STPS1L60

POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

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

FEATURES AND BENEFITS

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

SMA
(JEDEC DO-214AC)
STPS1L60A

DO-41
STPS1L60

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 voltage			10	A
$I_{F(AV)}$	Average forward current	SMA	T_L = 130°C δ = 0.5	1	A
		DO-41	T_L = 120°C δ = 0.5		
I_{FSM}	Surge non repetitive forward current		tp = 10ms sinusoidal	40	A
P_{ARM}	Repetitive peak avalanche power		tp = 1µs Tj = 25°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/µs

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

Table 4: Thermal Resistance

Symbol	Parameter			Value	Unit
$R_{th(j-a)}$	Junction to ambient		SMA	120	°C/W
		Lead length = 10 mm	DO-41	100	
$R_{th(j-l)}$	Junction to lead		SMA	30	°C/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°C	$V_R = V_{RRM}$			50	µA
		T_j = 100°C			1.5	5	mA
V_F **	Forward voltage drop	T_j = 25°C	I_F = 1A			0.57	V
		T_j = 100°C				0.56	
		T_j = 125°C			0.5	0.54	
		T_j = 25°C	I_F = 2A			0.75	
		T_j = 100°C				0.68	
		T_j = 125°C			0.6	0.66	

Pulse test: * tp = 380 µs, δ < 2%

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

Figure 1: Average forward power dissipation versus average forward current

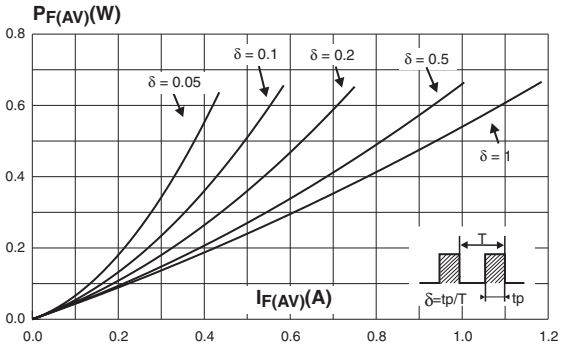


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

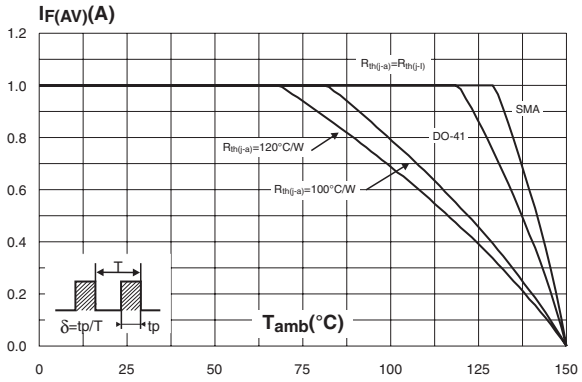


Figure 3: Normalized avalanche power derating versus pulse duration

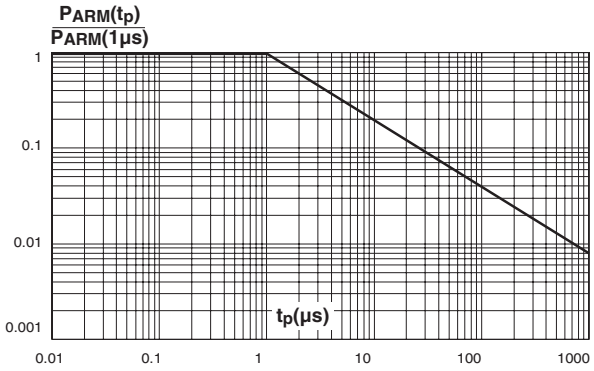


Figure 4: Normalized avalanche power derating versus junction temperature

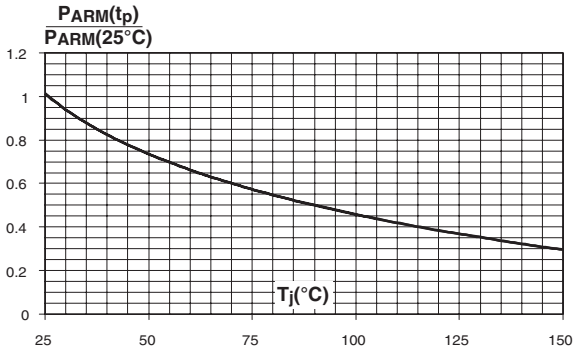


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

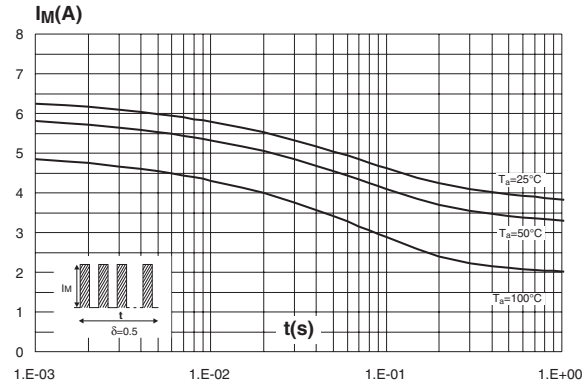


Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values) (DO-41)

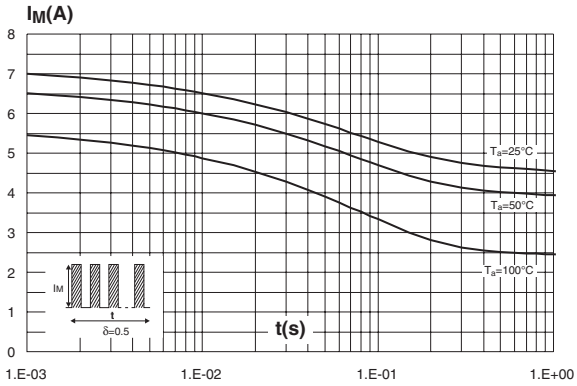


Figure 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA)

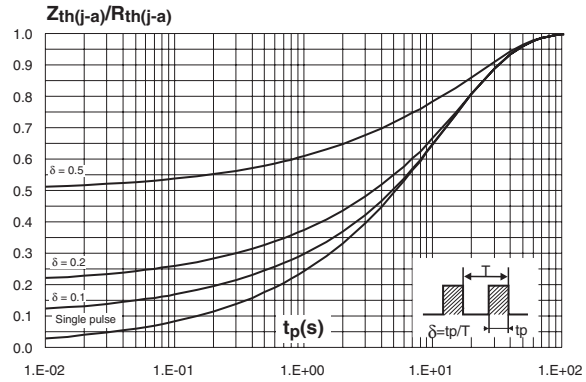


Figure 8: Relative variation of thermal impedance junction to ambient versus pulse duration (DO-41)

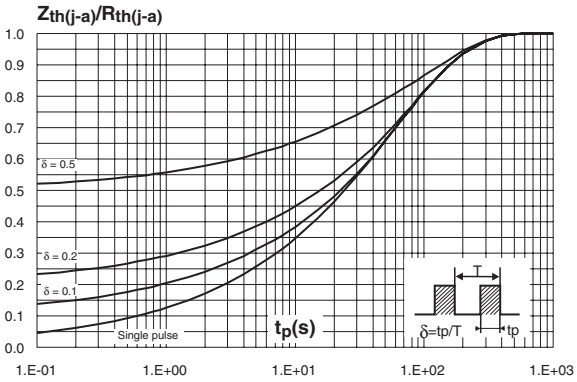


Figure 9: Reverse leakage current versus reverse voltage applied (typical values)

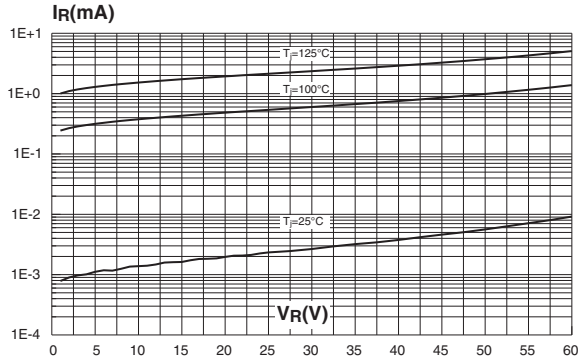


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

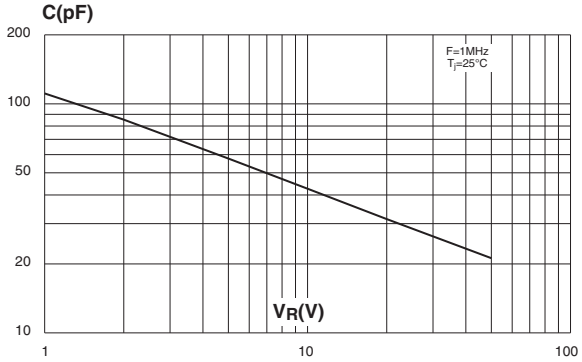


Figure 11: Forward voltage drop versus forward current (maximum values, high level) (SMA)

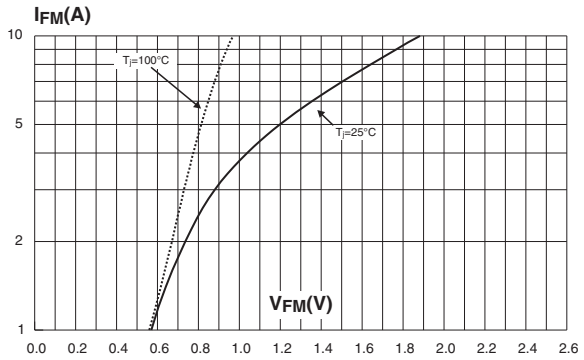


Figure 12: Forward voltage drop versus forward current (maximum values, low level) (DO-41)

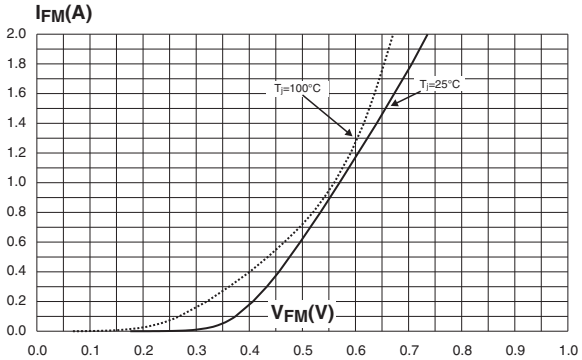


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)

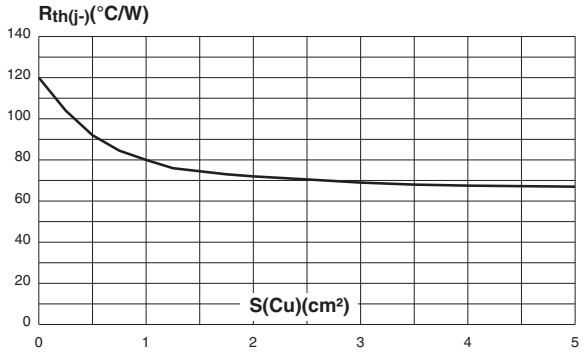


Figure 14: Thermal resistance versus lead length (DO-41)

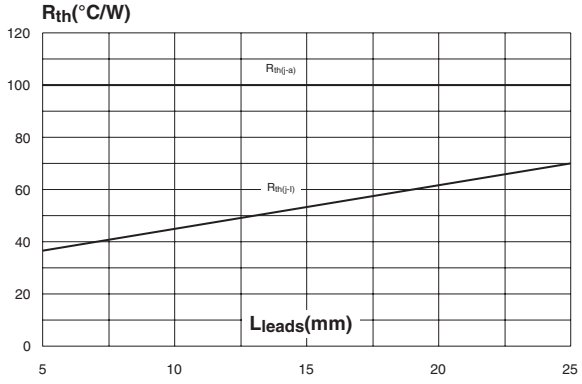
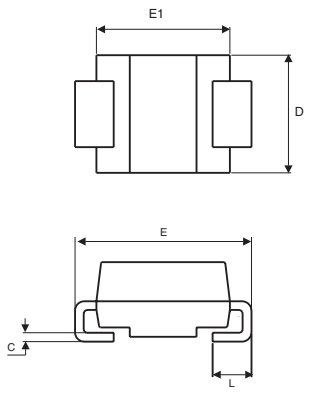


Figure 15: SMA Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.03	0.075	0.080
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

Figure 16: SMA Foot Print Dimensions
(in millimeters)

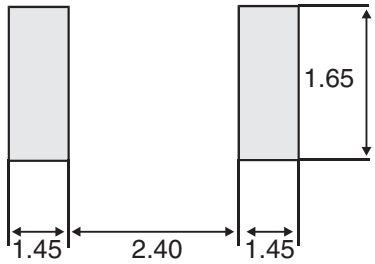
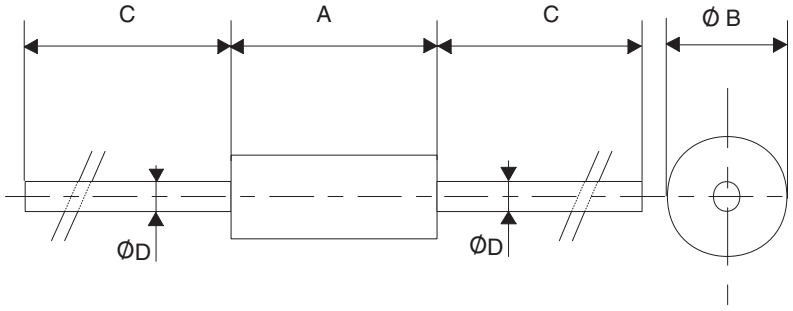


Figure 17: DO-41 Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
C	28		1.102	
D	0.712	0.863	0.028	0.034

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).