

## POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics**

$I_{F(AV)}$	1 A
$V_{RRM}$	60 V
$T_j(\text{max})$	150°C
$V_F(\text{max})$	0.56 V

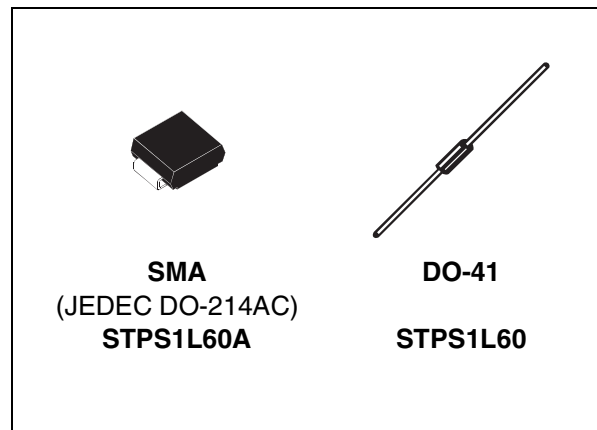
### FEATURES AND BENEFITS

- Negligible switching losses
- Low forward voltage drop
- Surface mount miniature package
- Avalanche capability specified

### DESCRIPTION

Axial and Surface Mount Power Schottky rectifiers suited to Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in SMA and DO-41, this device is especially intended for use in low voltage, high frequency inverters and small battery chargers.



**Table 2: Order Codes**

Part Number	Marking
STPS1L60A	GB6
STPS1L60	STPS1L60
STPS1L60RL	STPS1L60

**Table 3: Absolute Ratings** (limiting values)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		60	V
$I_{F(RMS)}$	RMS forward current		10	A
$I_{F(AV)}$	Average forward current	SMA	1	A
		DO-41		
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	40	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		10000	V/ $\mu\text{s}$

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

# STPS1L60

**Table 4: Thermal Resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient	SMA	120	$^{\circ}\text{C}/\text{W}$
		Lead length = 10 mm DO-41	100	
$R_{th(j-l)}$	Junction to lead	SMA	30	$^{\circ}\text{C}/\text{W}$
		Lead length = 10 mm DO-41	45	

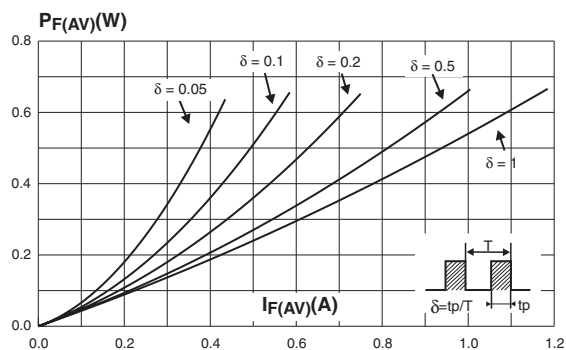
**Table 5: Static Electrical Characteristics**

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			50	$\mu\text{A}$
		$T_j = 100^{\circ}\text{C}$		1.5	5	mA	
$V_F^{**}$	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{A}$			0.57	V
		$T_j = 100^{\circ}\text{C}$				0.56	
		$T_j = 125^{\circ}\text{C}$		0.5	0.54		
		$T_j = 25^{\circ}\text{C}$	$I_F = 2\text{A}$			0.75	
		$T_j = 100^{\circ}\text{C}$				0.68	
		$T_j = 125^{\circ}\text{C}$		0.6	0.66		

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

To evaluate the conduction losses use the following equation:  $P = 0.44 \times I_{F(AV)} + 0.12 I_F^2 (\text{RMS})$

**Figure 1: Average forward power dissipation versus average forward current**



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

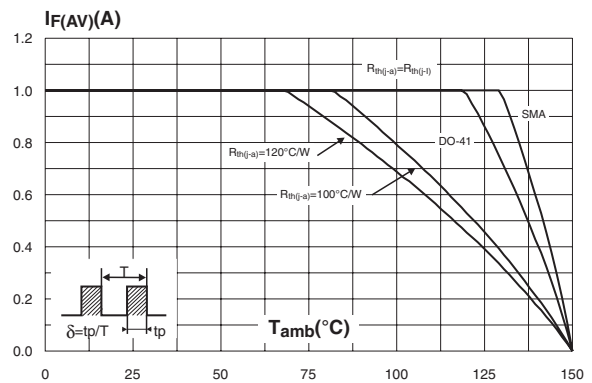


Figure 3: Normalized avalanche power derating versus pulse duration

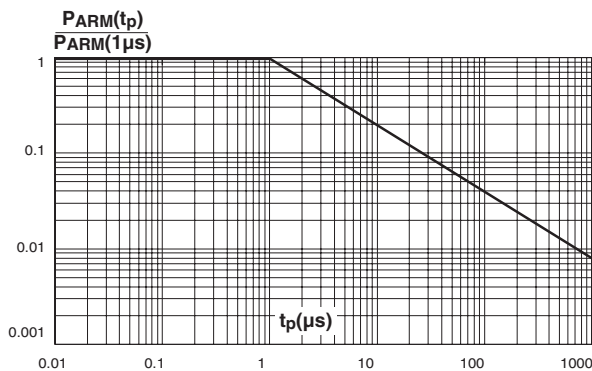


Figure 4: Normalized avalanche power derating versus junction temperature

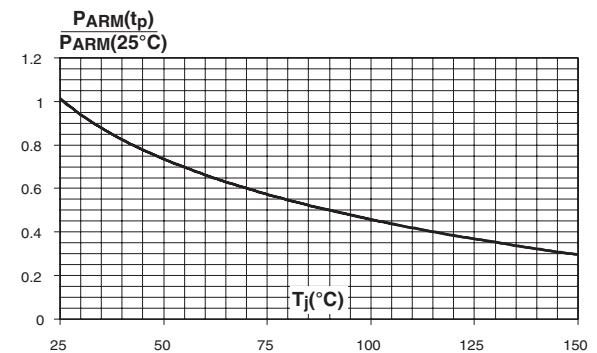


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

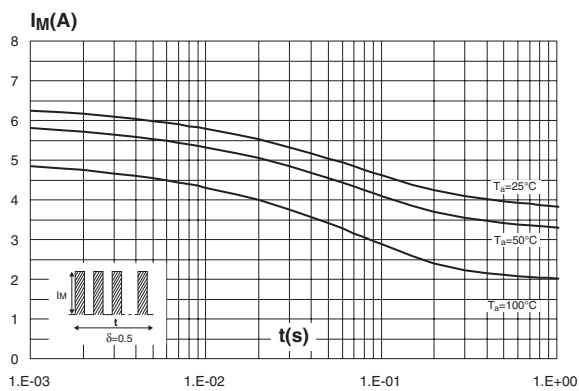


Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values) (DO-41)

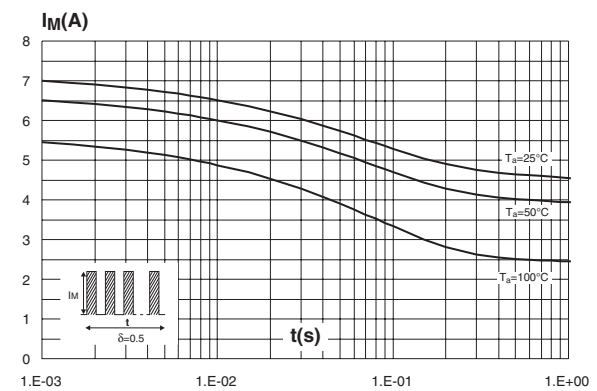


Figure 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA)

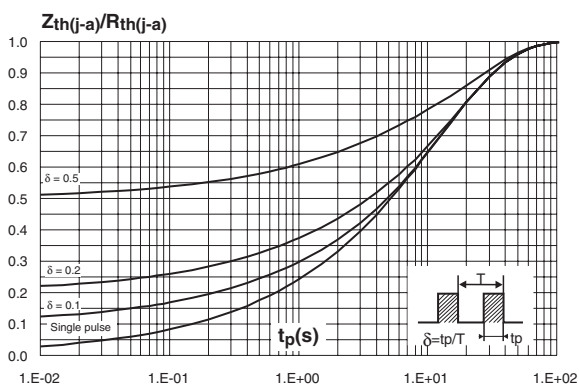


Figure 8: Relative variation of thermal impedance junction to ambient versus pulse duration (DO-41)

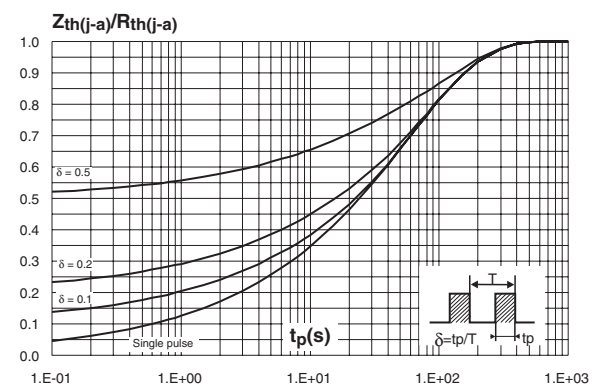


Figure 9: Reverse leakage current versus reverse voltage applied (typical values)

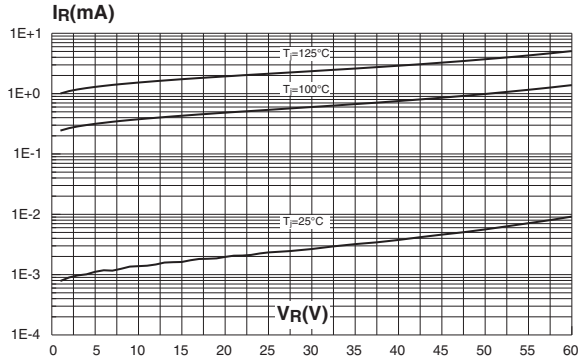


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

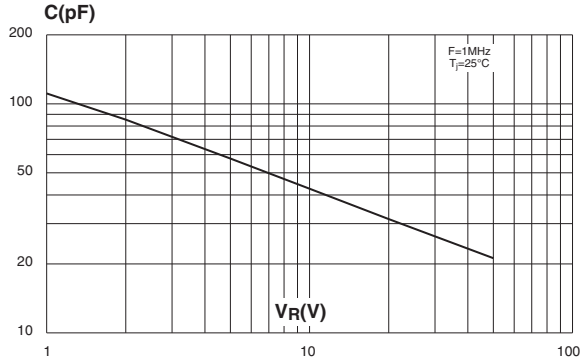


Figure 11: Forward voltage drop versus forward current (maximum values, high level) (SMA)

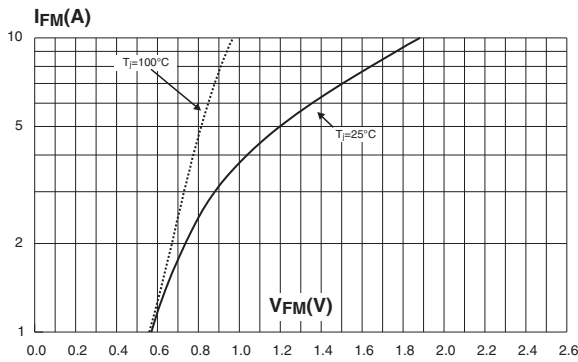


Figure 12: Forward voltage drop versus forward current (maximum values, low level) (DO-41)

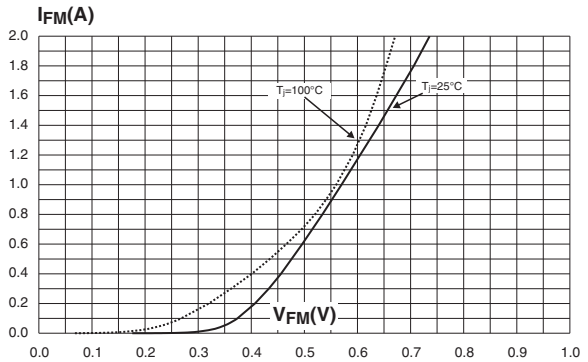


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)

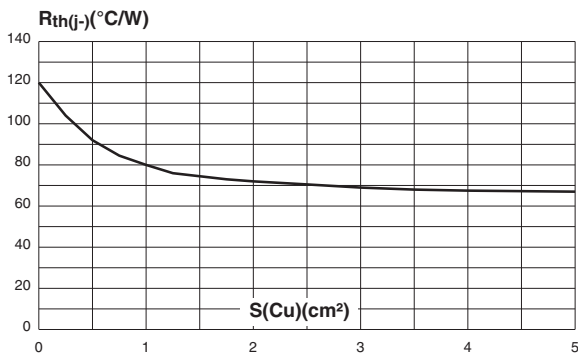


Figure 14: Thermal resistance versus lead length (DO-41)

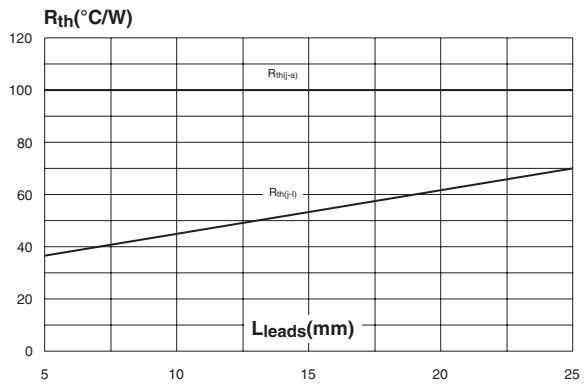


Figure 15: SMA Package Mechanical Data

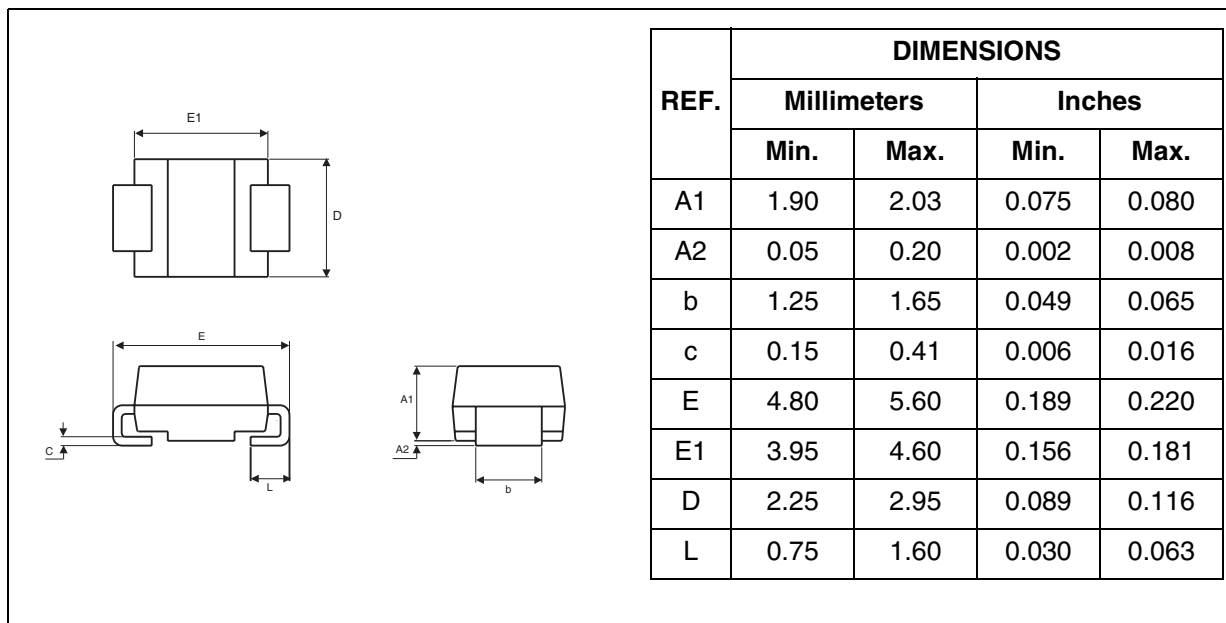
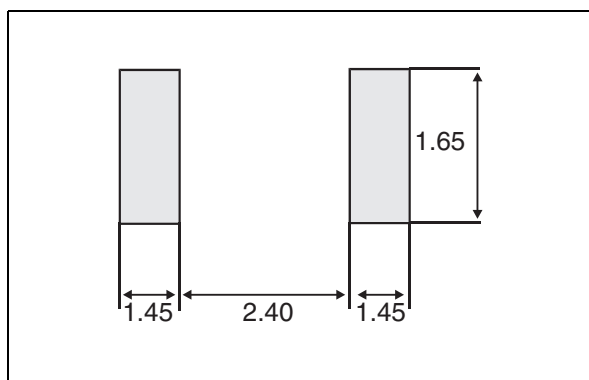
Figure 16: SMA Foot Print Dimensions  
(in millimeters)

Figure 17: DO-41 Package Mechanical Data

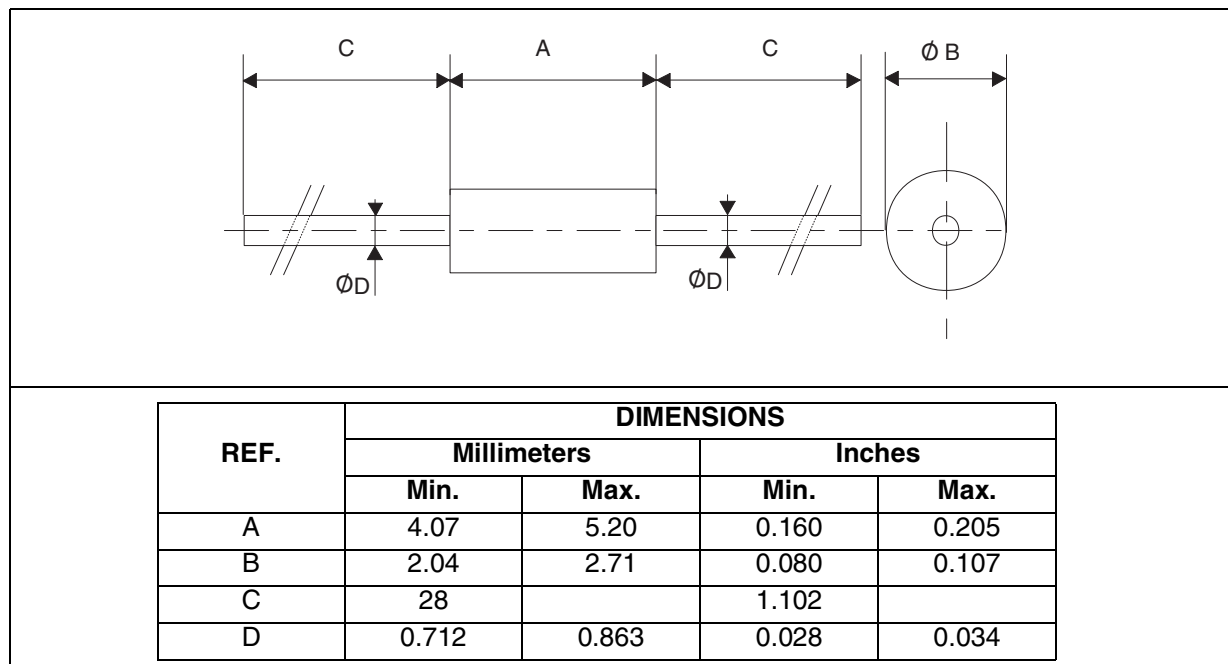


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS1L60A	GB6	SMA	0.068 g	5000	Tape & reel
STPS1L60	STPS1L60	DO-41	0.34 g	2000	Ammopack
STPS1L60RL	STPS1L60	DO-41	0.34 g	5000	Tape & reel

- Band indicates cathode
- Epoxy meets UL94, V0

Table 7: Revision History

Date	Revision	Description of Changes
Jul-2003	5A	Last update.
Aug-2004	6	SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106inc.) to 2.03mm (0.080).

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