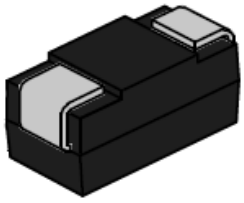
SMBJxx(C)AS Series 600W Transient Voltage Suppressor

Rev.1.1

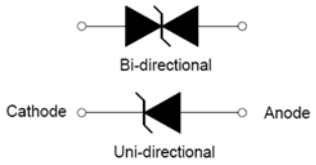
DESCRIPTION:

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.



SMB

FEATURES:



Symbol

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ Typical I_R less than 1μA above 10V.
- ✧ 600W peak pulse power capability at 10/1000μs waveform.
- ✧ 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.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ UL 497B item recognized. (File No.:E480698).
- ✧ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).

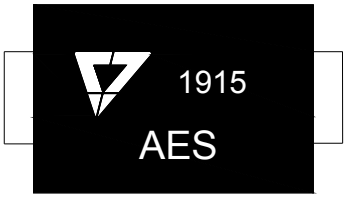
ABSOLUTE MAXIMUM RATINGS(T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating junction and storage temperature range	T_J/T_{STG}	-55 to +150	℃
Peak pulse power dissipation at 10/1000μs waveform	P_{PP}	600	W
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	5.0	W
Maximum instantaneous forward voltage at 50A for unidirectional	V_F	5.0	V
Peak forward surge current, 8.3ms single half sine wave(Note 1)	I_{FSM}	100	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	℃/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



AES: Device Marking Code
1915: The 15th week, 2019

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
SMBJ6.5AS	SMBJ6.5CAS	KKS	AKS	6.5	120	7.22	7.98	10	11.2	53.6
SMBJ7.0AS	SMBJ7.0CAS	KMS	AMS	7.0	50	7.78	8.60	10	12.0	50.0
SMBJ7.5AS	SMBJ7.5CAS	KPS	APS	7.5	50	8.33	9.21	1	12.9	46.5
SMBJ8.0AS	SMBJ8.0CAS	KRS	ARS	8.0	20	8.89	9.83	1	13.6	44.1
SMBJ8.5AS	SMBJ8.5CAS	KTS	ATS	8.5	10	9.44	10.40	1	14.4	41.7
SMBJ9.0AS	SMBJ9.0CAS	KVS	AVS	9.0	5	10.00	11.10	1	15.4	39.0
SMBJ10AS	SMBJ10CAS	KXS	AXS	10	2	11.10	12.30	1	17.0	35.3
SMBJ11AS	SMBJ11CAS	KZS	AZS	11	1	12.20	13.50	1	18.2	33.0
SMBJ12AS	SMBJ12CAS	LES	BES	12	1	13.30	14.70	1	19.9	30.2
SMBJ13AS	SMBJ13CAS	LGS	BGS	13	1	14.40	15.90	1	21.5	27.9
SMBJ14AS	SMBJ14CAS	LKS	BKS	14	1	15.60	17.20	1	23.2	25.9
SMBJ15AS	SMBJ15CAS	LMS	BMS	15	1	16.70	18.50	1	24.4	24.6
SMBJ16AS	SMBJ16CAS	LPS	BPS	16	1	17.80	19.70	1	26.0	23.1
SMBJ17AS	SMBJ17CAS	LRS	BRS	17	1	18.90	20.90	1	27.6	21.8
SMBJ18AS	SMBJ18CAS	LTS	BTS	18	1	20.00	22.10	1	29.2	20.6
SMBJ20AS	SMBJ20CAS	LVS	BVS	20	1	22.20	24.50	1	32.4	18.6
SMBJ22AS	SMBJ22CAS	LXS	BXS	22	1	24.40	26.90	1	35.5	16.9
SMBJ24AS	SMBJ24CAS	LZS	BZS	24	1	26.70	29.50	1	38.9	15.4
SMBJ26AS	SMBJ26CAS	MES	CES	26	1	28.90	31.90	1	42.1	14.3
SMBJ28AS	SMBJ28CAS	MGS	CGS	28	1	31.10	34.40	1	45.4	13.2
SMBJ30AS	SMBJ30CAS	MKS	CKS	30	1	33.30	36.80	1	48.4	12.4
SMBJ33AS	SMBJ33CAS	MMS	CMS	33	1	36.70	40.60	1	53.3	11.3
SMBJ36AS	SMBJ36CAS	MPS	CPS	36	1	40.00	44.20	1	58.1	10.4
SMBJ40AS	SMBJ40CAS	MRS	CRS	40	1	44.40	49.10	1	64.5	9.3

ELECTRICAL CHARACTERISTICS (T_A=25℃,contiuned)

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
SMBJ43AS	SMBJ43CAS	MTS	CTS	43	1	47.80	52.80	1	69.4	8.7
SMBJ45AS	SMBJ45CAS	MVS	CVS	45	1	50.00	55.30	1	72.7	8.3
SMBJ48AS	SMBJ48CAS	MXS	CXS	48	1	53.30	58.90	1	77.4	7.8
SMBJ51AS	SMBJ51CAS	MZS	CZS	51	1	56.70	62.70	1	82.4	7.3
SMBJ54AS	SMBJ54CAS	NES	DES	54	1	60.00	66.30	1	87.1	6.9
SMBJ58AS	SMBJ58CAS	NGS	DGS	58	1	64.40	71.20	1	93.6	6.4
SMBJ60AS	SMBJ60CAS	NKS	DKS	60	1	66.70	73.70	1	96.8	6.2
SMBJ64AS	SMBJ64CAS	NMS	DMS	64	1	71.10	78.60	1	103.0	5.8
SMBJ70AS	SMBJ70CAS	NPS	DPS	70	1	77.80	86.00	1	113.0	5.3
SMBJ75AS	SMBJ75CAS	NRS	DRS	75	1	83.30	92.10	1	121.0	5.0
SMBJ78AS	SMBJ78CAS	NTS	DTS	78	1	86.70	95.80	1	126.0	4.8
SMBJ85AS	SMBJ85CAS	NVS	DVS	85	1	94.40	104.0	1	137.0	4.4
SMBJ90AS	SMBJ90CAS	NXS	DXS	90	1	100.0	111.0	1	146.0	4.1
SMBJ100AS	SMBJ100CAS	NZS	DZS	100	1	111.0	123.0	1	162.0	3.7

①Surge 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

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

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

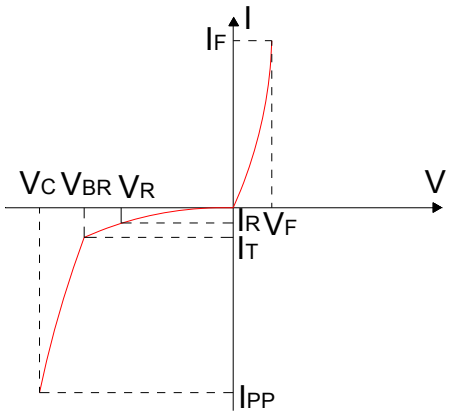


FIG.2:V- I curve characteristics (Bi-directional)

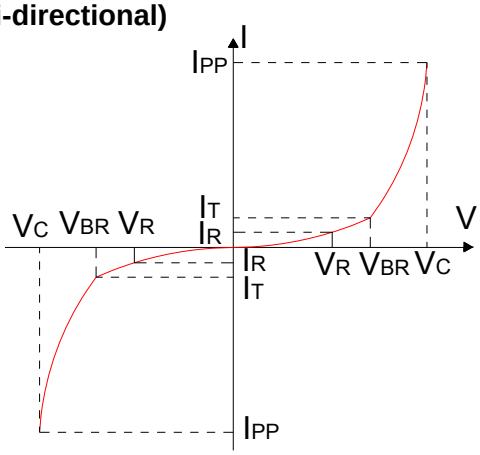


FIG.3: Pulse waveform

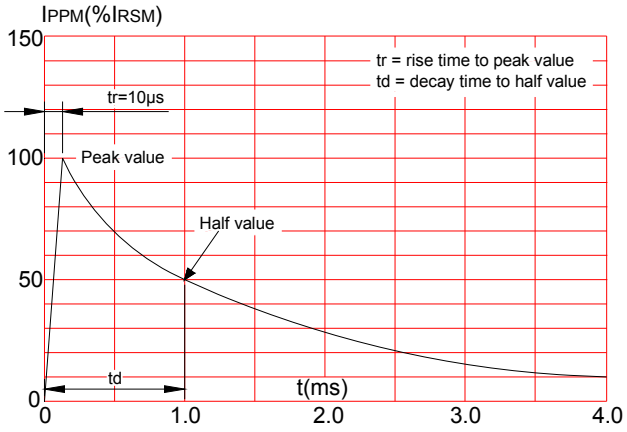
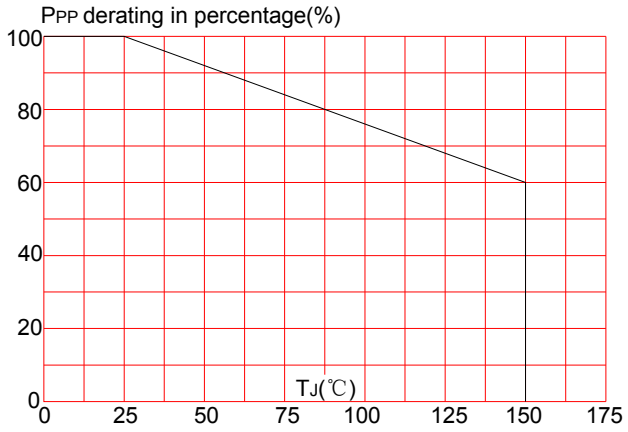
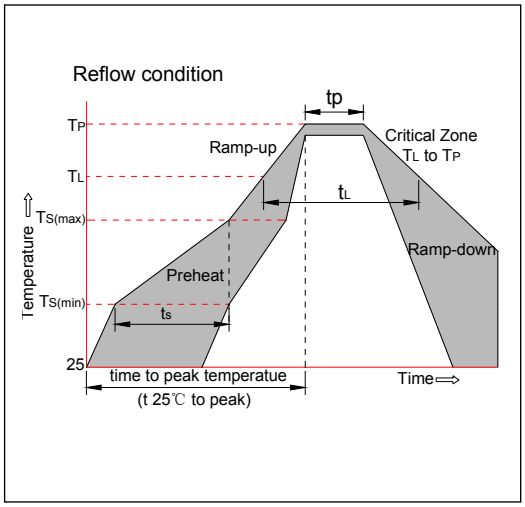


FIG.4: Pulse derating curve

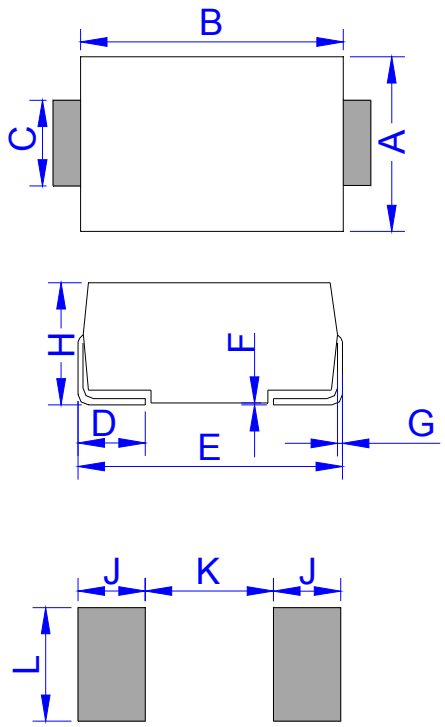


SOLDERING PARAMETERS

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℃



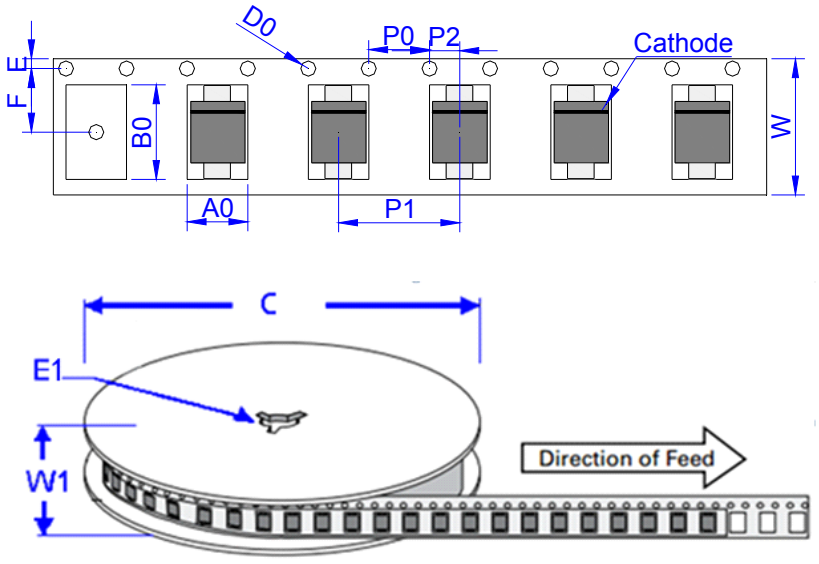
PACKAGE MECHANICAL DATA



DO-214AA (SMB)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.30	3.94	0.130	0.155
B	4.30	4.80	0.169	0.189
C	1.90	2.20	0.075	0.087
D	0.95	1.52	0.037	0.060
E	5.20	5.60	0.205	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.10	2.40	0.083	0.094
J	2.20		0.087	
K		2.60		0.102
L	2.30		0.091	

TAPE AND REEL SPECIFICATION-SMB



Ref.	Dimensions	
	Millimeters	Inches
A0	3.76 ± 0.3	0.148 ± 0.012
B0	5.69± 0.3	0.224 ± 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	8.00 ± 0.2	0.3145 ± 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
SMBJxxAS/CAS	0.098	3,000	48,000	13 inch reel pack

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