

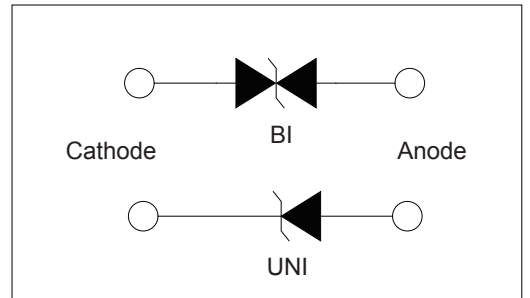
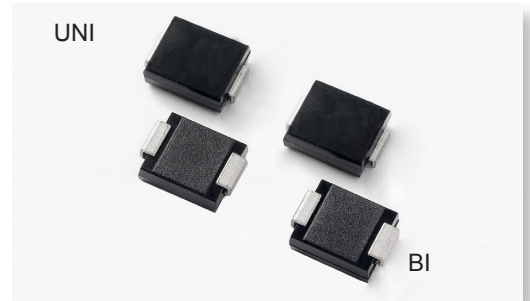
# Transient Voltage Suppressors

**SMDJ Series**

## Transient Voltage Suppressors - SMDJ Series

### Features

- Low profile package
- Matte tin lead-free Plated
- Halogen free and RoHS compliant
- Low incremental surge resistance
- Typical IR less than 1µA above 12V
- Compatible with industrial standard package DO-214AB
- For surface mounted applications to optimize board space
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- 3000W peak pulse power capability with at 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- High temperature soldering : 260°C/ 40 seconds at terminals



### Description

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

### Mechanical Characteristics

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation at TA=25°C by 10/1000µs Waveform (Fig.2)(Note 1), (Note 2)	$P_{PPM}$	3000	Watts
Power Dissipation on Infinite Heat Sink at TA=50°C	$P_D$	6.5	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	$I_{FSM}$	300	Amps
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only (Note 4)	$V_F$	3.5/6.5	V
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55°C to 150°C	°C
Typical Thermal Resistance Junction to Lead	$R_{uJL}$	15	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{uJA}$	75	°C/W

Notes:

1. Non-repetitive current pulse, per Fig.4 and derated above TA=25°C per Fig. 3.
2. Mounted on 5.0x5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
4.  $V_F < 3.5V$  for  $V_{BR} \leq 200V$  and  $V_F < 6.5V$  for  $V_{BR} \geq 201V$

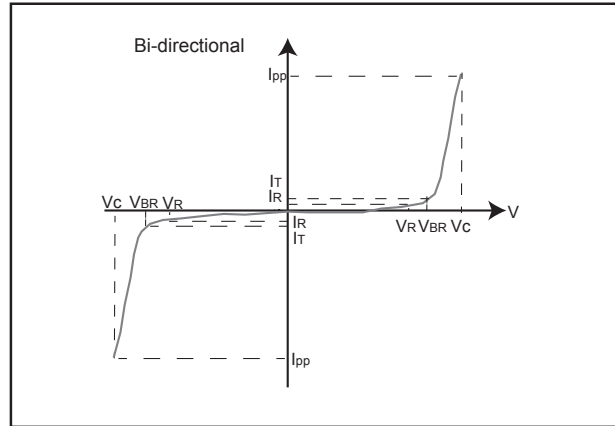
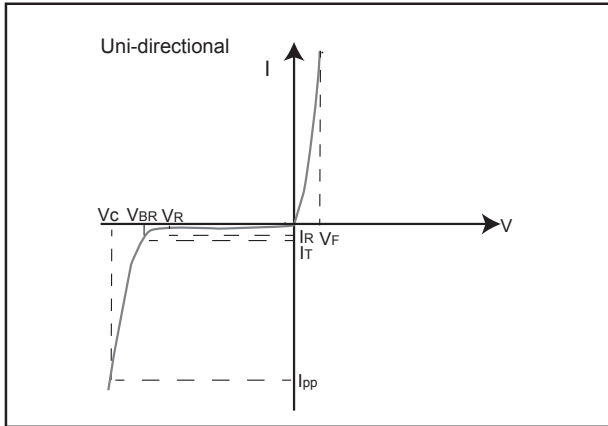
## Electrical Characteristics

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>R</sub>
UNI	BI	UNI	BI	V <sub>R</sub> (V)	V <sub>BR MIN.</sub> (V)	V <sub>BR MAX.</sub> (V)	I <sub>T</sub> (mA)	VC(V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SMDJ5.0A	SMDJ5.0CA	RDE	DDE	5.0	6.40	7.25	10	9.2	326.1	800
SMDJ6.0A	SMDJ6.0CA	RDG	DDG	6.0	6.67	7.67	10	10.3	291.3	800
SMDJ6.5A	SMDJ6.5CA	RDK	DDK	6.5	7.22	8.30	10	11.2	267.9	500
SMDJ7.0A	SMDJ7.0CA	PDM	DDM	7.0	7.78	8.95	10	12.0	250.0	200
SMDJ7.5A	SMDJ7.5CA	PDP	DDP	7.5	8.33	9.58	1	12.9	232.6	100
SMDJ8.0A	SMDJ8.0CA	PDR	DDR	8.0	8.89	10.23	1	13.6	220.6	50
SMDJ8.5A	SMDJ8.5CA	PDT	DDT	8.5	9.44	10.82	1	14.4	208.3	20
SMDJ9.0A	SMDJ9.0CA	PDV	DDV	9.0	10.00	11.50	1	15.4	194.8	10
SMDJ10A	SMDJ10CA	PDX	DDX	10.0	11.10	12.80	1	17.0	176.5	5
SMDJ11A	SMDJ11CA	PDZ	DDZ	11.0	12.20	14.00	1	18.2	164.8	1
SMDJ12A	SMDJ12CA	PEE	DEE	12.0	13.30	15.30	1	19.9	150.8	1
SMDJ13A	SMDJ13CA	PEG	DEG	13.0	14.40	16.50	1	21.5	139.5	1
SMDJ14A	SMDJ14CA	PEK	DEK	14.0	15.60	17.90	1	23.2	129.3	1
SMDJ15A	SMDJ15CA	PEM	DEM	15.0	16.70	19.20	1	24.4	123.0	1
SMDJ16A	SMDJ16CA	PEP	DEP	16.0	17.80	20.50	1	26.0	115.4	1
SMDJ17A	SMDJ17CA	PER	DER	17.0	18.90	21.70	1	27.6	108.7	1
SMDJ18A	SMDJ18CA	PET	DRT	18.0	20.00	23.30	1	29.2	102.7	1
SMDJ20A	SMDJ20CA	PEV	DEV	20.0	22.20	25.50	1	32.4	92.6	1
SMDJ22A	SMDJ22CA	PEX	DEX	22.0	24.40	28.00	1	35.5	84.5	1
SMDJ24A	SMDJ24CA	PEZ	DEZ	24.0	26.70	30.70	1	38.9	77.1	1
SMDJ26A	SMDJ26CA	PFE	DFE	26.0	28.90	33.20	1	42.1	71.3	1
SMDJ28A	SMDJ28CA	PFG	DFG	28.0	31.10	35.80	1	45.4	66.1	1
SMDJ30A	SMDJ30CA	PFK	DFK	30.0	33.30	38.30	1	48.4	62.0	1
SMDJ33A	SMDJ33CA	PFM	DFM	33.0	36.70	42.20	1	53.3	56.3	1
SMDJ36A	SMDJ36CA	PFP	DFP	36.0	40.00	46.00	1	58.1	51.6	1
SMDJ40A	SMDJ40CA	PFR	DFR	40.0	44.40	51.10	1	64.5	46.5	1
SMDJ43A	SMDJ43CA	PFT	DFT	43.0	47.80	54.90	1	69.4	43.2	1
SMDJ45A	SMDJ45CA	PFV	DFV	45.0	50.00	57.50	1	72.7	41.3	1
SMDJ48A	SMDJ48CA	PFX	DFX	48.0	53.30	61.30	1	77.4	38.8	1
SMDJ51A	SMDJ51CA	PFZ	DFZ	51.0	56.70	65.20	1	82.4	36.4	1
SMDJ54A	SMDJ54CA	PGE	DGE	54.0	60.00	69.00	1	87.1	34.4	1
SMDJ58A	SMDJ58CA	PGG	DGG	58.0	64.40	74.10	1	93.6	32.1	1
SMDJ60A	SMDJ60CA	PGK	DGK	60.0	66.70	76.70	1	96.8	31.0	1
SMDJ64A	SMDJ64CA	PGM	DGM	64.0	71.10	81.80	1	103.0	29.1	1
SMDJ70A	SMDJ70CA	PGP	DGP	70.0	77.80	89.50	1	113.0	26.5	1
SMDJ75A	SMDJ75CA	PGR	DGR	75.0	83.30	95.80	1	121.0	24.8	1
SMDJ78A	SMDJ78CA	PGT	DGT	78.0	86.70	99.70	1	126.0	23.8	1
SMDJ85A	SMDJ85CA	PGV	DGV	85.0	94.40	108.2	1	137.0	20.8	1
SMDJ90A	SMDJ90CA	PGX	DGX	90.0	100.0	115.5	1	146.0	20.6	1
SMDJ100A	SMDJ100CA	PGZ	DGZ	100.0	111.0	128.0	1	162.0	18.6	1
SMDJ110A	SMDJ110CA	PHE	DHE	110.0	122.0	140.5	1	177.0	16.8	1
SMDJ120A	SMDJ120CA	PHG	DHG	120.0	133.0	153.0	1	193.0	15.6	1
SMDJ130A	SMDJ130CA	PHK	DHK	130.0	144.0	165.5	1	209.0	14.4	1
SMDJ150A	SMDJ150CA	PHM	DHM	150.0	167.0	192.5	1	243.0	12.4	1
SMDJ160A	SMDJ160CA	PHP	DHP	160.0	178.0	205.0	1	259.0	11.6	1
SMDJ170A	SMDJ170CA	PHR	DHR	170.0	189.0	217.5	1	275.0	11.0	1
SMDJ180A	SMDJ180CA	HHT	IHT	180.0	198.0	230.4	1	292.0	10.3	1
SMDJ190A	SMDJ190CA	HHV	IHV	190.0	209.0	243.2	1	308.0	9.7	1
SMDJ200A	SMDJ200CA	HHX	IHX	200.0	220.0	256.0	1	324.0	9.3	1
SMDJ210A	SMDJ210CA	HHZ	IHZ	210.0	231.0	268.8	1	340.0	8.8	1
SMDJ220A	SMDJ220CA	HIE	IIE	220.0	242.0	281.0	1	356.0	8.4	1

For bidirectional type having VR of 10V and less, the IR limit is double

## Transient Voltage Suppressors - SMDJ Series

### 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 ( $T_A = 25^\circ C$  unless otherwise noted)

Figure 1 - TVS Transients Clamping Waveform

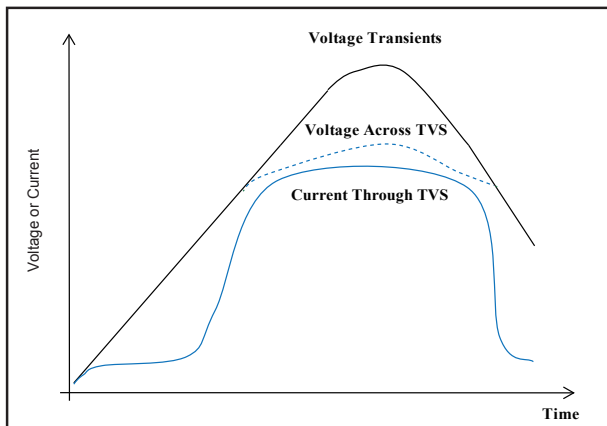
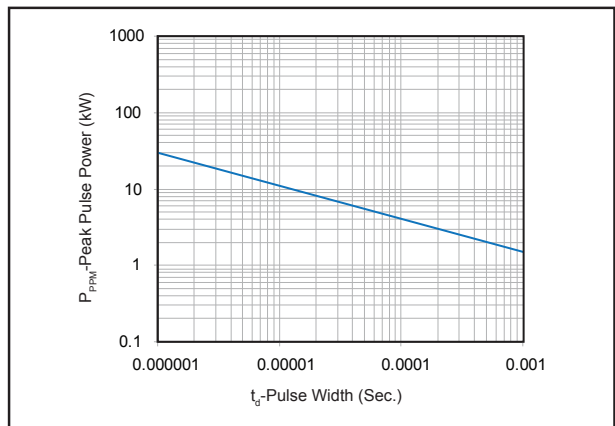


Figure 2 - Peak Pulse Power Rating



## Transient Voltage Suppressors - SMDJ Series

### Ratings and Characteristic Curves (TA=25°C unless otherwise noted) (Continued)

Figure 3 - Peak Pulse Power or Current Derating Curve vs Initial Junction Temperature

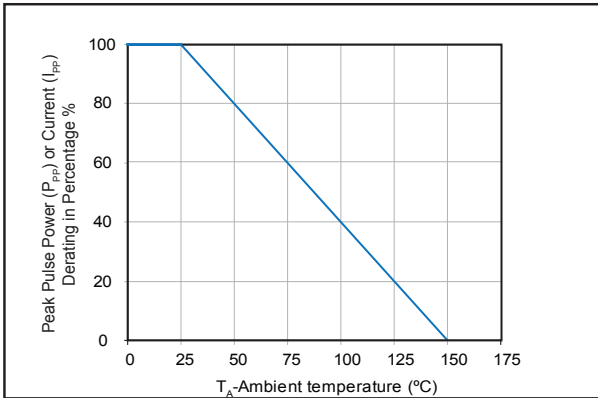


Figure 4 - Pulse Waveform

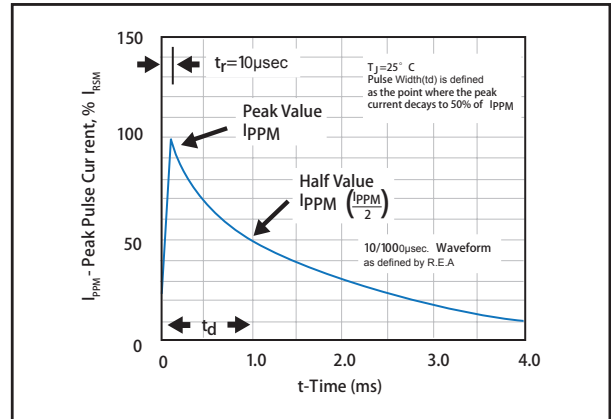


Figure 5 - Typical Junction Capacitance

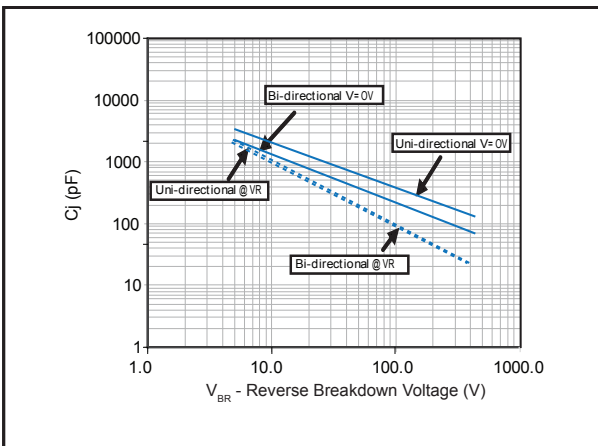


Figure 6 - Steady State Power Derating Curve

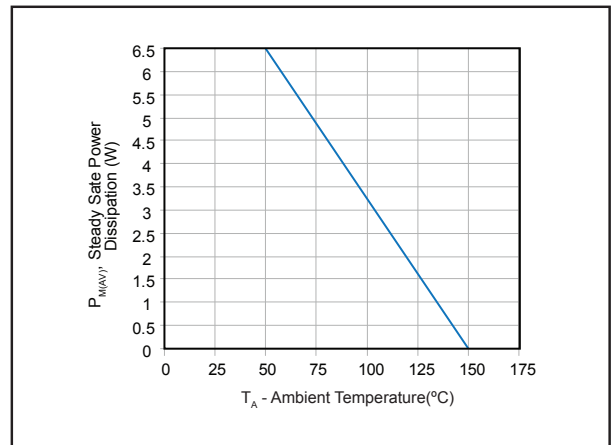
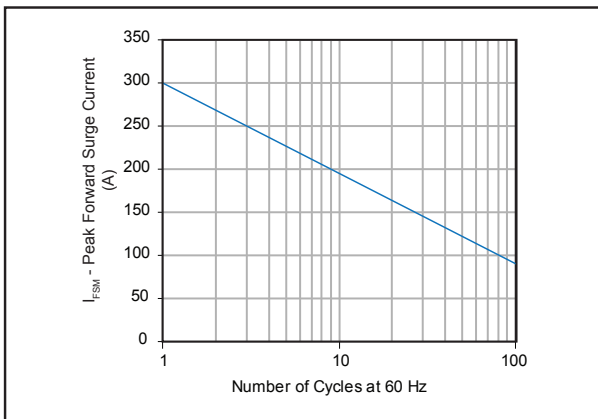


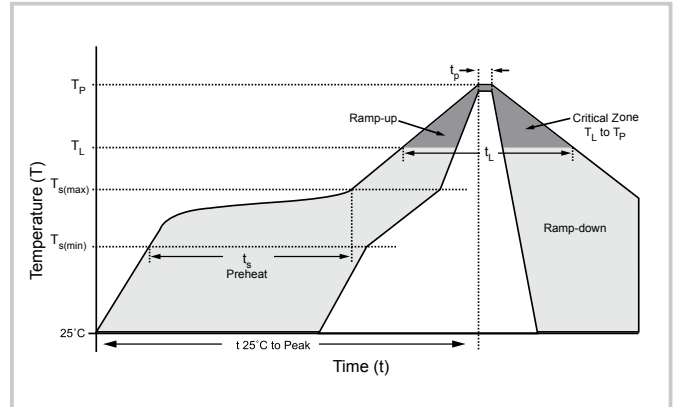
Figure 7 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional only



## Transient Voltage Suppressors - SMDJ Series

### Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min (T <sub>s(min)</sub> )	150°C
	- Temperature Max (T <sub>s(max)</sub> )	200°C
	- Time (min to max) (t <sub>s</sub> )	60-180 secs
Average ramp up rate (Liquidus Temp (T <sub>A</sub> ) to peak)		3°C/second max
T <sub>S(max)</sub> to T <sub>A</sub> - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T <sub>A</sub> ) (Liquidus)	217°C
	- Time (min to max) (t <sub>s</sub> )	60-150 seconds
Peak Temperature (T <sub>P</sub> )		260+0/-5 °C
Time within 5°C of actual peak Temperature (t <sub>p</sub> )		20-40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T <sub>P</sub> )		8 minutes Max.
Do not exceed		280°C



### Environmental Specifications

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

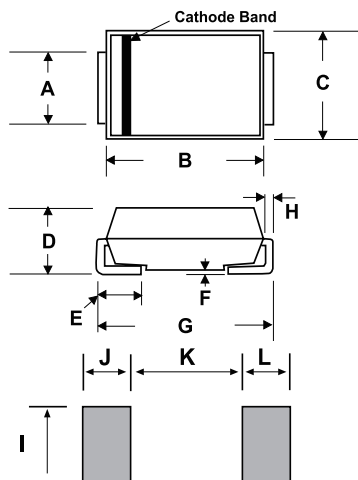
### Physical Specifications

Weight	0.007 ounce, 0.21 grams
Case	JEDEC DO214AB. Molded plastic body over glass passivated junction
Polarity	Color band denotes cathode except Bidirectional.
Terminations	Matte Tin axial leads, solderable per JESD22-B102D.

### Flow/Wave Soldering

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

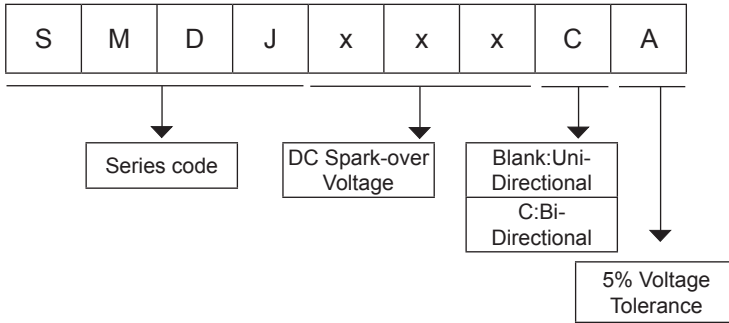
### Dimensions DO-214AB/SMC



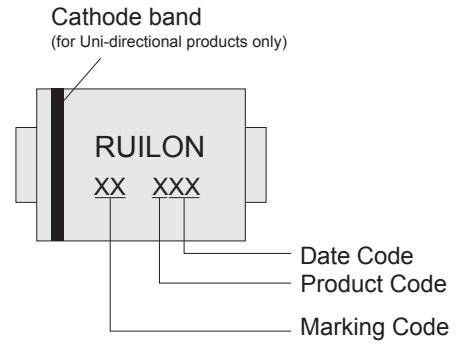
DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.900	3.200
B	0.260	0.280	6.600	7.110
C	0.220	0.245	5.590	6.220
D	0.079	0.103	2.060	2.620
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.750	8.130
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	24.00	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-

## Transient Voltage Suppressors - SMDJ Series

### Product Name



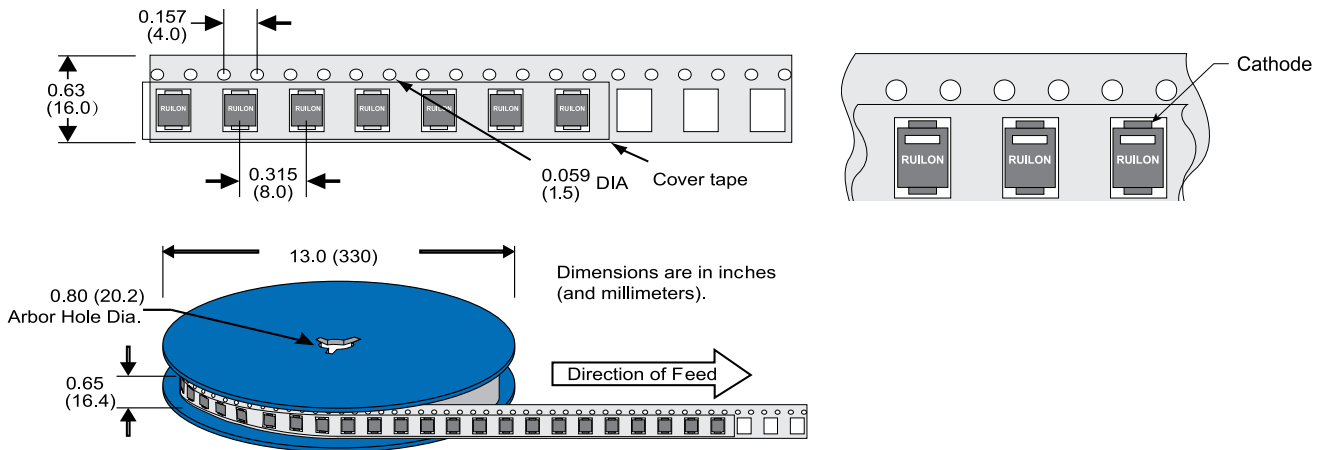
### Part Marking System



### Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
SMDJxxxXX	DO-214AB	500	Tape & Reel	EIA RS-481

### Tape and Reel Specification



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