Transient Voltage Suppressors (TVS) Data Sheet

Description

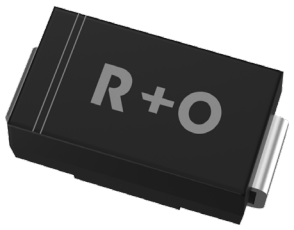
The SMA6J series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events

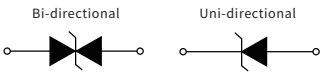
Breakdown Voltage
5.0 to 130 V
Peak Pulse Power
600 W

Features

- For surface mounted applications in order to optimize board space
- Low leakage
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 600W peak pulse power capability at 10/1000μs waveform
- Fast response time
- Typical IR less than 5μA above 12V
- High Temperature soldering: 260°C /40 seconds at terminals
- Typical maximum temperature coefficient ΔV_{BR} = 0.1% ×V_{BR}@25°C ×ΔT
- Plastic package has Underwriters Laboratory Flammability 94V-0
- Matte tin lead–free Plated
- Halogen free and RoHS compliant
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC 61000-4-2 ESD 30KV(Air),30KV(contact)

DO-214AC(SMA)





Applications

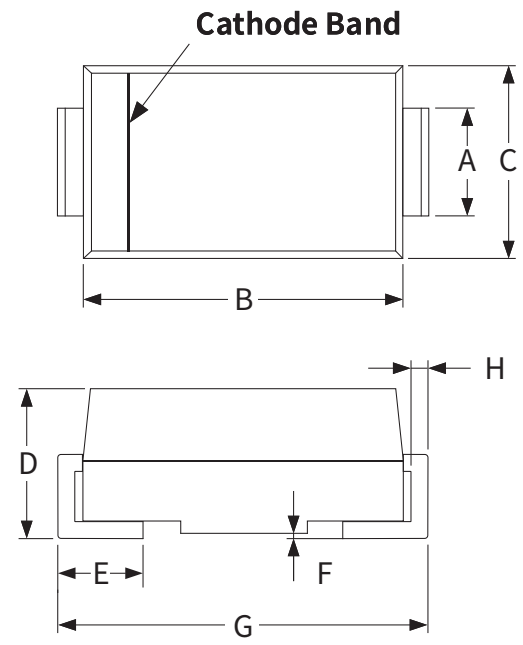
TVS devices are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	SYMBOL
Peak Pulse Power Dissipation with a 10/1000μs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	600	W
Peak Pulse Current with a 10/1000μs waveform.(Note1,Fig.3)	I_{PP}	See Next Table	A
Power Dissipation on Infinite Heat Sink at TL=75° C	$P_{M(AV)}$	3.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	60	A
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only(Note 4)	V_F	3.5/5.0	V
Operating junction and Storage Temperature Range	T_J , T_{STG}	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta J-L}$	30	°C /W
Typical thermal resistance junction to ambient	$R_{\theta J-A}$	120	°C /W

Note :
(1) Non-repetitive current pulse, per Fig. 3 and derated above Ta = 25°C per Fig. 2.
(2))Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

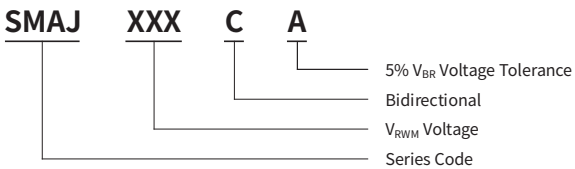
Package Outline Dimensions (SMA/DO-214AC)



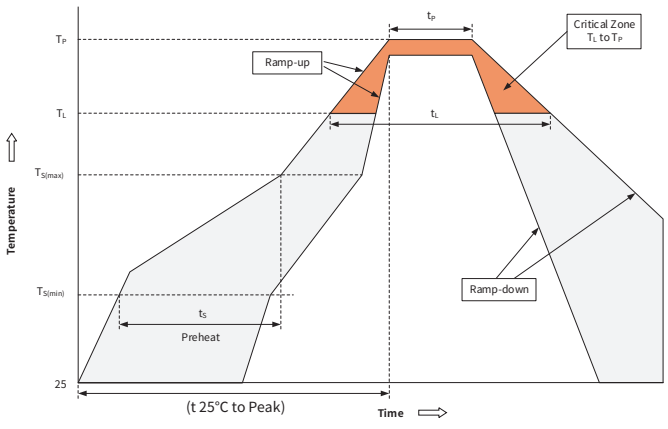
Note:
(1) Cathode Band: unidirectional only.
(2) Bidirectional devices without this marking.

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.25	1.65	0.049	0.065
B	3.95	4.65	0.156	0.183
C	2.35	2.85	0.093	0.112
D	1.98	2.41	0.078	0.095
E	0.76	1.52	0.030	0.060
F	-	0.203	-	0.008
G	4.70	5.30	0.185	0.209
H	0.15	0.31	0.006	0.012
M	2.26	-	0.089	-
J	2.10	-	0.085	-
K	-	2.74	-	0.107

Part Numbering



Soldering Parameters



Profile Feature		Pb-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 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C /sec. Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C /sec. Max
Reflow	Temperature(T_L)(Liquid us)	+217°C
	Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage V_{BR} (V) @I_T		Test Current	Maximum Clamping Voltage@I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
Uni	Bi	Uni	Bi	V_{RWM}(V)	Min.	Max.	I_T(mA)	V_C(V)	I_{PP} (A)	I_R(μA)
SMA6J5.0A	SMA6J5.0CA	KE	AE	5.0	6.40	7.00	10	9.2	65.2	800
SMA6J6.0A	SMA6J6.0CA	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
SMA6J6.5A	SMA6J6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
SMA6J7.0A	SMA6J7.0CA	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200
SMA6J7.5A	SMA6J7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	46.5	100
SMA6J8.0A	SMA6J8.0CA	KR	AR	8.0	8.89	9.83	1	13.6	44.1	50
SMA6J8.5A	SMA6J8.5CA	KT	AT	8.5	9.44	10.40	1	14.4	41.7	10
SMA6J9.0A	SMA6J9.0CA	KV	AV	9.0	10.00	11.10	1	15.4	39.0	5
SMA6J10A	SMA6J10CA	KX	AX	10.0	11.10	12.30	1	17.0	35.3	1
SMA6J11A	SMA6J11CA	KZ	AZ	11.0	12.20	13.50	1	18.2	33.0	1
SMA6J12A	SMA6J12CA	LE	BE	12.0	13.30	14.70	1	19.9	30.2	1
SMA6J13A	SMA6J13CA	LG	BG	13.0	14.40	15.90	1	21.5	27.9	1
SMA6J14A	SMA6J14CA	LK	BK	14.0	15.60	17.20	1	23.2	25.9	1
SMA6J15A	SMA6J15CA	LM	BM	15.0	16.70	18.50	1	24.4	24.6	1
SMA6J16A	SMA6J16CA	LP	BP	16.0	17.80	19.70	1	26.0	23.1	1
SMA6J17A	SMA6J17CA	LR	BR	17.0	18.90	20.90	1	27.6	21.7	1
SMA6J18A	SMA6J18CA	LT	BT	18.0	20.00	22.10	1	29.2	20.5	1
SMA6J19A	SMA6J19CA	LB	BB	19.0	21.10	23.30	1	30.8	19.5	1
SMA6J20A	SMA6J20CA	LV	BV	20.0	22.20	24.50	1	32.4	18.5	1
SMA6J22A	SMA6J22CA	LX	BX	22.0	24.40	26.90	1	35.5	16.9	1
SMA6J24A	SMA6J24CA	LZ	BZ	24.0	26.70	29.50	1	38.9	15.4	1
SMA6J26A	SMA6J26CA	ME	CE	26.0	28.90	31.90	1	42.1	14.3	1
SMA6J28A	SMA6J28CA	MG	CG	28.0	31.10	34.40	1	45.4	13.2	1
SMA6J30A	SMA6J30CA	MK	CK	30.0	33.30	36.80	1	48.4	12.4	1
SMA6J33A	SMA6J33CA	MM	CM	33.0	36.70	40.60	1	53.3	11.3	1
SMA6J36A	SMA6J36CA	MP	CP	36.0	40.00	44.20	1	58.1	10.3	1
SMA6J40A	SMA6J40CA	MR	CR	40.0	44.40	49.10	1	64.5	9.3	1
SMA6J43A	SMA6J43CA	MT	CT	43.0	47.80	52.80	1	69.4	8.7	1
SMA6J45A	SMA6J45CA	MV	CV	45.0	50.00	55.30	1	72.7	8.3	1
SMA6J48A	SMA6J48CA	MX	CX	48.0	53.30	58.90	1	77.4	7.8	1
SMA6J51A	SMA6J51CA	MZ	CZ	51.0	56.70	62.70	1	82.4	7.3	1
SMA6J54A	SMA6J54CA	NE	DE	54.0	60.00	66.30	1	87.1	6.9	1
SMA6J58A	SMA6J58CA	NG	DG	58.0	64.40	71.20	1	93.6	6.4	1
SMA6J60A	SMA6J60CA	NK	DK	60.0	66.70	73.70	1	6.20	96.8	1
SMA6J64A	SMA6J64CA	NM	DM	64.0	71.10	78.60	1	5.83	103.0	1
SMA6J70A	SMA6J70CA	NP	DP	70.0	77.80	86.00	1	5.31	113.0	1
SMA6J75A	SMA6J75CA	NR	DR	75.0	83.30	92.10	1	4.96	121.0	1
SMA6J78A	SMA6J78CA	NT	DT	78.0	86.70	95.80	1	4.76	126.0	1
SMA6J80A	SMA6J80CA	NB	DB	80.0	88.80	97.60	1	4.63	129.6	1
SMA6J85A	SMA6J85CA	NV	DV	85.0	94.40	104.00	1	4.38	137.0	1
SMA6J90A	SMA6J90CA	NX	DX	90.0	100.00	111.00	1	4.11	146.0	1
SMA6J100A	SMA6J100CA	NZ	DZ	100.0	111.00	123.00	1	3.70	162.0	1
SMA6J110A	SMA6J110CA	PE	EE	110.0	122.00	135.00	1	3.39	177.0	1
SMA6J120A	SMA6J120CA	PG	EG	120.0	133.00	147.00	1	3.11	193.0	1
SMA6J130A	SMA6J130CA	PK	EK	130.0	144.00	159.00	1	2.87	209.0	1

Note :
(1)Suffix 'A ' denotes 5% tolerance device.
(2)Add suffix ' CA ' after part number to specify Bi-directional devices.
(3)For Bi-Directional devices having VR of 10 volts and under, the IR limit is double.

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

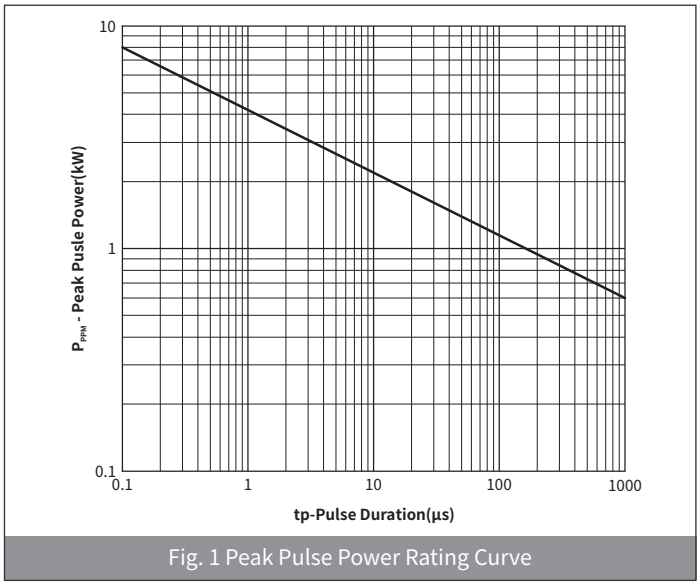


Fig. 1 Peak Pulse Power Rating Curve

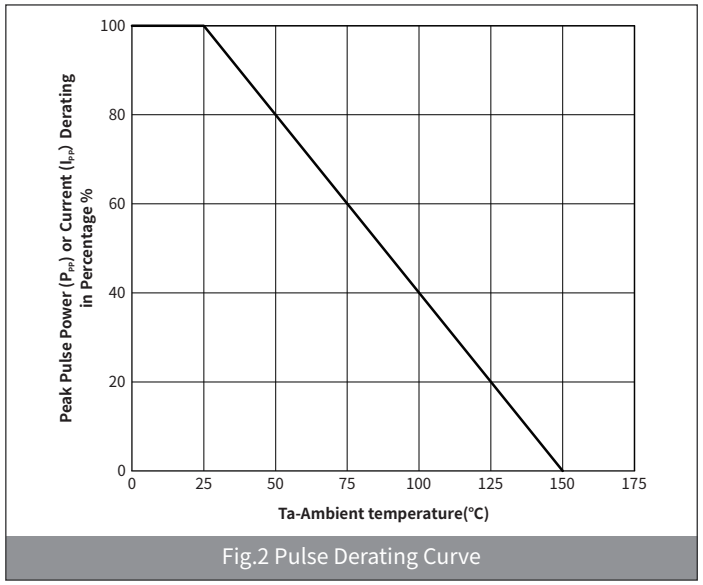


Fig.2 Pulse Derating Curve

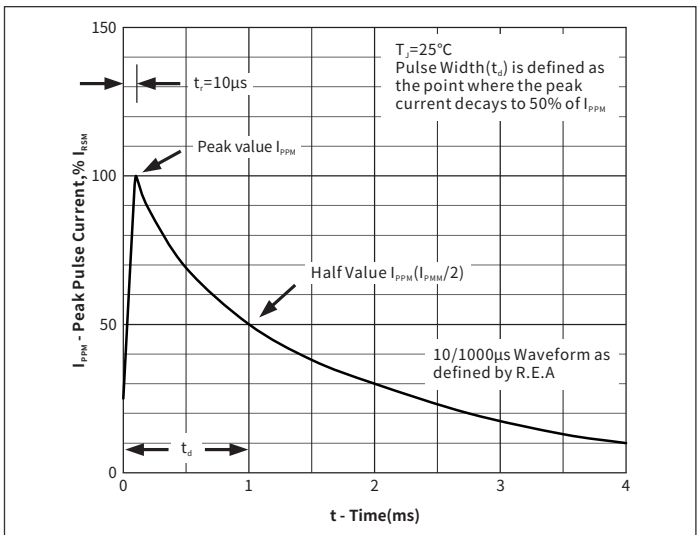


Fig.3 Pulse Waveform

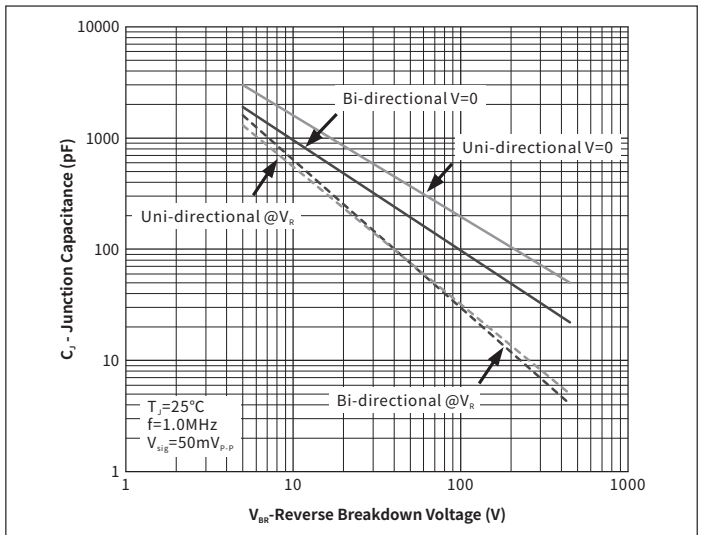


Fig.4 Typical Junction Capacitance

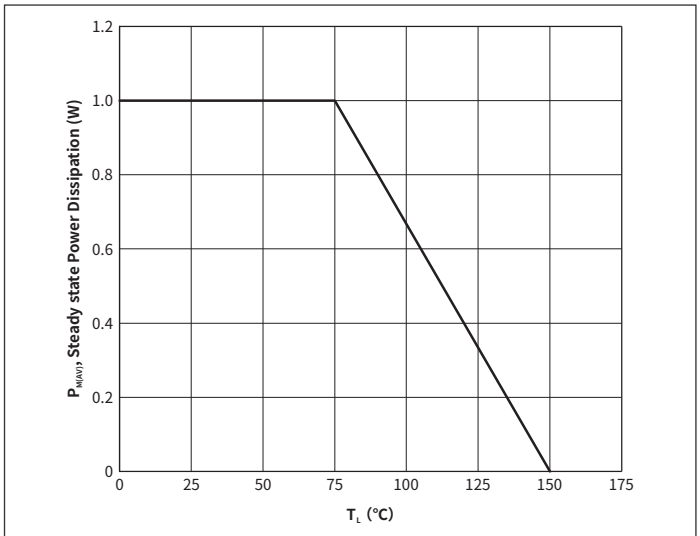


Fig.5 Steady State Power Dissipation Derating Curve

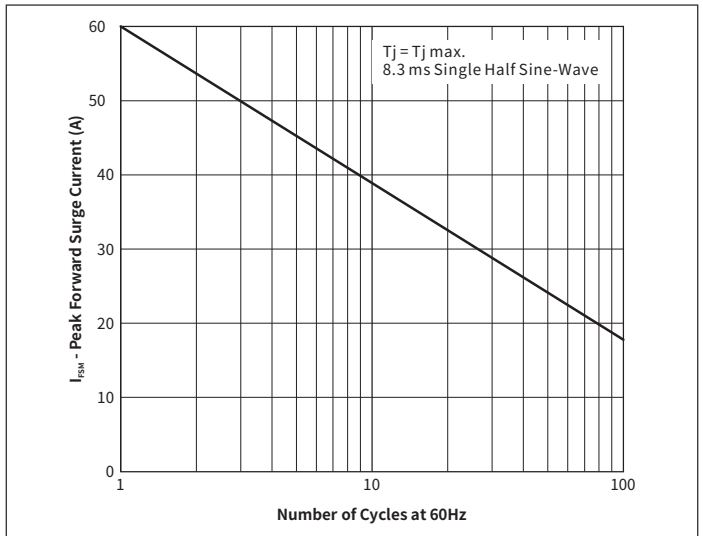
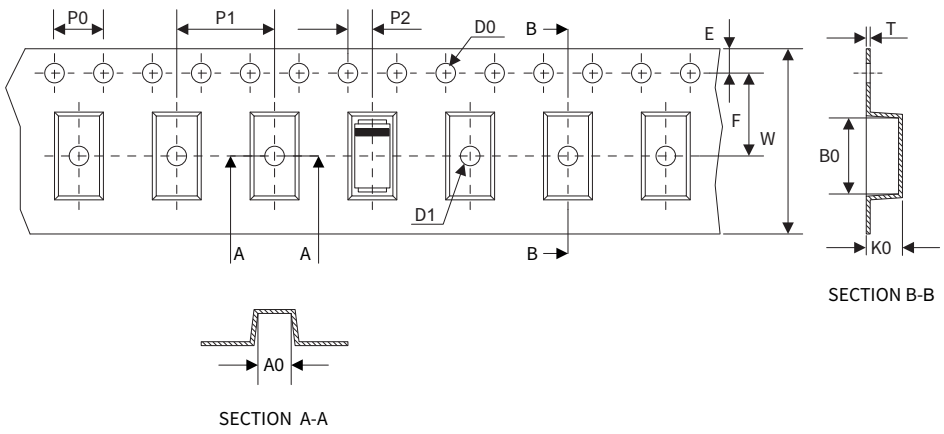


Fig.6 Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SMA	R2	0.07	5000	10000	80000	11''
SMA	R3	0.07	7500	15000	120000	13''

Packaging (SMA/DO-214AC)



Symbol	Dimension (mm)
W	12.00±0.20
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	Φ1.5±0.10
D1	Φ1.5±0.10
E	1.75±0.10
F	5.50±0.05
A0	2.79±0.10
B0	5.33±0.10
K0	2.55±0.15
T	0.25±0.05