

**Features**

- 400W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C

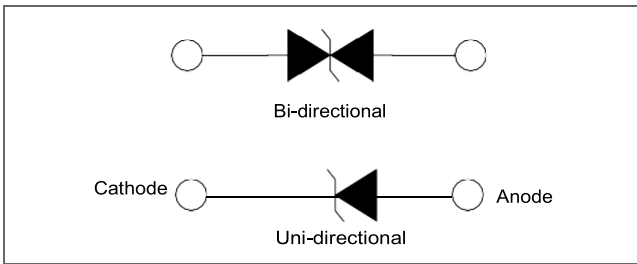
**RoHS**  
Compliant



**Applications**

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

**Function Diagram**




Maximum Ratings and Thermal Characteristics (T <sub>A</sub> =25°C unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T <sub>A</sub> =25°C by 10/1000µs Waveform (Fig.3)	P <sub>PPM</sub>	400	W
Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =50°C	P <sub>D</sub>	3.3	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I <sub>FSM</sub>	60	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)	V <sub>F</sub>	3.5	V
Operating Temperature Range	T <sub>J</sub>	-55 to 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
	Pending


**Notes:**

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
2. V<sub>F</sub> < 3.5V for single die parts and V<sub>F</sub>< 5V for stacked-die parts.

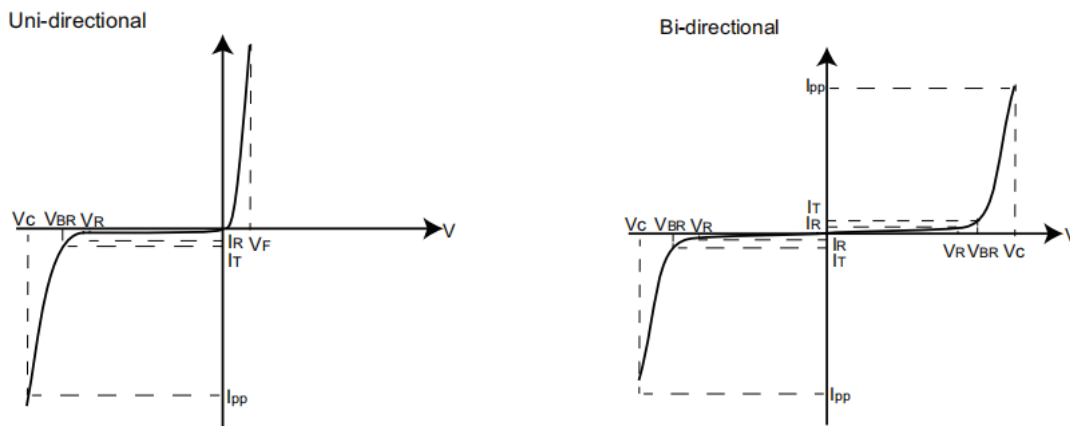
**Characteristics (T = 25°C unless otherwise noted)**

Part Number (Uni)	Part Number (Bi)	Key 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 Clamping Voltage V <sub>C</sub> @ I <sub>DD</sub> (V)	Maximum Peak Pulse Current I <sub>PP</sub> (A)	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA)	Agency Approval 
		UNI	BI		MIN	MAX					
\	SMAJ5.0CA	\	005C	5.0	6.40	7.00	10	9.2	43.5	400	
SMAJ5.0A	\	005A	\	5.0	6.40	7.00	10	9.2	43.5	100	
\	SMAJ6.0CA	\	006C	6.0	6.67	7.37	10	10.3	38.8	400	
SMAJ6.0A	\	006A	\	6.0	6.67	7.37	10	10.3	38.8	100	
\	SMAJ6.5CA	\	06FC	6.5	7.22	7.98	10	11.2	35.7	150	
SMAJ6.5A	\	06FA	\	6.5	7.22	7.98	10	11.2	35.7	80	
SMAJ7.0A	SMAJ7.0CA	007A	007C	7.0	7.78	8.60	10	12.0	33.3	60	
SMAJ7.5A	SMAJ7.5CA	07FA	07FC	7.5	8.33	9.21	1	12.9	31.0	50	
SMAJ8.0A	SMAJ8.0CA	008A	008C	8.0	8.89	9.83	1	13.6	29.4	30	
SMAJ8.5A	SMAJ8.5CA	08FA	08FC	8.5	9.44	10.40	1	14.4	27.8	20	
SMAJ9.0A	SMAJ9.0CA	009A	009C	9.0	10.00	11.10	1	15.4	26.0	10	
SMAJ10A	SMAJ10CA	010A	010C	10.0	11.10	12.30	1	17.0	23.5	5	
SMAJ11A	SMAJ11CA	011A	011C	11.0	12.20	13.50	1	18.2	22.0	1	
SMAJ12A	SMAJ12CA	012A	012C	12.0	13.30	14.70	1	19.9	20.1	1	
SMAJ13A	SMAJ13CA	013A	013C	13.0	14.40	15.90	1	21.5	18.6	1	
SMAJ14A	SMAJ14CA	014A	014C	14.0	15.60	17.20	1	23.2	17.3	1	
SMAJ15A	SMAJ15CA	015A	015C	15.0	16.70	18.50	1	24.4	16.4	1	
SMAJ16A	SMAJ16CA	016A	016C	16.0	17.80	19.70	1	26.0	15.4	1	
SMAJ17A	SMAJ17CA	017A	017C	17.0	18.90	20.90	1	27.6	14.5	1	
SMAJ18A	SMAJ18CA	018A	018C	18.0	20.00	22.10	1	29.2	13.7	1	
SMAJ20A	SMAJ20CA	020A	020C	20.0	22.20	24.50	1	32.4	12.4	1	
SMAJ22A	SMAJ22CA	022A	022C	22.0	24.40	26.90	1	35.5	11.3	1	
SMAJ24A	SMAJ24CA	024A	024C	24.0	26.70	29.50	1	38.9	10.3	1	
SMAJ26A	SMAJ26CA	026A	026C	26.0	28.90	31.90	1	42.1	9.5	1	
SMAJ28A	SMAJ28CA	028A	028C	28.0	31.10	34.40	1	45.4	8.8	1	
SMAJ30A	SMAJ30CA	030A	030C	30.0	33.30	36.80	1	48.4	8.3	1	
SMAJ33A	SMAJ33CA	033A	033C	33.0	36.70	40.60	1	53.3	7.5	1	
SMAJ36A	SMAJ36CA	036A	036C	36.0	40.00	44.20	1	58.1	6.9	1	
SMAJ40A	SMAJ40CA	040A	040C	40.0	44.40	49.10	1	64.5	6.2	1	
SMAJ43A	SMAJ43CA	043A	043C	43.0	47.80	52.80	1	69.4	5.8	1	
SMAJ45A	SMAJ45CA	045A	045C	45.0	50.00	55.30	1	72.7	5.5	1	
SMAJ48A	SMAJ48CA	048A	048C	48.0	53.30	58.90	1	77.4	5.2	1	
SMAJ51A	SMAJ51CA	051A	051C	51.0	56.70	62.70	1	82.4	4.9	1	
SMAJ54A	SMAJ54CA	054A	054C	54.0	60.00	66.30	1	87.1	4.6	1	
SMAJ58A	SMAJ58CA	058A	058C	58.0	64.40	71.20	1	93.6	4.3	1	
SMAJ60A	SMAJ60CA	060A	060C	60.0	66.70	73.70	1	96.8	4.1	1	
SMAJ64A	SMAJ64CA	064A	064C	64.0	71.10	78.60	1	103.0	3.9	1	
SMAJ70A	SMAJ70CA	070A	070C	70.0	77.80	86.00	1	113.0	3.6	1	
SMAJ75A	SMAJ75CA	075A	075C	75.0	83.30	92.10	1	121.0	3.3	1	
SMAJ78A	SMAJ78CA	078A	078C	78.0	86.70	95.80	1	126.0	3.2	1	
SMAJ85A	SMAJ85CA	085A	085C	85.0	94.40	104.0	1	137.0	2.9	1	



Part Number (Uni)	Part Number (Bi)	Key Marking		Reverse Stand off Voltage $V_R$ (Volts)	Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ @ $I_{DM}$ (V)	Maximum Peak Pulse Current $I_{pp}$ (A)	Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu$ A)	Agency Approval 
		UNI	BI		MIN	MAX					
SMAJ90A	SMAJ90CA	090A	090C	90.0	100.0	111.0	1	146.0	2.8	1	
SMAJ100A	SMAJ100CA	100A	100C	100.0	111.0	123.0	1	162.0	2.5	1	
SMAJ110A	SMAJ110CA	110A	110C	110.0	122.0	135.0	1	177.0	2.3	1	
SMAJ120A	SMAJ120CA	120A	120C	120.0	133.0	147.0	1	193.0	2.1	1	
SMAJ130A	SMAJ130CA	130A	130C	130.0	144.0	159.0	1	209.0	1.9	1	
SMAJ150A	SMAJ150CA	150A	150C	150.0	167.0	185.0	1	243.0	1.7	1	
SMAJ160A	SMAJ160CA	160A	160C	160.0	178.0	197.0	1	259.0	1.6	1	
SMAJ170A	SMAJ170CA	170A	170C	170.0	189.0	209.0	1	275.0	1.5	1	
SMAJ180A	SMAJ180CA	180A	180C	180.0	201.0	222.0	1	292.0	1.4	1	
SMAJ200A	SMAJ200CA	200A	200C	200.0	224.0	247.0	1	324.0	1.3	1	
SMAJ220A	SMAJ220CA	220A	220C	220.0	246.0	272.0	1	356.0	1.1	1	
SMAJ250A	SMAJ250CA	250A	250C	250.0	279.0	309.0	1	405.0	1.0	1	
SMAJ300A	SMAJ300CA	300A	300C	300.0	335.0	371.0	1	486.0	0.8	1	
SMAJ350A	SMAJ350CA	350A	350C	350.0	391.0	432.0	1	567.0	0.7	1	
SMAJ400A	SMAJ400CA	400A	400C	400.0	447.0	494.0	1	648.0	0.6	1	
SMAJ440A	SMAJ440CA	440A	440C	440.0	492.0	543.0	1	713.0	0.6	1	

### I-V Curve Characteristics



$P_{PPM}$  Peak Pulse Power Dissipation -- Max power dissipation

$V_R$  Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

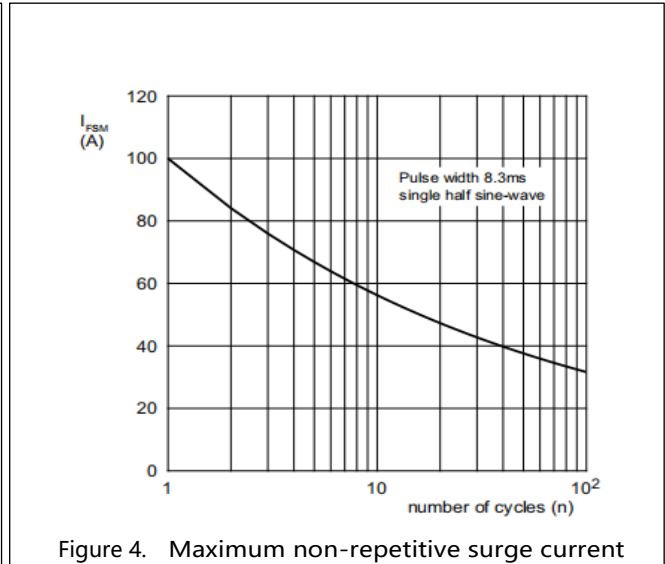
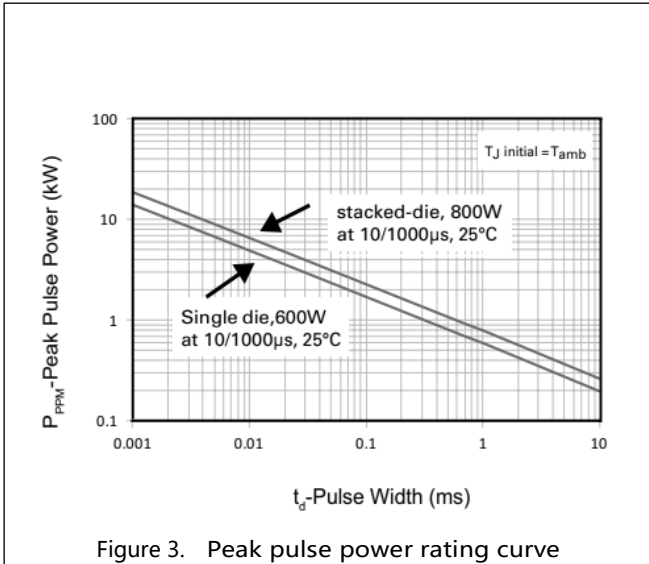
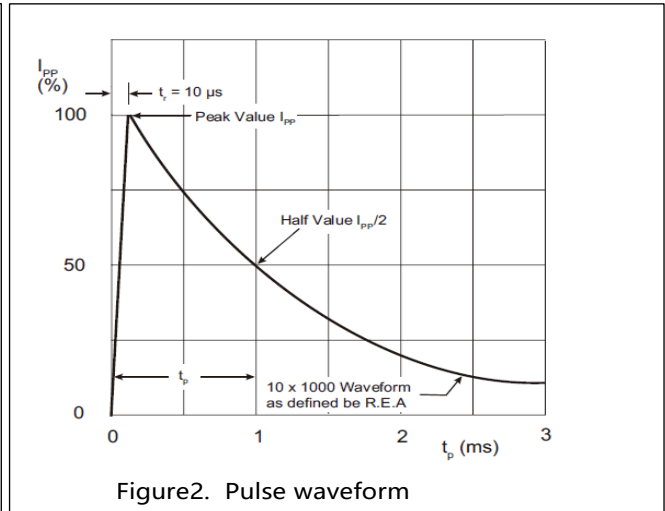
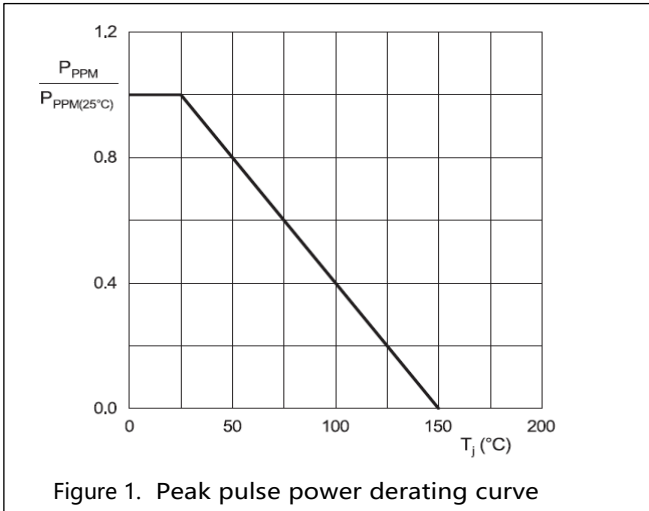
$V_{BR}$  Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )

$V_C$  Clamping Voltage -- Peak voltage measured across the TVS at a specified  $I_{PPM}$  (peak impulse current)

$I_R$  Reverse Leakage Current -- Current measured at  $V_R$

$V_F$  Forward Voltage Drop for Uni-directional

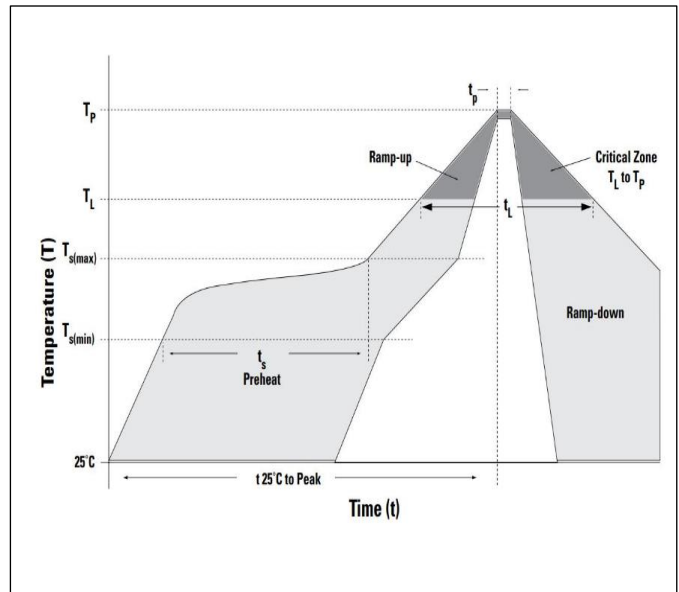
**Ratings and Characteristic Curves (T = 25°C unless otherwise noted)**



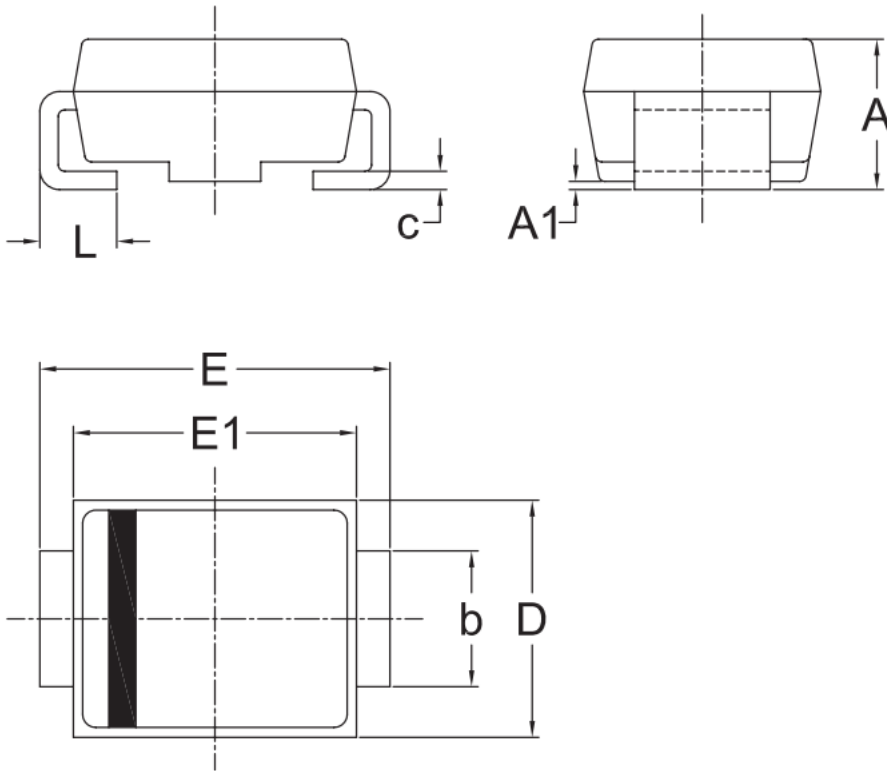
Soldering Parameters

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 $T_A$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_A$ ) (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		260°C

Soldering profile



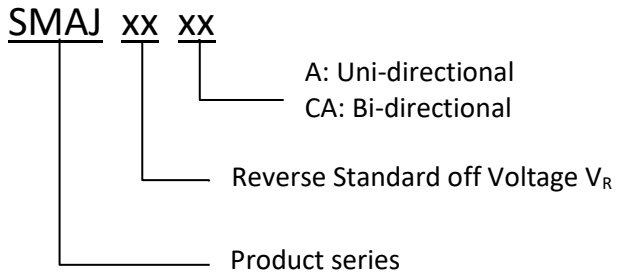
Dimensions



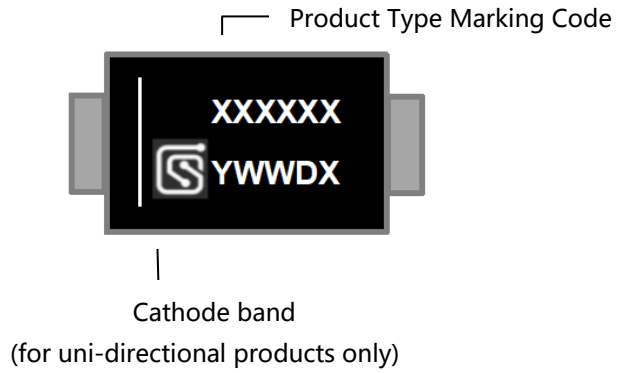
UNIT	A	A1	b	c	D	E	E1	L	
mm	Max	2.50	0.30	2.15	0.25	3.75	5.54	4.65	1.50
	Min	2.00	0.00	1.85	0.15	3.45	5.04	4.35	0.80

Remark: Dimensions D and E1 do not include mold flash & gate remain.

Part Numbering



Part Marking

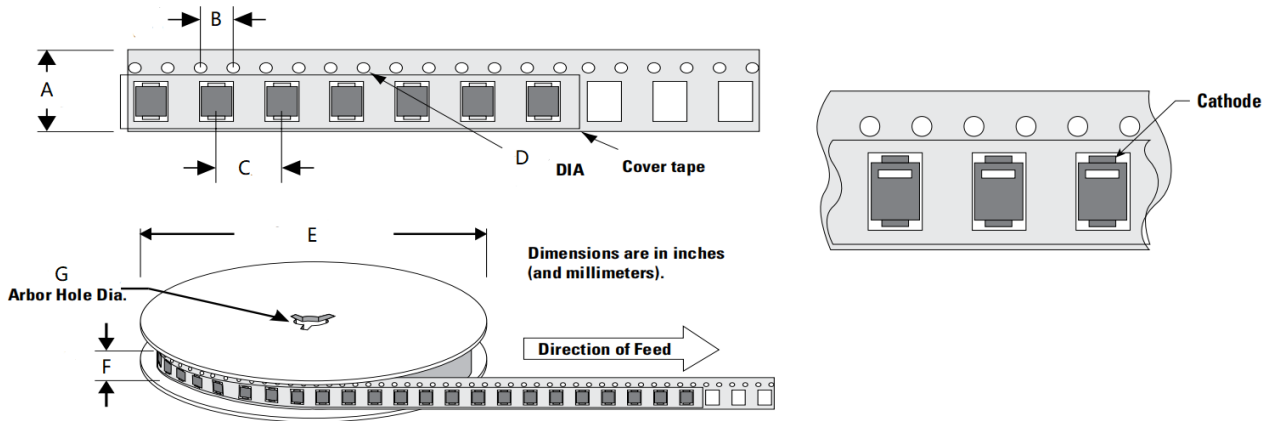


Packing

Part number	Package name	Small packing quantity	Packing method
SMAJXXXX	DO-214AC	5000	Tape & Reel



Tape and Reel Specification



Symbol	Millimeter
A	12.00±0.10
B	4.00±0.10
C	8.00±0.10
D	1.55±0.05
E	330.20±2.00
F	15.70±2.00
G	13.30±0.30

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-July-2021
1.1	Modified Temperature Range & Details	16-August-2021

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