

## SMAJ Series

### General Information

The SMA series is designed to protect voltage sensitive components from high voltage, high energy transients. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The SMA series is supplied in YINT Semiconductor's exclusive, cost-effective, highly reliable and is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer Applications.



Molded plastic  
glass passivated junction.

### Features

- Case: DO-214AC/SMA
- For surface mounted applications in order to optimize board space.
- Polarity: Color band denoted positive end (cathode) except Bidirectional.
- Typical failure mode is short from over-specified voltage or current
- High Temperature soldering: 260°C/10 seconds at terminals.
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026.

### Applications

TVS devices are ideal for the protection of I/O Interfaces, V<sub>CC</sub> bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

### Electrical Characteristics (@ T<sub>A</sub> = 25°C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Minimum Peak Pulse Power Dissipation (T = 1 ms) (note 1 note 2)	P <sub>PK</sub>	400	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I <sub>FSM</sub>	40	Amps
Steady State Power Dissipation @ TL = 75 °C	P <sub>M(AV)</sub>	3.3	Watts
Maximum Instantaneous Forward Voltage @ I <sub>PP</sub> = 35 A (For Unidirectional Units Only)(note 4 note 5)	V <sub>F</sub>	3.5/6.5	Volts
Operating Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).
4. Single Phase, Half Wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20 %.
5. V<sub>F</sub> < 3.5V for V<sub>BR</sub> < 200V and V<sub>F</sub> < 6.5V for V<sub>BR</sub> > 201V.

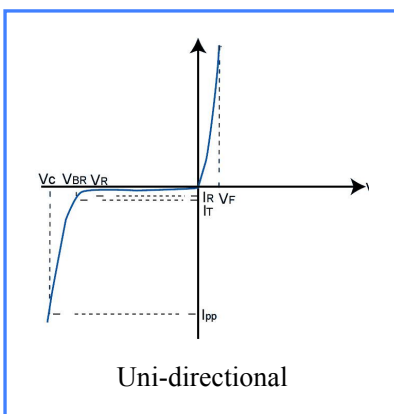
**Electrical Characteristics (TA = 25 °C unless otherwise noted)**

Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts)@I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA)	Maximum Peak Pulse Current I <sub>pp</sub> (A)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>pp</sub> (V)
		BI	UNI		Min .V	Max .V				
SMAJ5.0CA	SMAJ5.0A	WE	AE	5.0	6.40	7.00	10	500	43.5	9.2
SMAJ6.0CA	SMAJ6.0A	WG	AG	6.0	6.67	7.37	10	500	38.8	10.3
SMAJ 6.5CA	SMAJ 6.5A	WK	AK	6.5	7.22	7.90	10	300	35.7	11.2
SMAJ7.0CA	SMAJ7.0 A	WM	AM	7.0	7.78	8.60	10	200	33.3	12.0
SMAJ 7.5CA	SMAJ 7.5A	WP	AP	7.5	8.33	9.21	1	100	31.0	12.9
SMAJ 8.0CA	SMAJ 8.0A	WR	AR	8.0	8.89	9.83	1	50	29.4	13.6
SMAJ8.5CA	SMAJ8.5 A	WT	AT	8.5	9.44	10.40	1	20	27.8	14.4
SMAJ9.0CA	SMAJ9.0 A	WV	AV	9.0	10.00	11.10	1	10	26.0	15.4
SMAJ10CA	SMAJ10 A	WX	AX	10.0	11.10	12.30	1	5	23.5	17.0
SMAJ11CA	SMAJ11 A	WZ	AZ	11.0	12.20	13.50	1	1	22.0	18.2
SMAJ12CA	SMAJ12 A	XE	BE	12.0	13.30	14.70	1	1	20.1	19.9
SMAJ13CA	SMAJ13A	XG	BG	13.0	14.40	15.90	1	1	18.6	21.5
SMAJ14CA	SMAJ14A	XK	BK	14.0	15.60	17.20	1	1	17.2	23.2
SMAJ15CA	SMAJ15A	XM	BM	15.0	16.70	18.50	1	1	16.4	24.4
SMAJ16CA	SMAJ16A	XP	BP	16.0	17.80	19.70	1	1	15.4	26.0
SMAJ17CA	SMAJ17A	XR	BR	17.0	18.90	20.90	1	1	14.5	27.6
SMAJ18CA	SMAJ18A	XT	BT	18.0	20.00	22.10	1	1	13.7	29.2
SMAJ20CA	SMAJ20A	XV	BV	20.0	22.20	24.50	1	1	12.3	32.4
SMAJ22CA	SMAJ22A	XX	BX	22.0	24.40	26.90	1	1	11.3	35.5
SMAJ24CA	SMAJ24A	XZ	BZ	24.0	26.70	29.50	1	1	10.3	38.9
SMAJ26CA	SMAJ26A	YE	CE	26.0	28.90	31.90	1	1	9.5	42.1
SMAJ28CA	SMAJ28A	YG	CG	28.0	31.10	34.40	1	1	8.8	45.4
SMAJ30CA	SMAJ30A	YK	CK	30.0	33.30	36.80	1	1	8.3	48.4
SMAJ33CA	SMAJ33A	YM	CM	33.0	36.70	40.60	1	1	7.5	53.3
SMAJ36CA	SMAJ36A	YP	CP	36.0	40.00	44.20	1	1	6.9	58.1
SMAJ40CA	SMAJ40A	YR	CR	40.0	44.40	49.10	1	1	6.2	64.5
SMAJ43CA	SMAJ43A	YT	CT	43.0	47.80	52.80	1	1	5.8	69.4
SMAJ45CA	SMAJ45A	YV	CV	45.0	50.00	55.30	1	1	5.5	72.7
SMAJ48CA	SMAJ48A	YX	CX	48.0	53.30	58.90	1	1	5.2	77.4
SMAJ51CA	SMAJ51A	YZ	CZ	51.0	56.70	62.70	1	1	4.9	82.4
SMAJ54CA	SMAJ54A	ZE	RE	54.0	60.00	66.30	1	1	4.6	87.1
SMAJ58CA	SMAJ58A	ZG	RG	58.0	64.40	71.20	1	1	4.3	93.6
SMAJ60CA	SMAJ60A	ZK	RK	60.0	66.70	73.70	1	1	4.1	96.8
SMAJ64CA	SMAJ64A	ZM	RM	64.0	71.10	78.60	1	1	3.9	103.0
SMAJ70CA	SMAJ70A	ZP	RP	70.0	77.80	86.00	1	1	3.5	113.0
SMAJ75CA	SMAJ75A	ZR	RR	75.0	83.30	92.10	1	1	3.3	121.0
SMAJ78CA	SMAJ78A	ZT	RT	78.0	86.70	95.80	1	1	3.2	126.0
SMAJ85CA	SMAJ85A	ZV	RV	85.0	94.4	104.0	1	1	2.9	137.0

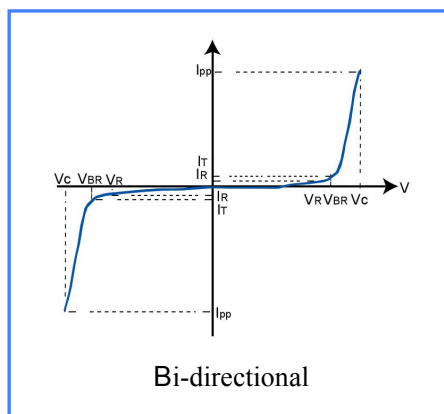
Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage $V_R$ (Volts)	Breakdown Voltage $V_{BR}$ (Volts)@ $I_T$		Test Current $I_T$ (mA)	Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu$ A)	Maximum Peak Pulse Current $I_{pp}$ (A)	Maximum Clamping Voltage $V_C$ @ $I_{pp}$ (V)
		BI	UNI		Min .V	Max .V				
SMAJ90CA	SMAJ90A	ZX	RX	90.0	100.0	111.0	1	1	2.7	146.0
SMAJ100CA	SMAJ100A	ZZ	RZ	100.0	111.0	123.0	1	1	2.5	162.0
SMAJ110CA	SMAJ110A	VE	SE	110.0	122.0	135.0	1	1	2.3	177.0
SMAJ120CA	SMAJ120A	VG	SG	120.0	133.0	147.0	1	1	2.1	193.0
SMAJ130CA	SMAJ130A	VK	SK	130.0	144.0	159.0	1	1	1.9	209.0
SMAJ150CA	SMAJ150A	VM	SM	150.0	167.0	185.0	1	1	1.6	243.0
SMAJ160CA	SMAJ160A	VP	SP	160.0	178.0	197.0	1	1	1.5	259.0
SMAJ170CA	SMAJ170A	VR	SR	170.0	189.0	209.0	1	1	1.5	275.0
SMAJ180CA	SMAJ180A	VT	ST	180.0	201.0	222.0	1	1	1.4	292.0
SMAJ190CA	SMAJ190A	YU	SU	190.0	211.0	233.0	1	1	1.3	308.0
SMAJ200CA	SMAJ200A	VV	SV	200.0	224.0	247.0	1	1	1.2	324.0
SMAJ210CA	SMAJ210A	YW	SW	210.0	237.0	263.0	1	1	1.2	340.0
SMAJ220CA	SMAJ220A	VX	GE	220.0	246.0	272.0	1	1	1.1	356.0
SMAJ250CA	SMAJ250A	VZ	SZ	250.0	279.0	309.0	1	1	1.0	405.0
SMAJ300CA	SMAJ300A	UE	TE	300.0	335.0	371.0	1	1	0.8	486.0
SMAJ350CA	SMAJ350A	UG	TG	350.0	391.0	432.0	1	1	0.7	567.0
SMAJ400CA	SMAJ400A	UK	TK	400.0	447.0	494.0	1	1	0.6	648.0
SMAJ440CA	SMAJ440A	UM	TM	440.0	492.0	543.0	1	1	0.6	713.0

Notes: For bidirectional devices with a  $V_R$  of 10 volts or less, the  $I_R$  limit is double.

### I-V Curve Characteristics



Uni-directional



Bi-directional

Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current

## Rating & Characteristic Curves

Figure 1- Pulse Derating Curve

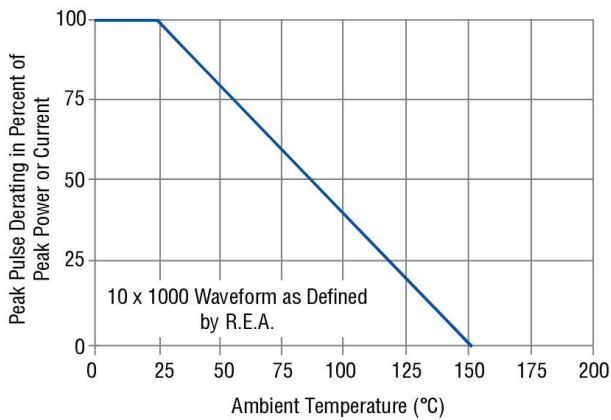


Figure 2- Maximum Non-Repetitive Surge Current

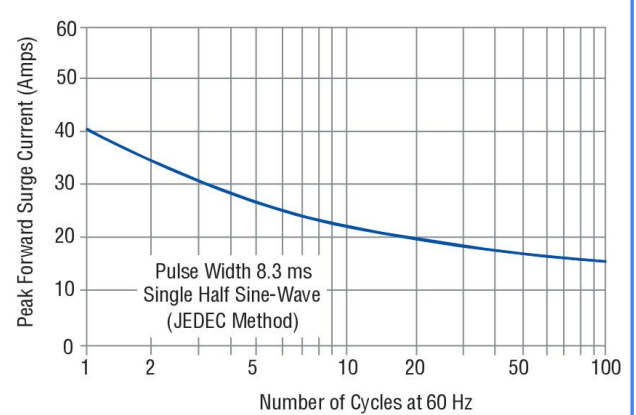


Figure 3- Typical Junction Capacitance

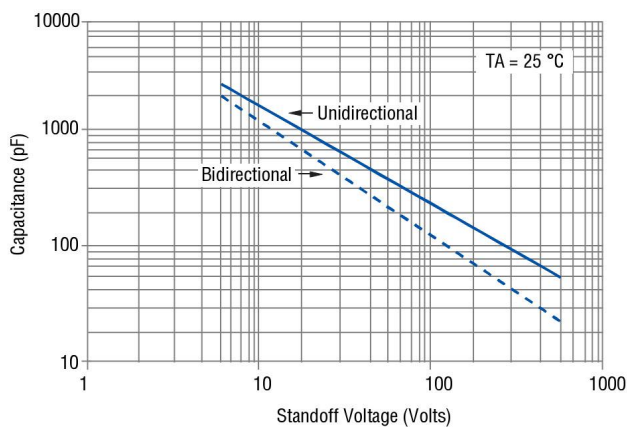


Figure 4- Pulse Waveform

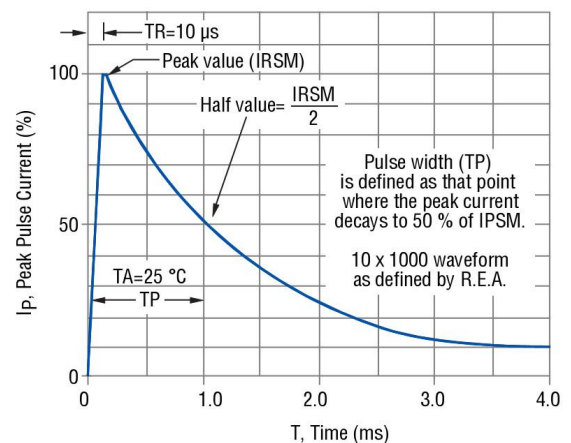


Figure 5- Steady State Power Derating Curve

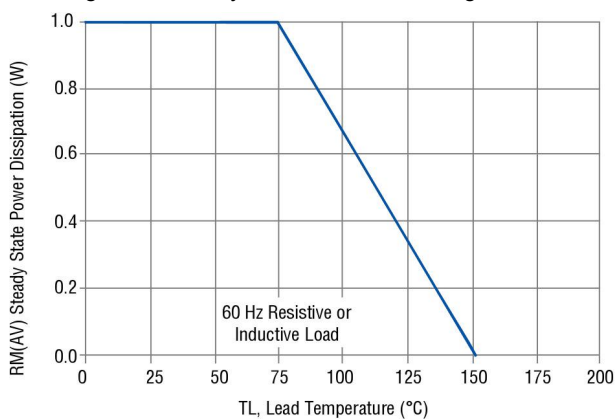
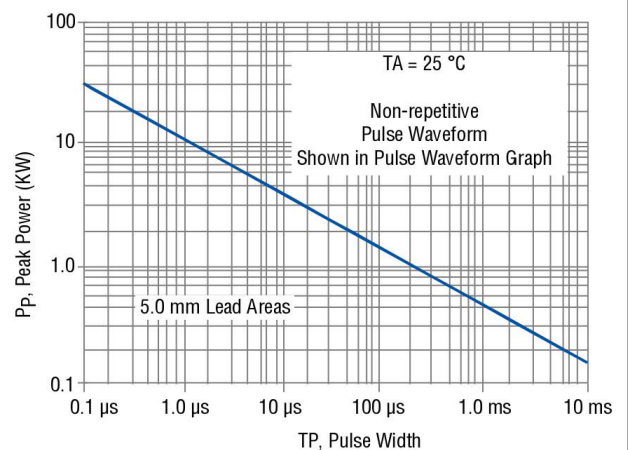
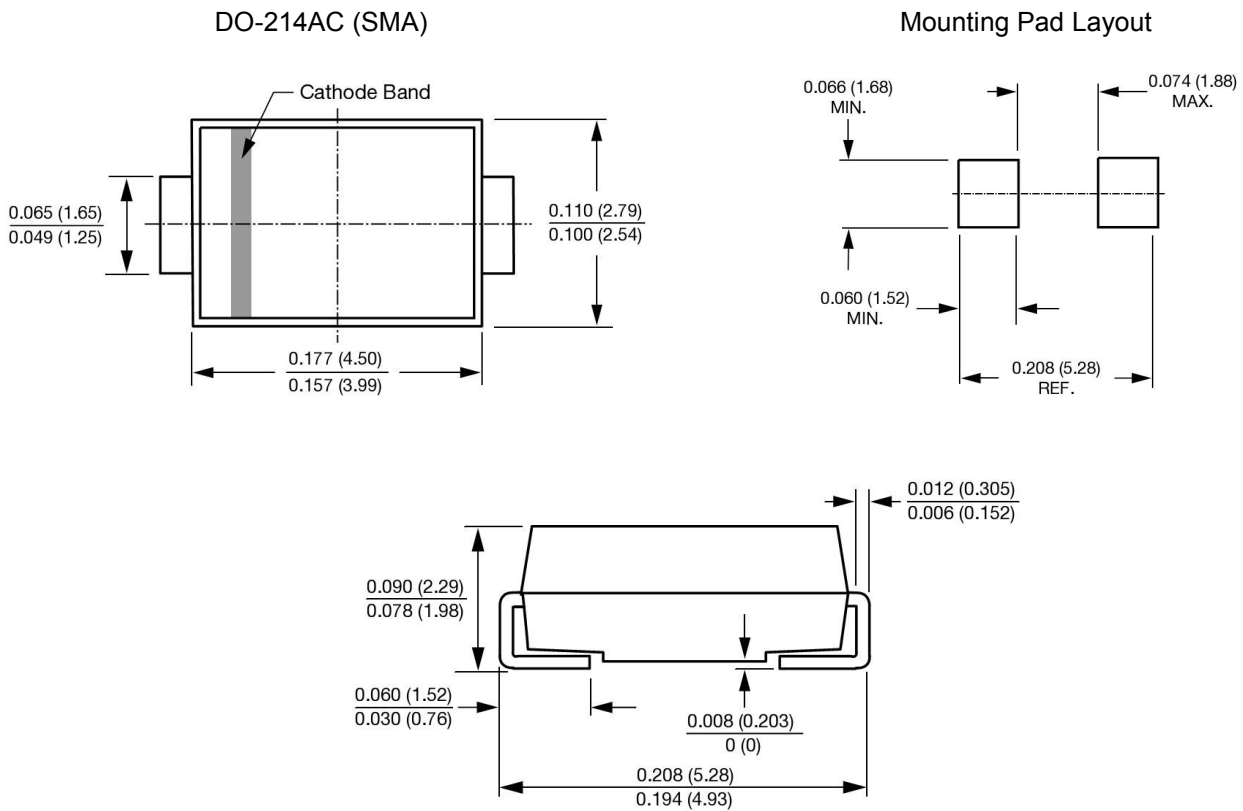


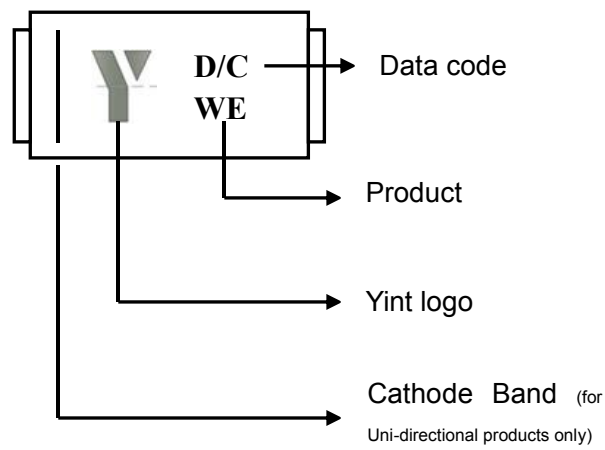
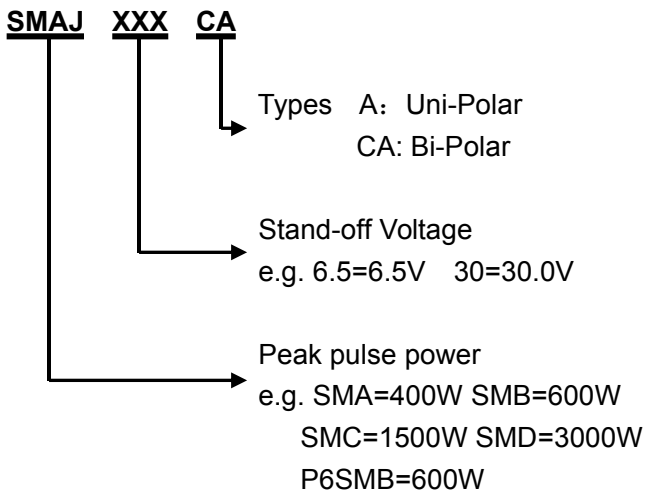
Figure 6- Pulse Rating Curve



**PACKAGE OUTLINE DIMENSIONS in inches (millimeters)**



**Part Numbering System**      **Part Marking System**



**Disclaimer**

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.