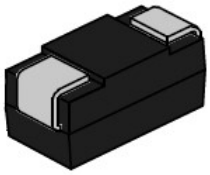
SMBJxx(C)A-AU Series 600W Transient Voltage Suppressor

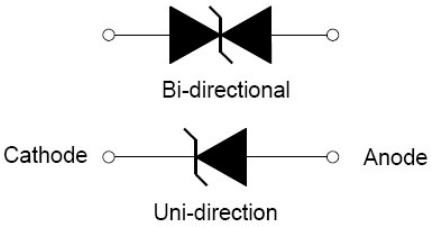
Rev.1.0

DESCRIPTION

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



SMB



Symbol

FEATURES

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 600W 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
Operating junction and storage temperature range	T_{STG}/T_J	-55 to +150	℃
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	5.0	W
Peak pulse power dissipation at 10/1000μs waveform	P_{PP}	600	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

AX: Device Marking Code
2221: the 21st 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
SMBJ10A-AU	SMBJ10CA-AU	KX	AX	10.0	2	11.10	12.30	1	17.0	35.3
SMBJ11A-AU	SMBJ11CA-AU	KZ	AZ	11.0	1	12.20	13.50	1	18.2	33.0
SMBJ12A-AU	SMBJ12CA-AU	LE	BE	12.0	1	13.30	14.70	1	19.9	30.2
SMBJ13A-AU	SMBJ13CA-AU	LG	BG	13.0	1	14.40	15.90	1	21.5	27.9
SMBJ14A-AU	SMBJ14CA-AU	LK	BK	14.0	1	15.60	17.20	1	23.2	25.9
SMBJ15A-AU	SMBJ15CA-AU	LM	BM	15.0	1	16.70	18.50	1	24.4	24.6
SMBJ16A-AU	SMBJ16CA-AU	LP	BP	16.0	1	17.80	19.70	1	26.0	23.1
SMBJ17A-AU	SMBJ17CA-AU	LR	BR	17.0	1	18.90	20.90	1	27.6	21.8
SMBJ18A-AU	SMBJ18CA-AU	LT	BT	18.0	1	20.00	22.10	1	29.2	20.6
SMBJ20A-AU	SMBJ20CA-AU	LV	BV	20.0	1	22.20	24.50	1	32.4	18.6
SMBJ22A-AU	SMBJ22CA-AU	LX	BX	22.0	1	24.40	26.90	1	35.5	16.9
SMBJ24A-AU	SMBJ24CA-AU	LZ	BZ	24.0	1	26.70	29.50	1	38.9	15.4
SMBJ26A-AU	SMBJ26CA-AU	ME	CE	26.0	1	28.90	31.90	1	42.1	14.3
SMBJ28A-AU	SMBJ28CA-AU	MG	CG	28.0	1	31.10	34.40	1	45.4	13.2
SMBJ30A-AU	SMBJ30CA-AU	MK	CK	30.0	1	33.30	36.80	1	48.4	12.4
SMBJ33A-AU	SMBJ33CA-AU	MM	CM	33.0	1	36.70	40.60	1	53.3	11.3
SMBJ36A-AU	SMBJ36CA-AU	MP	CP	36.0	1	40.00	44.20	1	58.1	10.4
SMBJ40A-AU	SMBJ40CA-AU	MR	CR	40.0	1	44.40	49.10	1	64.5	9.3
SMBJ43A-AU	SMBJ43CA-AU	MT	CT	43.0	1	47.80	52.80	1	69.4	8.7
SMBJ45A-AU	SMBJ45CA-AU	MV	CV	45.0	1	50.00	55.30	1	72.7	8.3
SMBJ48A-AU	SMBJ48CA-AU	MX	CX	48.0	1	53.30	58.90	1	77.4	7.8
SMBJ51A-AU	SMBJ51CA-AU	MZ	CZ	51.0	1	56.70	62.70	1	82.4	7.3
SMBJ54A-AU	SMBJ54CA-AU	NE	DE	54.0	1	60.00	66.30	1	87.1	6.9
SMBJ58A-AU	SMBJ58CA-AU	NG	DG	58.0	1	64.40	71.20	1	93.6	6.4

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
SMBJ60A-AU	SMBJ60CA-AU	NK	DK	60.0	1	66.70	73.70	1	96.8	6.2
SMBJ64A-AU	SMBJ64CA-AU	NM	DM	64.0	1	71.10	78.60	1	103.0	5.8
SMBJ70A-AU	SMBJ70CA-AU	NP	DP	70.0	1	77.80	86.00	1	113.0	5.3
SMBJ75A-AU	SMBJ75CA-AU	NR	DR	75.0	1	83.30	92.10	1	121.0	5.0
SMBJ78A-AU	SMBJ78CA-AU	NT	DT	78.0	1	86.70	95.80	1	126.0	4.8
SMBJ85A-AU	SMBJ85CA-AU	NV	DV	85.0	1	94.40	104.0	1	137.0	4.4
SMBJ90A-AU	SMBJ90CA-AU	NX	DX	90.0	1	100.0	111.0	1	146.0	4.1
SMBJ100A-AU	SMBJ100CA-AU	NZ	DZ	100.0	1	111.0	123.0	1	162.0	3.7
SMBJ110A-AU	SMBJ110CA-AU	PE	EE	110.0	1	122.0	135.0	1	177.0	3.4
SMBJ120A-AU	SMBJ120CA-AU	PG	EG	120.0	1	133.0	147.0	1	193.0	3.1
SMBJ130A-AU	SMBJ130CA-AU	PK	EK	130.0	1	144.0	159.0	1	209.0	2.9
SMBJ150A-AU	SMBJ150CA-AU	PM	EM	150.0	1	167.0	185.0	1	243.0	2.5
SMBJ160A-AU	SMBJ160CA-AU	PP	EP	160.0	1	178.0	197.0	1	259.0	2.3
SMBJ170A-AU	SMBJ170CA-AU	PR	ER	170.0	1	189.0	209.0	1	275.0	2.2
SMBJ180A-AU	SMBJ180CA-AU	PT	ET	180.0	1	201.0	222.0	1	292.0	2.1
SMBJ190A-AU	SMBJ190CA-AU	PV	EV	190.0	1	211.0	234.0	1	307.0	2.0
SMBJ200A-AU	SMBJ200CA-AU	PX	EX	200.0	1	224.0	247.0	1	324.0	1.9
SMBJ210A-AU	SMBJ210CA-AU	PZ	EZ	210.0	1	233.0	258.0	1	337.0	1.8
SMBJ220A-AU	SMBJ220CA-AU	QE	FE	220.0	1	246.0	272.0	1	356.0	1.7
SMBJ250A-AU	SMBJ250CA-AU	QG	FG	250.0	1	279.0	309.0	1	405.0	1.5
SMBJ300A-AU	SMBJ300CA-AU	QK	FK	300.0	1	335.0	371.0	1	486.0	1.3
SMBJ350A-AU	SMBJ350CA-AU	QM	FM	350.0	1	391.0	432.0	1	567.0	1.1
SMBJ400A-AU	SMBJ400CA-AU	QP	FP	400.0	1	447.0	494.0	1	648.0	0.9
SMBJ440A-AU	SMBJ440CA-AU	QR	FR	440.0	1	492.0	543.0	1	713.0	0.8

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

SMBJ xx C A -AU

- SMBJ: 600W SMB Series
- xx: V_R Voltage
- 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)

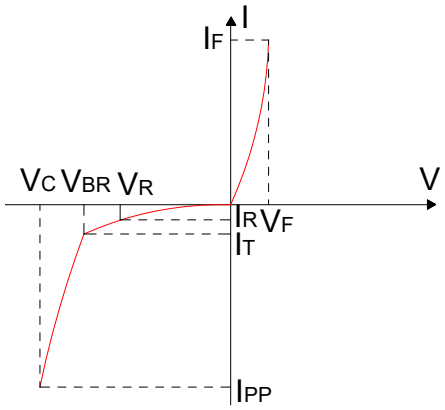


FIG.2:V- I curve characteristics (Bi-directional)

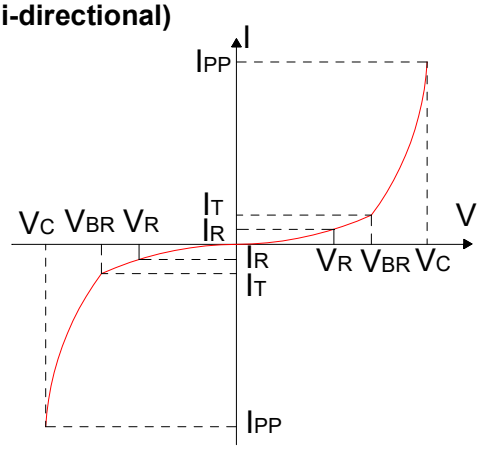


FIG.3: Pulse waveform

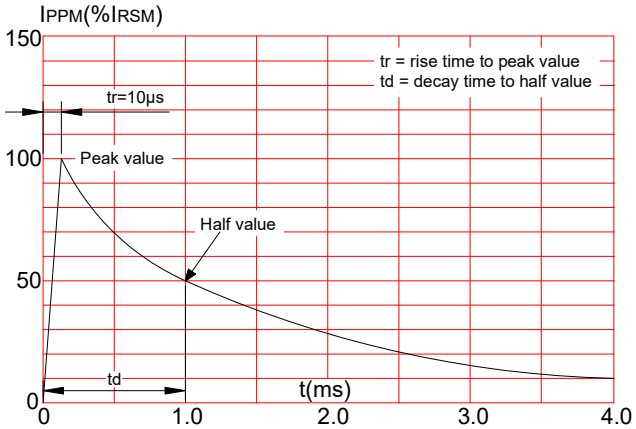


FIG.4: Pulse derating curve

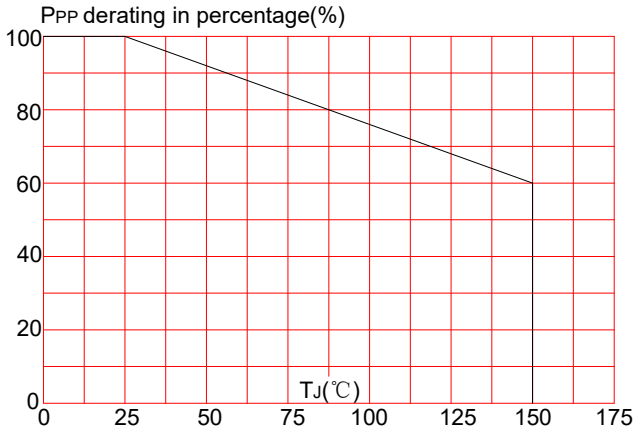
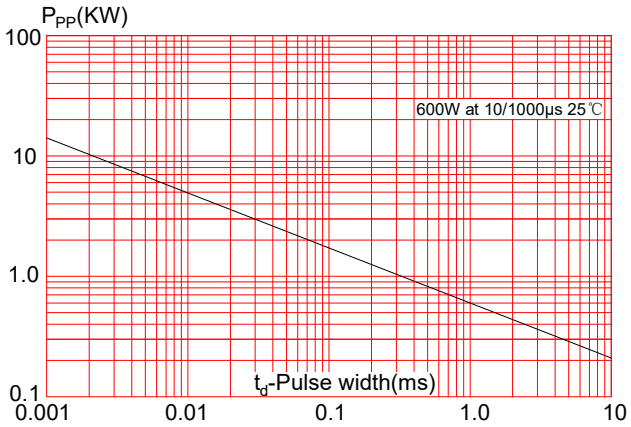
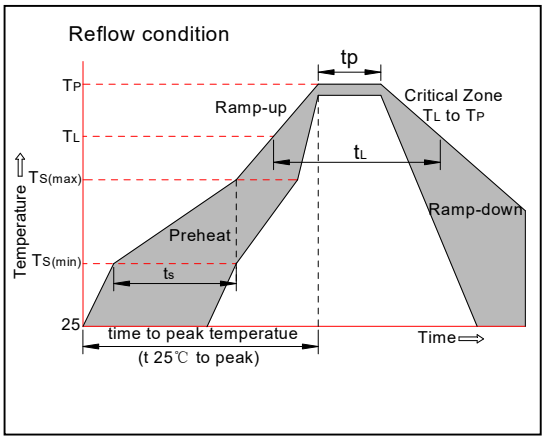


FIG.5:Peak pulse power dissipation vs. pulse width

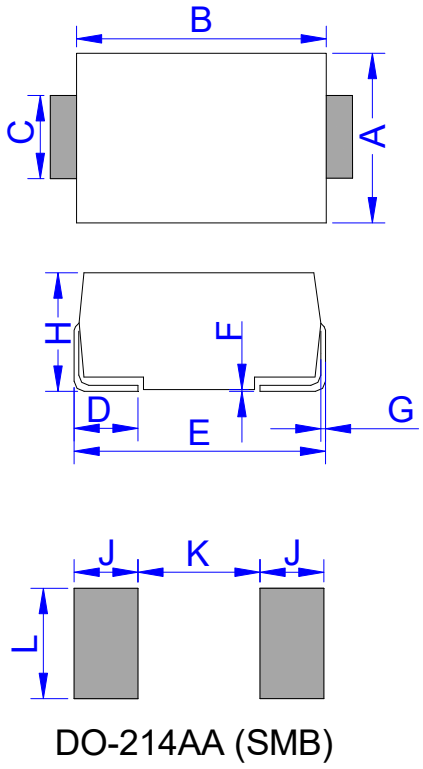


SOLDERING PARAMETERS

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℃



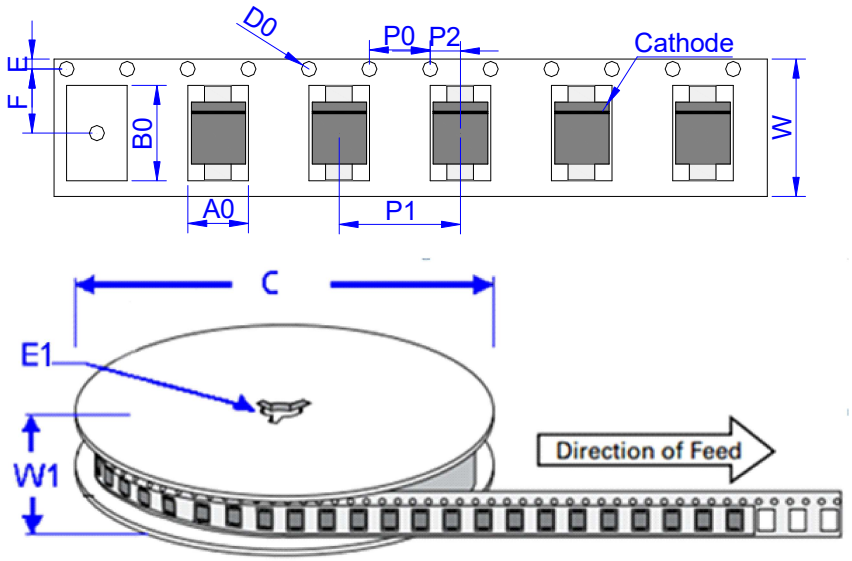
PACKAGE MECHANICAL DATA



DO-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
SMBJxxA/CA-AU	0.098	3,000	48,000	13 inch reel pack

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