

Surface Mount Transient Voltage Suppressors (TVS)

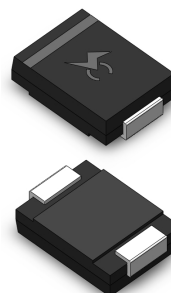
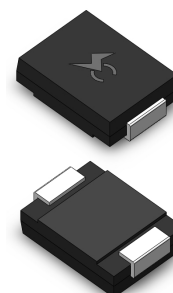
5.0SMDJ Series
8.0 to 440 V
5000W
DO-214AB/SMC

Description

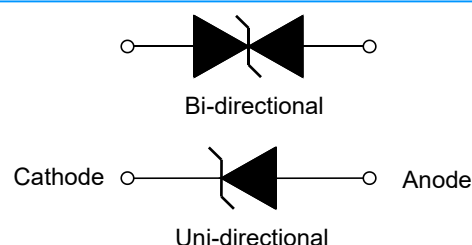
The 5.0SMDJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

- ◆ For surface mounted applications in order to optimize board space
- ◆ Low leakage
- ◆ Uni and Bidirectional unit
- ◆ Glass passivated junction
- ◆ Low inductance
- ◆ Excellent clamping capability
- ◆ 5000W Peak power capability at 10 × 1000μs waveform Repetition rate (duty cycle):0.01%
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to V_{BR} min
- ◆ Typical I_R less than 5μA above 25V.
- ◆ High Temperature soldering: 260°C/40 seconds at terminals
- ◆ Typical maximum temperature coefficient $\Delta V_{BR} = 0.1\% \times V_{BR}@25^\circ\text{C} \times \Delta T$
- ◆ Plastic package has Underwriters Laboratory Flammability 94V-0
- ◆ Matte tin lead-free Plated
- ◆ Halogen free and RoHS compliant
- ◆ Typical failure mode is short from over-specified voltage or current
- ◆ Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- ◆ IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- ◆ 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)

Uni-directional

Bi-directional


Functional Diagram



Applications

TVS devices are ideal for the protection of I/O interfaces, V_{CC} bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

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

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with a 10/1000μs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	5000	W
Peak Pulse Current with a 10/1000μs waveform.(Note1, Fig.3)	I_{PP}	See Next Table	A
Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	$P_{M(AV)}$	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	300	A
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only (Note 4)	V_F	3.5/5.0	V
Operating junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.
2. Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.
4. $V_F < 3.5\text{V}$ for $V_{BR} < 200\text{V}$ and $V_F < 6.5\text{V}$ for $V_{BR} > 201\text{V}$.

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

Part Number		Marking		Reverse Stand-Off Voltage V_{RWM} (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_{RWM} (μA)
Uni	Bi	Uni	Bi		MIN	MAX				
--	5.0SMDJ8.0CA	--	5BDP	8.0	8.89	9.83	10	13.6	367.60	1000
5.0SMDJ10A	5.0SMDJ10CA	5PDV	5BDV	10.0	12.20	14.00	10	17.0	294.20	800
5.0SMDJ11A	5.0SMDJ11CA	5PDX	5BDX	11.0	12.50	14.40	10	18.2	277.47	800
5.0SMDJ12A	5.0SMDJ12CA	5PDZ	5BDZ	12.0	13.30	14.70	10	19.9	253.77	800
5.0SMDJ13A	5.0SMDJ13CA	5PEE	5BEE	13.0	14.40	15.90	10	21.5	234.88	500
5.0SMDJ14A	5.0SMDJ14CA	5PEG	5BEG	14.0	15.60	17.20	10	23.2	217.67	200
5.0SMDJ15A	5.0SMDJ15CA	5PEK	5BEK	15.0	16.70	18.50	1	24.4	206.97	100
5.0SMDJ16A	5.0SMDJ16CA	5PEM	5BEM	16.0	17.80	19.70	1	26.0	194.23	50
5.0SMDJ17A	5.0SMDJ17CA	5PEP	5BEP	17.0	18.90	20.90	1	27.6	182.97	20
5.0SMDJ18A	5.0SMDJ18CA	5PER	5BER	18.0	20.00	22.10	1	29.2	172.95	10
5.0SMDJ19A	5.0SMDJ19CA	5PET	5BET	19.0	21.10	23.30	1	30.8	164.07	10
5.0SMDJ20A	5.0SMDJ20CA	5PEV	5BEV	20.0	22.20	24.50	1	32.4	155.86	5
5.0SMDJ22A	5.0SMDJ22CA	5PEX	5BEX	22.0	24.40	26.90	1	35.5	142.25	5
5.0SMDJ24A	5.0SMDJ24CA	5PEZ	5BEZ	24.0	26.70	29.50	1	38.9	129.82	5
5.0SMDJ26A	5.0SMDJ26CA	5PFE	5BFE	26.0	28.90	31.90	1	42.1	119.95	5
5.0SMDJ28A	5.0SMDJ28CA	5PFG	5BFG	28.0	31.10	34.40	1	45.4	111.23	5
5.0SMDJ30A	5.0SMDJ30CA	5PFK	5BFK	30.0	33.30	36.80	1	48.4	104.34	5
5.0SMDJ33A	5.0SMDJ33CA	5PFM	5BFM	33.0	36.70	40.60	1	53.3	94.75	5
5.0SMDJ36A	5.0SMDJ36CA	5PFP	5BFP	36.0	40.00	44.20	1	58.1	86.92	5
5.0SMDJ40A	5.0SMDJ40CA	5PFR	5BFR	40.0	44.40	49.10	1	64.5	78.29	5
5.0SMDJ43A	5.0SMDJ43CA	5PFT	5BFT	43.0	47.80	52.80	1	69.4	72.77	5
5.0SMDJ45A	5.0SMDJ45CA	5PFV	5BFV	45.0	50.00	55.30	1	72.7	69.46	5
5.0SMDJ48A	5.0SMDJ48CA	5PFX	5BFX	48.0	53.30	58.90	1	77.4	65.25	5
5.0SMDJ51A	5.0SMDJ51CA	5PFZ	5BFZ	51.0	56.70	62.70	1	82.4	61.29	5
5.0SMDJ54A	5.0SMDJ54CA	5PGE	5BGE	54.0	60.00	66.30	1	87.1	57.98	5
5.0SMDJ58A	5.0SMDJ58CA	5PGG	5BGG	58.0	64.40	71.20	1	93.6	53.95	5

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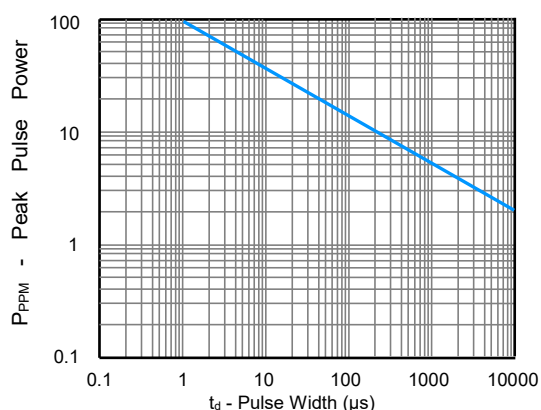
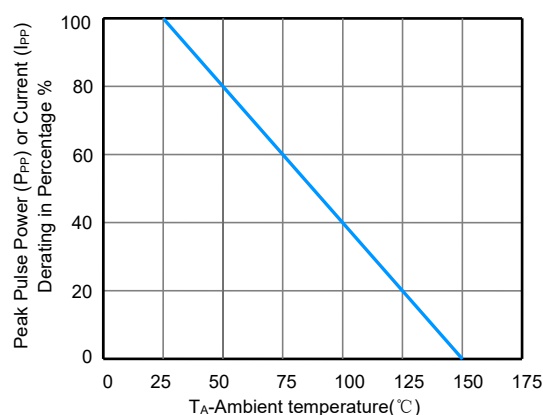
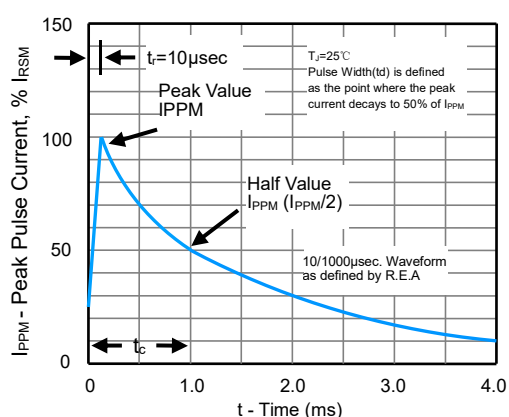
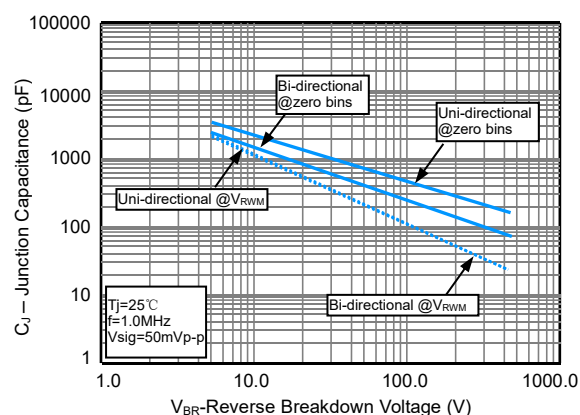
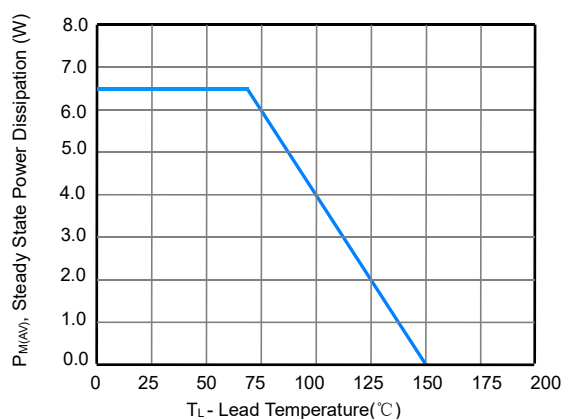
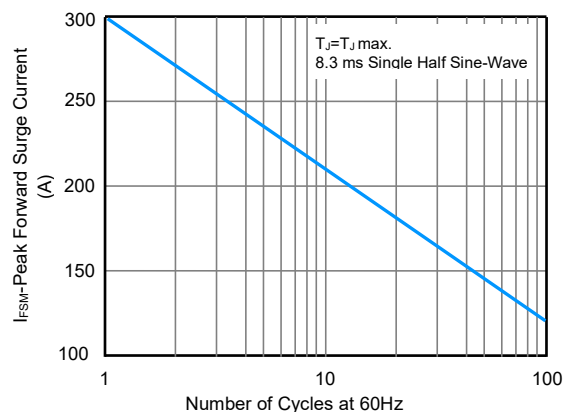
Electrical Characteristics (T_A=25°C unless otherwise noted) (Continue)

Part Number		Marking		Reverse Stand-Off Voltage V _{RWM} (V)	Breakdown Voltage V _{BR} (V) @I _T		Test Current I _T (mA)	Maximum Clamping Voltage V _C @I _{PP} (V)	Maximum Peak Pulse Current I _{PP} (A)	Maximum Reverse Leakage I _R @V _{RWM} (μA)
Uni	Bi	Uni	Bi		MIN	MAX				
5.0SMDJ60A	5.0SMDJ60CA	5PGK	5BGK	60.0	66.70	73.70	1	96.8	52.17	5
5.0SMDJ64A	5.0SMDJ64CA	5PGM	5BGM	64.0	71.10	78.60	1	103.0	49.03	5
5.0SMDJ70A	5.0SMDJ70CA	5PGP	5BGP	70.0	77.80	86.00	1	113.0	44.69	5
5.0SMDJ75A	5.0SMDJ75CA	5PGR	5BGR	75.0	83.30	92.10	1	121.0	41.74	5
5.0SMDJ78A	5.0SMDJ78CA	5PGT	5BGT	78.0	86.70	95.80	1	126.0	40.08	5
5.0SMDJ80A	5.0SMDJ80CA	5PGB	5BGB	80.0	88.80	97.60	1	129.6	38.97	5
5.0SMDJ85A	5.0SMDJ85CA	5PGV	5BGV	85.0	94.40	104.00	1	137.0	36.86	5
5.0SMDJ90A	5.0SMDJ90CA	5PGX	5BGX	90.0	100.00	111.00	1	146.0	34.59	5
5.0SMDJ100A	5.0SMDJ100CA	5PGZ	5BGZ	100.0	111.00	123.00	1	162.0	31.17	5
5.0SMDJ110A	5.0SMDJ110CA	5PHE	5BHE	110.0	122.00	135.00	1	177.0	28.53	5
5.0SMDJ120A	5.0SMDJ120CA	5PHG	5BHG	120.0	133.00	147.00	1	193.0	26.17	5
5.0SMDJ130A	5.0SMDJ130CA	5PHK	5BHK	130.0	144.00	159.00	1	209.0	24.16	5
5.0SMDJ140A	5.0SMDJ140CA	5PHB	5BHB	140.0	155.00	171.00	1	226.8	22.27	5
5.0SMDJ150A	5.0SMDJ150CA	5PHM	5BHM	150.0	167.00	185.00	1	243.0	20.78	5
5.0SMDJ160A	5.0SMDJ160CA	5PHP	5BHP	160.0	178.00	197.00	1	259.0	19.50	5
5.0SMDJ170A	5.0SMDJ170CA	5PHR	5BHR	170.0	189.00	209.00	1	275.0	18.36	5
5.0SMDJ180A	5.0SMDJ180CA	5PHT	5BHT	180.0	201.00	220.00	1	291.6	17.32	5
5.0SMDJ190A	5.0SMDJ190CA	5PHV	5BHV	190.0	211.00	232.00	1	307.8	16.41	5
5.0SMDJ200A	5.0SMDJ200CA	5PHW	5BHW	200.0	224.00	247.00	1	324.0	15.43	5
5.0SMDJ220A	5.0SMDJ220CA	5PHX	5BHX	220.0	246.00	272.00	1	356.0	14.04	5
5.0SMDJ250A	5.0SMDJ250CA	5PHZ	5BHZ	250.0	279.00	309.00	1	405.0	12.35	5
5.0SMDJ300A	5.0SMDJ300CA	5PJE	5BJE	300.0	335.00	371.00	1	486.0	10.29	5
5.0SMDJ350A	5.0SMDJ350CA	5PJG	5BJG	350.0	391.00	432.00	1	567.0	8.82	5
5.0SMDJ400A	5.0SMDJ400CA	5PJK	5BJK	400.0	447.00	494.00	1	648.0	7.72	5
5.0SMDJ440A	5.0SMDJ440CA	5PJM	5BJM	440.0	492.00	543.00	1	713.0	7.01	5

Notes:

1. Suffix 'A' denotes 5% tolerance device.
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices.
3. For Bi-Directional devices having V_R of 10 volts and under, the I_R limit is double.

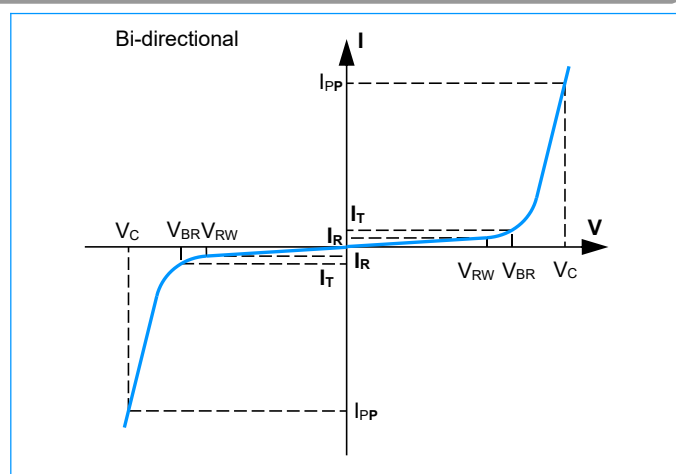
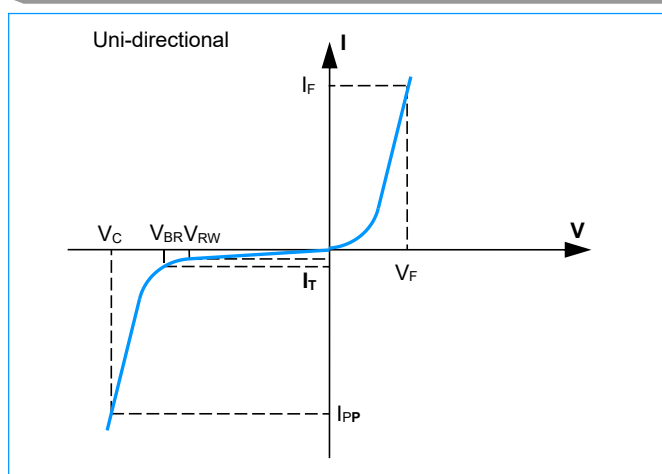
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Ratings and Characteristic Curves ($T_A=25^{\circ}\text{C}$ unless otherwise noted)
Figure 1 - Peak Pulse Power Rating Curve

Figure 2 - Pulse Derating Curve

Figure 3 - Pulse Waveform

Figure 4 - Typical Junction Capacitance

Figure 5 - Steady State Power Derating Curve

Figure 6 - Maximum Non-Repetitive Surge Current


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I-V Curve Characteristics



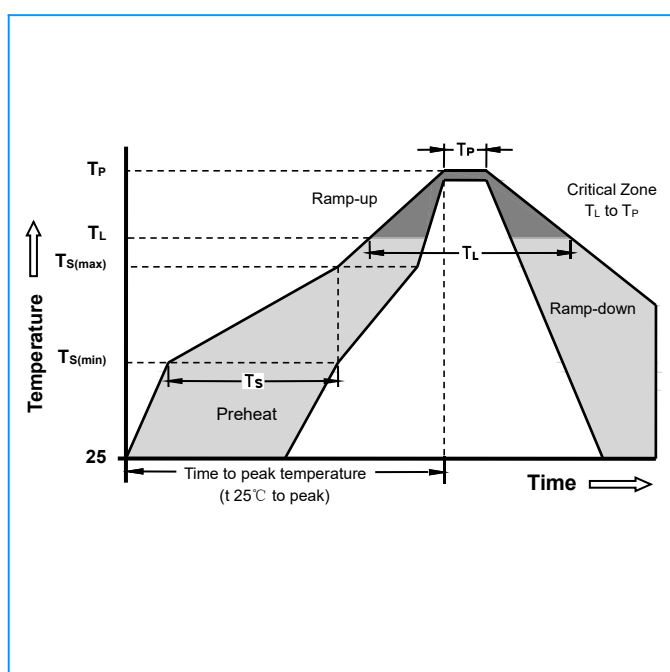
Physical Specifications

Weight	0.007 ounce, 0.21 gram
Case	JEDEC DO-214AB Molded Plastic over glass passivated junction
Polarity	Color band denotes cathode except Bipolar
Terminal	Matte Tin-plated leads, Solderable per JESD22-B102D

Environmental Specifications

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

Soldering Parameters

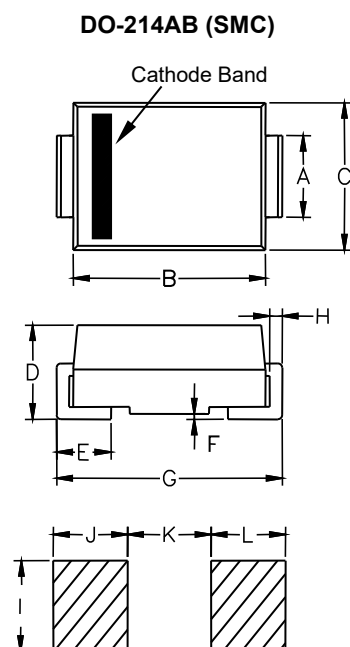


Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min ($T_{S(min)}$)	150°C
	-Temperature Max ($T_{S(max)}$)	200°C
	- Time (min to max) (T_S)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (T_L)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°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

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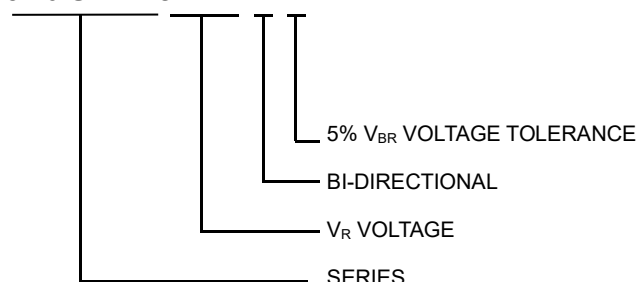
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Dimensions

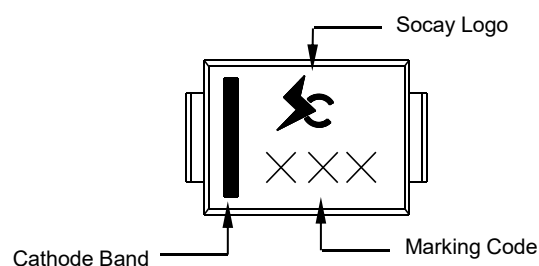


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.108	0.126	2.750	3.200
B	0.260	0.280	6.520	7.110
C	0.217	0.244	5.520	6.220
D	0.080	0.112	2.050	2.850
E	0.030	0.060	0.750	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.640	8.130
H	0.006	0.012	0.150	0.310
I	0.121	-	3.070	-
J	0.068	-	1.715	-
K	-	0.185	-	4.690
L	0.068	-	1.715	-

Part Numbering

5.0SMDJ × × × CA


Part Marking



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Packaging

Part Number	Component Package	Quantity	Packaging Option
5.0SMDJ Series	DO-214AB/SMC	500 PCS	7" reel
		3000 PCS	13" reel

Warning



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- ◆ SOCAY reserves the right to make changes without further notice to any products herein.
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