

Features

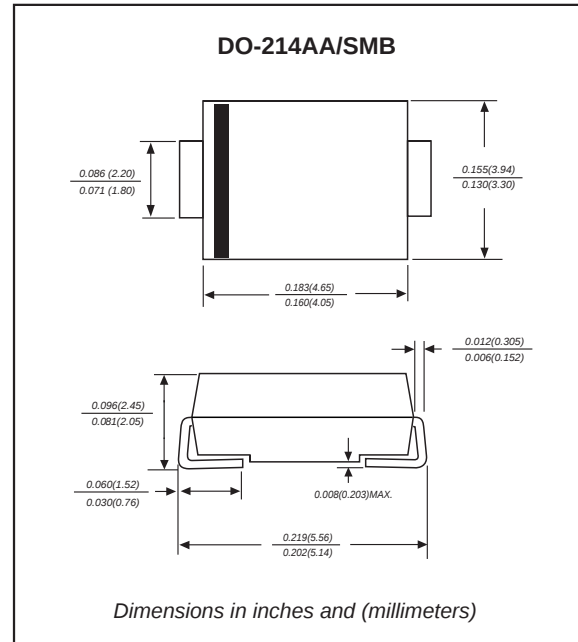


- 600W peak pulse power capability with a 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%.
- Low profile surface mounted application in order to optimize board space.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time from 0V to VBR, typically less than 1 ps for uni-directional & 5 ns for bi-directional types.
- Glass passivated chip junction.
- Lead-free parts meet RoHS requirements.
- Compliant to Halogen-free

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AA / SMB
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any

Package outline



Maximum ratings (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	Value	UNIT
Peak Power Dissipation	with a 10/1000 μ s waveform, Note 1, 2 & Fig. 1	P_{PPM}	600	W
Peak Pulse current	with a 10/1000 μ s waveform	I_{PPM}	See Table 1	A
Steady State Power Dissipation	at $T_L=75^\circ\text{C}$, Note 2	$P_{M(AV)}$	5.0	W
Peak Forward Surge Current	8.3ms Single Half Sine-Wave, Note 3	I_{FSM}	100	A
Maximum Instantaneous Forward Voltage	at 50A For Uni-Directional Types Only, Note 4	V_F	3.5/5.0	V
Typical Thermal resistance	Junction to case Junction to ambient	$R_{\theta JC}$ $R_{\theta JA}$	30 50	$^\circ\text{C/W}$
Operating junction temperature range		T_J	-55 ~ +150	$^\circ\text{C}$
Storage temperature range		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note 1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2

2. Mounted on copper pad area of 0.2"x0.2" (5.0x5.0 mm) per Fig 5

3. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum

4. $V_F < 3.5\text{V}$ for $V_{BR} < 200\text{V}$ and $V_F < 5.0\text{V}$ for $V_{BR} > 201\text{V}$.

Electrical characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand-off Voltage	Breakdown Voltage @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}		Maximum Reverse Leakage Current	Marking Code	
		V_{RWM}	$V_{BR Min}$	$V_{BR Max}$	I_T	V_c	I_{PP}	$I_R @ V_{RWM}$		
		Volts	Volts	Volts	mA	Volts	A	μA	UNI	BI
SMBJ 5.0A	SMBJ 5.0CA	5.0	6.40	7.00	10	9.2	65.2	800	KE	AE
SMBJ 6.0A	SMBJ 6.0CA	6.0	6.67	7.37	10	10.3	58.3	800	KG	AG
SMBJ 6.5A	SMBJ 6.5CA	6.5	7.22	7.98	10	11.2	53.6	500	KK	AK
SMBJ 7.0A	SMBJ 7.0CA	7.0	7.78	8.60	10	12.0	50.0	200	KM	AM
SMBJ 7.5A	SMBJ 7.5CA	7.5	8.33	9.21	1.0	12.9	46.5	100	KP	AP
SMBJ 8.0A	SMBJ 8.0CA	8.0	8.89	9.83	1.0	13.6	44.1	50	KR	AR
SMBJ 8.5A	SMBJ 8.5CA	8.5	9.44	10.4	1.0	14.4	41.7	20	KT	AT
SMBJ 9.0A	SMBJ 9.0CA	9.0	10.0	11.1	1.0	15.4	39.0	10	KV	AV
SMBJ 10A	SMBJ 10CA	10	11.1	12.3	1.0	17.0	35.3	5	KX	AX
SMBJ 11A	SMBJ 11CA	11	12.2	13.5	1.0	18.2	33.0	5	KZ	AZ
SMBJ 12A	SMBJ 12CA	12	13.3	14.7	1.0	19.9	30.2	5	LE	BE
SMBJ 13A	SMBJ 13CA	13	14.4	15.9	1.0	21.5	27.9	5	LG	BG
SMBJ 14A	SMBJ 14CA	14	15.6	17.2	1.0	23.2	25.9	5	LK	BK
SMBJ 15A	SMBJ 15CA	15	16.7	18.5	1.0	24.4	24.6	5	LM	BM
SMBJ 16A	SMBJ 16CA	16	17.8	19.7	1.0	26.0	23.0	5	LP	BP
SMBJ 17A	SMBJ 17CA	17	18.9	20.9	1.0	27.6	21.7	5	LR	BR
SMBJ 18A	SMBJ 18CA	18	20.0	22.1	1.0	29.2	20.5	5	LT	BT
SMBJ 20A	SMBJ 20CA	20	22.2	24.5	1.0	32.4	18.5	5	LV	BV
SMBJ 22A	SMBJ 22CA	22	24.4	26.9	1.0	35.5	16.9	5	LX	BX
SMBJ 24A	SMBJ 24CA	24	26.7	29.5	1.0	38.9	15.4	5	LZ	BZ
SMBJ 26A	SMBJ 26CA	26	28.9	31.9	1.0	42.1	14.3	5	ME	CE
SMBJ 28A	SMBJ 28CA	28	31.1	34.4	1.0	45.4	13.2	5	MG	CG
SMBJ 30A	SMBJ 30CA	30	33.3	36.8	1.0	48.4	12.4	5	MK	CK
SMBJ 33A	SMBJ 33CA	33	36.7	40.6	1.0	53.3	11.3	5	MM	CM
SMBJ 36A	SMBJ 36CA	36	40.0	44.2	1.0	58.1	10.3	5	MP	CP
SMBJ 40A	SMBJ 40CA	40	44.4	49.1	1.0	64.5	9.3	5	MR	CR
SMBJ 43A	SMBJ 43CA	43	47.8	52.8	1.0	69.4	8.6	5	MT	CT
SMBJ 45A	SMBJ 45CA	45	50.0	55.3	1.0	72.7	8.3	5	MV	CV
SMBJ 48A	SMBJ 48CA	48	53.3	58.9	1.0	77.4	7.8	5	MX	CX
SMBJ 51A	SMBJ 51CA	51	56.7	62.7	1.0	82.4	7.3	5	MZ	CZ
SMBJ 54A	SMBJ 54CA	54	60.0	66.3	1.0	87.1	6.9	5	NE	DE
SMBJ 58A	SMBJ 58CA	58	64.4	71.2	1.0	93.6	6.4	5	NG	DG
SMBJ 60A	SMBJ 60CA	60	66.7	73.7	1.0	96.8	6.2	5	NK	DK
SMBJ 64A	SMBJ 64CA	64	71.1	78.6	1.0	103.0	5.8	5	NM	DM
SMBJ 70A	SMBJ 70CA	70	77.8	86.0	1.0	113.0	5.3	5	NP	DP
SMBJ 75A	SMBJ 75CA	75	83.3	92.1	1.0	121.0	5.0	5	NR	DR
SMBJ 78A	SMBJ 78CA	78	86.7	95.8	1.0	126.0	4.8	5	NT	DT
SMBJ 85A	SMBJ 85CA	85	94.4	104	1.0	137.0	4.4	5	NV	DV

Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand-off Voltage	Breakdown Voltage @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}		Maximum Reverse Leakage Current	Marking Code	
		V_{RWM}	$V_{BR\ Min}$	$V_{BR\ Max}$	I_T	V_c	I_{PP}	$I_R@V_{RWM}$		
		Volts	Volts	Volts	mA	Volts	A	μA	UNI	BI
SMBJ 90A	SMBJ 90CA	90	100	111	1.0	146.0	4.1	5	NX	DX
SMBJ100A	SMBJ100CA	100	111	123	1.0	162.0	3.7	5	NZ	DZ
SMBJ110A	SMBJ110CA	110	122	135	1.0	177.0	3.4	5	PE	EE
SMBJ120A	SMBJ120CA	120	133	147	1.0	193.0	3.1	5	PG	EG
SMBJ130A	SMBJ130CA	130	144	159	1.0	209.0	2.9	5	PK	EK
SMBJ140A	SMBJ140CA	140	155	171	1.0	226.8	2.65	5	PL	EL
SMBJ150A	SMBJ150CA	150	167	185	1.0	243.0	2.5	5	PM	EM
SMBJ160A	SMBJ160CA	160	178	197	1.0	259.0	2.3	5	PP	EP
SMBJ170A	SMBJ170CA	170	189	209	1.0	275.0	2.2	5	PR	ER
SMBJ180A	SMBJ180CA	180	201	222	1.0	292.0	2.1	5	PT	ET
SMBJ188A	SMBJ188CA	188	209	231	1.0	304.0	2.0	5	PB	EB
SMBJ200A	SMBJ200CA	200	224	247	1.0	324.0	1.9	5	PX	EX
SMBJ220A	SMBJ220CA	220	246	272	1.0	356.0	1.7	5	PV	EV
SMBJ250A	SMBJ250CA	250	279	309	1.0	405.0	1.5	5	PZ	EZ
SMBJ300A	SMBJ300CA	300	335	371	1.0	486.0	1.3	5	QE	FE
SMBJ350A	SMBJ350CA	350	391	432	1.0	567.0	1.1	5	QG	FG
SMBJ400A	SMBJ400CA	400	447	494	1.0	648.0	0.9	5	QK	FK
SMBJ440A	SMBJ440CA	440	492	543	1.0	713.0	0.9	5	QM	FM

Note 1. V_{BR} measured after I_T applied for 300us, I_T =square wave pulse or equivalent

2. Surge current waveform per Fig. 3 and derated per Fig. 2

3. For bi-directional types having V_{RWM} of 10 volts and less, the I_R limit is doubled

4. Suffix 'C' denotes bi-directional devices. Suffix 'A' denotes 5% tolerance devices, no suffix denotes 10% tolerance devices.

Fig. a - Transients of several thousand volts can be clamped to a safe level by the TVS

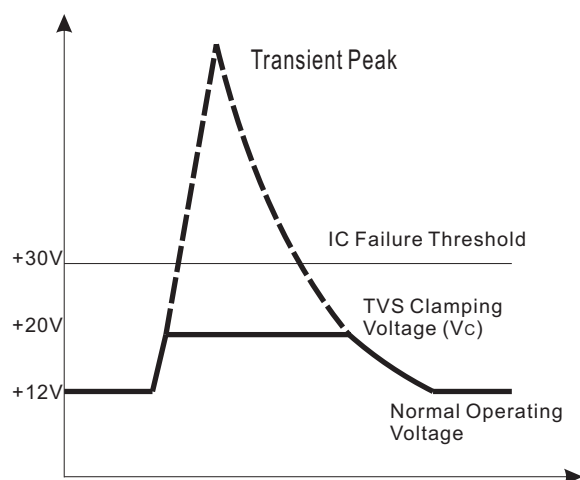
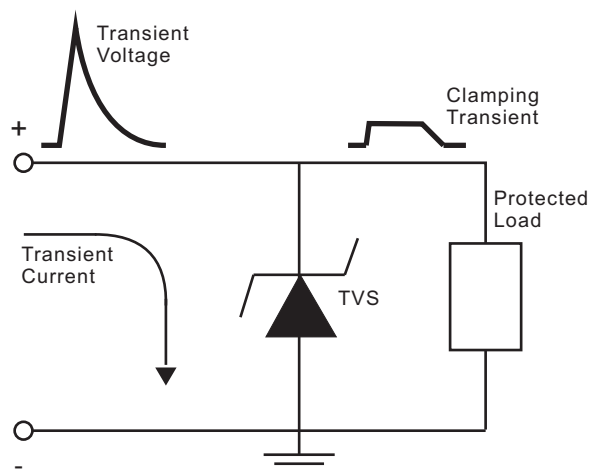


Fig. b - Transient current is diverted to ground thru TVS; the voltage seen by the protected load is limited to the clamping voltage level



Rating and characteristic curves

Fig.1 - Peak Pulse Power Rating Curve

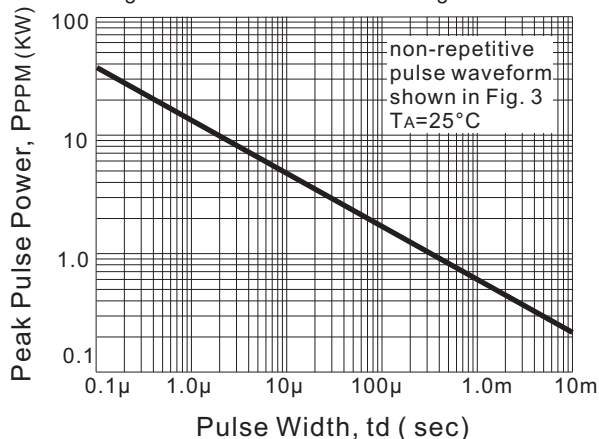


Fig.2 - Pulse Derating Curve

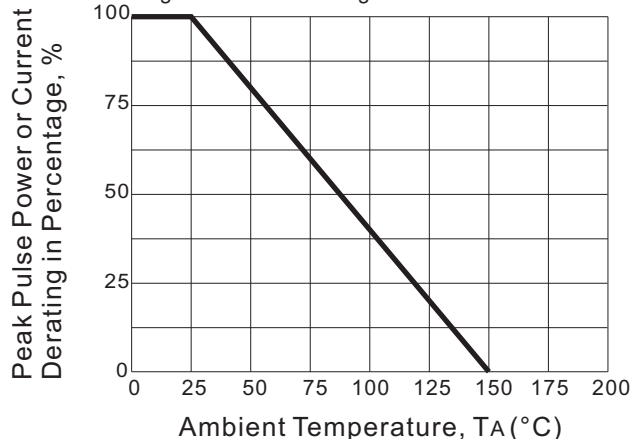


Fig.3 - Pulse Waveform

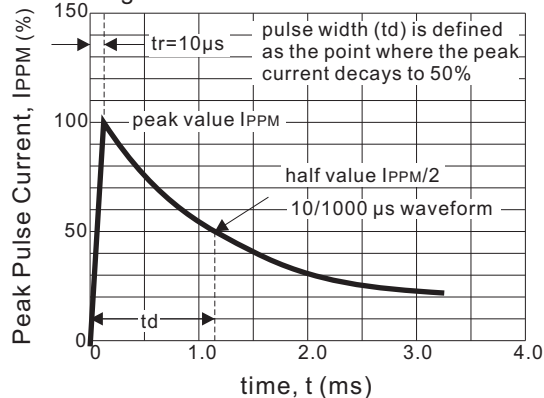


Fig.4 - Typical Junction Capacitance

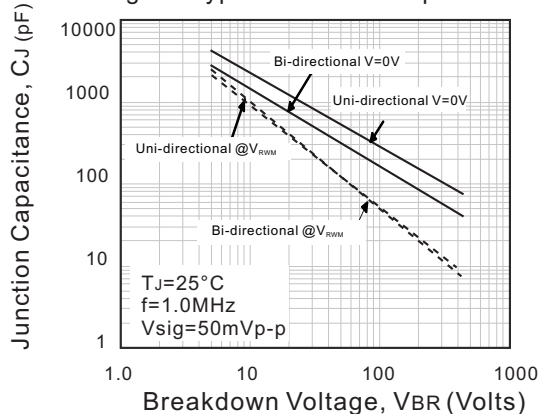


Fig.5 - Steady State Power Derating Curve

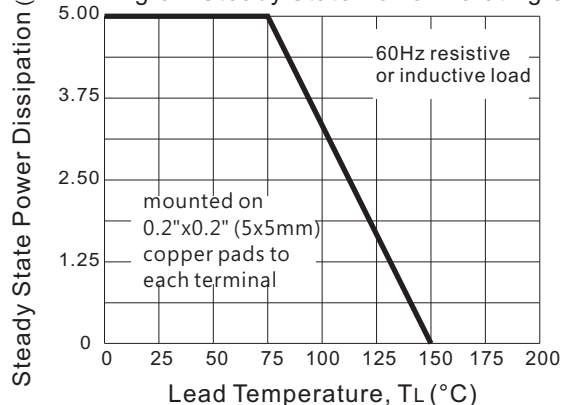
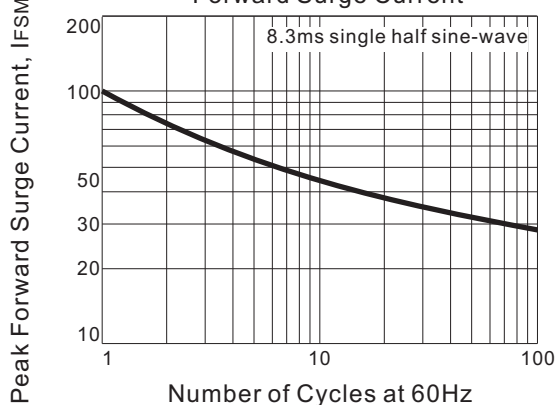
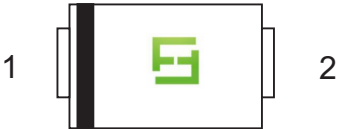


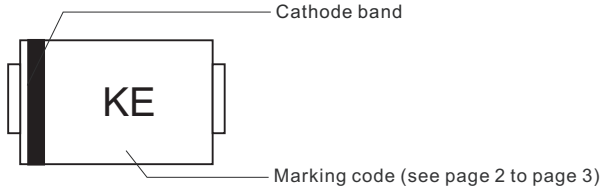
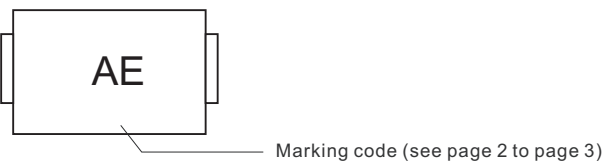
Fig.6 - Maximum Non-Repetitive Forward Surge Current



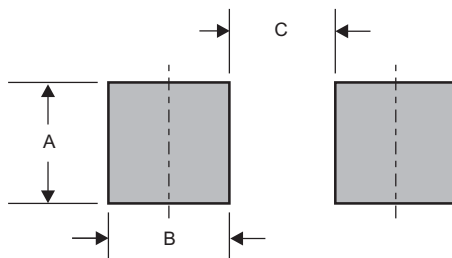
Pinning information

Pin	Simplified outline	Symbol
Uni-Directional Pin1 cathode Pin2 anode		
Bi-Directional		

Marking

Type number	Example
Uni-Directional	
Bi-Directional	

Suggested solder pad layout

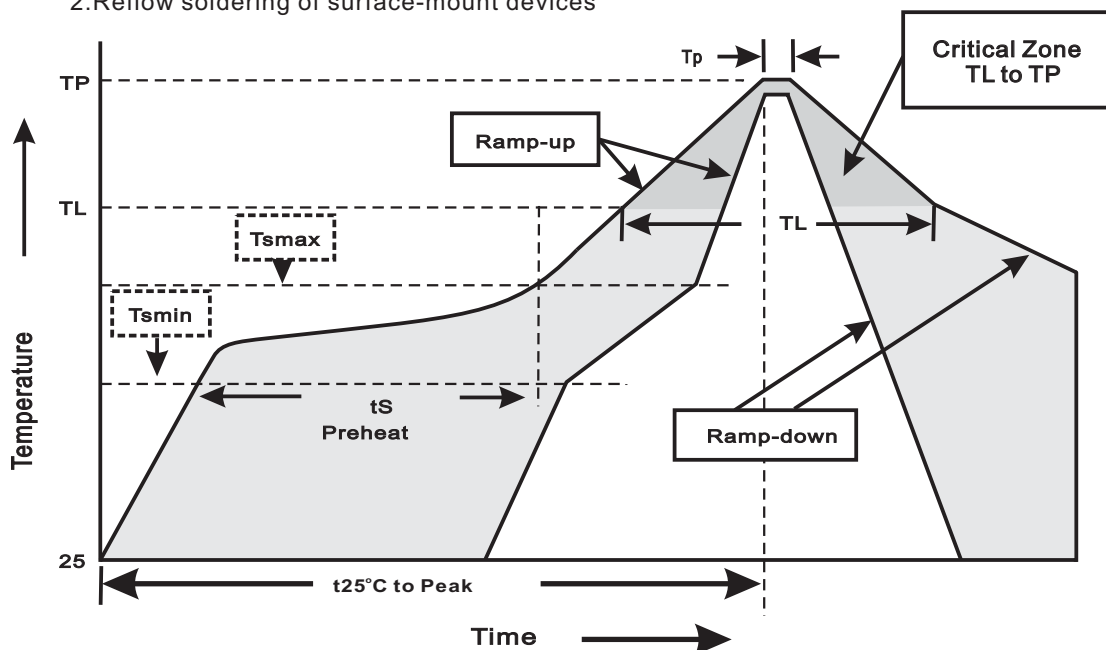


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMB	0.078 (2.00)	0.059 (1.50)	0.110 (2.80)

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{min}) -Temperature Max(T _{max}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{max} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes