



**THE DATASHEET OF  
PGSMAJ33CA R2G**



## 400W, 5V - 100V Surface Mount Transient Voltage Suppressor

### FEATURES

- Low profile package
- Ideal for automated placement
- Photo Glass passivated junction
- Excellent clamping capability
- Typical  $I_R$  less than  $1\mu A$  above 10V
- 400 watts peak pulse power capability with a 10 / 1000  $\mu s$  waveform (300W above 78V)
- Compliant to RoHS directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_{WM}$	5 - 100	V
$V_{BR}$	6.8 - 117	V
$T_{J\ MAX}$	175	°C
Package	DO-214AC (SMA)	
Configuration	Single die	



### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter



### MECHANICAL DATA

- Case: DO-214AC (SMA)
- Molding compound meets UL 94V-0 flammability rating
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Moisture sensitivity level: level 1, per J-STD-020
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.06 g (approximately)

DO-214AC (SMA)

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation at $T_A=25^\circ C$ , $t_d=1ms$ (Note 1)	$P_{PPM}$	400	W
Steady state power dissipation	$P_D$	1	W
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	40	A
Maximum instantaneous forward voltage at 25 A for unidirectional only	$V_F$	3.5	V
Operating junction temperature range	$T_J$	-55 to +175	°C
Storage temperature range	$T_{STG}$	-55 to +175	°C

#### Notes:

1. Non-repetitive Current Pulse Per Fig.3 and derated above  $T_A=25^\circ C$  Per Fig.2. Rating is 300 W for  $V_{WM} > 78 V$

#### Devices for Bi-directional Applications

1. For Bi-directional use CA suffix (e.g. PGSMAJ10CA).
2. Electrical Characteristics Apply in Both Directions

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>LIMIT</b>	<b>UNIT</b>
Junction-to-lead thermal resistance per diode	$R_{\theta JL}$	29	$^{\circ}C/W$
Junction-to-ambient thermal resistance per diode	$R_{\theta JA}$	120	$^{\circ}C/W$
Junction-to-case thermal resistance per diode	$R_{\theta JC}$	31	$^{\circ}C/W$

**Thermal Performance Note:** Units mounted on recommended PCB (5.0mm x 5.0mm Cu pad test board)

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}C$ unless otherwise noted)								
Part number	Marking code	Breakdown voltage $V_{BR}@I_T$ (V) (Note 1)		Test current $I_T$ (mA)	Working stand-off voltage $V_{WM}$ (V)	Maximum reverse leakage current $I_R@V_{WM}$ ( $\mu A$ ) (Note 1)	Maximum peak impulse current $I_{PPM}$ (A) $t_p = 10/1000 \mu s$	Maximum clamping voltage $V_C@I_{PPM}$ (V) $t_p = 10/1000 \mu s$
		Min.	Max.					
PGSMAJ5.0A	PAE	6.4	7.00	10	5	800	43.5	9.2
PGSMAJ6.0A	PAG	6.67	7.37	10	6	800	38.8	10.3
PGSMAJ6.5A	PAK	7.22	7.98	10	6.5	500	35.7	11.2
PGSMAJ7.0A	PAM	7.78	8.60	10	7	200	33.3	12.0
PGSMAJ7.5A	PAP	8.33	9.21	1	7.5	100	31.0	12.9
PGSMAJ8.0A	PAR	8.89	9.83	1	8	50	29.4	13.6
PGSMAJ8.5A	PAT	9.44	10.40	1	8.5	10	27.8	14.4
PGSMAJ9.0A	PAV	10.0	11.10	1	9	5	26.0	15.4
PGSMAJ10A	PAX	11.1	12.30	1	10	5	23.5	17.0
PGSMAJ11A	PAZ	12.2	13.50	1	11	1	22.0	18.2
PGSMAJ12A	PBE	13.3	14.70	1	12	1	20.1	19.9
PGSMAJ13A	PBG	14.4	15.90	1	13	1	18.6	21.5
PGSMAJ14A	PBK	15.6	17.20	1	14	1	17.2	23.2
PGSMAJ15A	PBM	16.7	18.50	1	15	1	16.4	24.4
PGSMAJ16A	PBP	17.8	19.70	1	16	1	15.4	26.0
PGSMAJ17A	PBR	18.9	20.90	1	17	1	14.5	27.6
PGSMAJ18A	PBT	20.0	22.10	1	18	1	13.7	29.2
PGSMAJ20A	PBV	22.2	24.50	1	20	1	12.3	32.4
PGSMAJ22A	PBX	24.4	26.90	1	22	1	11.3	35.5
PGSMAJ24A	PBZ	26.7	29.50	1	24	1	10.3	38.9
PGSMAJ26A	PCE	28.9	31.90	1	26	1	9.5	42.1
PGSMAJ28A	PCG	31.1	34.40	1	28	1	8.8	45.4
PGSMAJ30A	PCK	33.3	36.8	1	30	1	8.3	48.4
PGSMAJ33A	PCM	36.7	40.6	1	33	1	7.5	53.3
PGSMAJ36A	PCP	40.0	44.2	1	36	1	6.9	58.1
PGSMAJ40A	PCR	44.4	49.1	1	40	1	6.2	64.5
PGSMAJ43A	PCT	47.8	52.8	1	43	1	5.8	69.4
PGSMAJ45A	PCV	50.0	55.3	1	45	1	5.5	72.7
PGSMAJ48A	PCX	53.3	58.9	1	48	1	5.2	77.4
PGSMAJ51A	PCZ	56.7	62.7	1	51	1	4.9	82.4
PGSMAJ54A	PRE	60.0	66.3	1	54	1	4.6	87.1
PGSMAJ58A	PRG	64.4	71.2	1	58	1	4.3	93.6
PGSMAJ60A	PRK	66.7	73.7	1	60	1	4.1	96.8
PGSMAJ64A	PRM	71.1	78.6	1	64	1	3.9	103
PGSMAJ70A	PRP	77.8	86	1	70	1	3.5	113
PGSMAJ75A	PRR	83.3	92.1	1	75	1	3.3	121
PGSMAJ78A	PRT	86.7	95.8	1	78	1	3.2	126
PGSMAJ85A	PRV	94.4	104	1	85	1	2.2	137
PGSMAJ90A	PRX	100	111	1	90	1	2.1	146
PGSMAJ100A	PRZ	111	123	1	100	1	1.9	162

**Notes:**

1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_A=25^{\circ}C$  per Fig. 2
2. Mounted on 5 x 5mm copper pads to each terminal
3. Lead temperature at  $T_L=75^{\circ}C$
4. Measure on 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum
5. Peak pulse power waveform is 10/1000  $\mu s$
6. For Bi-directional devices having  $V_R$  of 10 volts and under, the  $I_R$  limit is double

**ORDERING INFORMATION**

<b>PART NO.</b>	<b>PART NO. SUFFIX(*)</b>	<b>PACKING CODE</b>	<b>PACKING CODE SUFFIX</b>	<b>PACKAGE</b>	<b>PACKING</b>
PGSMAJxxxx (Note 1)	H	R3	G	SMA	1,800 / 7" Plastic reel
		R2		SMA	7,500 / 13" Paper reel
		M2		SMA	7,500 / 13" Plastic reel
		F3		Folded SMA	1,800 / 7" Plastic reel
		F2		Folded SMA	7,500 / 13" Paper reel
		F4		Folded SMA	7,500 / 13" Plastic reel
		E3		Clip SMA	1,800 / 7" Plastic reel
		E2		Clip SMA	7,500 / 13" Plastic reel

**Note :**

1. "xxxx" defines voltage from 5.0V (PGSMAJ5.0A) to 100V (PGSMAJ100A)

\*: Optional available.

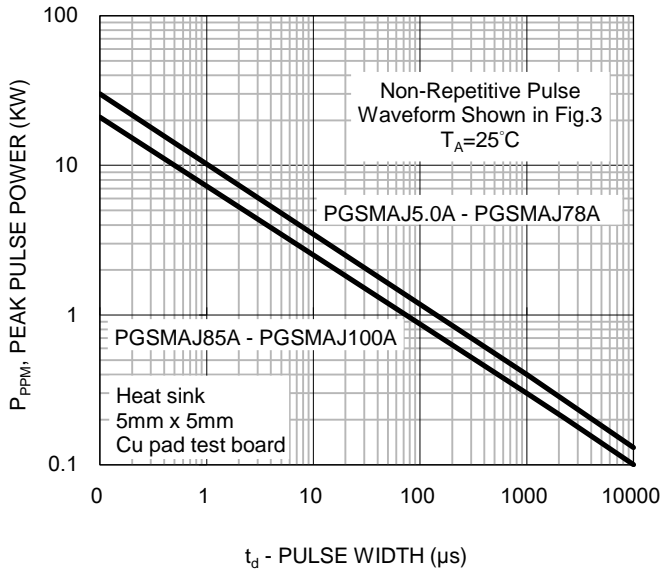
**EXAMPLE**

<b>EXAMPLE P/N</b>	<b>PART NO.</b>	<b>PART NO. SUFFIX</b>	<b>PACKING CODE</b>	<b>PACKING CODE SUFFIX</b>	<b>DESCRIPTION</b>
PGSMAJ26AHR3G	PGSMAJ26A	H	R3	G	AEC-Q101 qualified Green compound

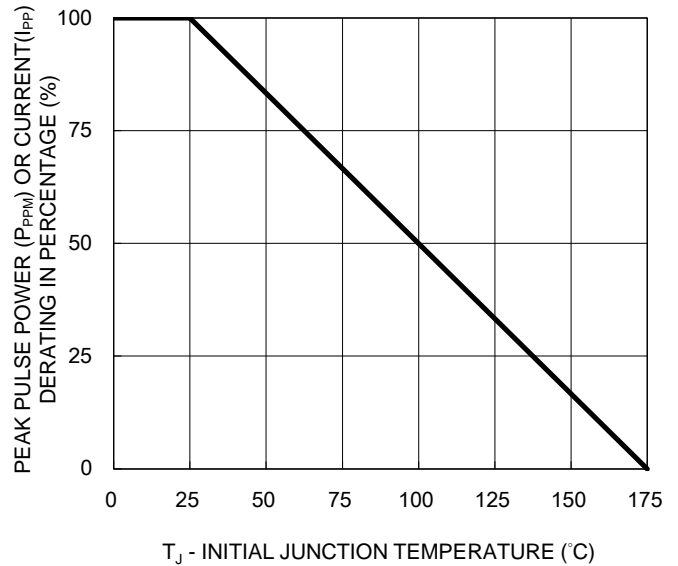
**CHARACTERISTICS CURVES**

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

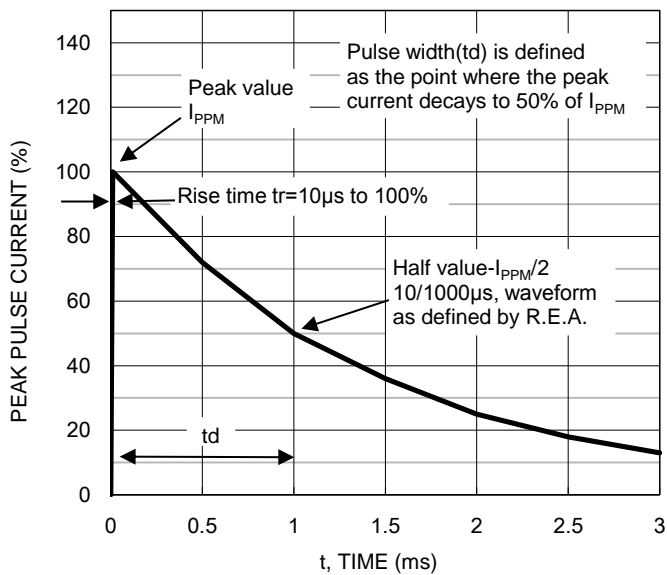
**Fig.1 Peak Pulse Power Rating Curve**



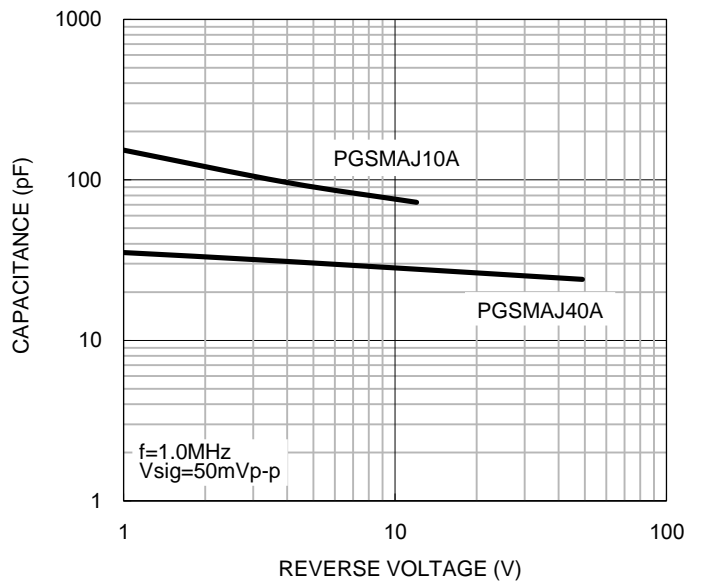
**Fig.2 Pulse Derating Curve**



**Fig.3 Clamping Power Pulse Waveform**

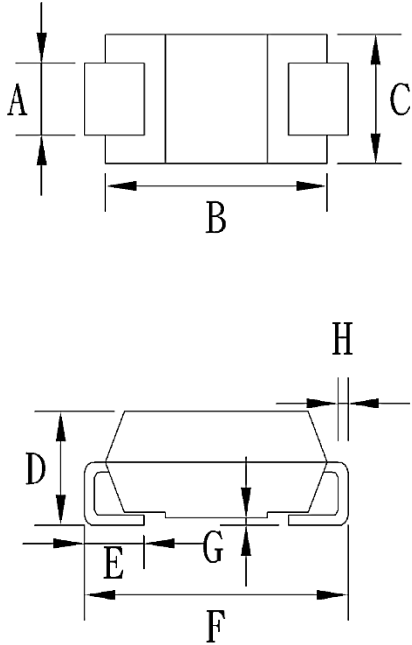


**Fig.4 Typical Junction Capacitance**



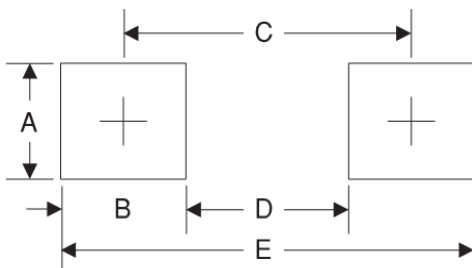
**PACKAGE OUTLINE DIMENSIONS**

DO-214AC (SMA)



DIM	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.27	1.58	0.050	0.062
B	4.06	4.60	0.160	0.181
C	2.29	2.83	0.090	0.111
D	1.99	2.50	0.078	0.098
E	0.90	1.41	0.035	0.056
F	4.95	5.33	0.195	0.210
G	0.10	0.20	0.004	0.008
H	0.15	0.31	0.006	0.012

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	1.68	0.066
B	1.52	0.060
C	3.93	0.155
D	2.41	0.095
E	5.45	0.215

**MARKING DIAGRAM**



- P/N = Marking Code
- G = Green Compound
- YW = Date Code
- F = Factory Code

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