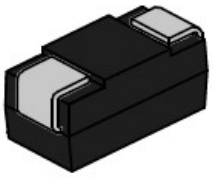
SMAJxx(C)A-AU Series 400W Transient Voltage Suppressor

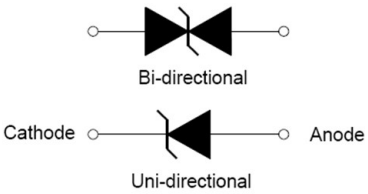
Rev.1.0

DESCRIPTION

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



SMA



Symbol

FEATURES

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 400W peak pulse power capability at 10/1000μs waveform.
- ✧ Typical I_R less than 1μA above 10V.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature to reflow soldering: 260℃/40s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260℃.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).
- ✧ UL 497B item recognized. (File No.:E480698).
- ✧ For surface mounted applications in order to optimize board space.
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).

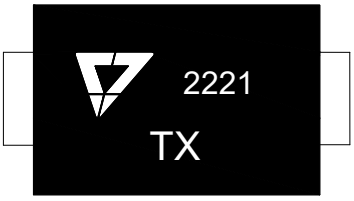
ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	T_{STG}/T_J	-55 to +150	℃
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	3.3	W
Peak pulse power dissipation at 10/1000μs waveform	P_{PP}	400	W
Maximum instantaneous forward voltage at 30A for unidirectional	V_F	5.0	V
Peak forward surge current, 8.3ms single half sine wave(Note 1)	I_{FSM}	60	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	℃/W

Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

MARKING



TX: Device Marking Code
2221: the 21th week, 2022

ELECTRICAL CHARACTERISTICS (T_A=25℃)

Part Number		Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-polar	Bi-polar	Uni	Bi	V	max (μA)	min(V)	max(V)	mA	max(V)	A
SMAJ10A-AU	SMAJ10CA-AU	HX	TX	10.0	2	11.10	12.30	1	17.0	23.5
SMAJ11A-AU	SMAJ11CA-AU	HZ	TZ	11.0	1	12.20	13.50	1	18.2	22.0
SMAJ12A-AU	SMAJ12CA-AU	IE	UE	12.0	1	13.30	14.70	1	19.9	20.1
SMAJ13A-AU	SMAJ13CA-AU	IG	UG	13.0	1	14.40	15.90	1	21.5	18.6
SMAJ14A-AU	SMAJ14CA-AU	IK	UK	14.0	1	15.60	17.20	1	23.2	17.3
SMAJ15A-AU	SMAJ15CA-AU	IM	UM	15.0	1	16.70	18.50	1	24.4	16.4
SMAJ16A-AU	SMAJ16CA-AU	IP	UP	16.0	1	17.80	19.70	1	26.0	15.4
SMAJ17A-AU	SMAJ17CA-AU	IR	UR	17.0	1	18.90	20.90	1	27.6	14.5
SMAJ18A-AU	SMAJ18CA-AU	IT	UT	18.0	1	20.00	22.10	1	29.2	13.7
SMAJ20A-AU	SMAJ20CA-AU	IV	UV	20.0	1	22.20	24.50	1	32.4	12.4
SMAJ22A-AU	SMAJ22CA-AU	IX	UX	22.0	1	24.40	26.90	1	35.5	11.3
SMAJ24A-AU	SMAJ24CA-AU	IZ	UZ	24.0	1	26.70	29.50	1	38.9	10.3
SMAJ26A-AU	SMAJ26CA-AU	JE	VE	26.0	1	28.90	31.90	1	42.1	9.5
SMAJ28A-AU	SMAJ28CA-AU	JG	VG	28.0	1	31.10	34.40	1	45.4	8.8
SMAJ30A-AU	SMAJ30CA-AU	JK	VK	30.0	1	33.30	36.80	1	48.4	8.3
SMAJ33A-AU	SMAJ33CA-AU	JM	VM	33.0	1	36.70	40.60	1	53.3	7.5
SMAJ36A-AU	SMAJ36CA-AU	JP	VP	36.0	1	40.00	44.20	1	58.1	6.9
SMAJ40A-AU	SMAJ40CA-AU	JR	VR	40.0	1	44.40	49.10	1	64.5	6.2
SMAJ43A-AU	SMAJ43CA-AU	JT	VT	43.0	1	47.80	52.80	1	69.4	5.8
SMAJ45A-AU	SMAJ45CA-AU	JV	VV	45.0	1	50.00	55.30	1	72.7	5.5
SMAJ48A-AU	SMAJ48CA-AU	JX	VX	48.0	1	53.30	58.90	1	77.4	5.2
SMAJ51A-AU	SMAJ51CA-AU	JZ	VZ	51.0	1	56.70	62.70	1	82.4	4.9

ELECTRICAL CHARACTERISTICS(T_A=25℃,continued)

Part Number		Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-polar	Bi-polar	Uni	Bi	V	max (μA)	min(V)	max(V)	mA	max(V)	A
SMAJ54A-AU	SMAJ54CA-AU	RE	WE	54.0	1	60.00	66.30	1	87.1	4.6
SMAJ58A-AU	SMAJ58CA-AU	RG	WG	58.0	1	64.40	71.20	1	93.6	4.3
SMAJ60A-AU	SMAJ60CA-AU	RK	WK	60.0	1	66.70	73.70	1	96.8	4.1
SMAJ64A-AU	SMAJ64CA-AU	RM	WM	64.0	1	71.10	78.60	1	103.0	3.9
SMAJ70A-AU	SMAJ70CA-AU	RP	WP	70.0	1	77.80	86.00	1	113.0	3.6
SMAJ75A-AU	SMAJ75CA-AU	RR	WR	75.0	1	83.30	92.10	1	121.0	3.3
SMAJ78A-AU	SMAJ78CA-AU	RT	WT	78.0	1	86.70	95.80	1	126.0	3.2
SMAJ85A-AU	SMAJ85CA-AU	RV	WV	85.0	1	94.40	104.0	1	137.0	2.9
SMAJ90A-AU	SMAJ90CA-AU	RX	WX	90.0	1	100.0	111.0	1	146.0	2.8
SMAJ100A-AU	SMAJ100CA-AU	RZ	WZ	100.0	1	111.0	123.0	1	162.0	2.5
SMAJ110A-AU	SMAJ110CA-AU	SE	XE	110.0	1	122.0	135.0	1	177.0	2.3
SMAJ120A-AU	SMAJ120CA-AU	SG	XG	120.0	1	133.0	147.0	1	193.0	2.1
SMAJ130A-AU	SMAJ130CA-AU	SK	XK	130.0	1	144.0	159.0	1	209.0	1.9
SMAJ150A-AU	SMAJ150CA-AU	SM	XM	150.0	1	167.0	185.0	1	243.0	1.7
SMAJ160A-AU	SMAJ160CA-AU	SP	XP	160.0	1	178.0	197.0	1	259.0	1.6
SMAJ170A-AU	SMAJ170CA-AU	SR	XR	170.0	1	189.0	209.0	1	275.0	1.5
SMAJ180A-AU	SMAJ180CA-AU	ST	XT	180.0	1	201.0	222.0	1	292.0	1.4
SMAJ200A-AU	SMAJ200CA-AU	SX	XX	200.0	1	224.0	247.0	1	324.0	1.3
SMAJ220A-AU	SMAJ220CA-AU	ZE	YE	220.0	1	246.0	272.0	1	356.0	1.1
SMAJ250A-AU	SMAJ250CA-AU	ZG	YG	250.0	1	279.0	309.0	1	405.0	1.0
SMAJ300A-AU	SMAJ300CA-AU	ZK	YK	300.0	1	335.0	371.0	1	486.0	0.8
SMAJ350A-AU	SMAJ350CA-AU	ZM	YM	350.0	1	391.0	432.0	1	567.0	0.7
SMAJ400A-AU	SMAJ400CA-AU	ZP	YP	400.0	1	447.0	494.0	1	648.0	0.6
SMAJ440A-AU	SMAJ440CA-AU	ZR	YR	440.0	1	492.0	543.0	1	713.0	0.6

① Surge waveform: 10/1000μs

V_R: Stand-off voltage –Maximum voltage that can be applied

V_{BR}: Breakdown voltage

V_C：Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

I_R：Reverse leakage current

ORDERING INFORMATION

SMAJ xx C A -AU

- SMAJ: 400W SMA Series
- xx: V_R Voltage
- C: C:Bi-directional
- A: 5% V_{BR} Voltage tolerance
- -AU: For AEC-Q101

RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

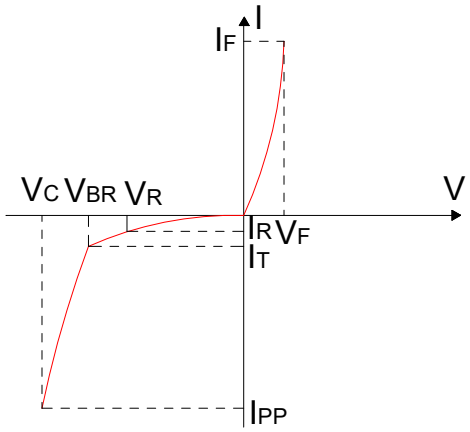


FIG.2:V- I curve characteristics (Bi-directional)

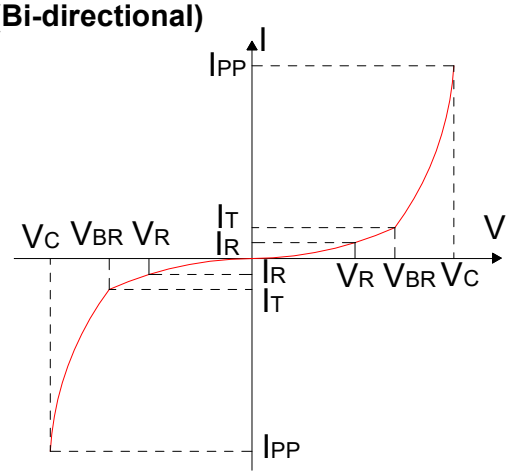


FIG.3: Pulse waveform

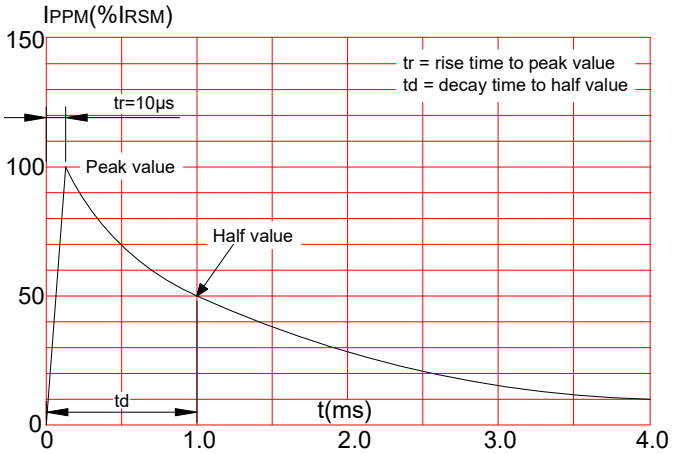


FIG.4: Pulse derating curve

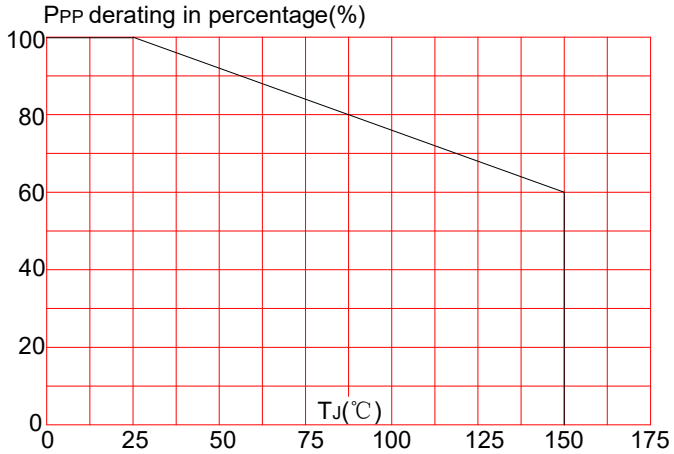
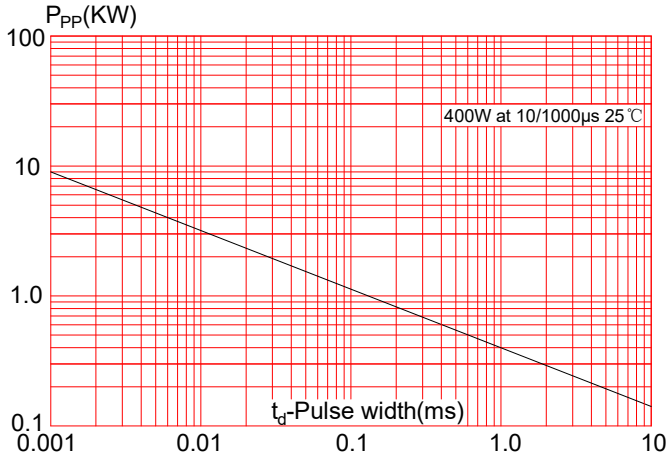
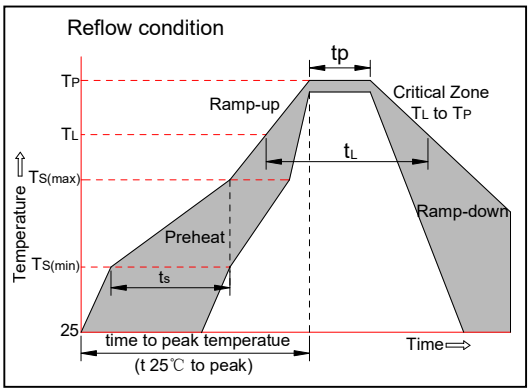


FIG.5:Peak pulse power dissipation vs. pulse width

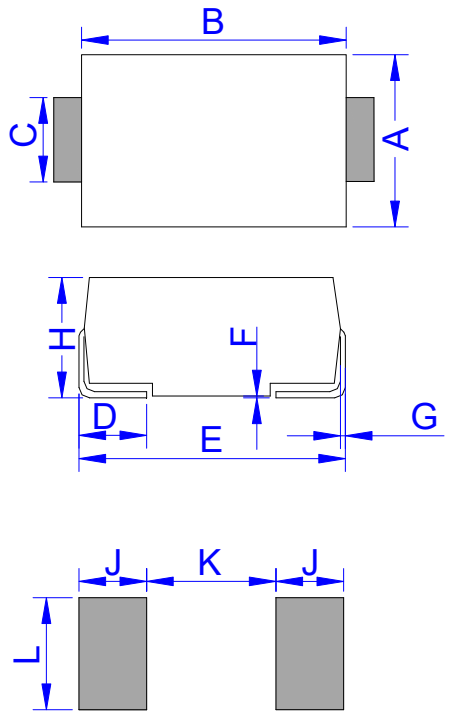


SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃



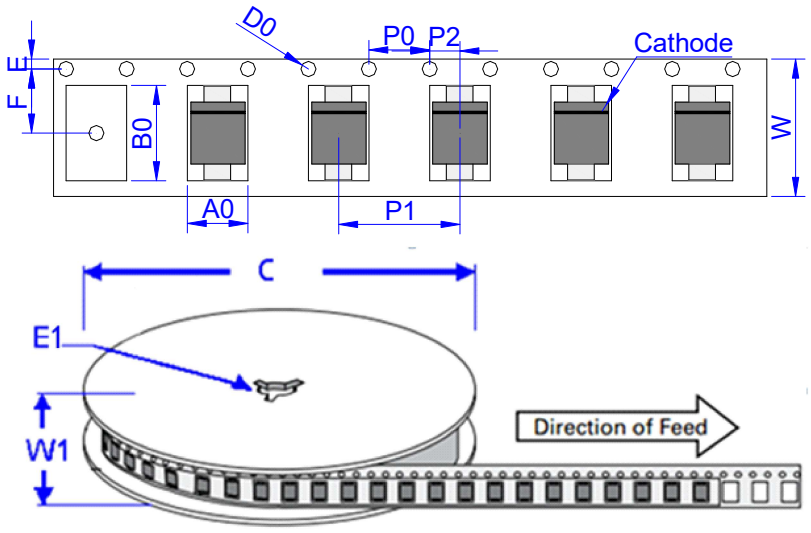
PACKAGE MECHANICAL DATA



DO-214AC (SMA)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.60	3.00	0.102	0.118
B	4.15	4.65	0.163	0.183
C	1.25	1.65	0.049	0.065
D	0.95	1.52	0.037	0.060
E	4.90	5.30	0.193	0.209
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.00	2.44	0.079	0.096
J	2.00		0.079	
K		2.30		0.091
L	1.80		0.071	

TAPE AND REEL SPECIFICATION-SMA



Ref.	Dimensions	
	Millimeters	Inches
A0	2.79 ± 0.3	0.110 ± 0.012
B0	5.33 ± 0.3	0.210 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524± 0.012
F	5.5 ± 0.2	0.217 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	12.0± 0.2	0.472 ± 0.008
W1	15.7 ± 2.0	0.618 ± 0.079

PART No.	UNIT WEIGHT (g/PCS) typ.	REEL (PCS)	PER CARTON (PCS)	DESCRIPTION
SMAJxxA/CA-AU	0.067	7,500	120,000	13 inch reel pack

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