600W, 12V - 60V Surface Mount Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified
- Glass passivated chip junction
- Maximum V_{BR} temperature coefficient: 0.094%/°C
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	12 - 60	V
V_{BR}	13.4 - 74.1	V
P_{PPM}	600	W
$T_{J\,MAX}$	175	°C
Package	SOD-128	

Pb-Free RoHS COMPLIANT HALOGEN FREE

APPLICATIONS

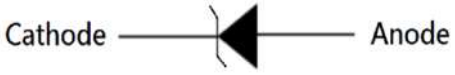
- Switching mode power supply (SMPS)
- Motor for BLDC
- Lighting application
- Battery Management System
- Automotive

MECHANICAL DATA

- Case: SOD-128
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Uni-directional
- Weight: 0.029g (approximately)



SOD-128



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Non-repetitive peak impulse power dissipation with 10/1000μs waveform[1]	P_{PPM}	600	W
Steady state power dissipation at T_L = 25°C[2]	P_D	7.14	W
Forward Voltage @ I_F = 25A for Uni-directional only[3]	V_F	3.5	V
Junction temperature	T_J	-55 to +175	°C
Storage temperature	T_{STG}	-55 to +175	°C

Notes:

1. Non-repetitive current pulse per fig.3 and derated above T_A=25°C per Fig.1
2. Units mounted on PCB (5mm x 5mm Cu pad test board)
3. Pulse test with PW = 0.3ms

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\Theta JL}$	21	°C/W
Junction-to-ambient thermal resistance	$R_{\Theta JA}$	62	°C/W
Junction-to-case thermal resistance	$R_{\Theta JC}$	16	°C/W

Thermal Performance Note: Units mounted on PCB (5mm x 5mm Cu pad test board)

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part number	Marking code	Breakdown voltage $V_{BR}@I_T$ (V) (Note 1)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum blocking leakage current $I_R@V_{WM}$ (μA) (Note 1)	Maximum peak impulse current I_{PPM} (A) tp =10/1000 μs	Maximum clamping voltage $V_C@I_{PPM}$ (V)
		Min	Max					
SMA6S12AH	6S012	13.4	14.8	1	12	1	30.8	19.5
SMA6S15AH	6S015	16.8	18.5	1	15	1	24.6	24.4
SMA6S18AH	6S018	20.1	22.2	1	18	1	20.5	29.2
SMA6S20AH	6S020	22.4	24.7	1	20	1	18.5	32.5
SMA6S21AH	6S021	23.5	25.9	1	21	1	17.6	34.1
SMA6S22AH	6S022	24.6	27.2	1	22	1	16.8	35.7
SMA6S24AH	6S024	26.8	29.6	1	24	1	15.4	39.0
SMA6S25AH	6S025	27.9	30.9	1	25	1	14.8	40.6
SMA6S26AH	6S026	29.1	32.1	1	26	1	14.2	42.2
SMA6S30AH	6S030	33.5	37.1	1	30	1	12.3	48.7
SMA6S33AH	6S033	36.9	40.8	1	33	1	11.2	53.6
SMA6S36AH	6S036	40.2	44.5	1	36	1	10.3	58.4
SMA6S39AH	6S039	43.6	48.2	1	39	1	9.5	63.3
SMA6S40AH	6S040	44.7	49.4	1	40	1	9.2	64.9
SMA6S43AH	6S043	48.1	53.1	1	43	1	8.6	69.8
SMA6S47AH	6S047	52.5	58.1	1	47	1	7.9	76.3
SMA6S51AH	6S051	57.0	63.0	1	51	1	7.2	82.8
SMA6S56AH	6S056	62.6	69.2	1	56	1	6.6	90.9
SMA6S60AH	6S060	67.1	74.1	1	60	1	6.2	97.4

Note:

1. Pulse test with PW = 30ms

ORDERING INFORMATION		
ORDERING CODE(1)	**PACKAGE**	**PACKING**
SMA6SxxAH	SOD-128	14,000 / Tape & Reel

Note:

(1) "xx" defines voltage from 12V (SMA6S12AH) to 60V (SMA6S60AH)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Pulse Power or Current vs. Initial Junction Temperature

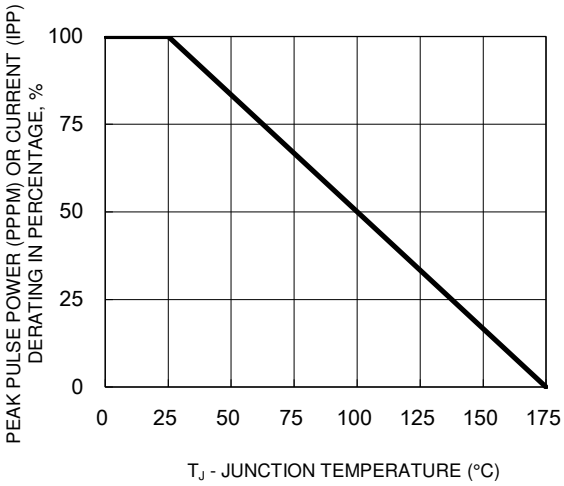


Fig.2 Steady State Power Derating

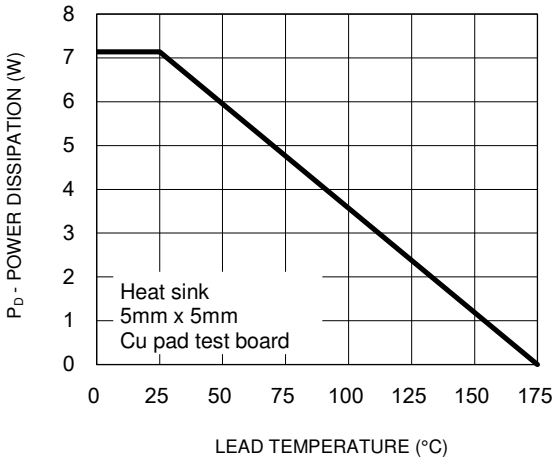


Fig.3 Clamping Power Pulse Waveform

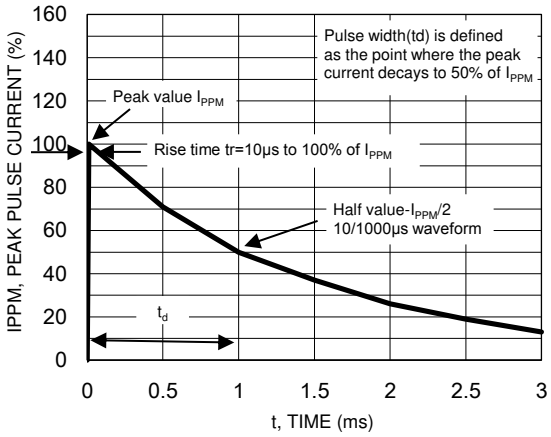


Fig.4 Typical Junction Capacitance

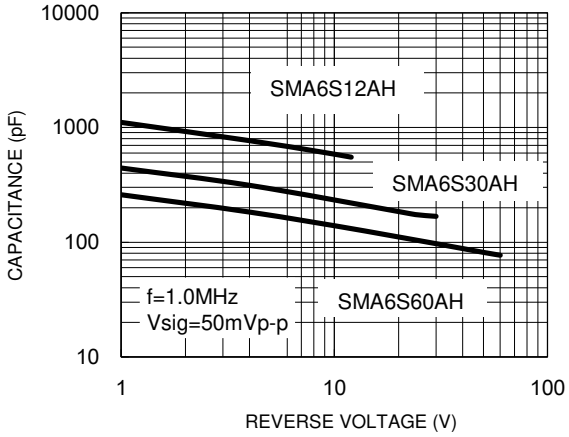
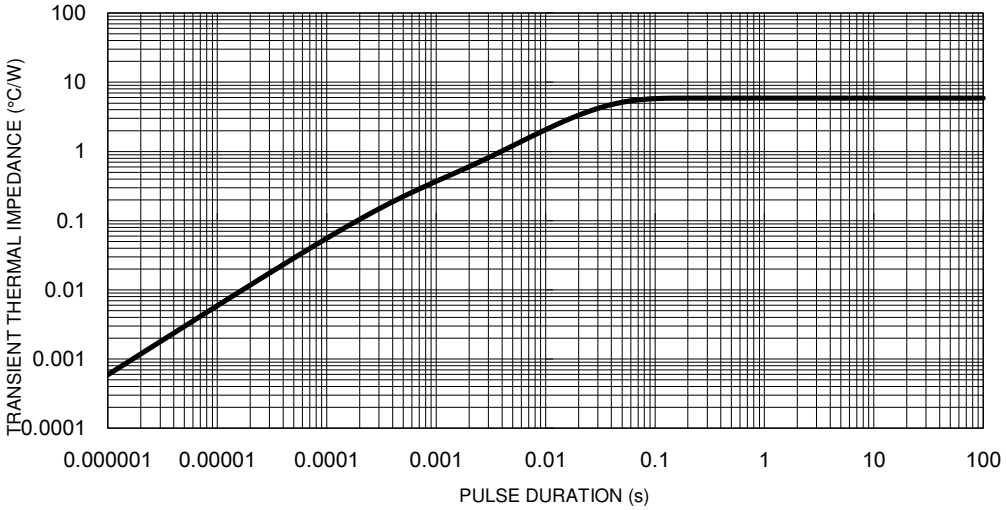
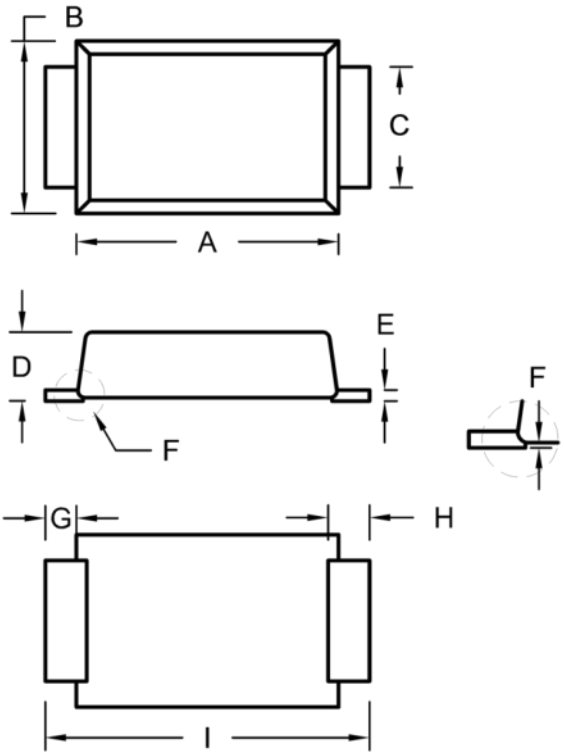


Fig.5 Typical Transient Thermal Impedance



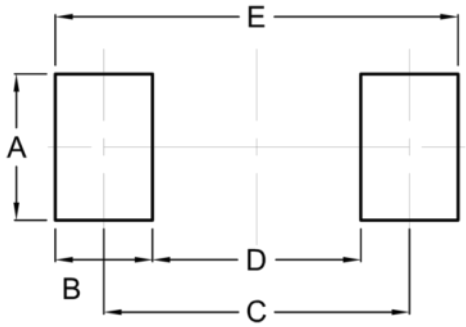
PACKAGE OUTLINE DIMENSIONS

SOD-128



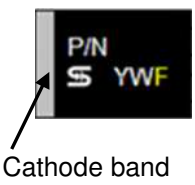
DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	3.60	4.00	0.142	0.157
B	2.30	2.70	0.091	0.106
C	1.60	1.90	0.063	0.075
D	0.90	1.10	0.035	0.043
E	0.10	0.22	0.004	0.009
F	0.00	0.10	0.000	0.004
G	0.30	0.60	0.012	0.024
H	0.40	0.80	0.016	0.031
I	4.40	5.00	0.173	0.197

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	2.10	0.083
B	1.40	0.055
C	4.40	0.173
D	3.00	0.118
E	5.80	0.228

MARKING DIAGRAM



Cathode band

P/N = Marking Code
YW = Date Code
F = Factory Code

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