

## SMCG Plastic-Encapsulate Diodes

### Transient Voltage Suppressor Diodes

#### Features

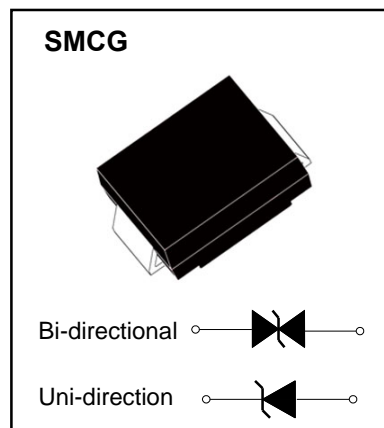
- $P_{PP}$  5000W
- $V_{RWM}$  11V - 440V
- Glass passivated chip

#### Applications

- Clamping Voltage

#### Marking

- 5.0SMDJ  
XXCA/XXA/XX  
XX : From 11 To 440



#### Limiting Values (Absolute Maximum Rating)

Item	Symbol	Unit	Conditions	Max
Peak pulse power dissipation	$P_{PPM}$	W	with a 10/1000us waveform <sup>(1)</sup>	5000
Peak pulse current	$I_{PPM}$	A	with a 10/1000us waveform <sup>(1)</sup>	See Next Table
Peak forward surge current	$I_{FSM}$	A	8.3 ms single half sine-wave unidirectional only <sup>(2)</sup>	300
Power dissipation	$P_D$	W	On infinite heat sink at $T_L=70^\circ\text{C}$	6.5
Operating junction and storage temperature range	$T_J, T_{STG}$	$^\circ\text{C}$		-55 to +150

#### Electrical Characteristics ( $T_A=25^\circ\text{C}$ Unless otherwise specified)

Item	Symbol	Unit	Conditions	Max
Maximum instantaneous forward Voltage (3)	$V_F$	V	at 100A for unidirectional only	3.5/5.0
Thermal resistance	$R_{\theta JL}$	$^\circ\text{C}/\text{W}$	junction to lead	15
	$R_{\theta JA}$	$^\circ\text{C}/\text{W}$	junction to ambient	75

#### Notes:

- (1) Non-repetitive current pulse, per Fig. 5 and derated above  $T_A = 25^\circ\text{C}$  per Fig.1.
- (2) Mounted on 0.31 x 0.31" (8.0 x 8.0 mm) copper pads to each terminal
- (3)  $V_F < 3.5\text{V}$  for devices of  $V_{BR} < 200\text{V}$  and  $V_F < 5.0\text{V}$  for devices of  $V_{BR} > 201\text{V}$

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Device Marking Code		Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub>			Maximum Reverse Leakage I <sub>R</sub> @V <sub>RWM</sub> (uA)	Working Peak Reverse Voltage V <sub>RWM</sub> (V)	Maximum Reverse Surge Current I <sub>PP</sub> (A)	Maximum Clamping Voltage V <sub>C</sub> @I <sub>PP</sub> (V)
		Uni	Bi	Min (V)	Max (V)	I <sub>T</sub> (mA)				
5.0SMDJ11	5.0SMDJ11C	5PDW	5BDW	12.20	14.90	10	800	11.0	248.8	20.1
5.0SMDJ11A	5.0SMDJ11CA	5PDX	5BDX	12.20	13.50	10	800	11.0	274.7	18.2
5.0SMDJ12	5.0SMDJ12C	5PDY	5BDY	13.30	16.30	10	800	12.0	227.3	22.0
5.0SMDJ12A	5.0SMDJ12CA	5PDZ	5BDZ	13.30	14.70	10	800	12.0	251.3	19.9
5.0SMDJ13	5.0SMDJ13C	5PED	5BED	14.40	17.60	10	500	13.0	210.1	23.8
5.0SMDJ13A	5.0SMDJ13CA	5PEE	5BEE	14.40	15.90	10	500	13.0	232.6	21.5
5.0SMDJ14	5.0SMDJ14C	5PEF	5BEF	15.60	19.10	10	200	14.0	193.8	25.8
5.0SMDJ14A	5.0SMDJ14CA	5PEG	5BEG	15.60	17.20	10	200	14.0	215.5	23.2
5.0SMDJ15	5.0SMDJ15C	5PEH	5BEH	16.70	20.40	1	100	15.0	185.9	26.9
5.0SMDJ15A	5.0SMDJ15CA	5PEK	5BEK	16.70	18.50	1	100	15.0	204.9	24.4
5.0SMDJ16	5.0SMDJ16C	5PEL	5BEL	17.80	21.80	1	50	16.0	173.6	28.8
5.0SMDJ16A	5.0SMDJ16CA	5PEM	5BEM	17.80	19.70	1	50	16.0	192.3	26.0
5.0SMDJ17	5.0SMDJ17C	5PEN	5BEN	18.90	23.10	1	20	17.0	163.9	30.5
5.0SMDJ17A	5.0SMDJ17CA	5PEP	5BEP	18.90	20.90	1	20	17.0	181.2	27.6
5.0SMDJ18	5.0SMDJ18C	5PEQ	5BEQ	20.00	24.40	1	10	18.0	155.3	32.2
5.0SMDJ18A	5.0SMDJ18CA	5PER	5BER	20.00	22.10	1	10	18.0	171.2	29.2
5.0SMDJ19	5.0SMDJ19C	5PES	5BES	21.13	25.76	1	10	19.0	147.0	34.0
5.0SMDJ19A	5.0SMDJ19CA	5PET	5BET	21.10	23.30	1	10	19.0	162.4	30.8
5.0SMDJ20	5.0SMDJ20C	5PEU	5BEU	22.20	27.10	1	5	20.0	139.7	35.8
5.0SMDJ20A	5.0SMDJ20CA	5PEV	5BEV	22.20	24.50	1	5	20.0	154.3	32.4
5.0SMDJ22	5.0SMDJ22C	5PEW	5BEW	24.40	29.80	1	5	22.0	126.9	39.4
5.0SMDJ22A	5.0SMDJ22CA	5PEX	5BEX	24.40	26.90	1	5	22.0	140.8	35.5
5.0SMDJ24	5.0SMDJ24C	5PEY	5BEY	26.70	32.60	1	5	24.0	116.3	43.0
5.0SMDJ24A	5.0SMDJ24CA	5PEZ	5BEZ	26.70	29.50	1	5	24.0	128.5	38.9
5.0SMDJ26	5.0SMDJ26C	5PFD	5BFD	28.90	35.30	1	5	26.0	107.3	46.6
5.0SMDJ26A	5.0SMDJ26CA	5PFE	5BFE	28.90	31.90	1	5	26.0	118.8	42.1
5.0SMDJ28	5.0SMDJ28C	5PFF	5BFF	31.10	38.00	1	5	28.0	100.0	50.0
5.0SMDJ28A	5.0SMDJ28CA	5PFG	5BFG	31.10	34.40	1	5	28.0	110.1	45.4
5.0SMDJ30	5.0SMDJ30C	5PFH	5BFH	33.30	40.70	1	5	30.0	93.5	53.5
5.0SMDJ30A	5.0SMDJ30CA	5PFK	5BFK	33.30	36.80	1	5	30.0	103.3	48.4
5.0SMDJ33	5.0SMDJ33C	5PFL	5BFL	36.70	44.90	1	5	33.0	84.7	59.0
5.0SMDJ33A	5.0SMDJ33CA	5PFM	5BFM	36.70	40.60	1	5	33.0	93.8	53.3
5.0SMDJ36	5.0SMDJ36C	5PFN	5BFN	40.00	48.90	1	5	36.0	77.8	64.3
5.0SMDJ36A	5.0SMDJ36CA	5PFP	5BFP	40.00	44.20	1	5	36.0	86.1	58.1
5.0SMDJ40	5.0SMDJ40C	5PFQ	5BFQ	44.40	54.30	1	5	40.0	70.0	71.4
5.0SMDJ40A	5.0SMDJ40CA	5PFR	5BFR	44.40	49.10	1	5	40.0	77.5	64.5
5.0SMDJ43	5.0SMDJ43C	5PFS	5BFS	47.80	58.40	1	5	43.0	65.2	76.7
5.0SMDJ43A	5.0SMDJ43CA	5PFT	5BFT	47.80	52.80	1	5	43.0	72.0	69.4
5.0SMDJ45	5.0SMDJ45C	5PFU	5BFU	50.00	61.10	1	5	45.0	62.3	80.3
5.0SMDJ45A	5.0SMDJ45CA	5PFV	5BFV	50.00	55.30	1	5	45.0	68.8	72.7
5.0SMDJ48	5.0SMDJ48C	5PFW	5BFW	53.30	65.10	1	5	48.0	58.5	85.5
5.0SMDJ48A	5.0SMDJ48CA	5PFX	5BFX	53.30	58.90	1	5	48.0	64.6	77.4
5.0SMDJ51	5.0SMDJ51C	5PFY	5BFY	56.70	69.30	1	5	51.0	54.9	91.1
5.0SMDJ51A	5.0SMDJ51CA	5PFZ	5BFZ	56.70	62.70	1	5	51.0	60.7	82.4
5.0SMDJ54	5.0SMDJ54C	5PGD	5BGD	60.00	73.30	1	5	54.0	51.9	96.3
5.0SMDJ54A	5.0SMDJ54CA	5PGE	5BGE	60.00	66.30	1	5	54.0	57.4	87.1
5.0SMDJ58	5.0SMDJ58C	5PGF	5BGF	64.40	78.70	1	5	58.0	48.5	103.0
5.0SMDJ58A	5.0SMDJ58CA	5PGG	5BGG	64.40	71.20	1	5	58.0	53.4	93.6
5.0SMDJ60	5.0SMDJ60C	5PGH	5BGH	66.70	81.50	1	5	60.0	46.7	107.0
5.0SMDJ60A	5.0SMDJ60CA	5PGK	5BGK	66.70	73.70	1	5	60.0	51.7	96.8
5.0SMDJ64	5.0SMDJ64C	5PGL	5BGL	71.10	86.90	1	5	64.0	43.9	114.0
5.0SMDJ64A	5.0SMDJ64CA	5PGM	5BGM	71.10	78.60	1	5	64.0	48.5	103.0

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Device Marking Code		Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub>			Maximum Reverse Leakage I <sub>R</sub> @V <sub>RWM</sub> (uA)	Working Peak Reverse Voltage V <sub>RWM</sub> (V)	Maximum Reverse Surge Current I <sub>PP</sub> (A)	Maximum Clamping Voltage V <sub>C</sub> @I <sub>PP</sub> (V)
		Uni	Bi	Min (V)	Max (V)	I <sub>T</sub> (mA)				
5.0SMDJ70	5.0SMDJ70C	5PGN	5BGN	77.80	95.10	1	5	70.0	40.0	125.0
5.0SMDJ70A	5.0SMDJ70CA	5PGP	5BGP	77.80	86.00	1	5	70.0	44.2	113.0
5.0SMDJ75	5.0SMDJ75C	5PGQ	5BGQ	83.30	102.0	1	5	75.0	37.3	134.0
5.0SMDJ75A	5.0SMDJ75CA	5PGR	5BGR	83.30	92.10	1	5	75.0	41.3	121.0
5.0SMDJ78	5.0SMDJ78C	5PGS	5BGS	86.70	106.0	1	5	78.0	36.0	139.0
5.0SMDJ78A	5.0SMDJ78CA	5PGT	5BGT	86.70	95.80	1	5	78.0	39.7	126.0
5.0SMDJ80	5.0SMDJ80C	5PGA	5BGA	88.96	108.8	1	5	80.0	34.9	143.2
5.0SMDJ80A	5.0SMDJ80CA	5PGB	5BGB	88.80	97.60	1	5	80.0	38.6	129.6
5.0SMDJ85	5.0SMDJ85C	5PGU	5BGU	94.40	115.0	1	5	85.0	33.1	151.0
5.0SMDJ85A	5.0SMDJ85CA	5PGV	5BGV	94.40	104.0	1	5	85.0	36.5	137.0
5.0SMDJ90	5.0SMDJ90C	5PGW	5BGW	100.0	122.0	1	5	90.0	31.3	160.0
5.0SMDJ90A	5.0SMDJ90CA	5PGX	5BGX	100.0	111.0	1	5	90.0	34.2	146.0
5.0SMDJ100	5.0SMDJ100C	5PGY	5BGY	111.0	136.0	1	5	100.0	27.9	179.0
5.0SMDJ100A	5.0SMDJ100CA	5PGZ	5BGZ	111.0	123.0	1	5	100.0	30.9	162.0
5.0SMDJ110	5.0SMDJ110C	5PHD	5BHD	122.0	149.0	1	5	110.0	25.5	196.0
5.0SMDJ110A	5.0SMDJ110CA	5PHE	5BHE	122.0	135.0	1	5	110.0	28.2	177.0
5.0SMDJ120	5.0SMDJ120C	5PHF	5BHF	133.0	163.0	1	5	120.0	23.4	214.0
5.0SMDJ120A	5.0SMDJ120CA	5PHG	5BHG	133.0	147.0	1	5	120.0	25.9	193.0
5.0SMDJ130	5.0SMDJ130C	5PHH	5BHH	144.0	176.0	1	5	130.0	21.6	231.0
5.0SMDJ130A	5.0SMDJ130CA	5PHK	5BHK	144.0	159.0	1	5	130.0	23.9	209.0
5.0SMDJ140	5.0SMDJ140C	5PHA	5BHA	155.7	190.4	1	5	140.0	20.0	250.6
5.0SMDJ140A	5.0SMDJ140CA	5PHB	5BHB	155.0	171.0	1	5	140.0	22.0	226.8
5.0SMDJ150	5.0SMDJ150C	5PHL	5BHL	167.0	204.0	1	5	150.0	18.7	268.0
5.0SMDJ150A	5.0SMDJ150CA	5PHM	5BHM	167.0	185.0	1	5	150.0	20.6	243.0
5.0SMDJ160	5.0SMDJ160C	5PHN	5BHN	178.0	218.0	1	5	160.0	17.4	287.0
5.0SMDJ160A	5.0SMDJ160CA	5PHP	5BHP	178.0	197.0	1	5	160.0	19.3	259.0
5.0SMDJ170	5.0SMDJ170C	5PHQ	5BHQ	189.0	231.0	1	5	170.0	16.4	304.0
5.0SMDJ170A	5.0SMDJ170CA	5PHR	5BHR	189.0	209.0	1	5	170.0	18.2	275.0
5.0SMDJ180	5.0SMDJ180C	5PHS	5BHS	200.2	244.8	1	5	180.0	15.5	322.2
5.0SMDJ180A	5.0SMDJ180CA	5PHT	5BHT	200.0	220.0	1	5	180.0	17.1	291.6
5.0SMDJ190	5.0SMDJ190C	5PHU	5BHU	211.3	258.4	1	5	190.0	14.7	340.1
5.0SMDJ190A	5.0SMDJ190CA	5PHV	5BHV	211.0	232.0	1	5	190.0	16.2	307.8
5.0SMDJ200A	5.0SMDJ200CA	5PHW	5BHW	224.0	247.0	1	5	200.0	15.4	324.0
5.0SMDJ220A	5.0SMDJ220CA	5PHX	5BHX	246.0	272.0	1	5	220.0	14.0	356.0
5.0SMDJ250A	5.0SMDJ250CA	5PHZ	5BHZ	279.0	309.0	1	5	250.0	12.3	405.0
5.0SMDJ300A	5.0SMDJ300CA	5PJE	5BJE	335.0	371.0	1	5	300.0	10.3	486.0
5.0SMDJ350A	5.0SMDJ350CA	5PJG	5BJG	391.0	432.0	1	5	350.0	8.8	567.0
5.0SMDJ400A	5.0SMDJ400CA	5PJK	5BJK	447.0	494.0	1	5	400.0	7.7	648.0
5.0SMDJ440A	5.0SMDJ440CA	5PJM	5BJM	492.0	543.0	1	5	440.0	7.0	713.0

**Note:**

1. Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V<sub>R</sub> of 20 volts and under, the I<sub>R</sub> limit is double

# Typical Characteristics

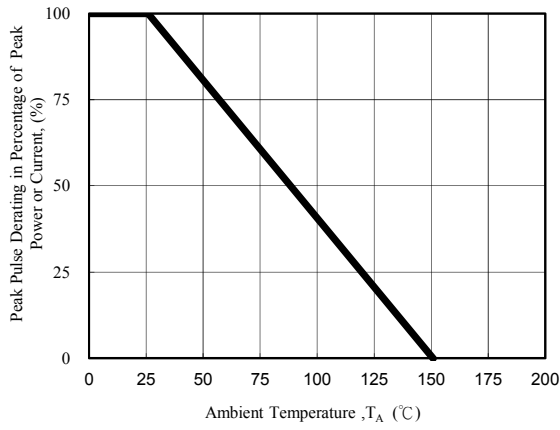


Fig. 1 - Pulse Derating Curve

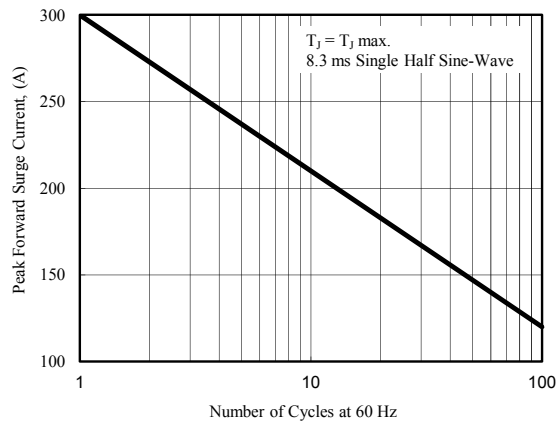


Fig. 2 - Maximum Non-Repetitive Surge Current

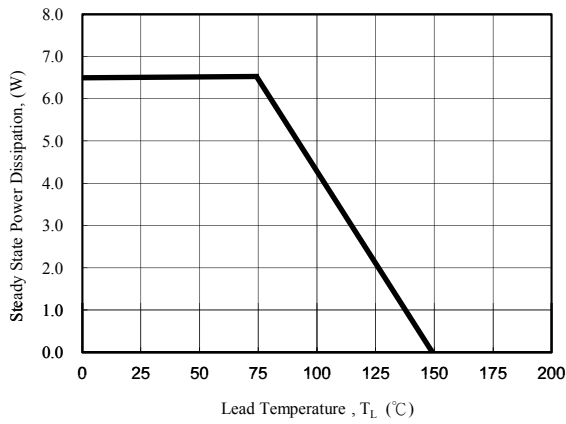


Fig. 3 - Steady State Power Derating Curve

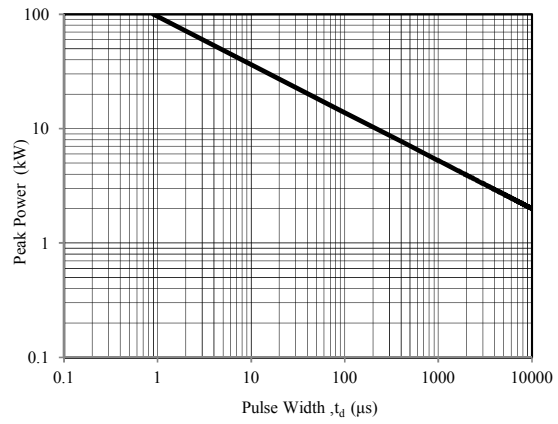


Fig. 4 - Peak Pulse Power Rating Curve

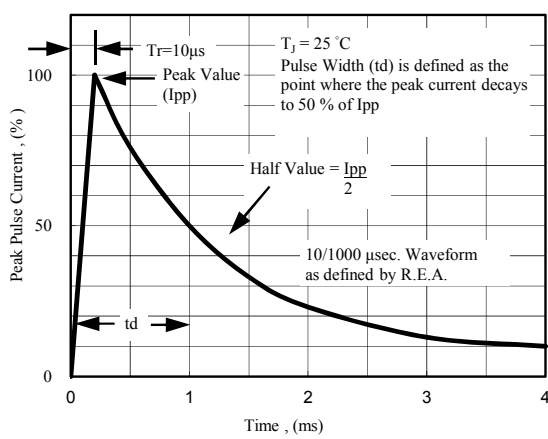


Fig. 5 - Pulse Waveform

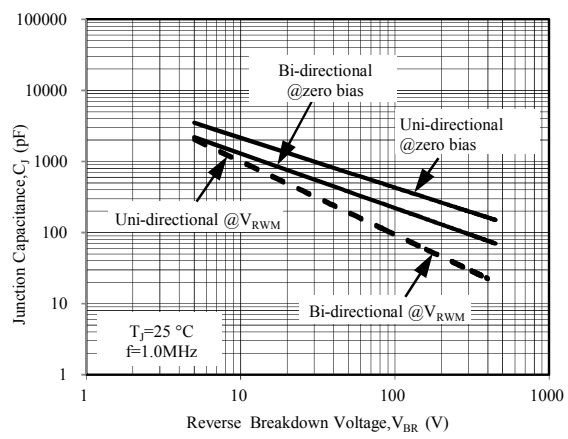
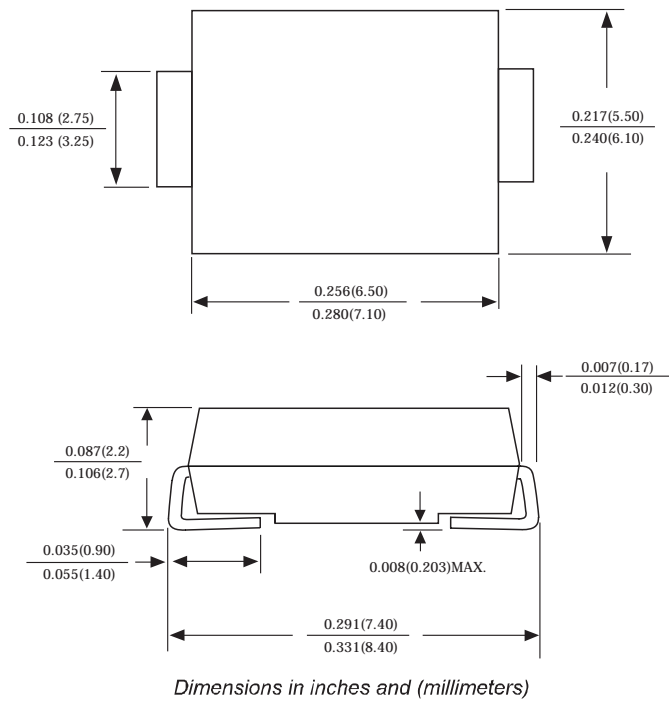
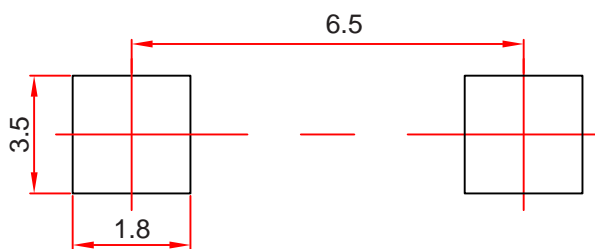


Fig. 6 - Typical Junction Capacitance

## SMCG Package Outline Dimensions



## SMCG Suggested Pad Layout



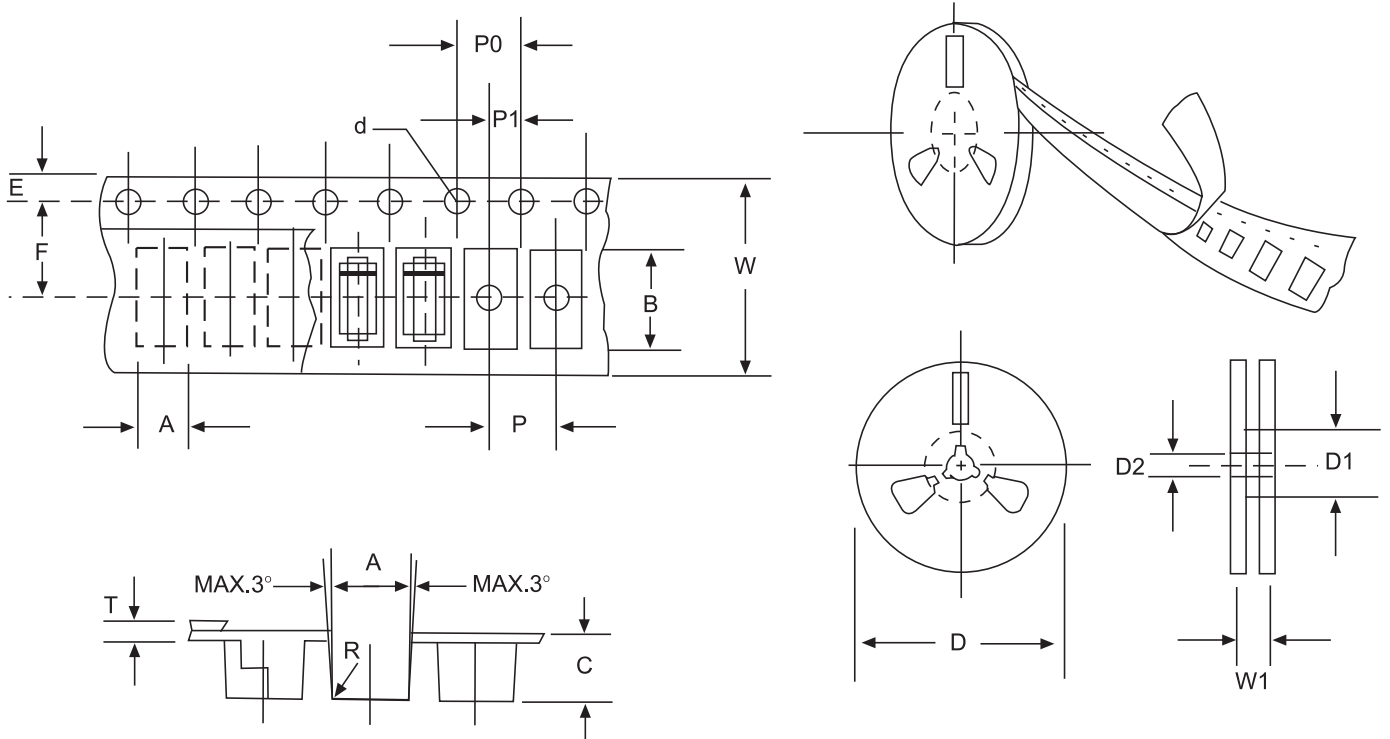
### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

### NOTICE

JSHD reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSHD does not assume any liability arising out of the application or use of any product described herein.

# Reel Taping Specifications For Surface Mount Devices–SMCG



**FIG : CONFIGURATION OF SURFACE MOUNTED DEVICES TAPING**

ITEM	SYMBOL	SMCG mm(inch)
Carrier width	A	6.05±0.1(0.238±0.004)
Carrier length	B	8.31±0.1(0.327±0.004)
Carrier depth	C	2.70±0.1(0.106±0.004)
Sprocket hole	d	1.55±0.05(0.061±0.002)
Reel outside diameter	D	330±2.0(13±0.079)
Reel inner diameter	D1	75 ±1.0 ( 2.95 ±0.039)
Feed hole diameter	D2	13±0.5(0.512±0.020)
Sprocket hole position	E	1.75±0.1(0.069±0.004)
Punch hole position	F	7.65±0.05(0.301±0.002)
Punch hole pitch	P	8.0±0.1(0.315±0.004)
Sprocket hole pitch	P0	4.0±0.1(0.157±0.004)
Embossment center	P1	2.0±0.1(0.079±0.004)
Totall tape thickness	T	0.3±0.1(0.012±0.004)
Tape width	W	16.0±0.2(0.630±0.008)
Reel width	W1	24.0±2.0(0.945±0.079)

NOTE:Devices are packde in accordance with EIA standard RS-481-A and specification given above.