

# GSESMAJ Series

## Transient Voltage Suppressor

### Product Description

The SMAJ Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.




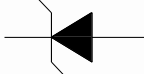
### Features

- 400W Peak Pulse Power Capability at 10/1000 $\mu$ s Waveform, Repetition Rate (Duty Cycle): 0.01%
- Uni- and Bi-Directional Type Selectable
- Glass Passivated Chip
- SMA (DO-214AC) Package
- Epoxy : UL 94V-0 Rate Flame Retardant
- Lead: Solderable per MIL-STD-750, Method 2026
- Polarity : Color Band denotes Cathode End for Uni-directional Type only

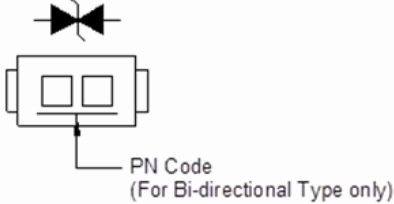
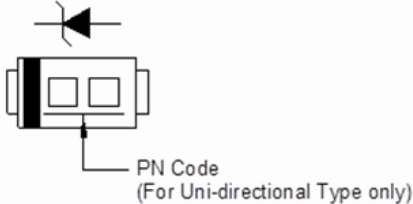
### Applications

- I/O Interfaces
- V<sub>CC</sub> Bus
- Telecom, Computer and Industrial applications

### Package and Pin Assignment

SMA (DO-214AC)	
	 <b>Bi-Directional</b>
 * Color Band denotes Cathode End	 <b>Uni-Directional</b>

## Ordering and Marking Information

Part Number	Package	Marking	Quantity/Reel
See Table	SMA (DO-214AC)	□□	5000 PCS
Ordering Information			
<b>GSESMAJ</b> <span style="border: 1px solid black; padding: 0 2px;">1</span> <span style="border: 1px solid black; padding: 0 2px;">1</span> <span style="border: 1px solid black; padding: 0 2px;">1</span> <span style="border: 1px solid black; padding: 0 2px;">2</span> <b>A F</b>			
<b>- Product Code:</b> GSESMAJ	<b>- Voltage Code:</b> <span style="border: 1px solid black; padding: 0 2px;">1</span> <span style="border: 1px solid black; padding: 0 2px;">1</span> <span style="border: 1px solid black; padding: 0 2px;">1</span> is $V_{RWM}$ Voltage For examples 7.0 is 7V and 70 is 70V etc.	<b>- Type Code:</b> <span style="border: 1px solid black; padding: 0 2px;">2</span> for type of direction. Empty: Uni-direction C: Bi-direction	
<b>- Tolerance Code:</b> <b>A</b> for 5% $V_{BR}$ Voltage Tolerance	<b>- Green Level:</b> <b>F</b> for RoHS Compliant and Halogen Free		
Marking Information			
			
			
<p>* Marking Code (PN Code) can be checked from the section of Electrical Characteristics for selected part number.</p>			

## Absolute Maximum Ratings

( $T_A=25^\circ\text{C}$  Unless Otherwise Specified. Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.)

Symbol	Parameter	Rating	Unit
$P_{PP}$	Peak power dissipation with a 10/1000 $\mu\text{s}$ waveform <sup>(1), (2)</sup>	400	W
$I_{PP}$	Peak pulse current with a 10/1000 $\mu\text{s}$ waveform <sup>(1)</sup>	See Next Table	A
$I_{FSM}$	Peak Forward Surge Current 8.3ms single half sine-wave for unidirectional only <sup>(3)</sup>	40	A
$P_D$	Steady state power dissipation at $T_A=50^\circ\text{C}$ (Fig.5)	3.3	W
$T_J$	Operating Temperature Range	-55 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +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 5.0mm $\times$ 5.0mm (0.03mm thick) copper pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ Unless Otherwise Specified)

Part Number (Uni-Directional)	Part Number (Bi-Directional)	MARKING CODE		Breakdown Voltage $V_{BR}@I_T$			$V_{RWM}$ (V)	$I_R@V_{RWM}$ ( $\mu\text{A}$ )	$V_C@I_{PP}$ (V)	$I_{PP\max}$ (A)
		Uni	Bi	Min (V)	Max (V)	$I_T$ (mA)				
GSESMAJ5.0AF	GSESMAJ5.0CAF	AE	WE	6.40	7.00	10	5.0	800	9.2	43.48
GSESMAJ6.0AF	GSESMAJ6.0CAF	AG	WG	6.67	7.37	10	6.0	800	10.3	38.83
GSESMAJ6.5AF	GSESMAJ6.5CAF	AK	WK	7.22	7.98	10	6.5	500	11.2	35.71
GSESMAJ7.0AF	GSESMAJ7.0CAF	AM	WM	7.78	8.60	10	7.0	200	12.0	33.33
GSESMAJ7.5AF	GSESMAJ7.5CAF	AP	WP	8.33	9.21	1.0	7.5	100	12.9	31.01
GSESMAJ8.0AF	GSESMAJ8.0CAF	AR	WR	8.89	9.83	1.0	8.0	50	13.6	29.41
GSESMAJ8.5AF	GSESMAJ8.5CAF	AT	WT	9.44	10.40	1.0	8.5	20	14.4	27.78
GSESMAJ9.0AF	GSESMAJ9.0CAF	AV	WV	10.0	11.10	1.0	9.0	10	15.4	25.97
GSESMAJ10AF	GSESMAJ10CAF	AX	WX	11.1	12.3	1.0	10	5	17.0	23.53
GSESMAJ11AF	GSESMAJ11CAF	AZ	WZ	12.2	13.5	1.0	11	5	18.2	21.98
GSESMAJ12AF	GSESMAJ12CAF	BE	XE	13.3	14.7	1.0	12	5	19.9	20.10
GSESMAJ13AF	GSESMAJ13CAF	BG	XG	14.4	15.9	1.0	13	5	21.5	18.60
GSESMAJ14AF	GSESMAJ14CAF	BK	XK	15.6	17.2	1.0	14	5	23.3	17.24
GSESMAJ15AF	GSESMAJ15CAF	BM	XM	16.7	18.5	1.0	15	5	24.4	16.39
GSESMAJ16AF	GSESMAJ16CAF	BP	XP	17.8	19.7	1.0	16	5	26.0	15.38
GSESMAJ17AF	GSESMAJ17CAF	BR	XR	18.9	20.9	1.0	17	5	27.6	14.49
GSESMAJ18AF	GSESMAJ18CAF	BT	XT	20.0	22.1	1.0	18	5	29.2	13.70
GSESMAJ20AF	GSESMAJ20CAF	BV	XV	22.2	24.5	1.0	20	5	32.4	12.35
GSESMAJ22AF	GSESMAJ22CAF	BX	XX	24.4	26.9	1.0	22	5	35.5	11.27
GSESMAJ24AF	GSESMAJ24CAF	BZ	XZ	26.7	29.5	1.0	24	5	38.9	10.28

Part Number (Uni-Directional)	Part Number (Bi-Directional)	MARKING CODE		Breakdown Voltage $V_{BR}@I_T$			$V_{RWM}$ (V)	$I_R@V_{RWM}$ ( $\mu$ A)	$V_C@I_{PP}$ (V)	$I_{PP\ max}$ (A)
		Uni	Bi	Min (V)	Max (V)	$I_T$ (mA)				
GSESMAJ26AF	GSESMAJ26CAF	CE	YE	28.9	31.9	1.0	26	5	42.1	9.50
GSESMAJ28AF	GSESMAJ28CAF	CG	YG	31.1	34.4	1.0	28	5	45.4	8.81
GSESMAJ30AF	GSESMAJ30CAF	CK	YK	33.3	36.8	1.0	30	5	48.4	8.26
GSESMAJ33AF	GSESMAJ33CAF	CM	YM	36.7	40.6	1.0	33	5	53.3	7.50
GSESMAJ36AF	GSESMAJ36CAF	CP	YP	40.0	44.2	1.0	36	5	58.1	6.88
GSESMAJ40AF	GSESMAJ40CAF	CR	YR	44.4	49.1	1.0	40	5	64.5	6.20
GSESMAJ43AF	GSESMAJ43CAF	CT	YT	47.8	52.8	1.0	43	5	69.4	5.76
GSESMAJ45AF	GSESMAJ45CAF	CV	YV	50.0	55.3	1.0	45	5	72.7	5.50
GSESMAJ48AF	GSESMAJ48CAF	CX	YX	53.3	58.9	1.0	48	5	77.4	5.17
GSESMAJ51AF	GSESMAJ51CAF	CZ	YZ	56.7	62.7	1.0	51	5	82.4	4.85
GSESMAJ54AF	GSESMAJ54CAF	RE	ZE	60.0	66.3	1.0	54	5	87.1	4.59
GSESMAJ58AF	GSESMAJ58CAF	RG	ZG	64.4	71.2	1.0	58	5	93.6	4.27
GSESMAJ60AF	GSESMAJ60CAF	RK	ZK	66.7	73.7	1.0	60	5	96.8	4.13
GSESMAJ64AF	GSESMAJ64CAF	RM	ZM	71.1	78.6	1.0	64	5	103	3.88
GSESMAJ70AF	GSESMAJ70CAF	RP	ZP	77.8	86.0	1.0	70	5	113	3.54
GSESMAJ75AF	GSESMAJ75CAF	RR	ZR	83.3	92.1	1.0	75	5	121	3.31
GSESMAJ78AF	GSESMAJ78CAF	RT	ZT	86.7	95.8	1.0	78	5	126	3.17
GSESMAJ85AF	GSESMAJ85CAF	RV	ZV	94.4	104	1.0	85	5	137	2.92
GSESMAJ90AF	GSESMAJ90CAF	RX	ZX	100	111	1.0	90	5	146	2.74
GSESMAJ100AF	GSESMAJ100CAF	RZ	ZZ	111	123	1.0	100	5	162	2.47
GSESMAJ110AF	GSESMAJ110CAF	SE	VE	122	135	1.0	110	5	177	2.26
GSESMAJ120AF	GSESMAJ120CAF	SG	VG	133	147	1.0	120	5	193	2.07
GSESMAJ130AF	GSESMAJ130CAF	SK	VK	144	159	1.0	130	5	209	1.91
GSESMAJ150AF	GSESMAJ150CAF	SM	VM	167	185	1.0	150	5	243	1.65
GSESMAJ160AF	GSESMAJ160CAF	SP	VP	178	197	1.0	160	5	259	1.54
GSESMAJ170AF	GSESMAJ170CAF	SR	VR	189	209	1.0	170	5	275	1.45
GSESMAJ180AF	GSESMAJ180CAF	ST	VT	200	220	1.0	180	5	292	1.37
GSESMAJ190AF	GSESMAJ190CAF	SU	YU	211	232	1.0	190	5	308	1.30
GSESMAJ200AF	GSESMAJ200CAF	SV	VV	224	247	1.0	200	5	324	1.23
GSESMAJ220AF	GSESMAJ220CAF	SX	VX	246	272	1.0	220	5	356	1.12
GSESMAJ250AF	GSESMAJ250CAF	SZ	VZ	279	309	1.0	250	5	405	0.99
GSESMAJ300AF	GSESMAJ300CAF	TE	UE	335	371	1.0	300	5	486	0.82
GSESMAJ350AF	GSESMAJ350CAF	TG	UG	391	432	1.0	350	5	567	0.71
GSESMAJ400AF	GSESMAJ400CAF	TK	UK	447	494	1.0	400	5	648	0.62
GSESMAJ440AF	GSESMAJ440CAF	TM	UM	492	543	1.0	440	5	713	0.56

**Note :**

4. Suffix 'A' denotes  $V_{BR}$  5% tolerance device.
5. For Bi-Directional devices having  $V_R$  of 10 volts and under, the  $I_R$  limit is double.

**Typical Characteristics** ( $T_A=25^\circ\text{C}$  Unless Otherwise Specified)

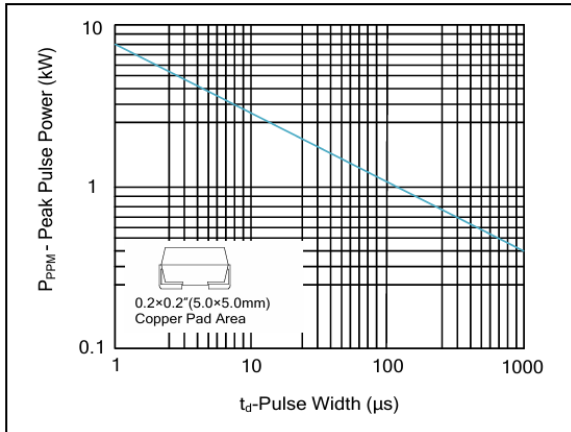


Figure 1. Peak Pulse Power Rating Curve

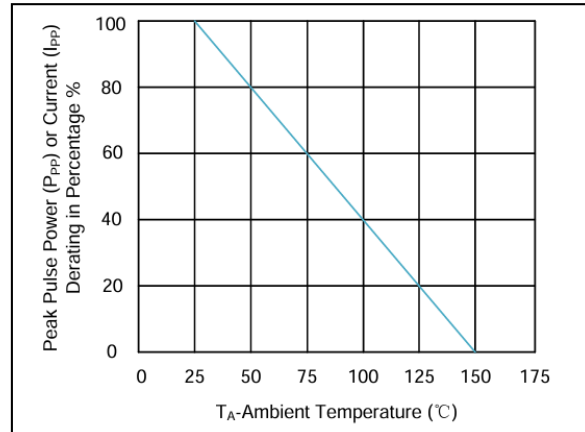


Figure 2. Pulse Derating Curve

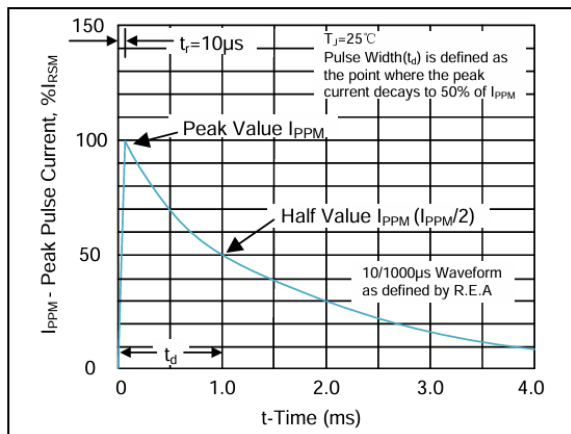


Figure 3. Pulse Waveform

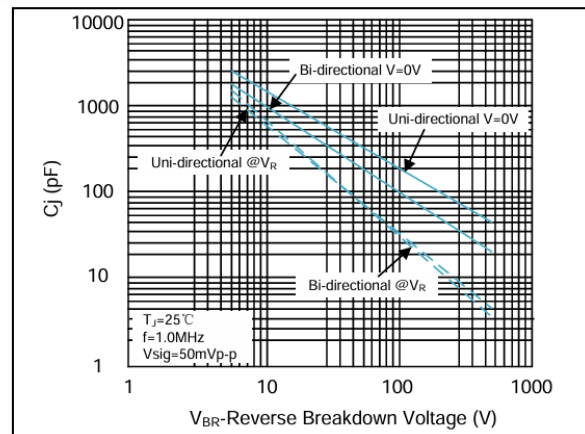


Figure 4. Typical Junction Capacitance

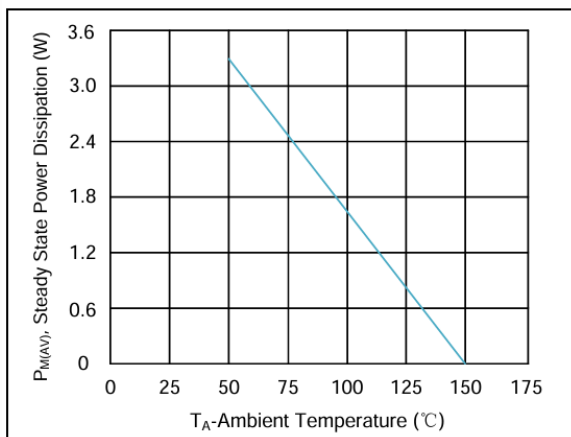


Figure 5. Steady State Power Dissipation Derating Curve

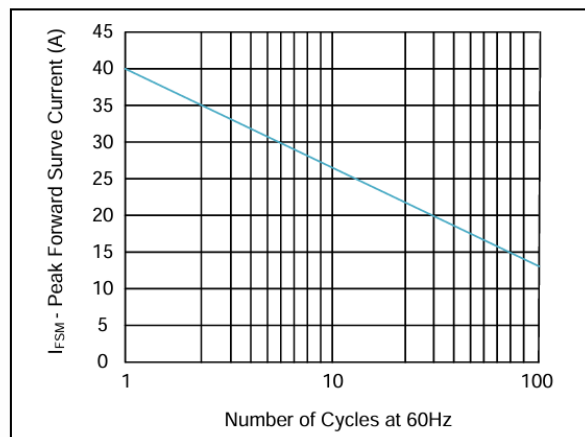
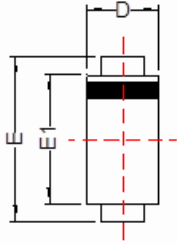


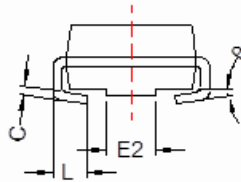
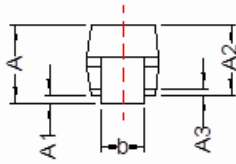
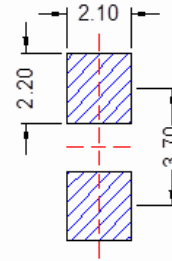
Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

# SMA (DO-214AC)

## Package Dimension



## Recommended Land Pattern



## Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.70	2.90	0.067	0.114
A1	1.70	---	0.067	---
A2	0.00	0.20	0.000	0.008
A3	0.05	0.30	0.002	0.012
b	1.25	1.70	0.049	0.067
c	0.15	0.41	0.006	0.016
D	2.18	2.95	0.086	0.116
E	4.70	5.60	0.185	0.220
E1	3.95	4.70	0.156	0.185
E2	1.40	1.90	0.055	0.075
L	0.75	1.6	0.030	0.063
$\theta$	0°	8°	0°	8°





**NOTE:**


DIMENSION DO NOT INCLUDE MOLD FLASH, TIE BAR BURRS, GATE BURRS, AND INTERLEAD FLASH, NOT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.

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