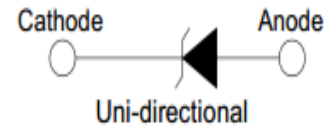
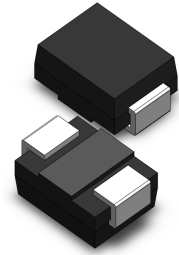


### Description

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

### Features

- For surface mounted applications in order to optimize board space
- RoHS compliant / Halogen-free
- Typical maximum temperature coefficient  
 $\Delta V_{BR} = 0.1\% \times V_{BR@25^{\circ}C} \times \Delta T$
- Glass passivated Chip junction in DO-214C package
- 400W peak pulse capability at 10×1000μs waveform, repetition rate (duty cycles):0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- Excellent clamping capability
- Low incremental surge resistance
- Typical I<sub>R</sub> less than 1μA above 11V
- High temperature soldering guaranteed: 260°C/40 seconds / 0.375", (9.5mm) lead length, 5lbs., (2.3kg) tension
- Plastic package has underwriters laboratory flammability classification 94v-0



### Application

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

### Maximum Ratings and Characteristics (T<sub>a</sub>=25°C unless otherwise specified)

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation by 10x1000μs test waveform (Fig.1)(Note 1)	P <sub>PPM</sub>	400	Watts
Steady State Power Dissipation on infinite heat sink at T <sub>L</sub> =75°C (Fig. 5)	P <sub>D</sub>	3.3	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only (Note 2)	I <sub>FSM</sub>	40	Amps
Maximum Instantaneous Forward Voltage at 25A for Unidirectional only (Note 3)	V <sub>F</sub>	3.5/5.0	V
Operating junction and Storage Temperature Range.	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C
Typical Thermal Resistance Junction to Lead	R <sub>θJL</sub>	30	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	120	°C/W

Notes:

1. Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25°C per Fig. 2.
2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.
3. V<sub>F</sub><3.5V for devices of V<sub>BR</sub> < 200V and V<sub>F</sub><5.0V for devices of V<sub>BR</sub> > 201V.

## Electrical Characteristics

## SMAJ Series 400W

Type Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage@I <sub>T</sub>		Test Current	Maximum Clamping Voltage@I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
(UNI)	(BI)	UNI	BI	V <sub>RWM</sub> (V)	V <sub>BR MIN.</sub> (V)	V <sub>BR MAX.</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SMAJ5.0A	SMAJ5.0CA	AE	WE	5.0	6.40	7.25	10	9.2	43.5	800
SMAJ6.0A	SMAJ6.0CA	AG	WG	6.0	6.67	7.67	10	10.3	38.8	800
SMAJ6.5A	SMAJ6.5CA	AK	WK	6.5	7.22	8.30	10	11.2	35.7	500
SMAJ7.0A	SMAJ7.0CA	AM	WM	7.0	7.78	8.95	10	12.0	33.3	200
SMAJ7.5A	SMAJ7.5CA	AP	WP	7.5	8.33	9.58	1	12.9	31.0	100
SMAJ8.0A	SMAJ8.0CA	AR	WR	8.0	8.89	10.23	1	13.6	29.4	50
SMAJ8.5A	SMAJ8.5CA	AT	WT	8.5	9.44	10.82	1	14.4	27.7	20
SMAJ9.0A	SMAJ9.0CA	AV	WV	9.0	10.00	11.50	1	15.4	26.0	10
SMAJ10A	SMAJ10CA	AX	WX	10.0	11.10	12.80	1	17.0	23.5	1
SMAJ11A	SMAJ11CA	AZ	WZ	11.0	12.20	14.00	1	18.2	22.0	1
SMAJ12A	SMAJ12CA	BE	XE	12.0	13.30	15.30	1	19.9	20.1	1
SMAJ13A	SMAJ13CA	BG	XG	13.0	14.40	16.50	1	21.5	18.6	1
SMAJ14A	SMAJ14CA	BK	XK	14.0	15.60	17.90	1	23.2	17.2	1
SMAJ15A	SMAJ15CA	BM	XM	15.0	16.70	19.20	1	24.4	16.4	1
SMAJ16A	SMAJ16CA	BP	XP	16.0	17.80	20.50	1	26.0	15.3	1
SMAJ17A	SMAJ17CA	BR	XR	17.0	18.90	21.70	1	27.6	14.5	1
SMAJ18A	SMAJ18CA	BT	XT	18.0	20.00	23.30	1	29.2	13.7	1
SMAJ20A	SMAJ20CA	BV	XV	20.0	22.20	25.50	1	32.4	12.3	1
SMAJ22A	SMAJ22CA	BX	XY	22.0	24.40	28.00	1	35.5	11.2	1
SMAJ24A	SMAJ24CA	BZ	XZ	24.0	26.70	30.70	1	38.9	10.3	1
SMAJ26A	SMAJ26CA	CE	YE	26.0	28.90	33.20	1	42.1	9.5	1
SMAJ28A	SMAJ28CA	CG	YG	28.0	31.10	35.80	1	45.4	8.8	1
SMAJ30A	SMAJ30CA	CK	YK	30.0	33.30	38.30	1	48.4	8.3	1
SMAJ33A	SMAJ33CA	CM	YM	33.0	36.70	42.20	1	53.3	7.5	1
SMAJ36A	SMAJ36CA	CP	YP	36.0	40.00	46.00	1	58.1	6.9	1
SMAJ40A	SMAJ40CA	CR	YR	40.0	44.40	51.10	1	64.5	6.2	1
SMAJ43A	SMAJ43CA	CT	YT	43.0	47.80	54.90	1	69.4	5.7	1
SMAJ45A	SMAJ45CA	CV	YV	45.0	50.00	57.50	1	72.7	5.5	1
SMAJ48A	SMAJ48CA	CX	YX	48.0	53.30	61.30	1	77.4	5.2	1
SMAJ51A	SMAJ51CA	CZ	YZ	51.0	56.70	65.20	1	82.4	4.9	1
SMAJ54A	SMAJ54CA	RE	ZE	54.0	60.00	69.00	1	87.1	4.6	1
SMAJ58A	SMAJ58CA	RG	WZ	58.0	64.40	74.10	1	93.6	4.3	1
SMAJ60A	SMAJ60CA	RK	ZK	60.0	66.70	76.70	1	96.8	4.1	1
SMAJ64A	SMAJ64CA	RM	ZM	64.0	71.10	81.80	1	103.0	3.9	1
SMAJ70A	SMAJ70CA	RP	ZP	70.0	77.80	89.50	1	113.0	3.5	1
SMAJ75A	SMAJ75CA	RR	ZR	75.0	83.30	95.80	1	121.0	3.3	1
SMAJ78A	SMAJ78CA	RT	ZT	78.0	86.70	99.70	1	126.0	3.2	1
SMAJ85A	SMAJ85CA	RV	ZV	85.0	94.40	108.20	1	137.0	2.9	1
SMAJ90A	SMAJ90CA	RX	ZX	90.0	100.00	115.50	1	146.0	2.7	1
SMAJ100A	SMAJ100CA	RZ	ZZ	100.0	111.00	128.00	1	162.0	2.5	1
SMAJ110A	SMAJ110CA	SE	VE	110.0	122.00	140.50	1	177.0	2.3	1
SMAJ120A	SMAJ120CA	SG	VG	120.0	133.00	153.00	1	193.0	2.0	1
SMAJ130A	SMAJ130CA	SK	VK	130.0	144.00	165.50	1	209.0	1.9	1
SMAJ150A	SMAJ150CA	SM	VM	150.0	167.00	192.60	1	243.0	1.6	1
SMAJ160A	SMAJ160CA	SP	VP	160.0	178.00	205.00	1	259.0	1.5	1
SMAJ170A	SMAJ170CA	SR	VR	170.0	189.00	217.50	1	275.0	1.4	1
SMAJ180A	SMAJ180CA	ST	VT	180.0	198.00	230.40	1	292.0	1.3	1
SMAJ190A	SMAJ190CA	SU	YU	190.0	209.00	243.20	1	308.0	1.3	1
SMAJ200A	SMAJ200CA	SV	VV	200.0	220.00	256.00	1	324.0	1.2	1
SMAJ210A	SMAJ210CA	SW	YW	210.0	231.00	268.80	1	340.0	1.2	1
SMAJ220A	SMAJ220CA	GE	VX	220.0	242.00	281.60	1	356.0	1.1	1
SMAJ250A	SMAJ250CA	SZ	VZ	250.0	279.00	309.00	1	405.0	1.0	1
SMAJ300A	SMAJ300CA	TE	UE	300.0	335.00	371.00	1	486.0	0.8	1
SMAJ350A	SMAJ350CA	TG	UG	350.0	391.00	432.00	1	567.0	0.7	1
SMAJ400A	SMAJ400CA	TK	UK	400.0	447.00	494.00	1	648.0	0.6	1
SMAJ440A	SMAJ440CA	TM	UM	440.0	492.00	543.00	1	713.0	0.6	1

Notes: For bidirectional type having V<sub>RWM</sub> of 10V and less, the I<sub>R</sub> limit is double.

## Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ unless otherwise specified) SMAJ Series 400W

Figure 1 - Peak Pulse Power Rating Curve

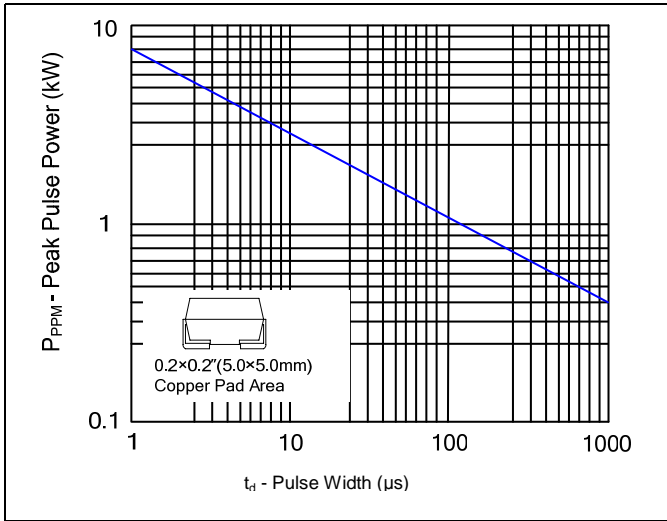


Figure 2 - Pulse Derating Curve

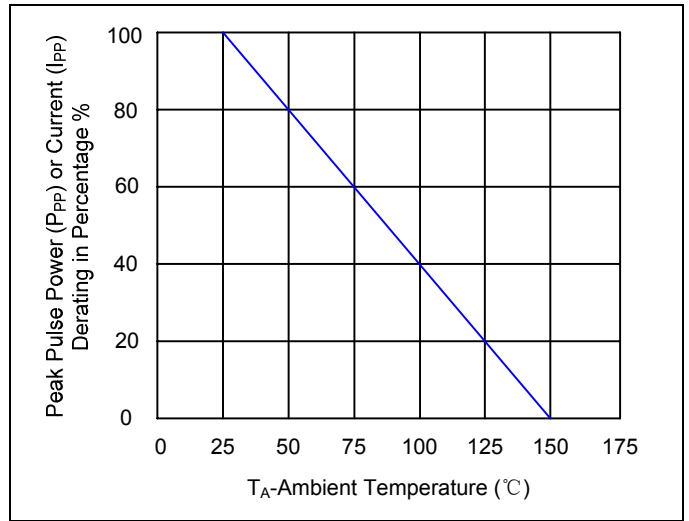


Figure 3 - Pulse Waveform

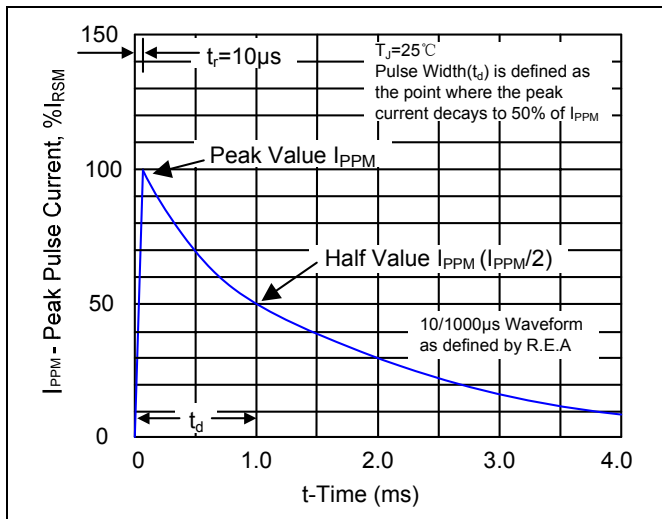


Figure 4 - Typical Junction Capacitance

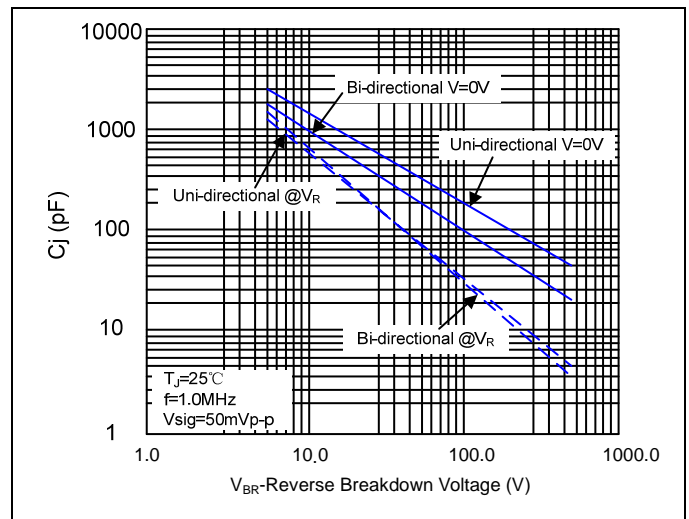


Figure 5. Steady State Power Dissipation Derating Curve

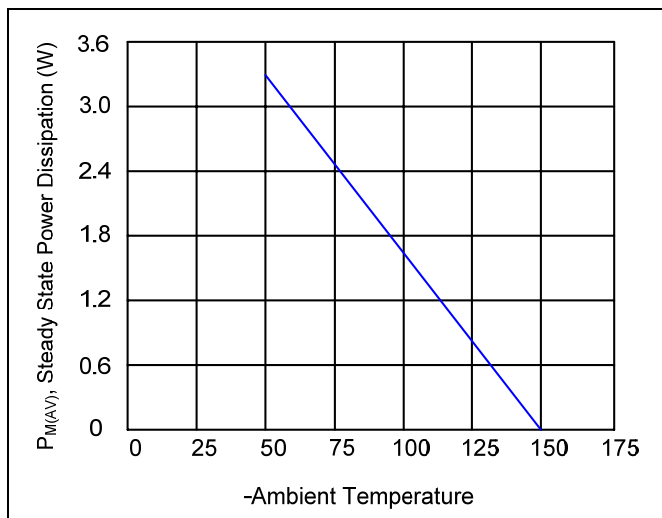
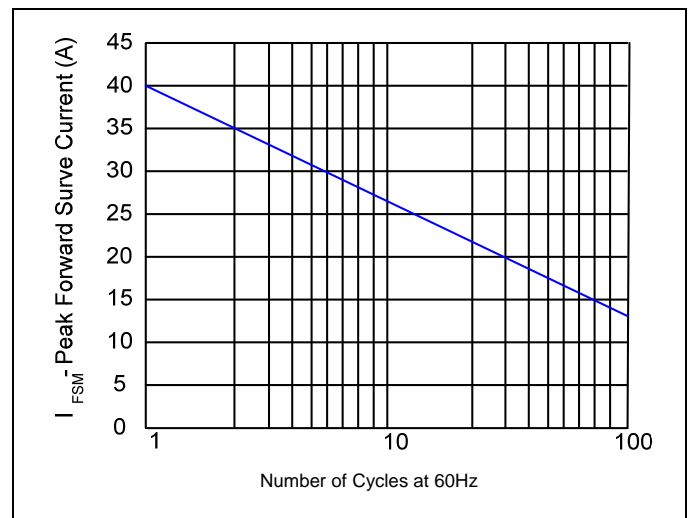
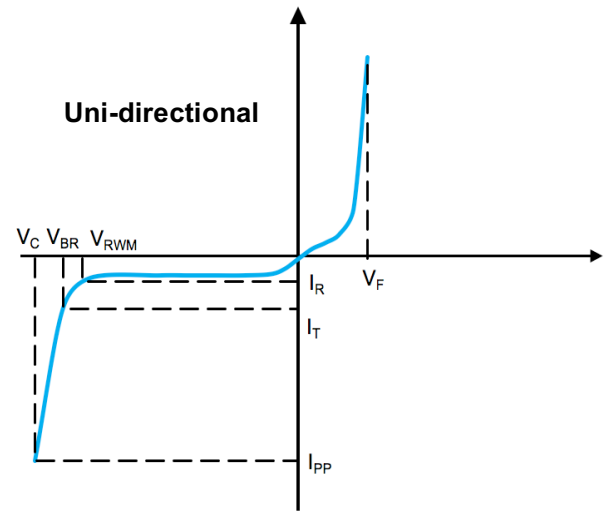
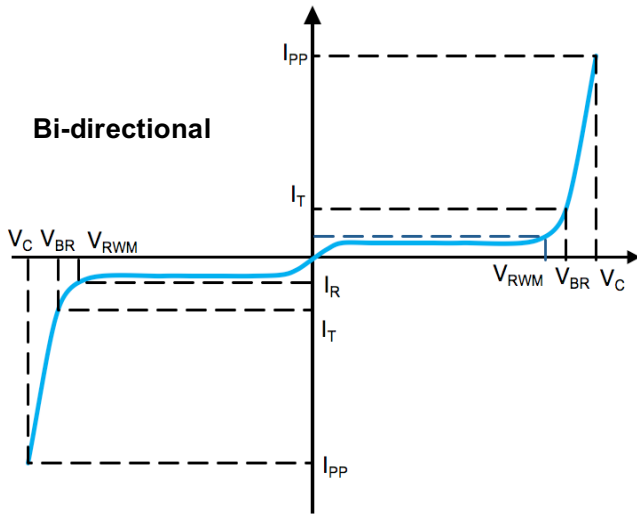


Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

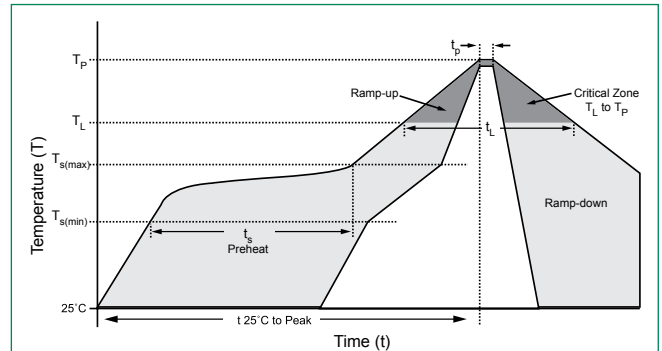


### I-V Curve Characteristics



### Recommended Soldering Conditions

Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 – 180 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Time (min to max) ( $t_s$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260 <sup>+0/-5</sup> °C
Time within 5°C of actual peak Temperature ( $t_p$ )		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_p$ )		8 minutes Max.
Do not exceed		280°C



### Flow/Wave Soldering(Solder Dipping)

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

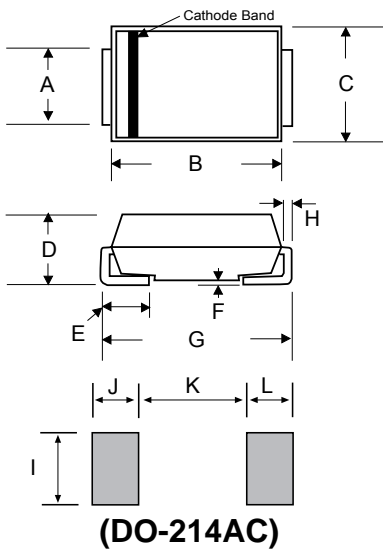
### Physical Specifications

Weight	0.015oz., 0.4g
Case	JEDEC DO-204AC (DO-15) molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Terminal	Matte Tin axial leads, solderable per JESD22-B102D.

### Environmental Specifications

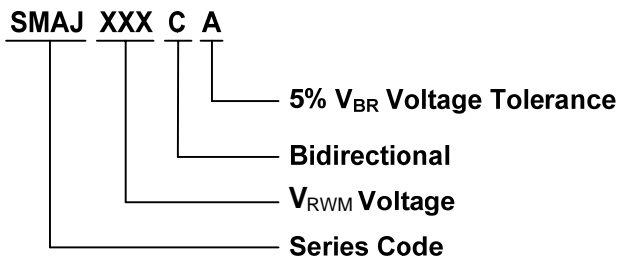
Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

### Dimensions

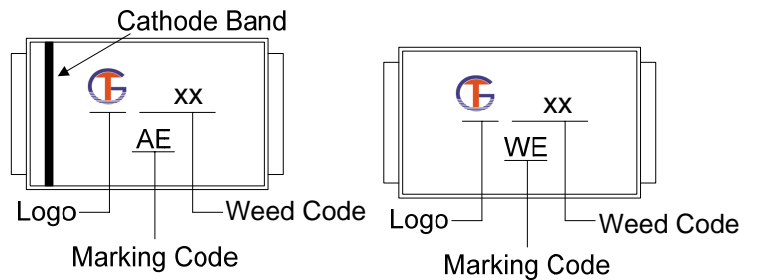


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.049	0.065	1.250	1.650
B	0.157	0.177	3.990	4.500
C	0.100	0.110	2.540	2.790
D	0.078	0.090	1.980	2.290
E	0.030	0.060	0.780	1.520
F	-	0.008	-	0.203
G	0.194	0.208	4.930	5.280
H	0.006	0.012	0.152	0.305
I	0.070	-	1.800	-
J	0.082	-	2.100	-
K	-	0.090	-	2.300
L	0.082	-	2.100	-

### Part Number Code



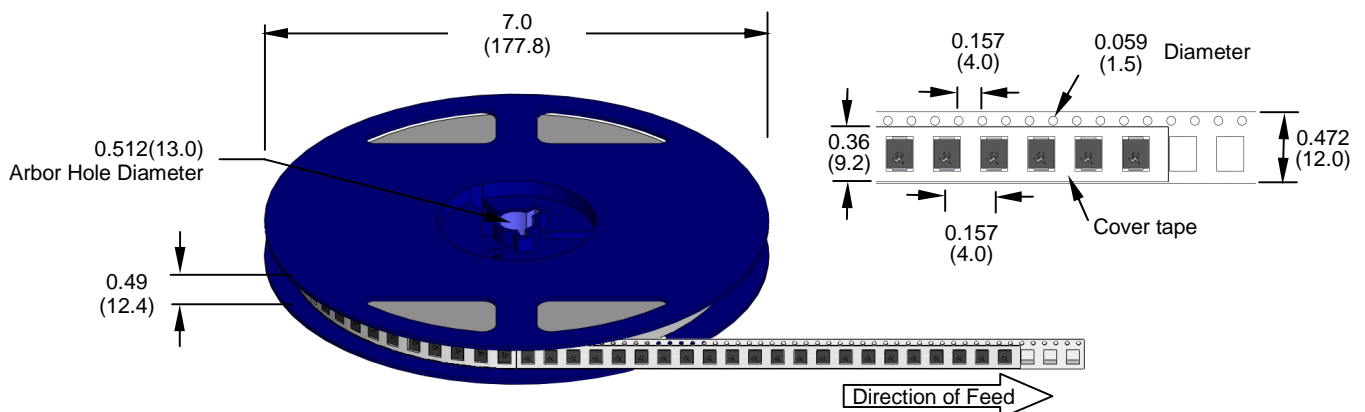
### Marking Code



### Packaging

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
SMAJxxxXX	DO-214AC	1000	Tape&Reel - 7' tape	EIA RS-481

### Packaging Dementions Unit:Inches(Millimeters)



Dimensions are in inches  
(and millimeters)