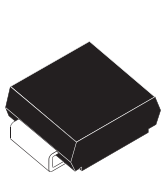
STPS1L30A/U

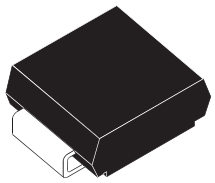
LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1 A
V_{RRM}	30 V
Tj (max)	150 °C
V_F (max)	0.3 V



SMA
STPS1L30A
JEDEC DO-214AC



SMB
STPS1L30U
JEDEC DO-214AA

FEATURES AND BENEFITS

- VERY LOW FORWARD VOLTAGE DROP FOR LESS POWER DISSIPATION
- OPTIMIZED CONDUCTION/REVERSE LOSSES TRADE-OFF WHICH MEANS THE HIGHEST YIELD IN THE APPLICATIONS
- SURFACE MOUNT MINIATURE PACKAGE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Single Schottky rectifier suited to Switched Mode Power Supplies and high frequency DC to DC converters, freewheel diode and integrated circuit latch up protection.

Packaged in SMA and SMB, this device is especially intended for use in parallel with MOSFETs in synchronous rectification.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		30	V
$I_{F(RMS)}$	RMS forward current		10	A
$I_{F(AV)}$	Average forward current	T_L = 135°C δ = 0.5	1	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	75	A
I_{RRM}	Repetitive peak reverse current	tp = 2 µs F = 1kHz square	1	A
I_{RSM}	Non repetitive peak reverse current	tp = 100 µs square	1	A
P_{ARM}	Repetitive peak avalanche power	tp = 1µs Tj = 25°C	1500	W
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		10000	V/µs

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

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th\ (j-l)}$	Junction to lead	SMA	30	°C/W
		SMB	25	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage Current	Tj = 25°C	$V_R = V_{RRM}$			200	µA
		Tj = 100°C			6	15	mA
V_F *	Forward Voltage drop	Tj = 25°C	I_F = 1 A			0.395	V
		Tj = 125°C			0.26	0.3	
		Tj = 25°C	I_F = 2 A			0.445	
		Tj = 125°C			0.325	0.375	

Pulse test : * tp = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.225 \times I_{F(AV)} + 0.075\ I_F{}^2{}_{(RMS)}$

Fig. 1: Average forward power dissipation versus average forward current.

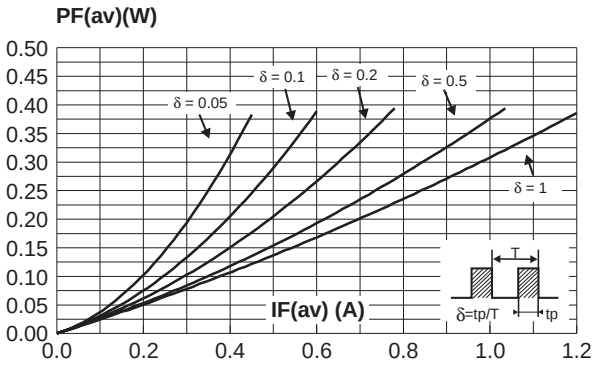


Fig. 2: Average forward current versus ambient temperature (δ=0.5).

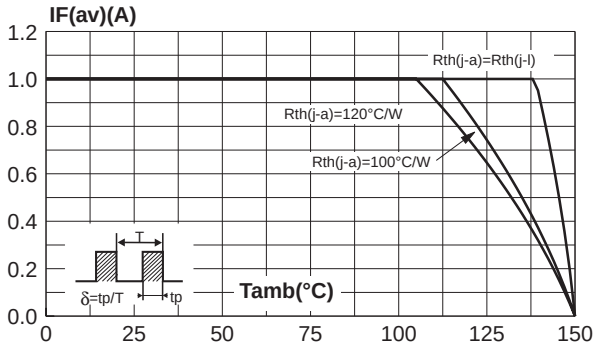


Fig. 3: Normalized avalanche power derating versus pulse duration.

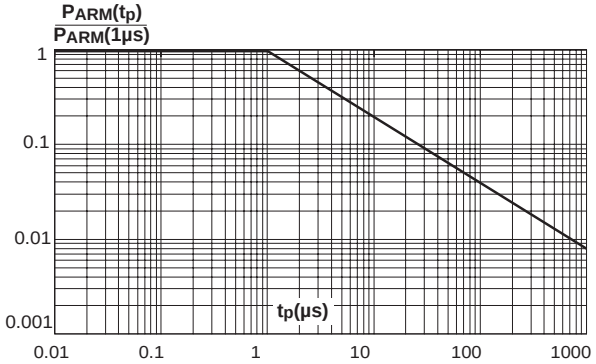


Fig. 4: Normalized avalanche power derating versus junction temperature.

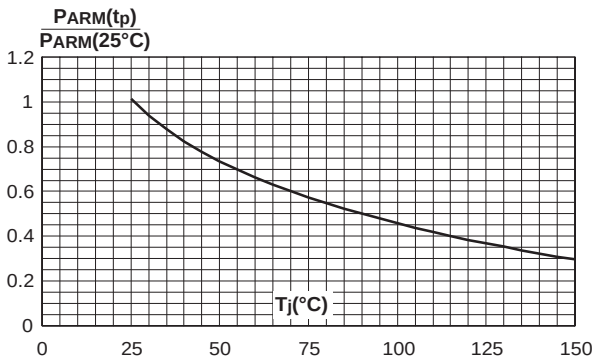


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA).

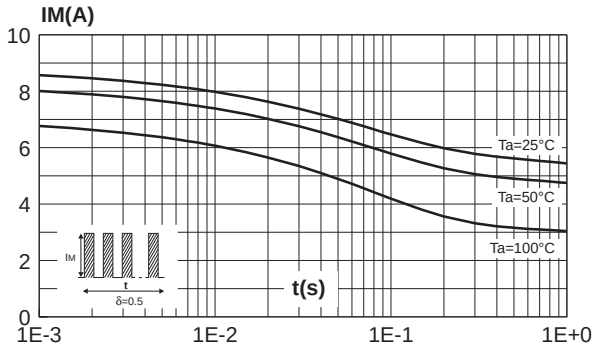


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (SMB).

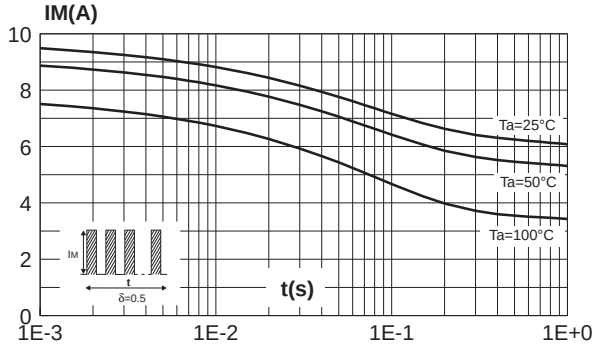


Fig. 6-1: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMB).

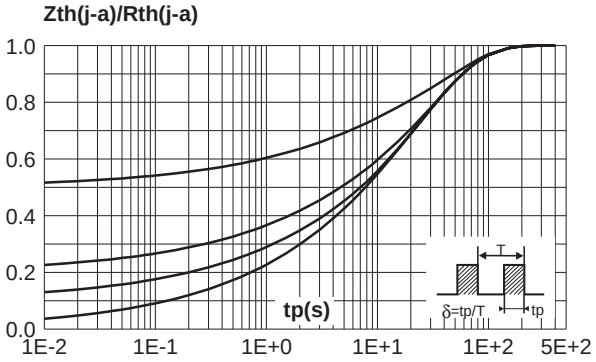


Fig. 6-2: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA).

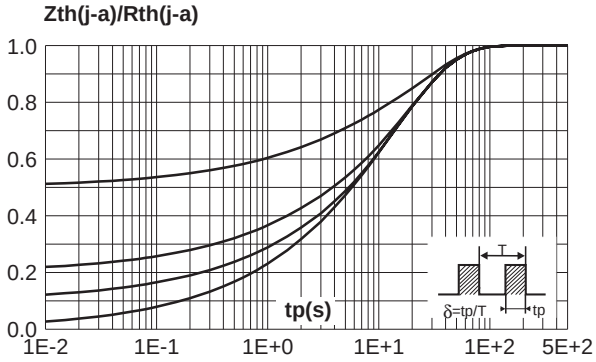


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

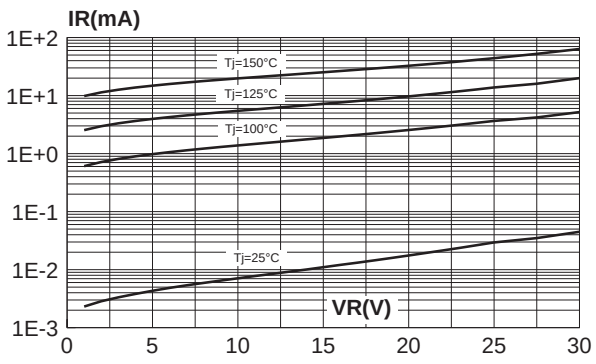


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

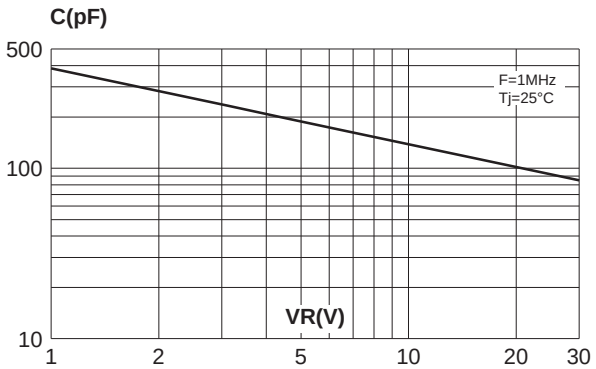


Fig. 9-1: Forward voltage drop versus forward current (typical values, high level).

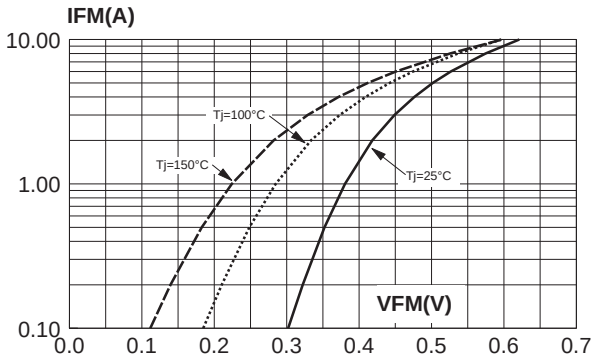


Fig. 9-2: Forward voltage drop versus forward current (maximum values, low level).

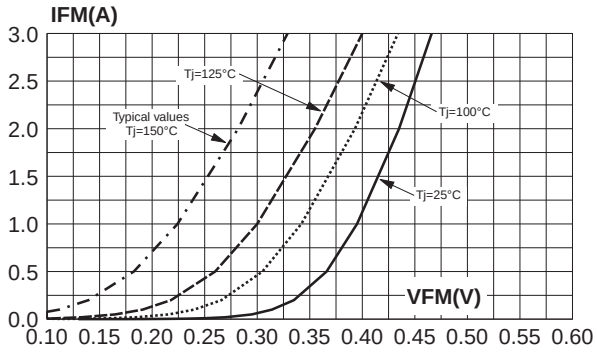


Fig. 10-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMB).

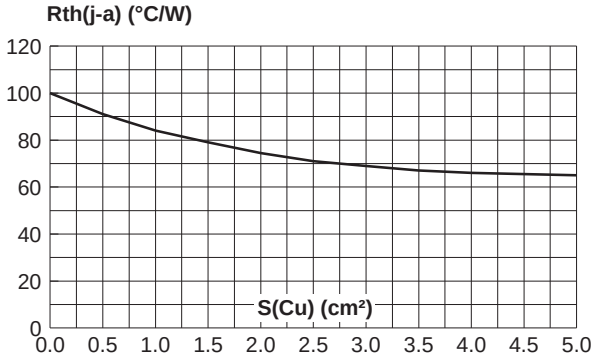
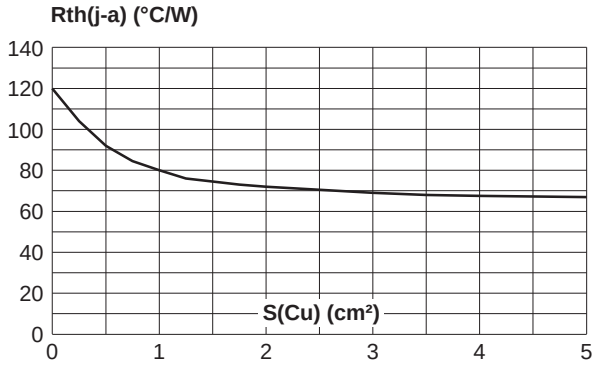
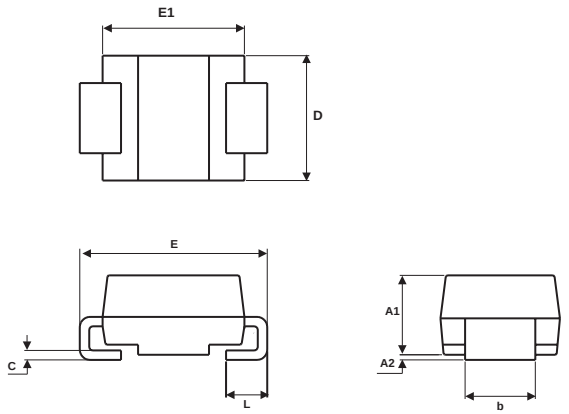


Fig. 10-2: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA).



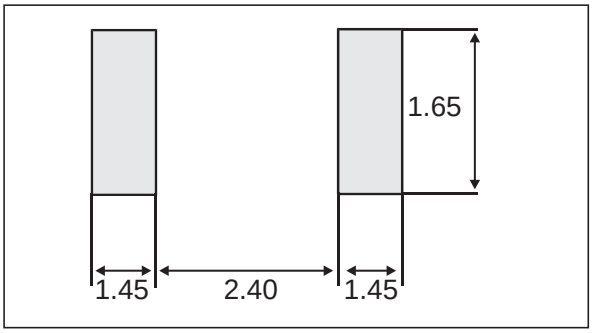
PACKAGE MECHANICAL DATA

SMA



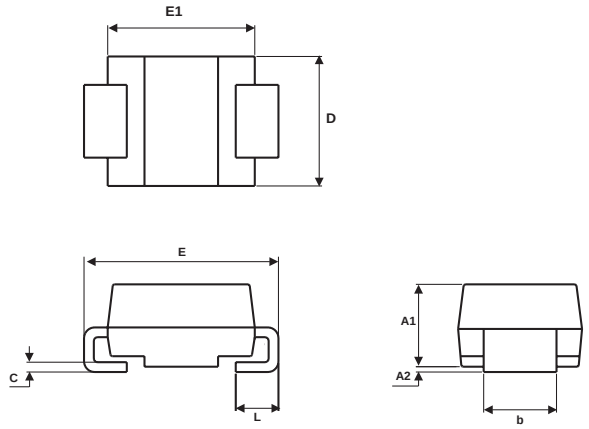
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOT PRINT DIMENSIONS (in millimeters)



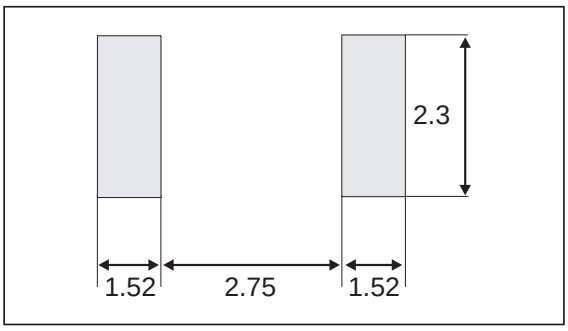
PACKAGE MECHANICAL DATA

SMB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

FOOT PRINT DIMENSIONS (in millimeters)



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS1L30U	G23	SMB	0.107g	2500	Tape & reel
STPS1L30A	GB3	SMA	0.068g	5000	Tape & reel

- Band indicates cathode
- Epoxy meets UL94,V0