

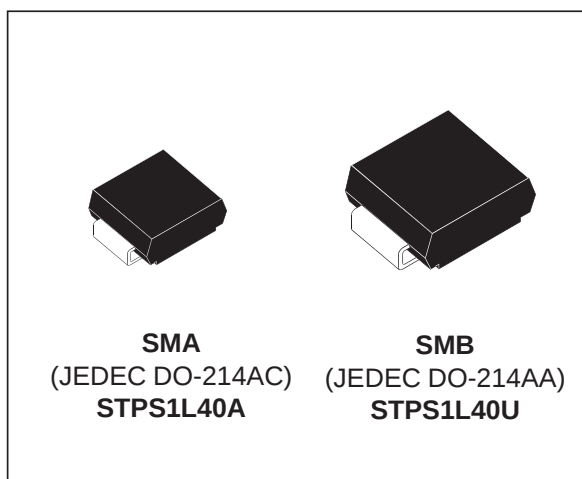
LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1 A
V_{RRM}	40 V
T_j (max)	150 °C
V_F (max)	0.42 V

FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- SURFACE MOUNT MINIATURE PACKAGE
- AVALANCHE CAPABILITY SPECIFIED



DESCRIPTION

Single chip Schottky rectifiers suited to Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in SMA and SMB, this device is especially intended for surface mounting and used in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
$I_{F(RMS)}$	RMS forward current		8	A
$I_{F(AV)}$	Average forward current	$T_L = 130^{\circ}\text{C} \quad \delta = 0.5$	1	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms Sinusoidal}$	60	A
I_{RRM}	Repetitive peak reverse current	$t_p = 2 \mu\text{s square } F=1\text{kHz}$	1	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100 \mu\text{s square}$	1	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s } T_j = 25^{\circ}\text{C}$	900	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		10000	V/ μs

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

STPS1L40A/U

THERMAL RESISTANCES

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

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions	Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = 40\text{ V}$		35	μA
		$T_j = 125^{\circ}\text{C}$		6	10	mA
V_F^*	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{ A}$		0.5	V
		$T_j = 125^{\circ}\text{C}$		0.37	0.42	
		$T_j = 25^{\circ}\text{C}$	$I_F = 2\text{ A}$		0.63	
		$T_j = 125^{\circ}\text{C}$		0.5	0.61	

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

To evaluate the maximum conduction losses use the following equation :

$$P = 0.23 \times I_{F(AV)} + 0.19 I_{F(RMS)}^2$$

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

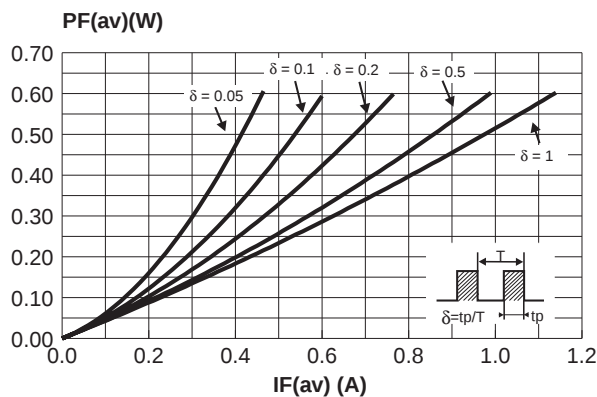


Fig. 3: Normalized avalanche power derating versus pulse duration.

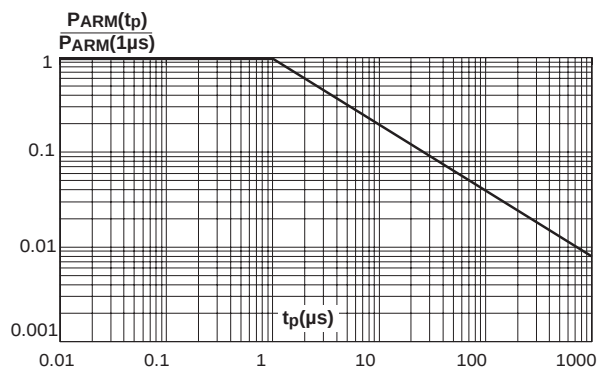


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

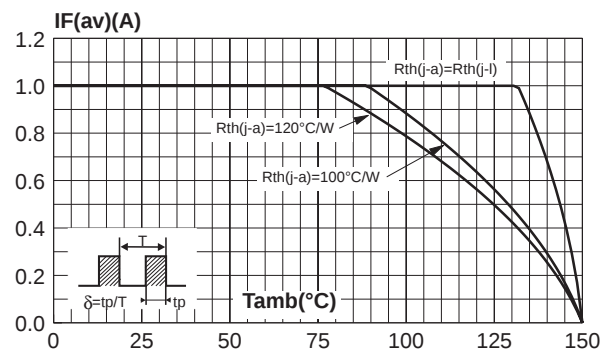


Fig. 4: Normalized avalanche power derating versus junction temperature.

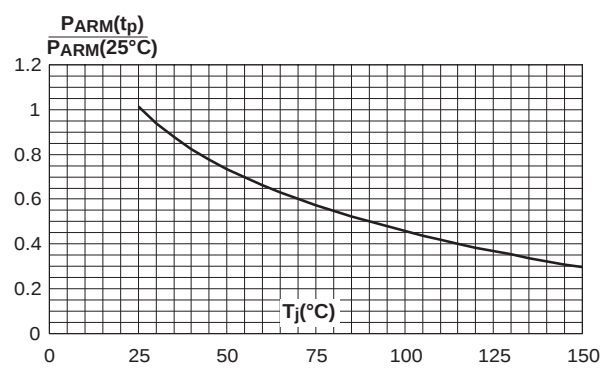


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (SMB).

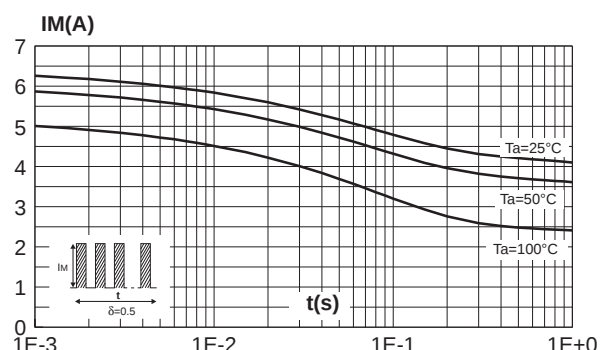


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA).

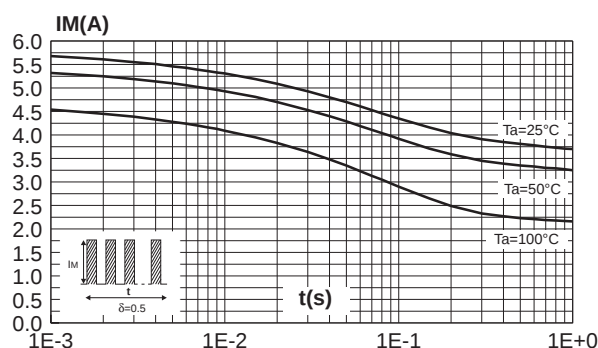


Fig. 6-1: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35μm, recommended pad layout) (SMB).

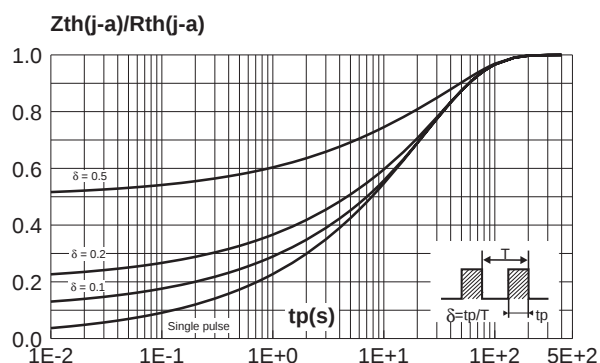


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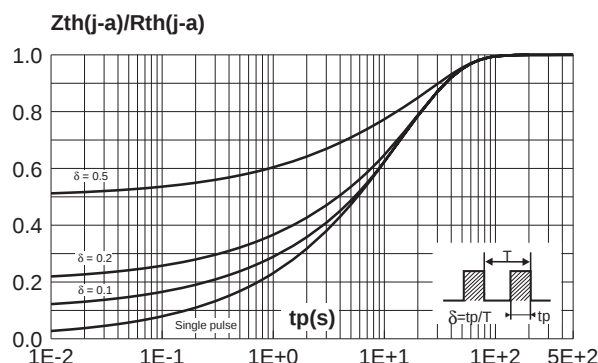


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

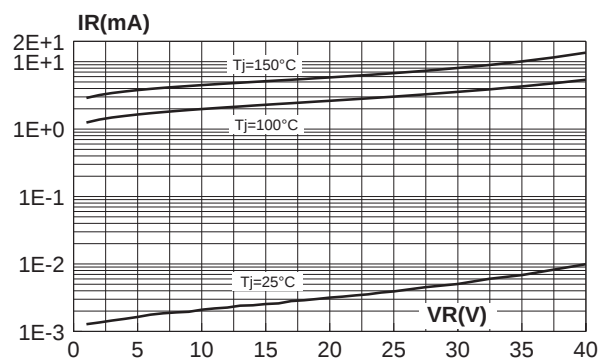


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

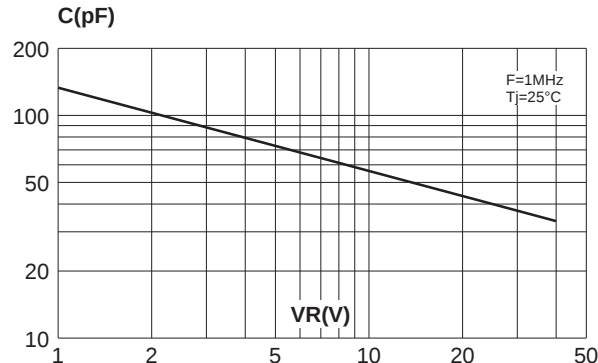


Fig. 9-1: Forward voltage drop versus forward current (typical values, high level).

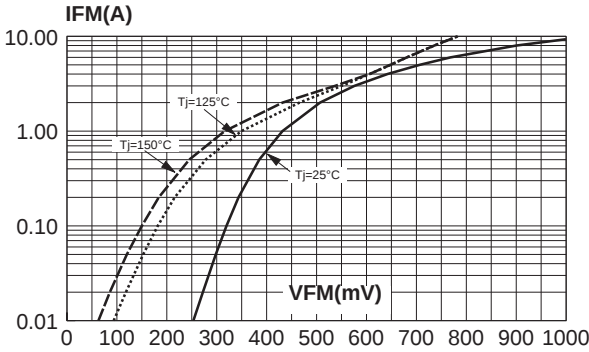


Fig. 9-2: Forward voltage drop versus forward current (typical values, low level).

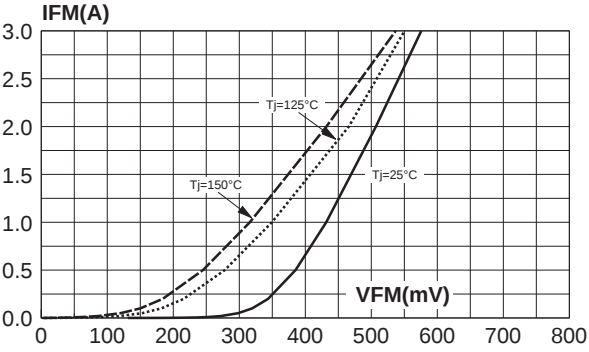


Fig. 10-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness e(Cu)= 35µm) (SMB).

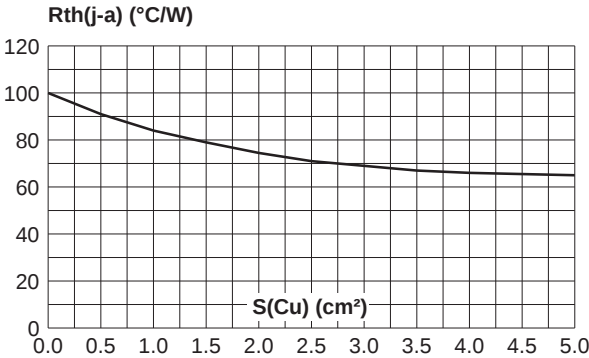
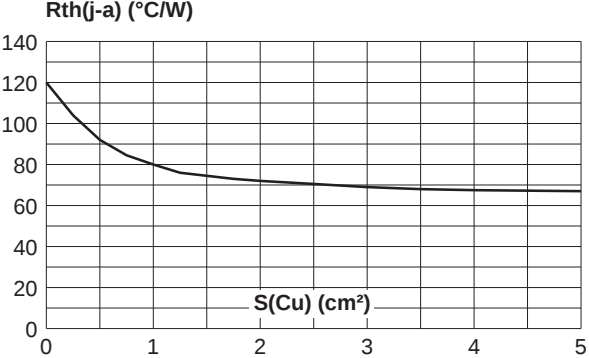
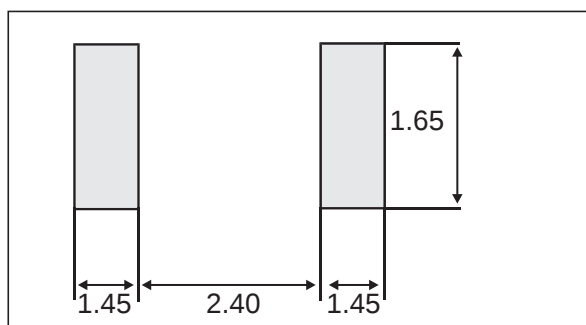


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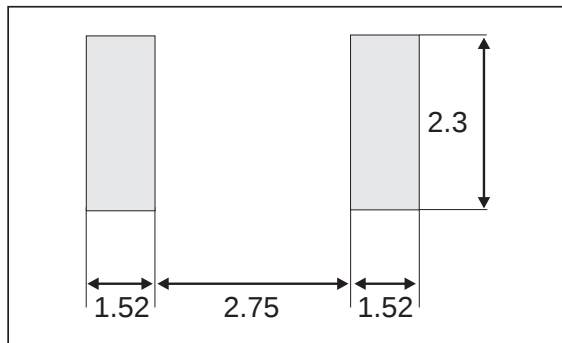
PACKAGE MECHANICAL DATA
SMA

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
STPS1L40U	GC4	SMB	0.107g	2500	Tape & reel
STPS1L40A	GB4	SMA	0.068g	5000	Tape & reel

- Band indicates cathode
- Epoxy meets UL94,V0

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