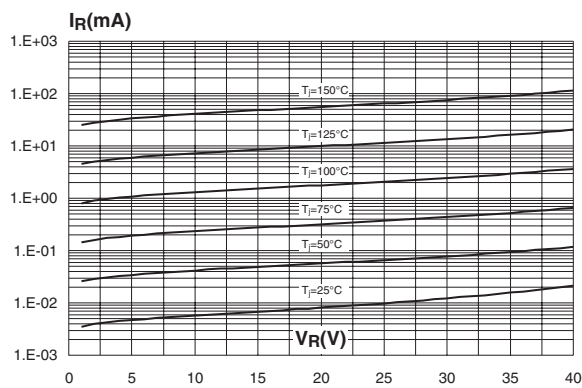


Figure 8: Reverse leakage current versus junction temperature (typical values)

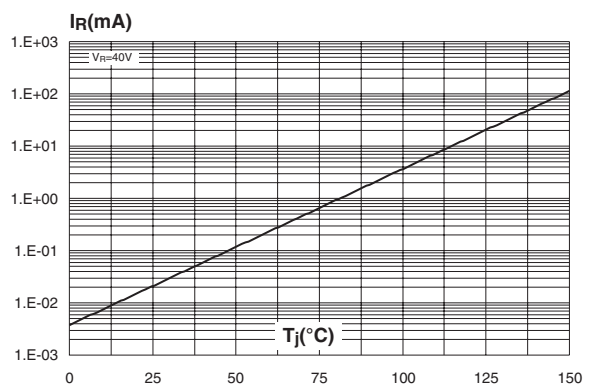


Figure 9: Junction capacitance versus reverse voltage applied (typical values)

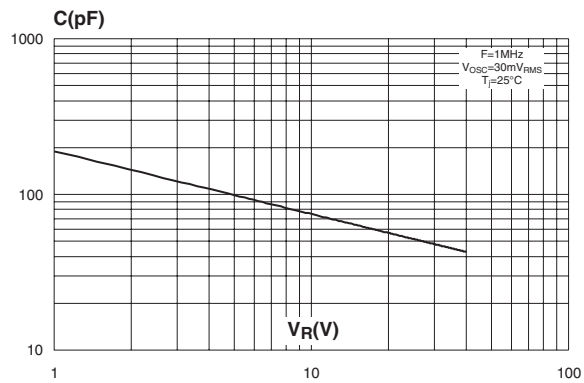


Figure 10: Forward voltage drop versus forward current

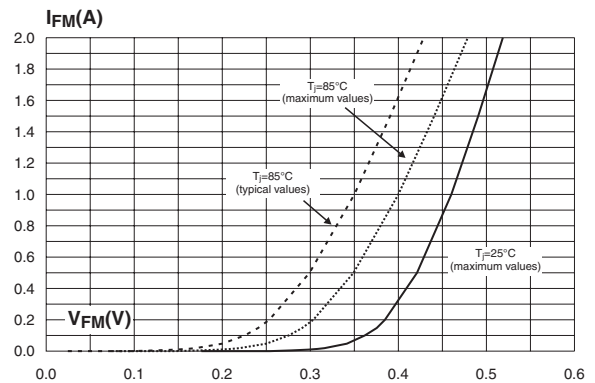
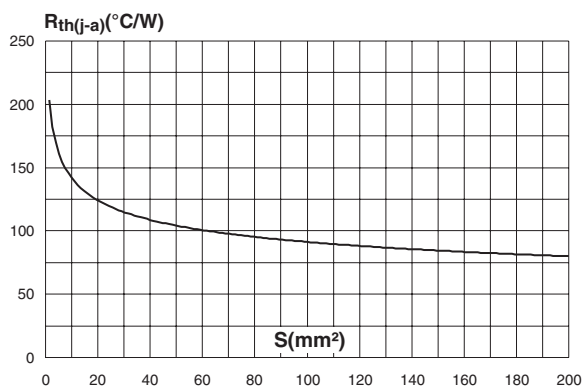


Figure 11: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35μm, typical values)



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