

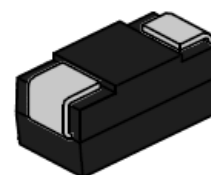


SMAJxxAH, SMAJxxCAH Series 400W TVS

Rev.3.4

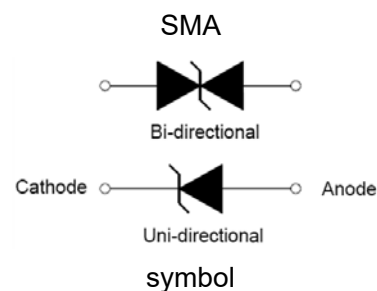
DESCRIPTION:

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



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°C/40s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).



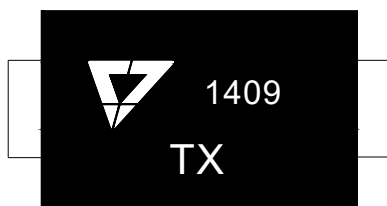
ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	T_{STG}/T_J	-55 to +150	°C
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	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	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	°C/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
1409: In ninth week, 2014

ELECTRICAL CHARACTERISTICS (T_A=25°C)

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
SMAJ10AH	SMAJ10CAH	HX	TX	10.0	2	11.10	12.30	1	17.0	23.5
SMAJ11AH	SMAJ11CAH	HZ	TZ	11.0	1	12.20	13.50	1	18.2	22.0
SMAJ12AH	SMAJ12CAH	IE	UE	12.0	1	13.30	14.70	1	19.9	20.1
SMAJ13AH	SMAJ13CAH	IG	UG	13.0	1	14.40	15.90	1	21.5	18.6
SMAJ14AH	SMAJ14CAH	IK	UK	14.0	1	15.60	17.20	1	23.2	17.3
SMAJ15AH	SMAJ15CAH	IM	UM	15.0	1	16.70	18.50	1	24.4	16.4
SMAJ16AH	SMAJ16CAH	IP	UP	16.0	1	17.80	19.70	1	26.0	15.4
SMAJ17AH	SMAJ17CAH	IR	UR	17.0	1	18.90	20.90	1	27.6	14.5
SMAJ18AH	SMAJ18CAH	IT	UT	18.0	1	20.00	22.10	1	29.2	13.7
SMAJ20AH	SMAJ20CAH	IV	UV	20.0	1	22.20	24.50	1	32.4	12.4
SMAJ22AH	SMAJ22CAH	IX	UX	22.0	1	24.40	26.90	1	35.5	11.3
SMAJ24AH	SMAJ24CAH	IZ	UZ	24.0	1	26.70	29.50	1	38.9	10.3
SMAJ26AH	SMAJ26CAH	JE	VE	26.0	1	28.90	31.90	1	42.1	9.5
SMAJ28AH	SMAJ28CAH	JG	VG	28.0	1	31.10	34.40	1	45.4	8.8
SMAJ30AH	SMAJ30CAH	JK	VK	30.0	1	33.30	36.80	1	48.4	8.3
SMAJ33AH	SMAJ33CAH	JM	VM	33.0	1	36.70	40.60	1	53.3	7.5
SMAJ36AH	SMAJ36CAH	JP	VP	36.0	1	40.00	44.20	1	58.1	6.9
SMAJ40AH	SMAJ40CAH	JR	VR	40.0	1	44.40	49.10	1	64.5	6.2
SMAJ43AH	SMAJ43CAH	JT	VT	43.0	1	47.80	52.80	1	69.4	5.8
SMAJ45AH	SMAJ45CAH	JV	VV	45.0	1	50.00	55.30	1	72.7	5.5
SMAJ48AH	SMAJ48CAH	JX	VX	48.0	1	53.30	58.90	1	77.4	5.2
SMAJ51AH	SMAJ51CAH	JZ	VZ	51.0	1	56.70	62.70	1	82.4	4.9
SMAJ54AH	SMAJ54CAH	RE	WE	54.0	1	60.00	66.30	1	87.1	4.6

ELECTRICAL CHARACTERISTICS($T_A=25^{\circ}\text{C}$, 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
SMAJ58AH	SMAJ58CAH	RG	WG	58.0	1	64.40	71.20	1	93.6	4.3
SMAJ60AH	SMAJ60CAH	RK	WK	60.0	1	66.70	73.70	1	96.8	4.1
SMAJ64AH	SMAJ64CAH	RM	WM	64.0	1	71.10	78.60	1	103.0	3.9
SMAJ70AH	SMAJ70CAH	RP	WP	70.0	1	77.80	86.00	1	113.0	3.6
SMAJ75AH	SMAJ75CAH	RR	WR	75.0	1	83.30	92.10	1	121.0	3.3
SMAJ78AH	SMAJ78CAH	RT	WT	78.0	1	86.70	95.80	1	126.0	3.2
SMAJ85AH	SMAJ85CAH	RV	WV	85.0	1	94.40	104.0	1	137.0	2.9
SMAJ90AH	SMAJ90CAH	RX	WX	90.0	1	100.0	111.0	1	146.0	2.8
SMAJ100AH	SMAJ100CAH	RZ	WZ	100.0	1	111.0	123.0	1	162.0	2.5
SMAJ110AH	SMAJ110CAH	SE	XE	110.0	1	122.0	135.0	1	177.0	2.3
SMAJ120AH	SMAJ120CAH	SG	XG	120.0	1	133.0	147.0	1	193.0	2.1
SMAJ130AH	SMAJ130CAH	SK	XK	130.0	1	144.0	159.0	1	209.0	1.9
SMAJ150AH	SMAJ150CAH	SM	XM	150.0	1	167.0	185.0	1	243.0	1.7
SMAJ160AH	SMAJ160CAH	SP	XP	160.0	1	178.0	197.0	1	259.0	1.6
SMAJ170AH	SMAJ170CAH	SR	XR	170.0	1	189.0	209.0	1	275.0	1.5
SMAJ180AH	SMAJ180CAH	ST	XT	180.0	1	201.0	222.0	1	292.0	1.4
SMAJ200AH	SMAJ200CAH	SX	XX	200.0	1	224.0	247.0	1	324.0	1.3
SMAJ220AH	SMAJ220CAH	ZE	YE	220.0	1	246.0	272.0	1	356.0	1.1
SMAJ250AH	SMAJ250CAH	ZG	YG	250.0	1	279.0	309.0	1	405.0	1.0
SMAJ300AH	SMAJ330CAH	ZK	YK	300.0	1	335.0	371.0	1	486.0	0.8
SMAJ350AH	SMAJ350CAH	ZM	YM	350.0	1	391.0	432.0	1	567.0	0.7
SMAJ400AH	SMAJ400CAH	ZP	YP	400.0	1	447.0	494.0	1	648.0	0.6
SMAJ440AH	SMAJ440CAH	ZR	YR	440.0	1	492.0	543.0	1	713.0	0.6

① Surge waveform: 10/1000 μs 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	H
400W SMA Series	V_R Voltage	C:Bi-directional	5% V_{BR} Voltage tolerance	For AEC-Q101

RATINGS AND V-I CHARACTERISTICS CURVES ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

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

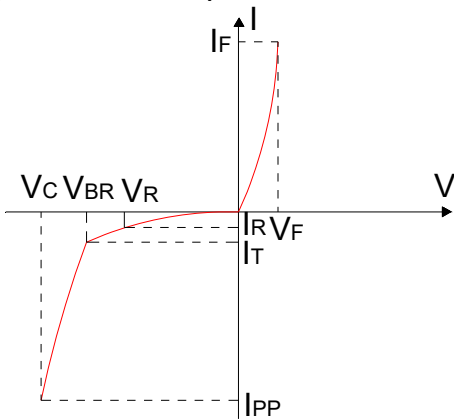


FIG.2:V- I curve characteristics
(Bi-directional)

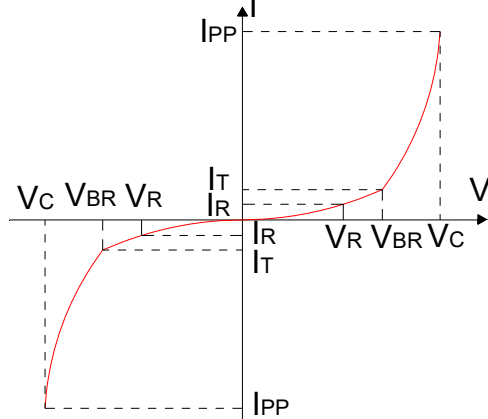


FIG.3: Pulse waveform

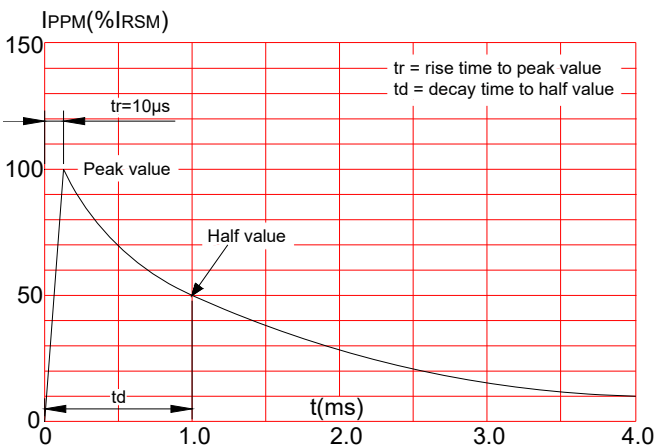


FIG.4: Pulse derating curve

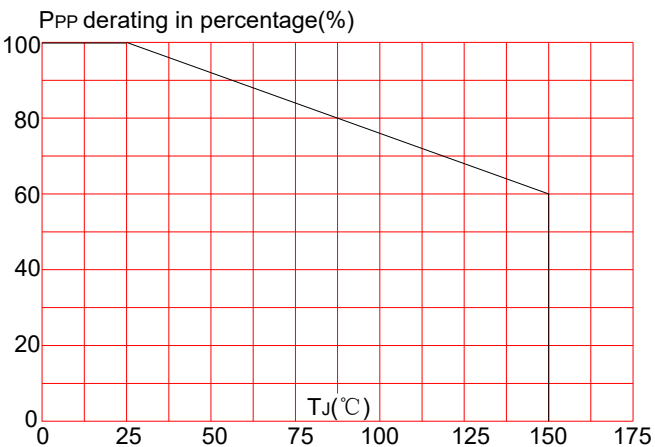
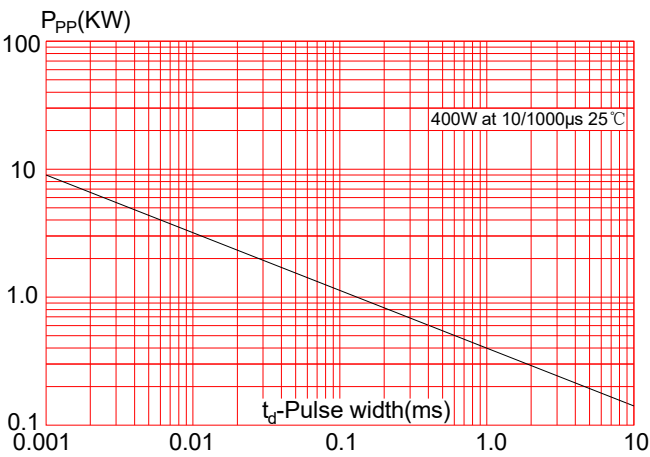
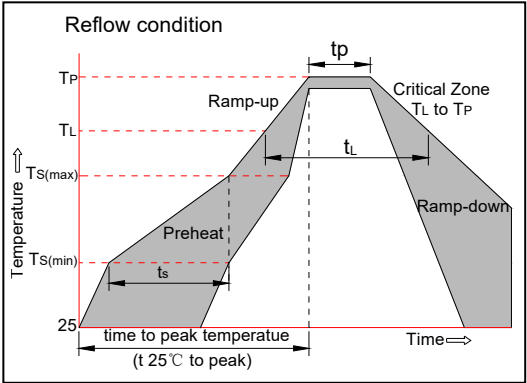


FIG.5:Peak pulse power dissipation vs. pulse width

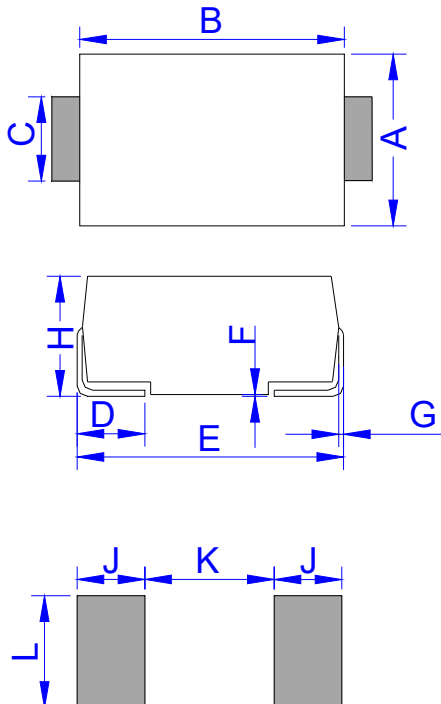


SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus 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)(Liquidus)	+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)		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



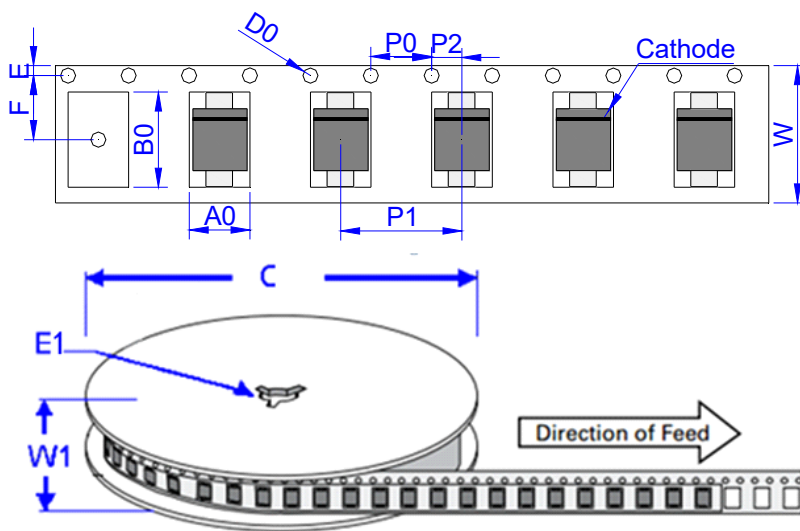
PACKAGE MECHANICAL DATA



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
SMAJxxAH/CAH	0.07	7,500	120,000	13 inch reel pack

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