

# SMAJ\*\*\* Series

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### VOLTAGE 5.0 TO 250 Volts

### 400 Watt Peak Pulse Power

#### FEATURES

- \* Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- \* For surface mounted applications in order to optimize board space
- \* Low profile package
- \* Built-in strain relief
- \* Glass passivated junction
- \* Low inductance
- \* Excellent clamping capability
- \* Repetition Rate (duty cycle):0.01%
- \* Fast response time: typically less than 1.0ps from 0 Volts to V(BR) for unidirectional types
- \* Typical IR less than 1mA above 10V
- \* High temperature soldering guaranteed:  
260°C/10 seconds,

#### MECHANICAL DATA

**Case:** JEDEC DO-214AC molded plastic

**Terminals:** Axial leads, solderable per MIL-STD-202, Method 208

**Polarity:** Color band denoted cathode except Bipolar

**Mounting Position:** Any

**Weight:** 0.0023 ounce, 0.065 gram

#### 1.DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types SMAJ5.0CA thru types SMAJ250CA

Electrical characteristics apply in both directions.marking like Uni; without color band.

#### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

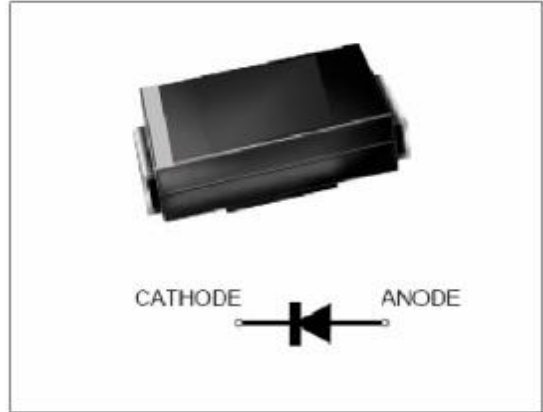
Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$ , $T_P=1\text{ms}$ (Note 1)	$P_{PPM}$	Minimum 400	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ (Note 2)	$P_{M(AV)}$	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load(JECED Method) (Note 3)	$I_{FSM}$	30	Amps
Operating Temperature Range	$T_J$	-55 to +150	°C
Storage Temperature Range	$T_{STG}$	-55 to +175	°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 Copper Leaf area of 1.57in<sup>2</sup>(40mm<sup>2</sup>).
3. 8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.



We declare that the material of product compliance with ROHS requirements

## SMAJ\*\*\* Series

Uni-Directional Part Number	Device marking code	Reverse Stand-off Voltage VRWM (V)	Breakdown Voltage VBR (V) Min. @IT	Breakdown Voltage VBR (V) Max. @IT	Test Current IT (mA)	Maximum Clamping Voltage @IPP VC (V)	Peak Pulse Current Ipp (A)	Reverse Leakage @VRWM IR (uA)
SMAJ5.0	AD	5.00	6.40	7.00	10.00	9.20	43.50	800
SMAJ5.0A	AE	5.00	6.40	7.00	10.00	9.20	43.50	800
SMAJ6.0	AF	6.00	6.67	7.37	10.00	10.30	38.80	800
SMAJ6.0A	AG	6.00	6.67	7.37	10.00	10.30	38.80	800
SMAJ6.5	AH	6.50	7.22	7.98	10.00	11.20	35.70	500
SMAJ6.5A	AK	6.50	7.22	7.98	10.00	11.20	35.70	500
SMAJ7.0	AL	7.00	7.78	8.60	10.00	12.00	33.30	200
SMAJ7.0A	AM	7.00	7.78	8.60	10.00	12.00	33.30	200
SMAJ7.5	AN	7.50	8.33	9.21	1.00	12.90	31.00	100
SMAJ7.5A	AP	7.50	8.33	9.21	1.00	12.90	31.00	100
SMAJ8.0	AQ	8.00	8.89	9.83	1.00	13.60	29.40	50
SMAJ8.0A	AR	8.00	8.89	9.83	1.00	13.60	29.40	50
SMAJ8.5	AS	8.50	9.44	10.40	1.00	14.40	27.80	20
SMAJ8.5A	AT	8.50	9.44	10.40	1.00	14.40	27.80	20
SMAJ9.0	AU	9.00	10.00	11.10	1.00	15.40	26.00	10
SMAJ9.0A	AV	9.00	10.00	11.10	1.00	15.40	26.00	10
SMAJ10	AW	10.00	11.10	12.30	1.00	17.00	23.50	5
SMAJ10A	AX	10.00	11.10	12.30	1.00	17.00	23.50	5
SMAJ11	AY	11.00	12.20	13.50	1.00	18.20	22.00	5
SMAJ11A	AZ	11.00	12.20	13.50	1.00	18.20	22.00	5
SMAJ12	BD	12.00	13.30	14.70	1.00	19.90	20.10	5
SMAJ12A	BE	12.00	13.30	14.70	1.00	19.90	20.10	5
SMAJ13	BF	13.00	14.40	15.90	1.00	21.50	18.60	5
SMAJ13A	BG	13.00	14.40	15.90	1.00	21.50	18.60	5
SMAJ14	BH	14.00	15.60	17.20	1.00	23.20	17.20	5
SMAJ14A	BK	14.00	15.60	17.20	1.00	23.20	17.20	5
SMAJ15	BL	15.00	16.70	18.50	1.00	24.40	16.40	5
SMAJ15A	BM	15.00	16.70	18.50	1.00	24.40	16.40	5
SMAJ16	BN	16.00	17.80	19.70	1.00	26.00	15.40	5
SMAJ16A	BP	16.00	17.80	19.70	1.00	26.00	15.40	5
SMAJ17	BQ	17.00	18.90	20.90	1.00	27.60	14.50	5
SMAJ17A	BR	17.00	18.90	20.90	1.00	27.60	14.50	5
SMAJ18	BS	18.00	20.00	22.10	1.00	29.20	13.70	5
SMAJ18A	BT	18.00	20.00	22.10	1.00	29.20	13.70	5
SMAJ20	BU	20.00	22.20	24.50	1.00	32.40	12.30	5
SMAJ20A	BV	20.00	22.20	24.50	1.00	32.40	12.30	5
SMAJ22	BW	22.00	24.40	26.90	1.00	35.50	11.30	5
SMAJ22A	BX	22.00	24.40	26.90	1.00	35.50	11.30	5
SMAJ24	BY	24.00	26.70	29.50	1.00	38.90	10.30	5
SMAJ24A	BZ	24.00	26.70	29.50	1.00	38.90	10.30	5
SMAJ26	CD	26.00	28.90	31.90	1.00	42.10	9.50	5
SMAJ26A	CE	26.00	28.90	31.90	1.00	42.10	9.50	5
SMAJ28	CF	28.00	31.10	34.40	1.00	45.40	8.80	5
SMAJ28A	CG	28.00	31.10	34.40	1.00	45.40	8.80	5
SMAJ30	CH	30.00	33.30	36.80	1.00	48.40	8.30	5
SMAJ30A	CK	30.00	33.30	36.80	1.00	48.40	8.30	5
SMAJ33	CL	33.00	36.70	40.60	1.00	53.30	7.50	5
SMAJ33A	CM	33.00	36.70	40.60	1.00	53.30	7.50	5
SMAJ36	CN	36.00	40.00	44.20	1.00	58.10	6.90	5
SMAJ36A	CP	36.00	40.00	44.20	1.00	58.10	6.90	5
SMAJ40	CQ	40.00	44.40	49.10	1.00	64.50	6.20	5
SMAJ40A	CR	40.00	44.40	49.10	1.00	64.50	6.20	5

## SMAJ\*\*\* Series

SMAJ43	CS	43.00	47.80	52.80	1.00	69.40	5.80	5
SMAJ43A	CT	43.00	47.80	52.80	1.00	69.40	5.80	5
SMAJ45	CU	45.00	50.00	55.30	1.00	72.70	5.50	5
SMAJ45A	CV	45.00	50.00	55.30	1.00	72.70	5.50	5
SMAJ48	CW	48.00	53.30	58.90	1.00	77.40	5.20	5
SMAJ48A	CX	48.00	53.30	58.90	1.00	77.40	5.20	5
SMAJ51	CY	51.00	56.70	62.70	1.00	82.40	4.90	5
SMAJ51A	CZ	51.00	56.70	62.70	1.00	82.40	4.90	5
SMAJ54	RD	54.00	60.00	66.30	1.00	87.10	4.60	5
SMAJ54A	RE	54.00	60.00	66.30	1.00	87.10	4.60	5
SMAJ58	RF	58.00	64.40	71.20	1.00	93.60	4.30	5
SMAJ58A	RG	58.00	64.40	71.20	1.00	93.60	4.30	5
SMAJ60	RH	60.00	66.70	73.70	1.00	96.80	4.10	5
SMAJ60A	RK	60.00	66.70	73.70	1.00	96.80	4.10	5
SMAJ64	RL	64.00	71.10	78.60	1.00	103.00	3.90	5
SMAJ64A	RM	64.00	71.10	78.60	1.00	103.00	3.90	5
SMAJ70	RN	70.00	77.80	86.00	1.00	113.00	3.50	5
SMAJ70A	RP	70.00	77.80	86.00	1.00	113.00	3.50	5
SMAJ75	RQ	75.00	83.30	92.10	1.00	121.00	3.30	5
SMAJ75A	RR	75.00	83.30	92.10	1.00	121.00	3.30	5
SMAJ78	RS	78.00	86.70	95.80	1.00	126.00	3.20	5
SMAJ78A	RT	78.00	86.70	95.80	1.00	126.00	3.20	5
SMAJ85	RU	85.00	94.40	104.00	1.00	137.00	2.90	5
SMAJ85A	RV	85.00	94.40	104.00	1.00	137.00	2.90	5
SMAJ90	RW	90.00	100.00	111.00	1.00	146.00	2.70	5
SMAJ90A	RX	90.00	100.00	111.00	1.00	146.00	2.70	5
SMAJ100	RY	100.00	111.00	123.00	1.00	162.00	2.50	5
SMAJ100A	RZ	100.00	111.00	123.00	1.00	162.00	2.50	5
SMAJ110	SD	110.00	122.00	135.00	1.00	177.00	2.30	5
SMAJ110A	SE	110.00	122.00	135.00	1.00	177.00	2.30	5
SMAJ120	SF	120.00	133.00	147.00	1.00	193.00	2.10	5
SMAJ120A	SG	120.00	133.00	147.00	1.00	193.00	2.10	5
SMAJ130	SH	130.00	144.00	159.00	1.00	209.00	1.90	5
SMAJ130A	SK	130.00	144.00	159.00	1.00	209.00	1.90	5
SMAJ150	SL	150.00	167.00	185.00	1.00	243.00	1.60	5
SMAJ150A	SM	150.00	167.00	185.00	1.00	243.00	1.60	5
SMAJ160	SN	160.00	178.00	197.00	1.00	259.00	1.50	5
SMAJ160A	SP	160.00	178.00	197.00	1.00	259.00	1.50	5
SMAJ170	SQ	170.00	189.00	209.00	1.00	275.00	1.50	5
SMAJ170A	SR	170.00	189.00	209.00	1.00	275.00	1.50	5
SMAJ180A	ST	180.00	198.00	221.00	1.00	291.00	1.40	5
SMAJ190A	SV	190.00	209.00	233.00	1.00	307.00	1.30	5
SMAJ200A	SX	200.00	220.00	246.00	1.00	324.00	1.30	5
SMAJ220A	SY	220.00	246.00	272.00	1.00	356.00	1.20	5
SMAJ250A	SZ	250.00	279.00	309.00	1.00	405.00	1.00	5

For bidirectional type having  $V_{rwm}$  of 10 volts and less, the IR limit is double.  
 For parts without A, the VBR is + 10%

# SMAJ\*\*\* Series

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

Fig. 1-Peak Pulse Power Rating Curve

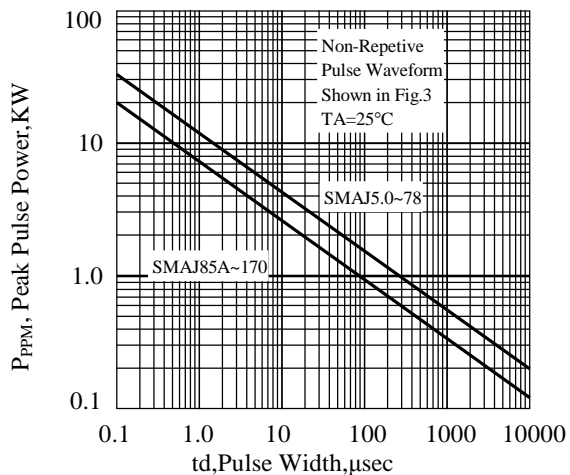


Fig. 2-Pulse Derating Curve

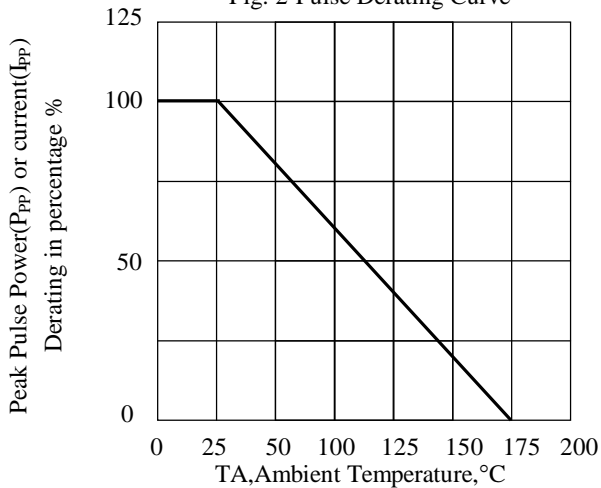


Fig. 3-Pulse Waveform

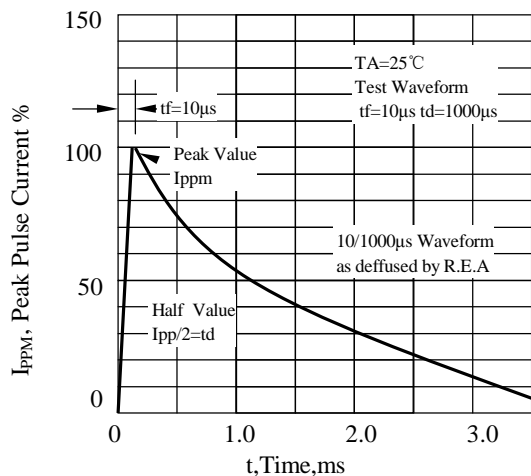


Fig. 4-Typical Junction Capacitance Unidirectional

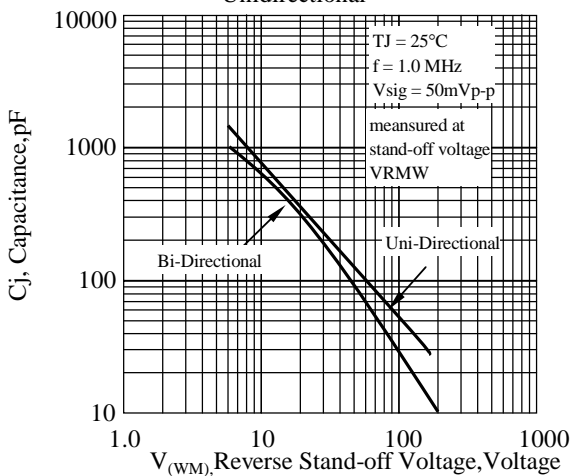


Fig 5. - typical transient thermal impedance

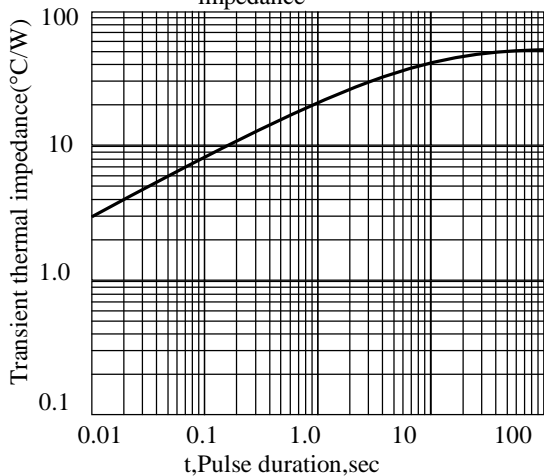
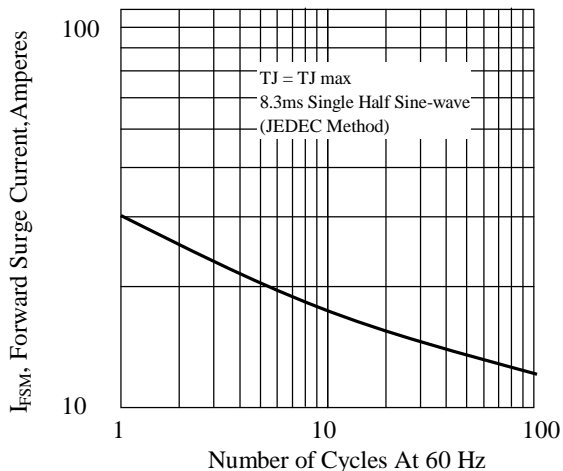
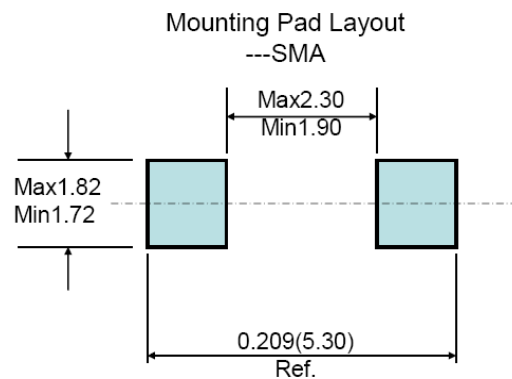
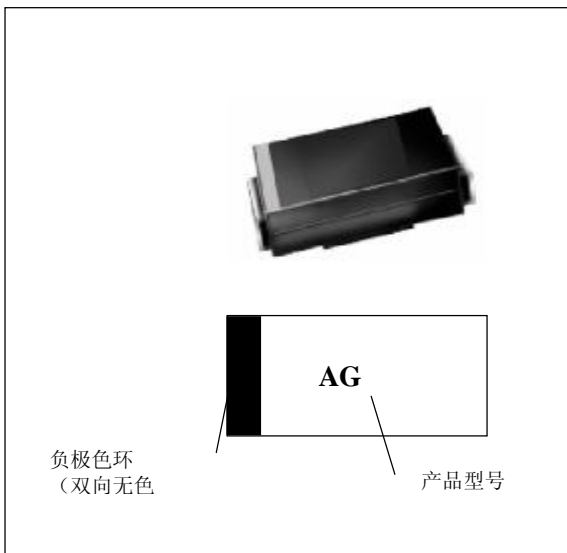
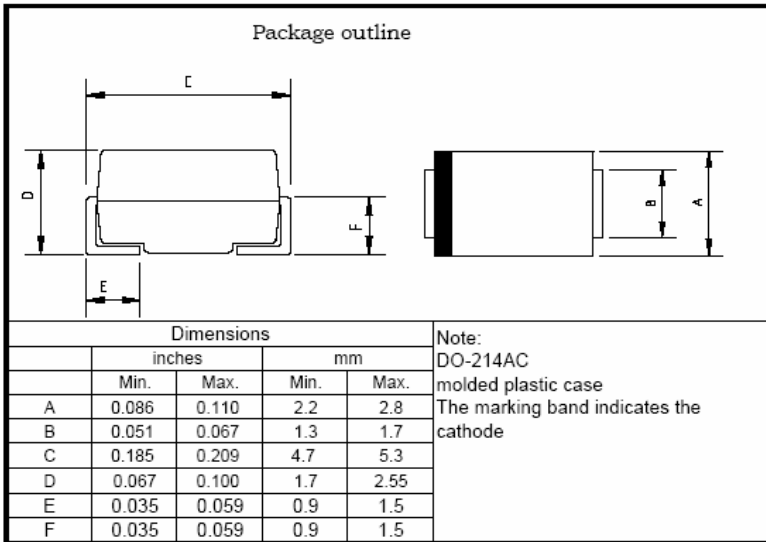


Fig. 6-Maximum Non-Repetitive Peak Forward Surge Current Unidirectional



## SMAJ\*\*\* Series

### 3. dimension:

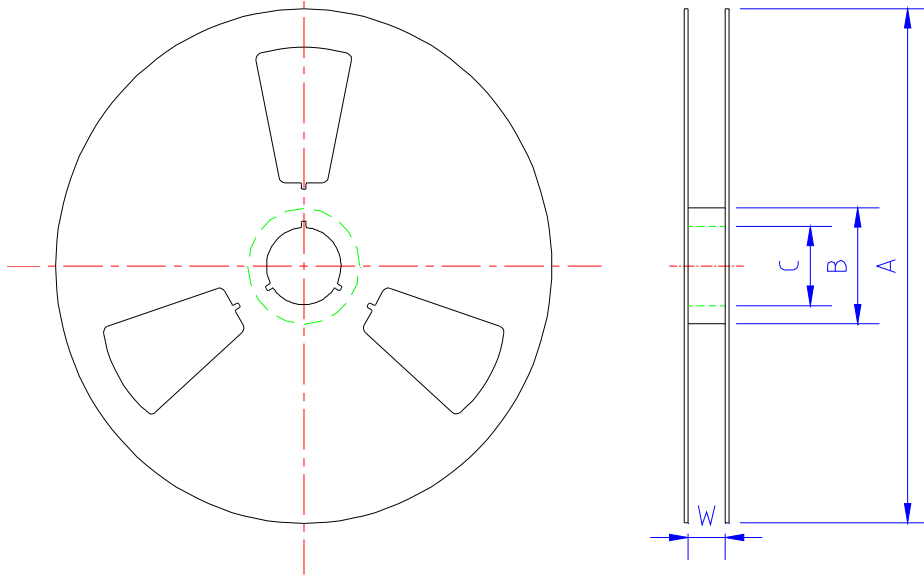


标题Title: <b>塑封生产线SMD产品包装规范</b> <b>Packaging specification of SMD</b>	文件编号: WI-258
	第 3 版 第 0 次修改
	第 2 页

SMD产品通用包装材料规格以及包装产品数量  
General packaging materials spec. and quantity

1.1 卷装 reel

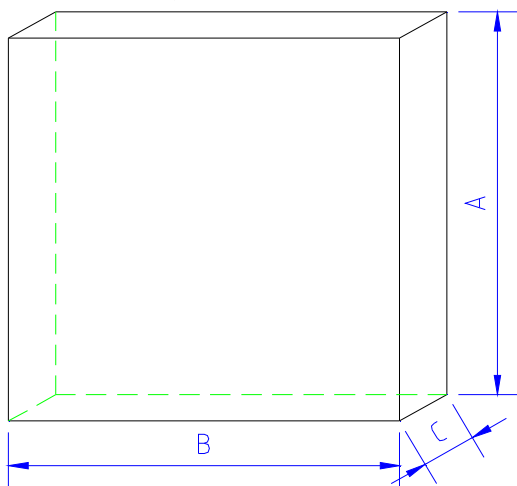
A. 卷盘规格 reel spec



单位: mm

规格	A	B	C	W	每卷数量
SMA 7"卷盘	177.0±2.0	54.0±0.5	13.0±0.5	13.2±0.2	2K
SMA13"卷盘	330.0±2.0	75.0±0.5	13.0±0.5	13.2±0.2	5K
SMB13"卷盘	330.0±2.0	75.0±0.5	13.0±0.5	13.5±0.5	3K
SMC13"卷盘	330.0±2.0	75.0±0.5	13.0±0.5	17.0±0.5	3K

B. 13"卷盘内盒 inner box



单位: mm

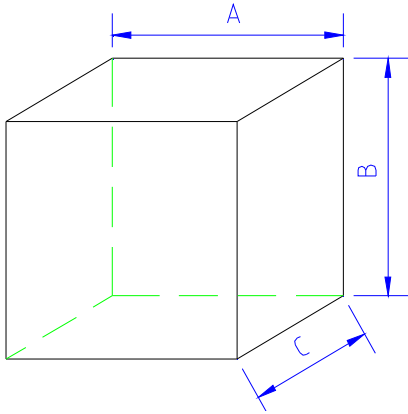
	A	B	C
尺寸	335±5.0	335±2.0	40±1.0

按以上包装方式, 产品包装数量: quantity

规格	每盒数量
SMA13"卷盘	10K
SMB13"卷盘	6K
SMC13"卷盘	6K

标题Title: <b>塑封生产线SMD产品包装规范</b> <b>Packaging specification of SMD</b>	文件编号: WI-258
	文件编号: WI-258
	第 3 页

C. 7"卷盘盒 box



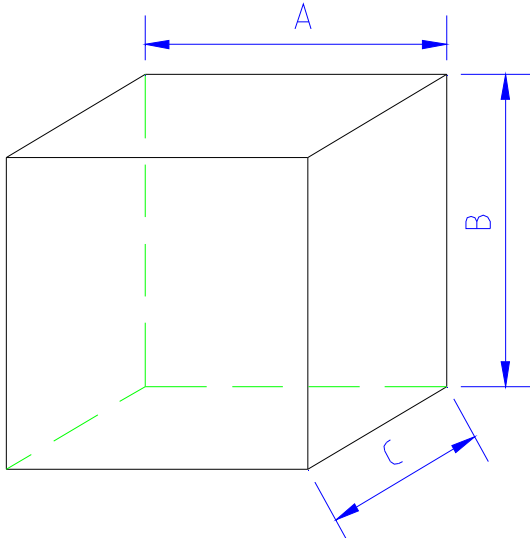
单位: mm

	A	B	C
尺寸	188±2.0	188±2.0	138±2.0

按以上包装方式, 产品包装数量: quantity

	每盒数量
7"卷盘	16K

D. 卷盘外箱 reel carton



单位: mm

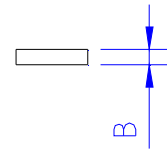
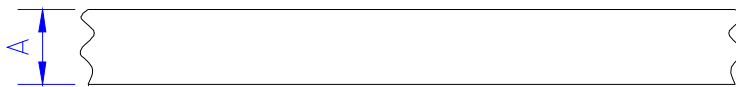
	A	B	C
尺寸	350±2.0	340±2.0	350±2.0

按以上包装方式, 产品包装数量:

规格	每箱数量
SMA 7"卷盘	80K
SMA13"卷盘	80K
SMB13"卷盘	48K
SMC13"卷盘	36K

1.2 编带规格 tape spec

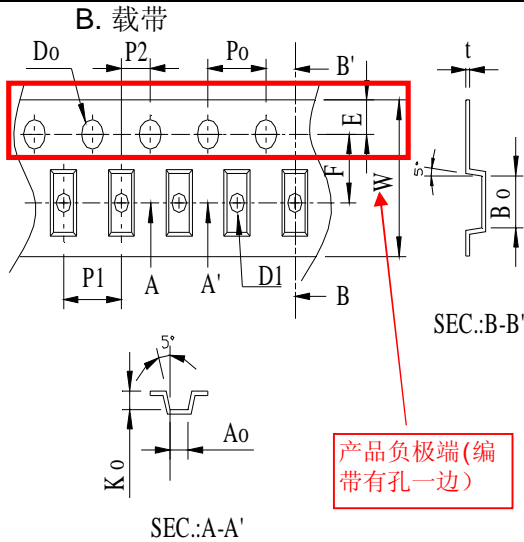
A. 盖带 Cover tape



单位: mm

	A	B
SMA	9.30±0.10	0.068±0.005
SMB		
SMC		

标题Title: <b>塑封生产线SMD产品包装规范</b> <b>Packaging specification of SMD</b>	文件编号: WI-258
	第 3 版 第 0 次修改
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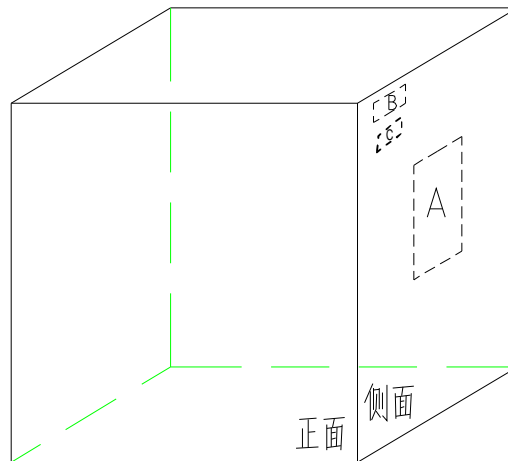
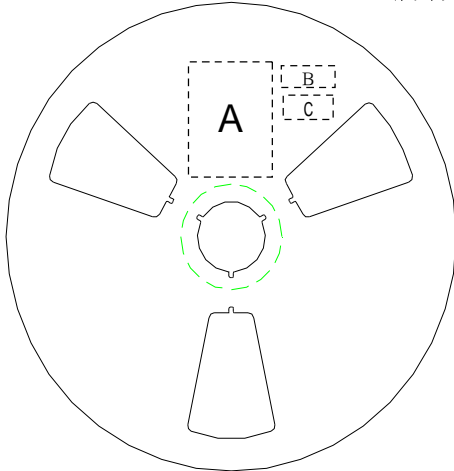
类型	SMA	SMB	SMC
W	12±0.3	12±0.3	16±0.3
P1	4±0.1	8±0.1	8±0.1
E	1.75±0.1	1.75±0.1	1.75±0.1
F	5.5±0.05	5.5±0.05	7.5±0.05
D0	1.55±0.05	1.55±0.05	1.55±0.05
D1	1.5±0.1	1.55±0.05	1.55±0.05
P0	4±0.1	4±0.1	4±0.1
P2	2±0.05	2±0.05	2±0.05
10P0	40±0.2	40±0.2	40±0.2
A0	2.79±0.1	3.8±0.1	6.05±0.1
B0	5.33±0.1	5.4±0.1	8.31±0.1
K0	2.36±0.1	2.45±0.1	2.54±0.1
T	0.25±0.05	0.25±0.05	0.25±0.05

## 2、SMD产品通用包装规范 General spec of SMD

### 5.2.1国内客户domestic

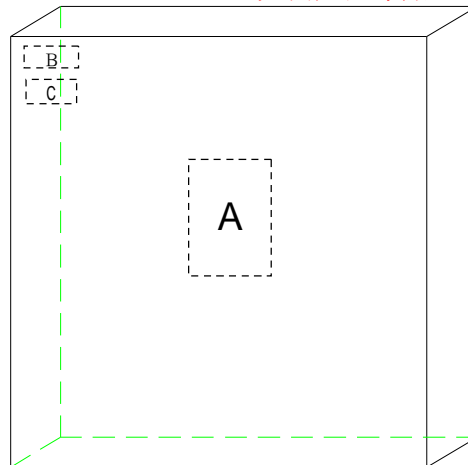
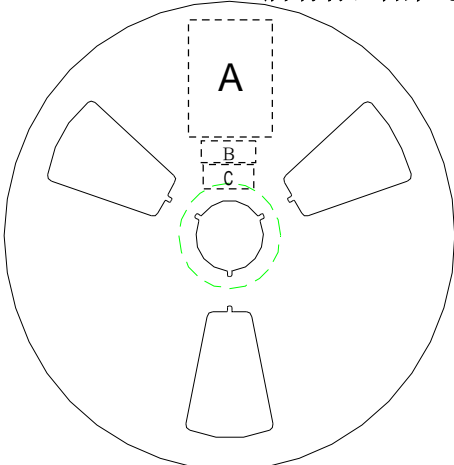
#### A. 7"卷盘reel

所有标签贴在卷盘负极 all the label on cathode side



A处:贴LRC标签; B处:贴ROHS标签 C处:贴无卤标签 HF label

#### B. 13"卷盘 所有标签贴在卷盘负极 all the label (无卤产品才贴HF only)




A处:贴LRC标签; B处:贴ROHS标签 C处:贴无卤标签 (无卤产品才贴HF only)



标题Title: <b>塑封生产线SMD产品包装规范</b> <b>Packaging specification of SMD</b>	文件编号: WI-258
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C. 标签要求label spec:

LRC标签label

型号 TYPE	*****	← LRC产品型号 type
数量(只) QTY(PCS)	*****	← 产品数量 quantity
批号 LOT	*****	← 产品批号 LOT
日期 DATE	*****	← 产品生产日期 date
检验员: CHECKER		

ROHS标签

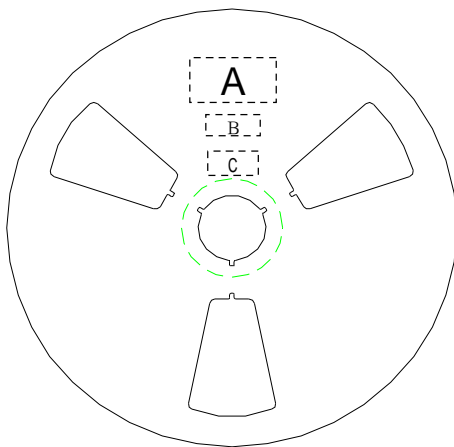


无卤标签 HF label

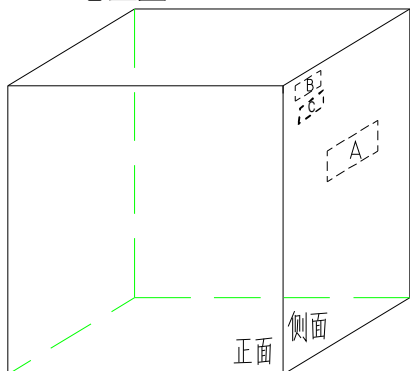


2.2 国外客户  
overseas

所有标签贴在卷盘负极 all the label on cathode side



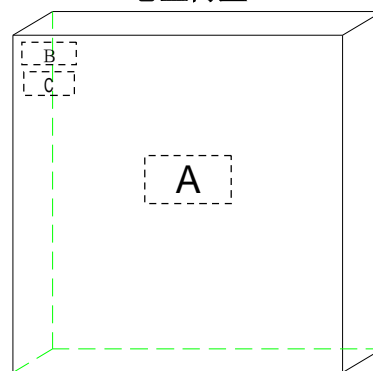
7"卷盘盒 inner box



A处:贴LRC标签;

B处:贴ROHS标签

13"卷盘内盒inner box



C处:贴无卤标签HF label  
(无卤产品才贴HF only)

<b>标题Title:</b> <b>塑封生产线SMD产品包装规范</b> <b>Packaging specification of SMD</b>	文件编号: WI-258
	第 3 版 第 0 次修改
	第 6 页

LRC标签label

<b>TYPE:*****</b>	← LRC产品型号
<b>MARK:*****</b>	← 印字型号
<b>Q'TY:*****</b>	← 产品数量
<b>DATE:*****</b>	← 产品生产日期

ROHS标签



无卤标签 HF label



**注意事项NOTE:**

- 13"卷盘内盒装好产品,需用热缩膜包装;13"reel'inner box must be packed by shrink film
- 所有编带产品卷装完成后,用白色胶带将编带粘牢;  
every tape after packing, must be fixed by white adhesive tape

**3.1产品出厂检验报告 testing report of the OQC**

每批出货时, 需要附上出厂检验报告 every lot must with test report

**3.2尾箱**

同一编码每批次只允许出现一个尾数箱, 对于尾数物料, 须用缓冲材料对空余部分填充好, 保证物料在受到一定的外作用力下不发生明显移动, 且物料间无碰撞。

The same coding is only one ending for each batch box materials for the mantissa to be good filled with cushioning material.

## SMAJ\*\*\* Series

### 4. Update Record

版次	更新记录	更新作者	更新日期
1	第一版	周杰	2010-4-27
2	调整储存温度为175度	周杰	2010-9-23
3	增加建议焊片尺寸，调整产品单只重量。	周杰	2011-12-6
4	明确双向产品印字规范。	周杰	2012-5-10