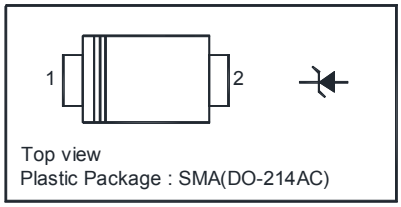
SMAJ Series-HAF

Surface Mount Transient Voltage Suppressors
Stand-off Voltage: 5.0 V - 440 V

PINNING

PIN	DESCRIPTION
1	Cathode
2	Anode



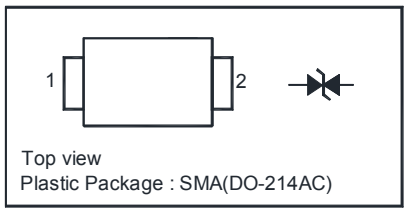
Uni-directional

Features
- For surface mounted applications in order to optimize board space
- Low profile package
- Glass passivated junction
- Low inductance
- Plastic package has Underwriters Laboratory Flammability
- Halogen and Antimony Free(HAF), RoHS compliant

Mechanical Data
- Case: DO-214AC (SMA) molded plastic
- Polarity: Color band denotes cathode end except Bipolar
- Mounting Position: Any

PINNING

PIN	DESCRIPTION
1	Anode
2	Anode



Bi-directional

Description
- Devices for bidirectional applications
- For bidirectional use CA suffix
- Electrical characteristics apply in both directions

Absolute Maximum Ratings (T_a = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with on 10/1000 μs Waveform [1) 2)]	P_{PPM}	400	W
Peak Pulse Current on 10/1000 μs waveform [1)]	I_{PPM}	See Table 1 and 2	A
Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load (JEDEC Method) [3)]	$I_{FSM(UNI)}$	60	A
Maximum Instantaneous Forward Voltage (Unidirectional only) at 25 A [4)]	V_F	3.5 / 5	V
Typical Thermal Resistance Junction to Ambient [2)]	$R_{\theta JA}$	100	℃/W
Operating Junction and Storage Temperature Range	T_j, T_{stg}	- 65 to + 150	℃

[1)] Non-repetitive current pulse, per Fig.3 and derated above TA = 25°C per Fig. 2.

[2)] Mounted on 5mm^2 copper pads to each terminal.

[3)] Peak Forward Surge Current: 8.3 ms single half sine-wave Superimposed on rated load (JEDEC method).

[4)] V_F < 3.5 V for devices of V_{BR} < 200 V and V_F < 5 V for devices of V_{BR} > 201 V.

Dated: 01/04/2025 JD Rev: 06

Electrical Characteristics (T_a = 25℃ unless otherwise specified) Table 1

Uni-directional / Bi-directional Type [3]	Marking Code		Stand-off Voltage V_{WM} (V)	Breakdown Voltage [1]		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) at I_{PPM}	Maximum Peak Pulse Current I_{PPM} (A)	Maximum Reverse Leakage [2] I_D (μA) at V_{WM}
	Uni	Bi		V_{BR} (V) Min. at I_T	V_{BR} (V) Max. at I_T				
SMAJ5.0 / C	5.0	5.0C	5	6.4	7.82	10	9.6	41.7	800
SMAJ5.0A / CA	5.0A	5.0CA	5	6.4	7.07	10	9.2	43.5	800
SMAJ6.0 / C	6.0	6.0C	6	6.67	8.15	10	11.4	35.1	800
SMAJ6.0A / CA	6.0A	6.0CA	6	6.67	7.37	10	10.3	38.8	800
SMAJ6.5 / C	6.5	6.5C	6.5	7.22	8.82	10	12.3	32.5	500
SMAJ6.5A / CA	6.5A	6.5CA	6.5	7.22	7.98	10	11.2	35.7	500
SMAJ7.0 / C	7.0	7.0C	7	7.78	9.51	10	13.3	30.1	200
SMAJ7.0A / CA	7.0A	7.0CA	7	7.78	8.6	10	12	33.3	200
SMAJ7.5 / C	7.5	7.5C	7.5	8.33	10.2	1	14.3	28	100
SMAJ7.5A / CA	7.5A	7.5CA	7.5	8.33	9.21	1	12.9	31	100
SMAJ8.0 / C	8.0	8.0C	8	8.89	10.9	1	15	26.7	50
SMAJ8.0A / CA	8.0A	8.0CA	8	8.89	9.83	1	13.6	29.4	50
SMAJ8.5 / C	8.5	8.5C	8.5	9.44	11.5	1	15.9	25.2	10
SMAJ8.5A / CA	8.5A	8.5CA	8.5	9.44	10.4	1	14.4	27.8	10
SMAJ9.0 / C	9.0	9.0C	9	10	12.2	1	16.9	23.7	5
SMAJ9.0A / CA	9.0A	9.0CA	9	10	11.1	1	15.4	26	5
SMAJ10 / C	10	10C	10	11.1	13.6	1	18.8	21.3	1
SMAJ10A / CA	10A	10CA	10	11.1	12.3	1	17	23.5	1
SMAJ11 / C	11	11C	11	12.2	14.9	1	20.1	19.9	1
SMAJ11A / CA	11A	11CA	11	12.2	13.5	1	18.2	22	1
SMAJ12 / C	12	12C	12	13.3	16.3	1	22	18.2	1
SMAJ12A / CA	12A	12CA	12	13.3	14.7	1	19.9	20.1	1
SMAJ13 / C	13	13C	13	14.4	17.6	1	23.8	16.8	1
SMAJ13A / CA	13A	13CA	13	14.4	15.9	1	21.5	18.6	1
SMAJ14 / C	14	14C	14	15.6	19.1	1	25.8	15.5	1
SMAJ14A / CA	14A	14CA	14	15.6	17.2	1	23.2	17.2	1
SMAJ15 / C	15	15C	15	16.7	20.4	1	26.9	14.9	1
SMAJ15A / CA	15A	15CA	15	16.7	18.5	1	24.4	16.4	1
SMAJ16 / C	16	16C	16	17.8	21.8	1	28.8	13.9	1
SMAJ16A / CA	16A	16CA	16	17.8	19.7	1	26	15.4	1
SMAJ17 / C	17	17C	17	18.9	23.1	1	30.5	13.1	1
SMAJ17A / CA	17A	17CA	17	18.9	20.9	1	27.6	14.5	1
SMAJ18 / C	18	18C	18	20	24.4	1	32.2	12.4	1
SMAJ18A / CA	18A	18CA	18	20	22.1	1	29.2	13.7	1
SMAJ20 / C	20	20C	20	22.2	27.1	1	35.8	11.2	1
SMAJ20A / CA	20A	20CA	20	22.2	24.5	1	32.4	12.3	1
SMAJ22 / C	22	20C	22	24.4	29.8	1	39.4	10.2	1
SMAJ22A / CA	22A	22CA	22	24.4	26.9	1	35.5	11.3	1
SMAJ24 / C	24	24C	24	26.7	32.6	1	43	9.3	1
SMAJ24A / CA	24A	24CA	24	26.7	29.5	1	38.9	10.3	1
SMAJ26 / C	26	26C	26	28.9	35.3	1	46.6	8.6	1
SMAJ26A / CA	26A	26CA	26	28.9	31.9	1	42.1	9.5	1
SMAJ28 / C	28	28C	28	31.1	38	1	50	8	1
SMAJ28A / CA	28A	28CA	28	31.1	34.4	1	45.4	8.8	1
SMAJ30 / C	30	30C	30	33.3	40.7	1	53.5	7.5	1
SMAJ30A / CA	30A	30CA	30	33.3	36.8	1	48.4	8.3	1
SMAJ33 / C	33	33C	33	36.7	44.9	1	59	6.8	1
SMAJ33A / CA	33A	33CA	33	36.7	40.6	1	53.3	7.5	1
SMAJ36 / C	36	36C	36	40	48.9	1	64.3	6.2	1
SMAJ36A / CA	36A	36CA	36	40	44.2	1	58.1	6.9	1
SMAJ40 / C	40	40C	40	44.4	54.3	1	71.4	5.6	1
SMAJ40A / CA	40A	40CA	40	44.4	49.1	1	64.5	6.2	1
SMAJ43 / C	43	43C	43	47.8	58.4	1	76.7	5.2	1
SMAJ43A / CA	43A	43CA	43	47.8	52.8	1	69.4	5.8	1

Electrical Characteristics (T_a = 25℃ unless otherwise specified) Table 2

Uni-directional / Bi-directional Type [3]	Marking Code		Stand-off Voltage V_{WM} (V)	Breakdown Voltage [1]		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) at I_{PPM}	Maximum Peak Pulse Current I_{PPM} (A)	Maximum Reverse Leakage [2] I_D (μA) at V_{WM}
	Uni	Bi		V_{BR} (V) Min. at I_T	V_{BR} (V) Max. at I_T				
SMAJ45 / C	45	45C	45	50	61.1	1	80.3	5	1
SMAJ45A / CA	45A	45CA	45	50	55.3	1	72.7	5.5	1
SMAJ48 / C	48	48C	48	53.3	65.1	1	85.5	4.7	1
SMAJ48A / CA	48A	48CA	48	53.3	58.9	1	77.4	5.2	1
SMAJ51 / C	51	51C	51	56.7	69.3	1	91.1	4.4	1
SMAJ51A / CA	51A	51CA	51	56.7	62.7	1	82.4	4.9	1
SMAJ54 / C	54	54C	54	60	73.3	1	96.3	4.2	1
SMAJ54A / CA	54A	54CA	54	60	66.3	1	87.1	4.6	1
SMAJ58 / C	58	58C	58	64.4	78.7	1	103	3.9	1
SMAJ58A / CA	58A	58CA	58	64.4	71.2	1	93.6	4.3	1
SMAJ60 / C	60	60C	60	66.7	81.5	1	107	3.7	1
SMAJ60A / CA	60A	60CA	60	66.7	73.7	1	96.8	4.1	1
SMAJ64 / C	64	64C	64	71.1	86.9	1	114	3.5	1
SMAJ64A / CA	64A	64CA	64	71.1	78.6	1	103	3.9	1
SMAJ70 / C	70	70C	70	77.8	95.1	1	125	3.2	1
SMAJ70A / CA	70A	70CA	70	77.8	86	1	113	3.5	1
SMAJ75 / C	75	75C	75	83.3	102	1	134	3	1
SMAJ75A / CA	75A	75CA	75	83.3	92.1	1	121	3.3	1
SMAJ78 / C	78	78C	78	86.7	106	1	139	2.9	1
SMAJ78A / CA	78A	78CA	78	86.7	95.8	1	126	3.2	1
SMAJ85 / C	85	85C	85	94.4	115	1	151	2	1
SMAJ85A / CA	85A	85CA	85	94.4	104	1	137	2.2	1
SMAJ90 / C	90	90C	90	100	122	1	160	1.9	1
SMAJ90A / CA	90A	90CA	90	100	111	1	146	2.1	1
SMAJ100 / C	100	100C	100	111	136	1	179	1.7	1
SMAJ100A / CA	100A	100CA	100	111	123	1	162	1.9	1
SMAJ110 / C	110	110C	110	122	149	1	196	1.5	1
SMAJ110A / CA	110A	110CA	110	122	135	1	177	1.7	1
SMAJ120 / C	120	120C	120	133	163	1	214	1.4	1
SMAJ120A / CA	120A	120CA	120	133	147	1	193	1.6	1
SMAJ130 / C	130	130C	130	144	176	1	231	1.3	1
SMAJ130A / CA	130A	130CA	130	144	159	1	209	1.4	1
SMAJ150 / C	150	150C	150	167	204	1	268	1.1	1
SMAJ150A / CA	150A	150CA	150	167	185	1	243	1.2	1
SMAJ160 / C	160	160C	160	178	218	1	287	1	1
SMAJ160A / CA	160A	160CA	160	178	197	1	259	1.2	1
SMAJ170 / C	170	170C	170	189	231	1	304	0.99	1
SMAJ170A / CA	170A	170CA	170	189	209	1	275	1.09	1
SMAJ180A / CA	180A	180CA	180	201	222	1	292	1.4	1
SMAJ200A / CA	200A	200CA	200	224	247	1	324	1.2	1
SMAJ220A / CA	220A	220CA	220	246	272	1	356	1.1	1
SMAJ250A / CA	250A	250CA	250	279	309	1	405	1	1
SMAJ300A / CA	300A	300CA	300	335	371	1	486	0.8	1
SMAJ350A / CA	350A	350CA	350	391	432	1	567	0.7	1
SMAJ400A / CA	400A	400CA	400	447	494	1	648	0.6	1
SMAJ440A / CA	440A	440CA	440	492	543	1	713	0.6	1

[1] V_{BR} measured after I_T applied for 300 μs square wave pulse or equivalent.

[2] For bidirectional types having V_{RWM} of 10 V and less, the I_D limit is doubled.

[3] For bidirectional use C or CA suffix types, the electrical characteristics apply in both directions.

Electrical Characteristics Curves

Fig.1 Peak Pulse Power Rating Curve

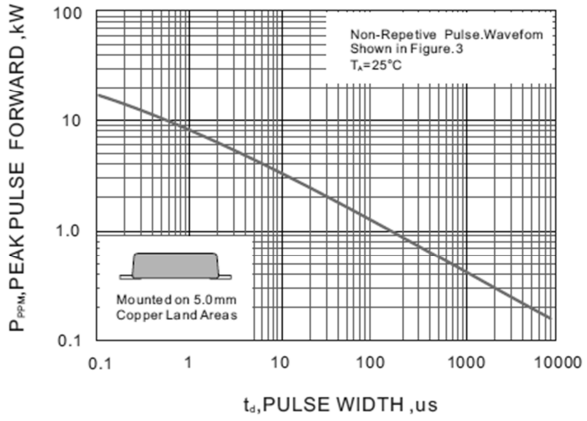


Fig.2 Forward Current Derating Curve

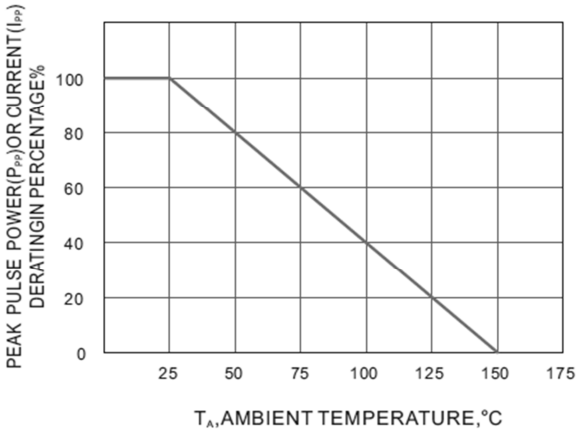


Fig.3 Pulse Waveform

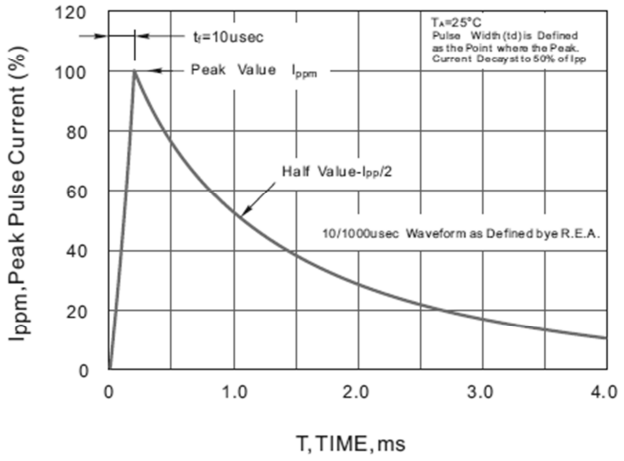
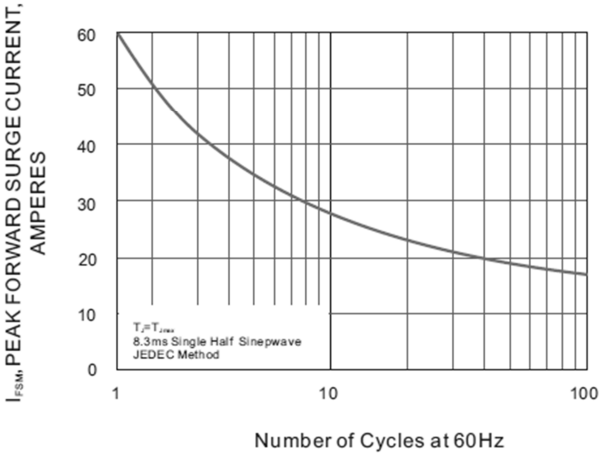
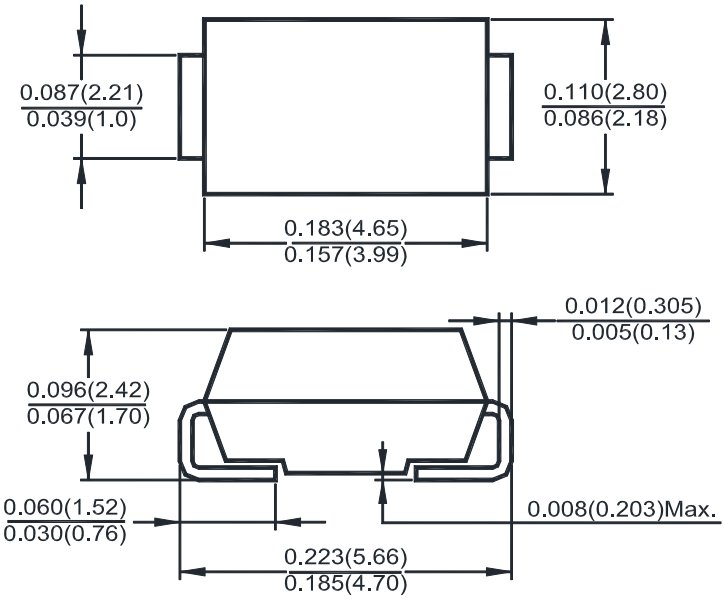


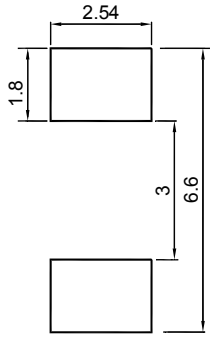
Fig.4 Maximum Non-Repetitive Peak Forward Surge Current



Package Outline Dimensions in inches (millimeters) SMA(DO-214AC)



Recommended Soldering Footprint



Marking information

" ***** " = Part No.
" III " = Cathode line
" • " = HAF (Halogen and Antimony Free)
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