1500W, 12V - 51V Surface Mount Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified
- Moisture sensitivity level: level 1, per J-STD-020
- Meets IEC 61000-4-2 (Level: 4) / ISO 10605 (Level: L4)
- Meets ISO7637-2 (Pulse 1/2a/2b/3a/3b)
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

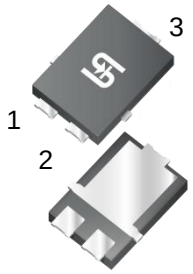
- Switching mode power supply (SMPS)
- Motor for BLDC
- Lighting application
- Battery Management System
- Automotive

MECHANICAL DATA

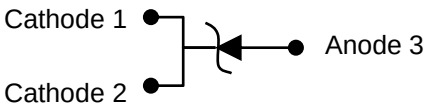
- Case: TO-277A (SMPC4.6U)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Uni-directional
- Weight: 0.095g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	10.2 - 43.6	V
V_{BR}	12 - 51	V
P_{PPM}	1500	W
$T_{J\ MAX}$	175	°C
Polarity	Uni-directional	
Package	TO-277A (SMPC4.6U)	

Pb-Free RoHS COMPLIANT HALOGEN FREE



TO-277A (SMPC4.6U)



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}	1500	W
Peak forward surge current 8.3ms single half sine-wave	I_{FSM}	200	A
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

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\Theta JL}$	6.4	°C/W
Junction-to-ambient thermal resistance	$R_{\Theta JA}$	51.1	°C/W
Junction-to-case thermal resistance	$R_{\Theta JC}$	8.9	°C/W

Thermal Performance Note: Units mounted on PCB (16mm x 16mm Cu pad test board)

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

PART NUMBER	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V_{BR}[1] AT I_T (V)			TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_R(μA)	MAXIMUM REVERSE LEAKAGE AT V_{WM} T_J = 150 °C I_D (μA)	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM}[2] (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C(V)	TYPICAL TEMP. COEFFICIENT OF V_{BR}[3] αT (%/°C)
		MIN	NOM	MAX							
1K5SMPC12APH	SMPC12AP	11.4	12.0	12.6	1.0	10.2	2.0	10	89.8	16.7	0.070
1K5SMPC13APH	SMPC13AP	12.4	13.0	13.7	1.0	11.1	2.0	10	82.4	18.2	0.072
1K5SMPC15APH	SMPC15AP	14.3	15.0	15.8	1.0	12.8	1.0	10	70.8	21.2	0.076
1K5SMPC16APH	SMPC16AP	15.2	16.0	16.8	1.0	13.6	1.0	10	66.7	22.5	0.078
1K5SMPC18APH	SMPC18AP	17.1	18.0	18.9	1.0	15.3	1.0	10	59.5	25.2	0.080
1K5SMPC20APH	SMPC20AP	19.0	20.0	21.0	1.0	17.1	1.0	10	54.2	27.7	0.082
1K5SMPC22APH	SMPC22AP	20.9	22.0	23.1	1.0	18.8	1.0	10	49.0	30.6	0.084
1K5SMPC24APH	SMPC24AP	22.8	24.0	25.2	1.0	20.5	1.0	10	45.2	33.2	0.085
1K5SMPC27APH	SMPC27AP	25.7	27.0	28.4	1.0	23.1	1.0	10	40.0	37.5	0.087
1K5SMPC30APH	SMPC30AP	28.5	30.0	31.5	1.0	25.6	1.0	10	36.2	41.4	0.088
1K5SMPC33APH	SMPC33AP	31.4	33.0	34.7	1.0	28.2	1.0	10	32.8	45.7	0.089
1K5SMPC36APH	SMPC36AP	34.2	36.0	37.8	1.0	30.8	1.0	15	30.1	49.9	0.090
1K5SMPC39APH	SMPC39AP	37.1	39.0	41.0	1.0	33.3	1.0	15	27.8	53.9	0.091
1K5SMPC43APH	SMPC43AP	40.9	43.0	45.2	1.0	36.8	1.0	20	25.3	59.3	0.092
1K5SMPC47APH	SMPC47AP	44.7	47.0	49.4	1.0	40.2	1.0	20	23.1	64.8	0.092
1K5SMPC51APH	SMPC51AP	48.5	51.0	53.6	1.0	43.6	1.0	20	21.4	70.1	0.093

Notes:
1. Pulse test with PW = 30ms
2. Surge current waveform per Fig.3 and derated per Fig.1
3. To calculate V_{BR} vs. junction temperature, use the following formula: V_{BR} at T_J = V_{BR} at 25 °C x (1 + αT x (T_J - 25))

ORDERING INFORMATION

ORDERING CODE[1]	PACKAGE	PACKING
1K5SMPCxAPH	TO-277A (SMPC4.6U)	6,000/ Tape & Reel

Notes:
1. "x" defines voltage from 12V (1K5SMPC12APH) to 51V (1K5SMPC51APH)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Pulse Power or Current vs. Junction Temperature

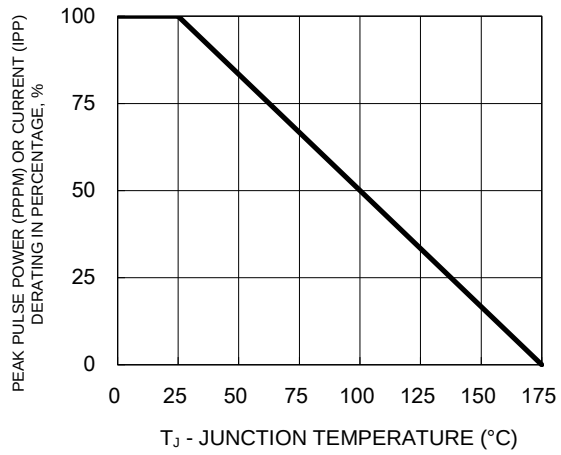


Fig.2 Peak Pulse Power Rating Cure

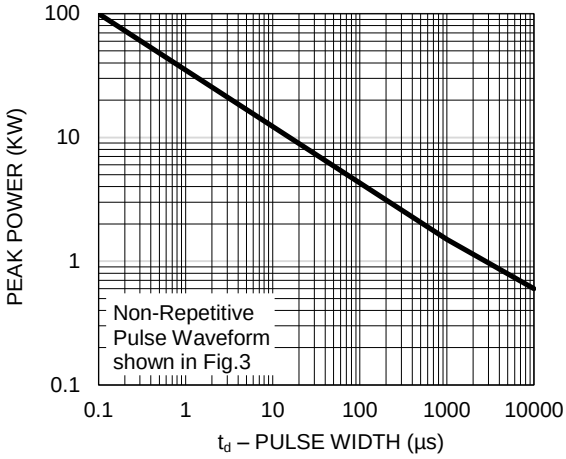


Fig.3 Clamping Power Pulse Waveform

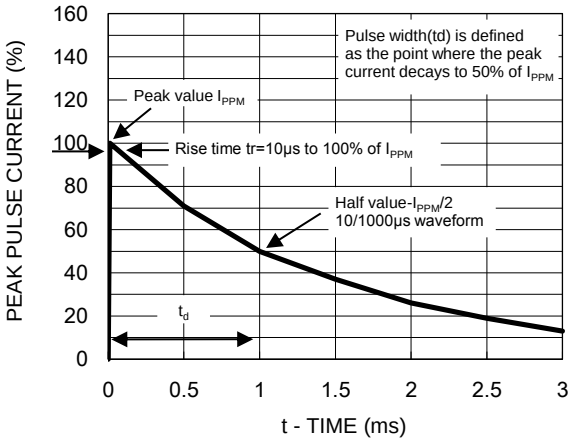


Fig.4 Typical Junction Capacitance

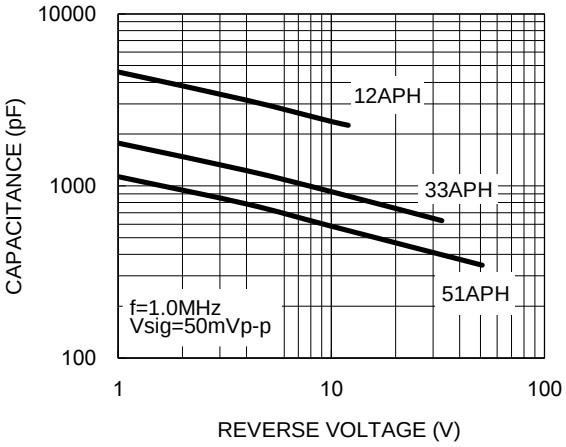
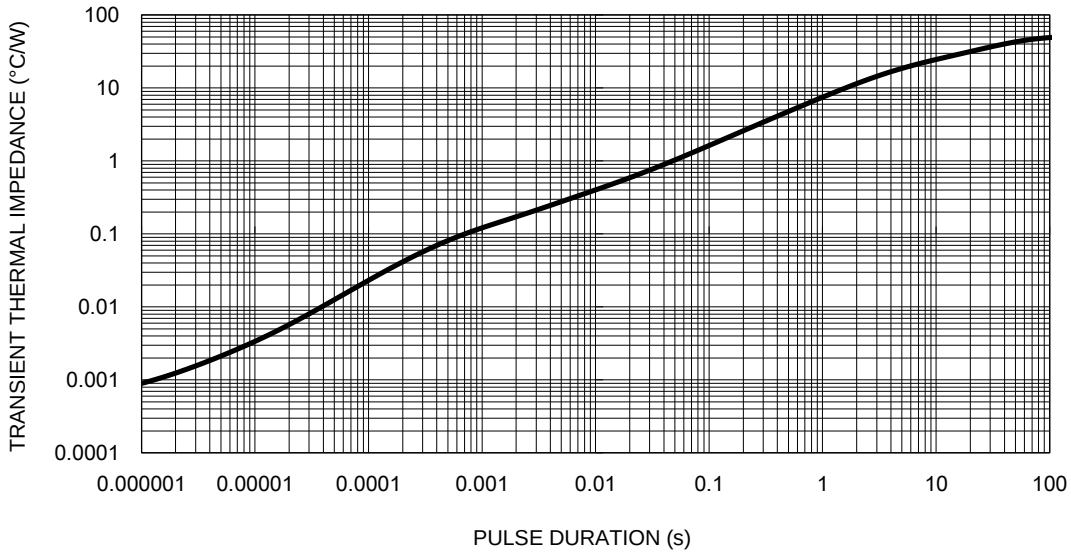
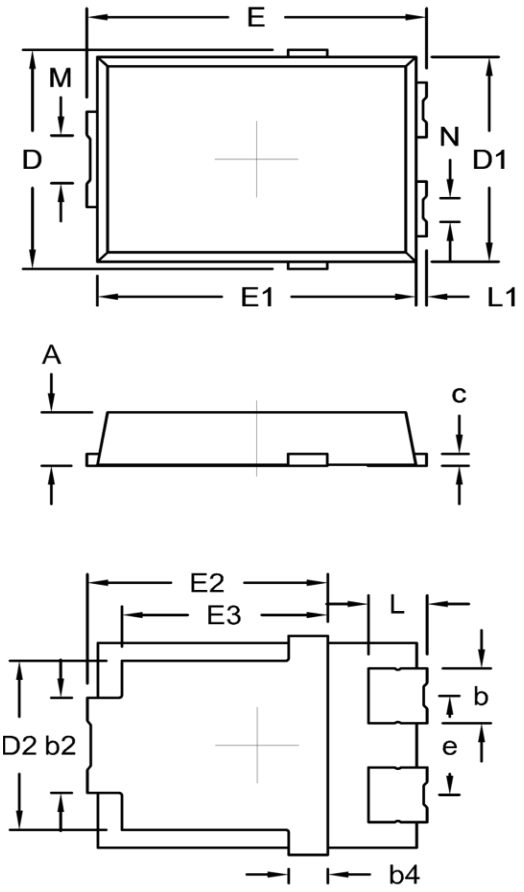


Fig.5 Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

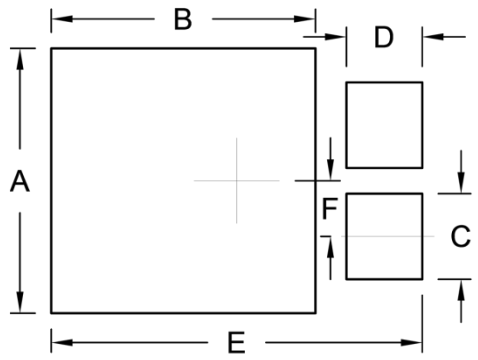
TO-277A (SMPC4.6U)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.00	1.20	0.039	0.047
b	1.05	1.35	0.041	0.053
b2	1.90	2.20	0.075	0.087
b4	0.75 (NOM.)		0.030 (NOM.)	
c	0.15	0.40	0.006	0.016
D	4.45	4.75	0.175	0.187
D1	4.25	4.35	0.167	0.171
D2	3.40	3.70	0.134	0.146
E	6.35	6.65	0.250	0.262
E1	6.05	6.15	0.238	0.242
E2	4.40	4.80	0.173	0.189
E3	3.94 (NOM.)		0.155 (NOM.)	
e	2.08 (NOM.)		0.082 (NOM.)	
L	0.94	1.24	0.037	0.049
L1	0.05	0.35	0.002	0.014
M	0.65	1.15	0.026	0.045
N	0.25	0.75	0.010	0.030

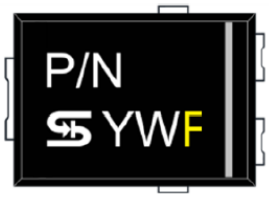
Package body size D1 and E1 do not include mold flash
Mold flash shall not exceed 0.1mm per side

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	4.95	0.195
B	4.95	0.195
C	1.60	0.063
D	1.42	0.056
E	6.95	0.274
F	1.04	0.041

MARKING DIAGRAM



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

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