

Surface Mount Transient Voltage Suppressors

TPSMA6J Series 13 To 40V 600W

Description

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

Working Voltage: 13 to 40 V

Peak Pulse Power: 600 W

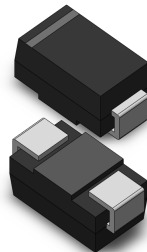
Features

- ◆ Glass passivated chip
- ◆ 600W peak pulse power capability with a 10/1000 μ A waveform, repetitive rate (duty cycle):0.01 %
- ◆ High reliability application and automotive grade AEC Q101 qualified
- ◆ Low leakage
- ◆ Uni and Bidirectional unit
- ◆ Excellent clamping capability
- ◆ Very fast response time
- ◆ RoHS compliant

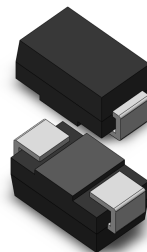
Applications

TVS devices are ideal for the protection of I/O interfaces, V_{CC} bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Uni-directional



Bi-directional



Mechanical Data

- ◆ Case: Molded plastic
- ◆ Epoxy: UL 94V-0 rate flame retardant
- ◆ Lead: Solderable per MIL-STD-750, method 2026 guaranteed
- ◆ Polarity: Color band denotes cathode end except Bipolar
- ◆ Mounting position: Any

Maximum Ratings and Thermal Characteristics(TA=25°C Unless otherwise noted)

Parameter	Symbol	Value	Units
Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾	P_{PPM}	600	W
Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	P_D	3.0	W
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I_{PP}	See Next Table	A
Junction and storage temperature range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$
Operating temperature range	T_{OP}	-55 to +150	$^\circ\text{C}$
Maximum Instantaneous Forward Voltage at 50A for Unidirectional only	V_F	3.5	V
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾	I_{FSM}	60	A

Note:

(1)Non-repetitive current pulse per Fig.5 and derated above $T_A=25^\circ\text{C}$ per Fig.1

(2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

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Electrical Characteristics(@25°C unless otherwise Specified)

Part Number		Marking		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_{RWM} (μA)
Uni	Bi	Uni	Bi		MIN	MAX				
TPSMA6J13A	TPSMA6J13CA	LGA	BGA	13.0	14.40	15.90	1	21.5	27.9	1
TPSMA6J14A	TPSMA6J14CA	LKA	BKA	14.0	15.60	17.20	1	23.2	25.9	1
TPSMA6J15A	TPSMA6J15CA	LMA	BMA	15.0	16.70	18.50	1	24.4	24.6	1
TPSMA6J16A	TPSMA6J16CA	LPA	BPA	16.0	17.80	19.70	1	26.0	23.1	1
TPSMA6J17A	TPSMA6J17CA	LRA	BRA	17.0	18.90	20.90	1	27.6	21.7	1
TPSMA6J18A	TPSMA6J18CA	LTA	BTA	18.0	20.00	22.10	1	29.2	20.5	1
TPSMA6J19A	TPSMA6J19CA	LBA	BBA	19.0	21.10	23.30	1	30.8	19.5	1
TPSMA6J20A	TPSMA6J20CA	LVA	BVA	20.0	22.20	24.50	1	32.4	18.5	1
TPSMA6J22A	TPSMA6J22CA	LXA	BXA	22.0	24.40	26.90	1	35.5	16.9	1
TPSMA6J24A	TPSMA6J24CA	LZA	BZA	24.0	26.70	29.50	1	38.9	15.4	1
TPSMA6J26A	TPSMA6J26CA	MEA	CEA	26.0	28.90	31.90	1	42.1	14.3	1
TPSMA6J28A	TPSMA6J28CA	MGA	CGA	28.0	31.10	34.40	1	45.4	13.2	1
TPSMA6J30A	TPSMA6J30CA	MKA	CKA	30.0	33.30	36.80	1	48.4	12.4	1
TPSMA6J33A	TPSMA6J33CA	MMA	CMA	33.0	36.70	40.60	1	53.3	11.3	1
TPSMA6J36A	TPSMA6J36CA	MPA	CPA	36.0	40.00	44.20	1	58.1	10.3	1
TPSMA6J40A	TPSMA6J40CA	MRA	CRA	40.0	44.40	49.10	1	64.5	9.30	1

Note:

(1)Add suffix ' CA ' after part number to specify Bi-directional devices

Ratings and Characteristics Curves($T_A=25^\circ C$ unless otherwise noted)

Figure 1-Pulse Waveform

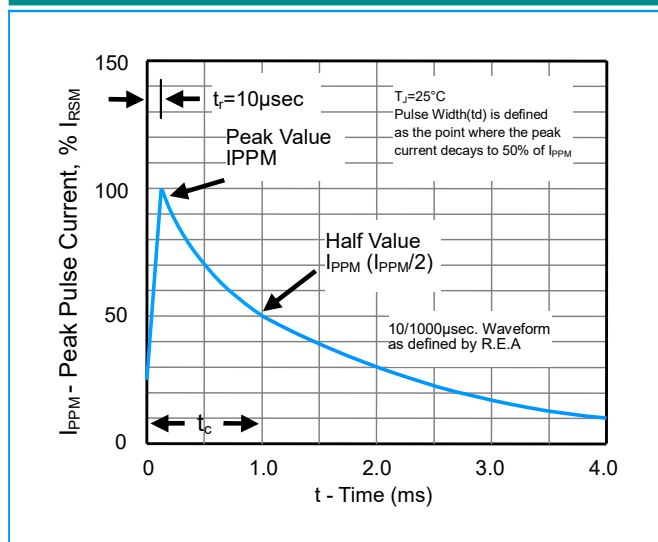
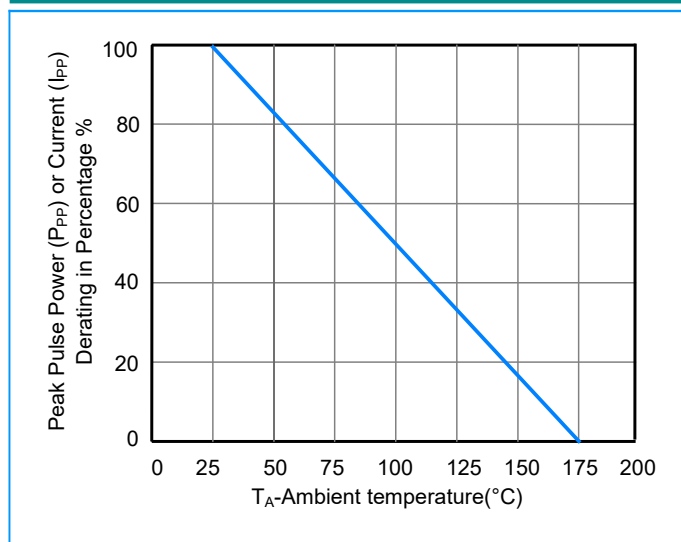


Figure 2-Pulse Derating Curve



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Figure 3-Peak Pulse Power Rating Curve

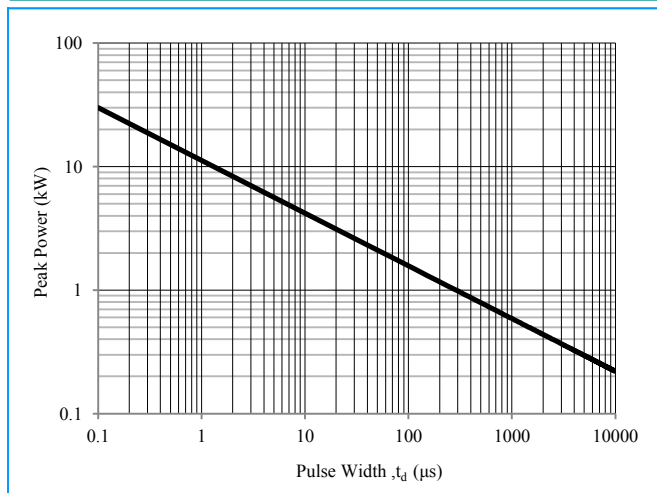


Figure 4-Steady State Power Derating Curve

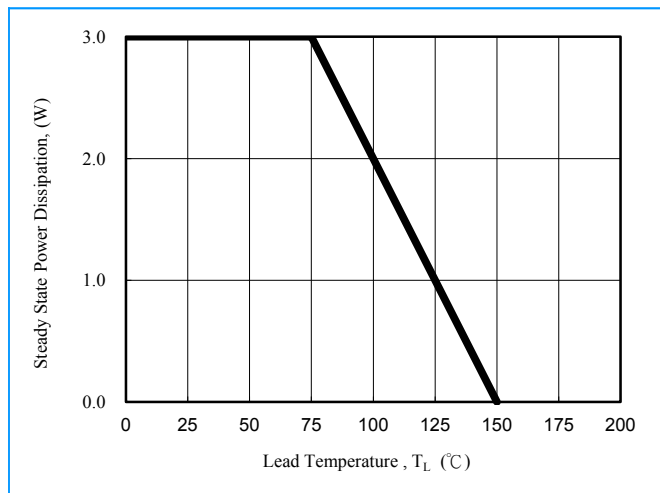


Figure 5-Maximum Non-Repetitive Surge Current

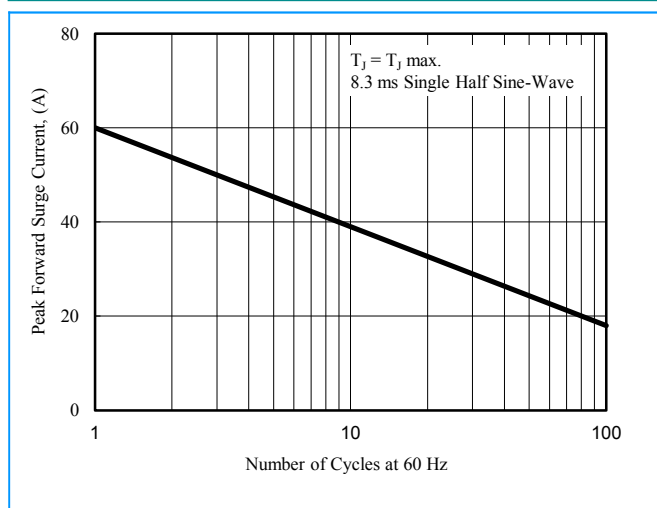
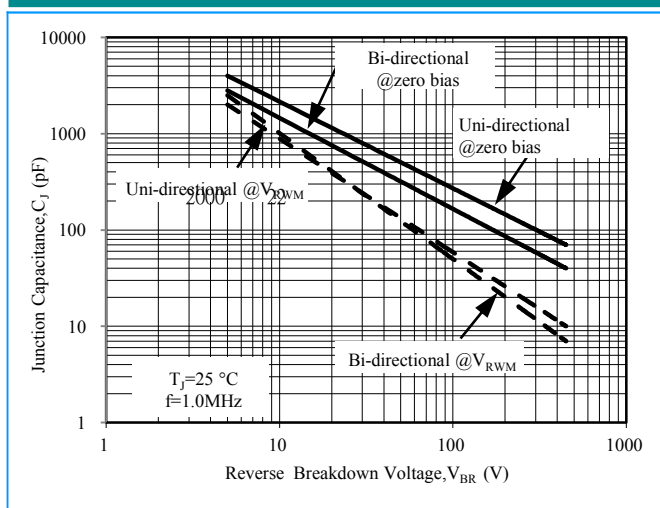
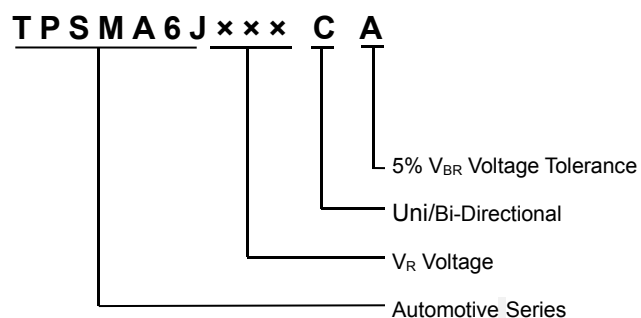


Figure 6-Typical Junction Capacitance



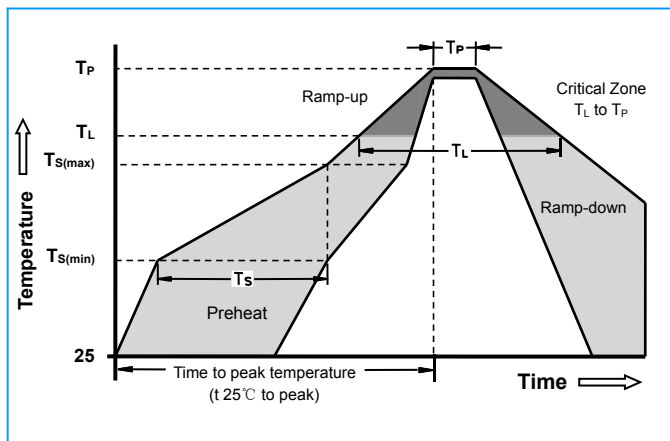
Part Numbering



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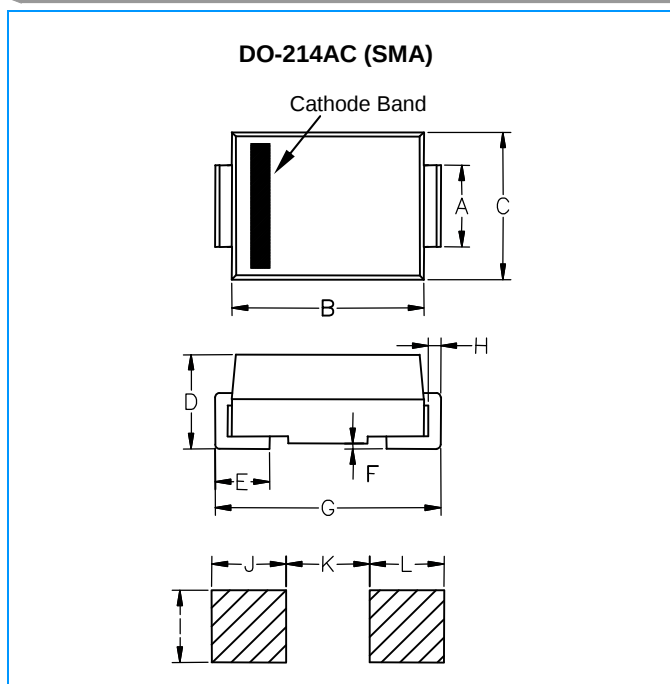
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Soldering Parameters



Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		20 -40 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		280°C

Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.049	0.064	1.230	1.630
B	0.162	0.179	4.10	4.550
C	0.099	0.109	2.510	2.760
D	0.077	0.089	1.960	2.260
E	0.030	0.060	0.750	1.510
F	-	0.008	-	0.203
G	0.192	0.206	4.87	5.220
H	0.006	0.012	0.152	0.305
I	0.070	-	1.800	-
J	0.082	-	2.100	-
K	-	0.090	-	2.300
L	0.082	-	2.100	-