

# Transient Voltage Suppression Diodes: 5.0SMDJ Series

## SMD Type 5000 W



### ■ Features

1. For surface mounted applications
2. RoHS compliant and halogen-free
3. Reliable low cost construction utilizing molded plastic technique
4. Glass passivated chip junction
5. Both bi-directional and uni-directional devices are available
6. Typical IR less than 5μA above 20V
7. Fast response time
8. Excellent clamping capacity
9. 5000W peak pulse power capability with a 10/1000 μs waveform, repetition rate (duty cycle): 0.01%



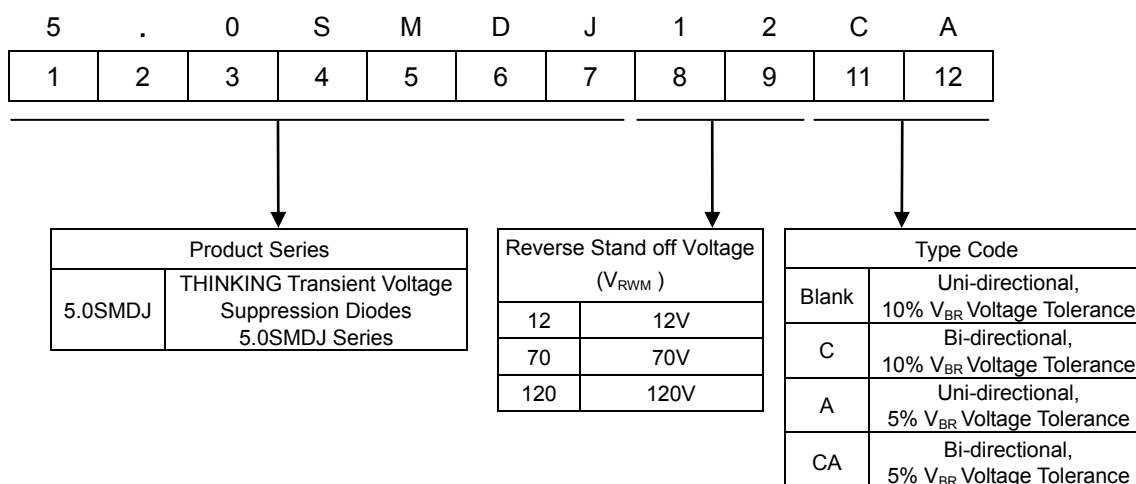
### ■ Recommended Applications

1. Telecommunication
2. Computer
3. Industrial device
4. Consumer electronic device

### ■ Mechanical Data

1. Case: DO-214AB (SMC), molded plastic meets UL flammability rating 94V-0
2. Terminal: Matte Tin-plated leads, solderable per MIL-STD-750, Method 2026.
3. Polarity: The band denotes cathode (Note: no polarity indicator for bi-directional devices)

### ■ Part Number Code



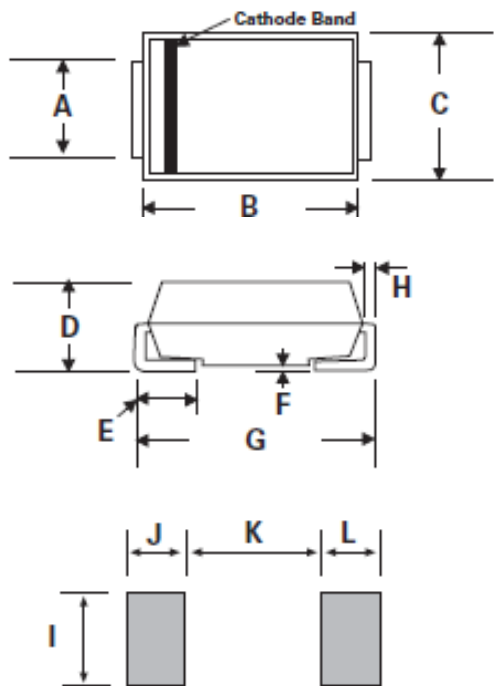
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### Structures and Dimensions

#### SMC/DO-214AB



Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.90	3.20	0.114	0.126
B	6.60	7.11	0.260	0.280
C	5.59	6.22	0.220	0.245
D	2.06	2.62	0.079	0.103
E	0.76	1.52	0.030	0.060
F	-	0.203	-	0.008
G	7.75	8.13	0.305	0.320
H	0.152	0.305	0.006	0.012
I	3.30	-	0.129	-
J/L	2.40	-	0.094	-
K	-	4.20	-	0.165

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

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at $T_A=25^\circ\text{C}$ by 10/1000 $\mu\text{s}$ waveform (Note1, Fig.1)	$P_{PPM}$	5000	W
Peak pulse current of on 10/1000 $\mu\text{s}$ waveform.(Note1, Fig.3)	$I_{PPM}$	See Table	A
Peak forward surge current, 8.3ms single half sine wave on rated load (Note 2)	$I_{FSM}$	300	A
Steady state power dissipation at $T_A=50^\circ\text{C}$ (Fig.5).	$P_{M(AV)}$	6.5	W
Operating junction and storage temperature range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

- Note:**
1. Please refer to Fig. 3 for non-repetitive current pulse, and Fig. 2 for derated above  $T_A = 25^\circ\text{C}$
  2. 8.3ms single half sine-wave, or square wave that has a maximum of 4 pulses per minute.

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

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage $V_{BR} @ I_T$		Test Current	Maximum Clamping Voltage $V_C @ I_{pp}$	Maximum Peak Pulse Current	Maximum Reverse Leakage $I_R @ V_{RWM}$	Marking Code	
			$V_{RWM} (V)$	Min(V)					Max(V)	$I_T (mA)$
5.0SMDJ12A	5.0SMDJ12CA	12	13.3	14.7	10	19.9	252	800	5PEP	5BEP
5.0SMDJ13A	5.0SMDJ13CA	13	14.4	15.9	10	21.5	233	500	5PEQ	5BEQ
5.0SMDJ14A	5.0SMDJ14CA	14	15.6	17.2	10	23.2	216	200	5PER	5BER
5.0SMDJ15A	5.0SMDJ15CA	15	16.7	18.5	1	24.4	205	100	5PES	5BES
5.0SMDJ16A	5.0SMDJ16CA	16	17.8	19.7	1	26	193	50	5PET	5BET
5.0SMDJ17A	5.0SMDJ17CA	17	18.9	20.9	1	27.6	181	20	5PEU	5BEU
5.0SMDJ18A	5.0SMDJ18CA	18	20	22.1	1	29.2	172	10	5PEV	5BEV
5.0SMDJ20A	5.0SMDJ20CA	20	22.2	24.5	1	32.4	155	5	5PEW	5BEW
5.0SMDJ22A	5.0SMDJ22CA	22	24.4	26.9	1	35.5	141	5	5PEX	5BEX
5.0SMDJ24A	5.0SMDJ24CA	24	26.7	29.5	1	38.9	129	5	5PEZ	5BEZ
5.0SMDJ26A	5.0SMDJ26CA	26	28.9	31.9	1	42.1	119	5	5PFE	5BFE
5.0SMDJ28A	5.0SMDJ28CA	28	31.1	34.4	1	45.4	110	5	5PFG	5BFG
5.0SMDJ30A	5.0SMDJ30CA	30	33.3	36.8	1	48.4	103	5	5PFK	5BFK
5.0SMDJ33A	5.0SMDJ33CA	33	36.7	40.6	1	53.3	93.9	5	5PFM	5BFM
5.0SMDJ36A	5.0SMDJ36CA	36	40	44.2	1	58.1	86.1	5	5PFP	5BFP
5.0SMDJ40A	5.0SMDJ40CA	40	44.4	49.1	1	64.5	77.6	5	5PFR	5BFR
5.0SMDJ43A	5.0SMDJ43CA	43	47.8	52.8	1	69.4	72.1	5	5PFT	5BFT
5.0SMDJ45A	5.0SMDJ45CA	45	50	55.3	1	72.7	68.8	5	5PFV	5BFV
5.0SMDJ48A	5.0SMDJ48CA	48	53.3	58.9	1	77.4	64.7	5	5PFX	5BFX
5.0SMDJ51A	5.0SMDJ51CA	51	56.7	62.7	1	82.4	60.7	5	5PFZ	5BFZ
5.0SMDJ54A	5.0SMDJ54CA	54	60	66.3	1	87.1	57.5	5	5RGE	5RGE
5.0SMDJ58A	5.0SMDJ58CA	58	64.4	71.2	1	93.6	53.5	5	5PGG	5BGG
5.0SMDJ60A	5.0SMDJ60CA	60	66.7	73.7	1	96.8	51.7	5	5PGK	5BGK
5.0SMDJ64A	5.0SMDJ64CA	64	71.1	78.6	1	103	48.6	5	5PGM	5BGM
5.0SMDJ70A	5.0SMDJ70CA	70	77.8	86	1	113	44.3	5	5PGP	5BGP
5.0SMDJ75A	5.0SMDJ75CA	75	83.3	92.1	1	121	41.4	5	5PGR	5BGR
5.0SMDJ78A	5.0SMDJ78CA	78	86.7	95.8	1	126	39.7	5	5PGT	5BGT
5.0SMDJ85A	5.0SMDJ85CA	85	94.4	104	1	137	36.5	5	5PGV	5BGV
5.0SMDJ90A	5.0SMDJ90CA	90	100	111	1	146	34.3	5	5PGX	5BGX

**Note:** For bidirectional type having  $V_{RWM}$  of 10 volts and under, the  $I_R$  limit is doubled.

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

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage $V_{BR}$ @ $I_T$		Test Current	Maximum Clamping Voltage $V_c$ @ $I_{pp}$	Maximum Peak Pulse Current	Maximum Reverse Leakage $I_R$ @ $V_{RWM}$	Marking Code	
			$V_{RWM}$ ( V )	Min( V )					Max( V )	$I_T$ ( mA )
5.0SMDJ100A	5.0SMDJ100CA	100	111	123	1	162	30.9	5	5PGZ	5BGZ
5.0SMDJ110A	5.0SMDJ110CA	110	122	135	1	177	28.3	5	5PHE	5BHE
5.0SMDJ120A	5.0SMDJ120CA	120	133	147	1	193	26	5	5PHG	5BHG
5.0SMDJ130A	5.0SMDJ130CA	130	144	159	1	209	24	5	5PHK	5BHK
5.0SMDJ140A	5.0SMDJ140CA	140	155	171	1	226.8	22.2	5	5PHB	5BHB
5.0SMDJ150A	5.0SMDJ150CA	150	167	185	1	243	20.6	5	5PHM	5BHM
5.0SMDJ160A	5.0SMDJ160CA	160	178	197	1	259	19.3	5	5PHP	5BHP
5.0SMDJ170A	5.0SMDJ170CA	170	189	209	1	275	18.2	5	5PHR	5BHR

**Note:** For bidirectional type having  $V_{RWM}$  of 10 volts and under, the  $I_R$  limit is doubled.

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### Rate and Characteristic Curve ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

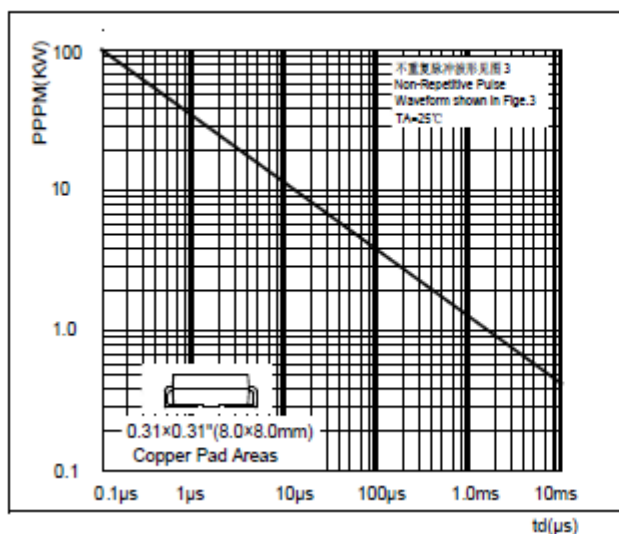


Figure 2. Pulse Derating Curve

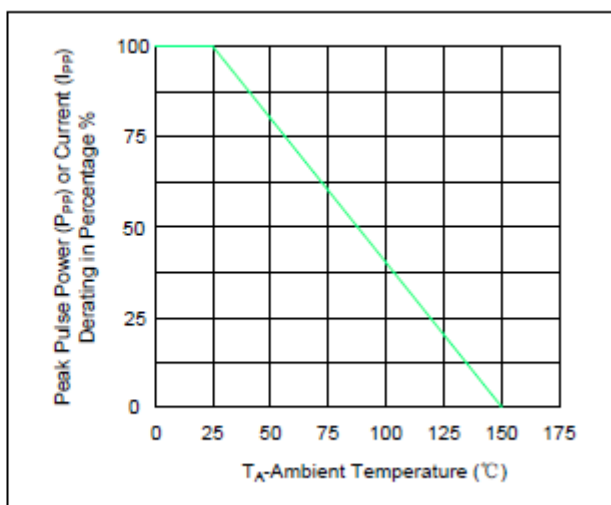


Figure 3. Pulse Waveform

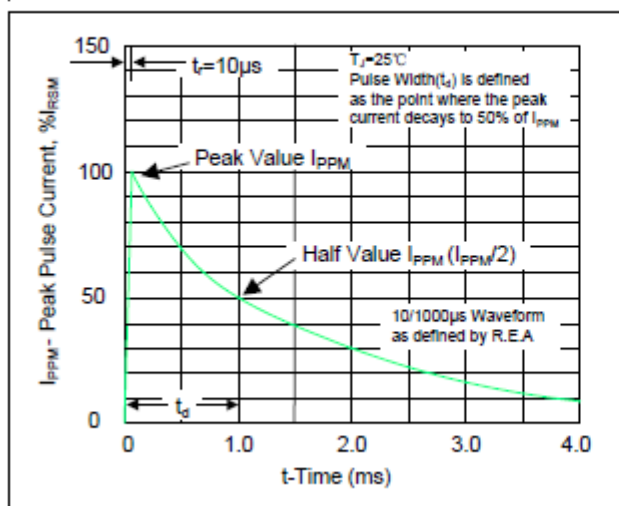


Figure 4. Typical Junction Capacitance

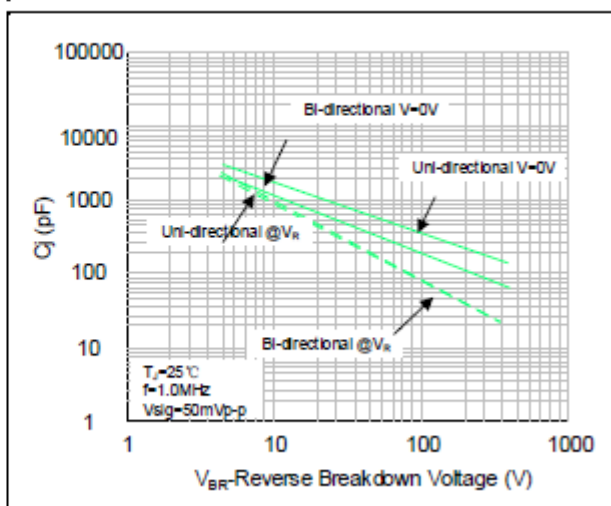


Figure 5. Steady State Power Dissipation Derating Curve

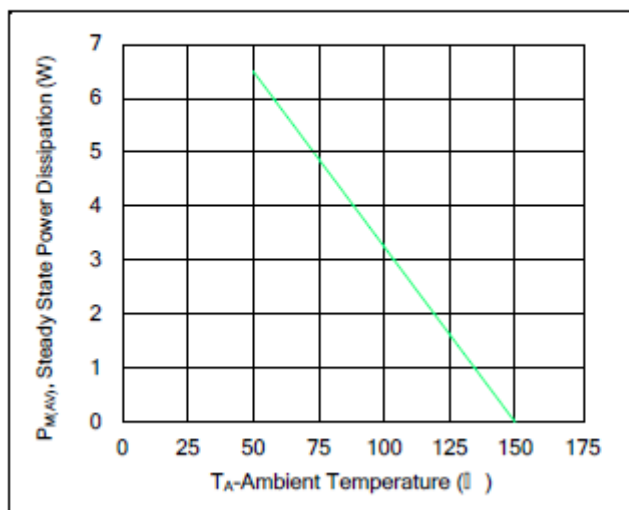
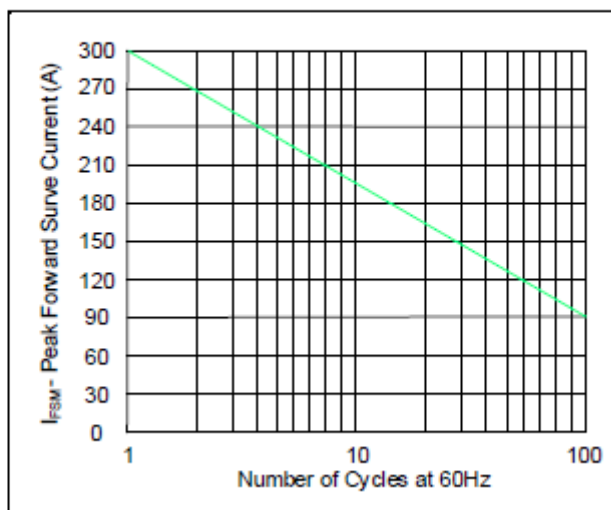


Figure 6. Maximum Non-Repetitive Forward Surge Current

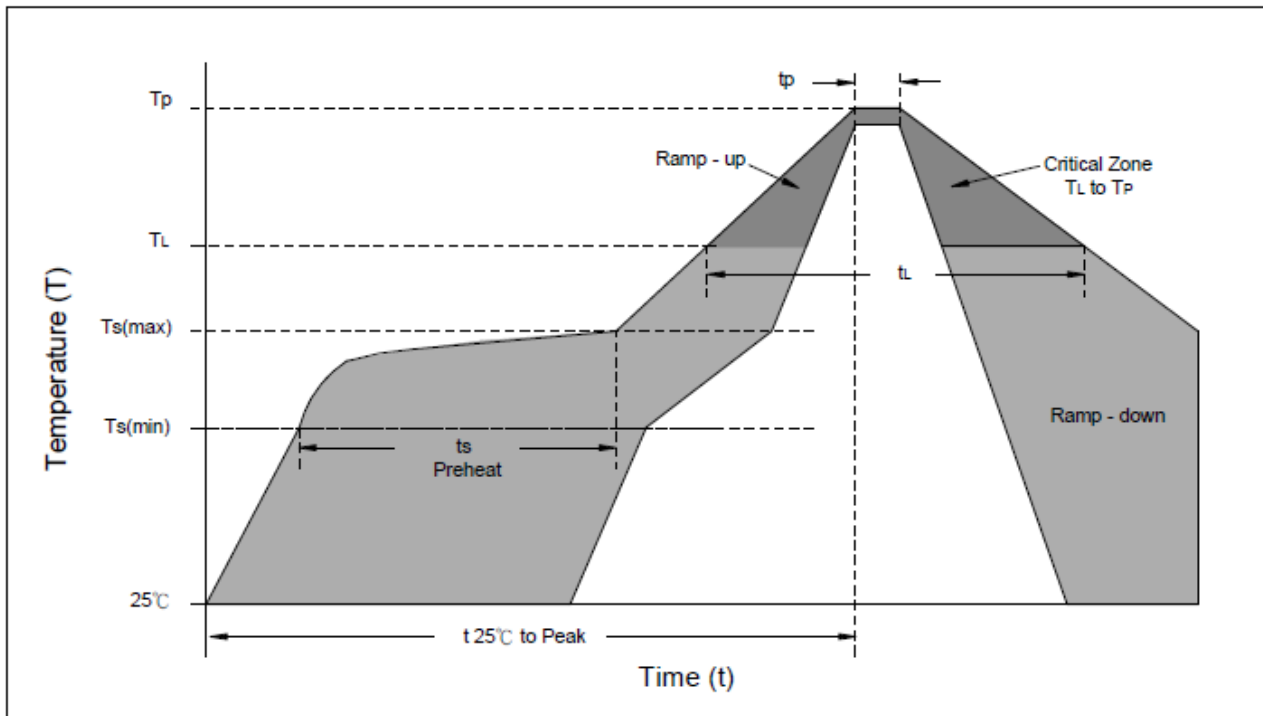


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### ■ Soldering Recommendation



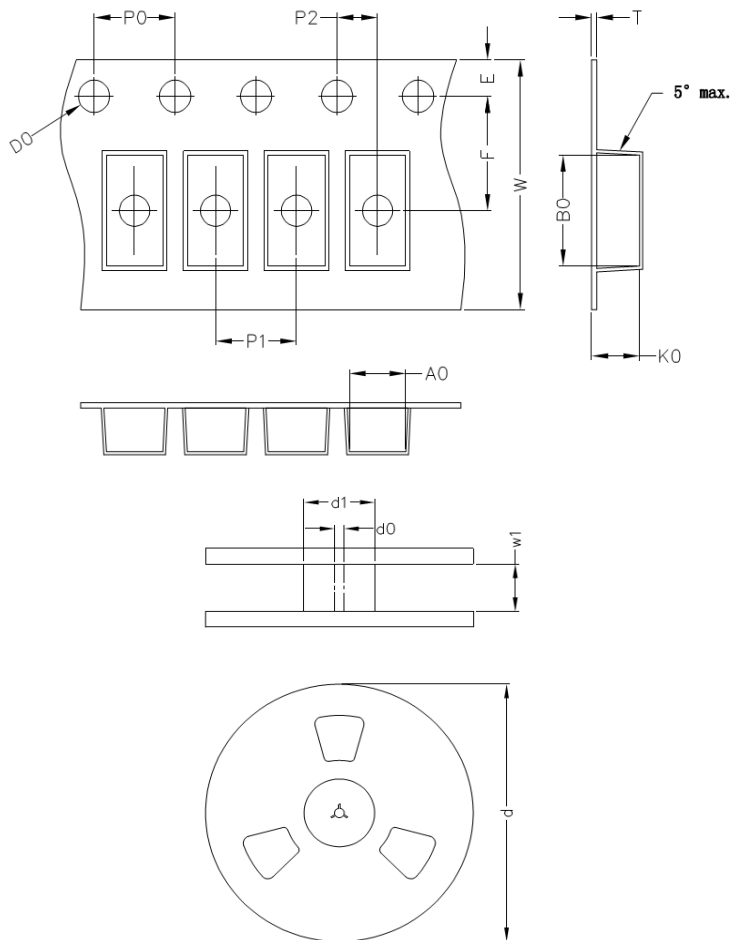
Reflow Condition	Lead-free assembly
<b>Preheat</b> -Temperature Min(Ts min) -Temperature Min(Ts max) -Time (min to max) (ts)	150°C 200°C 60 – 180 seconds
<b>Average ramp up rate</b> -Temperature Liquidus (TL) to peak	3°C/second max
<b>Ts(max) to TL</b> -Ramp-up Rate	3°C/second max.
<b>Reflow</b> -Temperature Liquidus (TL) -Time (tL)	217°C 60 – 150 seconds
<b>Peak Temperature (TP)</b>	260°C
<b>Time within 5°C of actual peak Temperature(TP)</b>	20 – 40 seconds
<b>Ramp-down Rate</b>	6°C/second max.
<b>Time 25°C to peak Temperature(TP)</b>	8 minutes max.
<b>Do not exceed</b>	260°C

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### ■ Packaging



Item	Symbol	DO-214AB (SMC) Unit: mm
Carrier width	A0	6.05
Carrier length	B0	8.31
Carrier depth	K0	2.54
Sprocket hole	D0	1.55
Sprocket hole position	E	1.75
Punch hole position	F	7.50
Sprocket hole pitch	P0	4.00
Carrier pitch	P1	8.00
Embossment center	P2	2.00
Tape thickness	T	0.25
Tape width	W	16.00
Reel outside diameter	d (13")	330.00
Reel inner diameter	d1	75
Feed hole diameter	d0	13.50
Reel inner width	w1	17.00

**Note:** The tolerance of carrier tape and top cover is  $\pm 0.1$ mm, and the tolerance of reel is  $\pm 2$ mm

### ■ Quantity

Package Type	Reel Size	Reel
	inch	Kpcs
SMC	13	3

### ■ Warehouse Storage Conditions of product

- Storage Condition:
  1. Storage Temperature:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
  2. Relative Humidity:  $\leq 75\% \text{RH}$
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.