

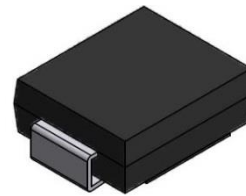
## Transient Voltage Suppressor

Version: A7 2018/6/15

### Features

- IEC 61000-4-2(ESD)  $\pm 15\text{KV}$ (air),  $\pm 8\text{KV}$ (contact)
- 1500Watts peak pulse power ( $t_p=10/1000\mu\text{S}$ )
- Quick response to surge voltage
- Low clamping voltage
- Moisture sensitivity level: Level 1

### Exterior



DO-214AB (SMC)

### Application Information

- DC Port
- RS485/232/422
- I/O Port

### Agency Approvals

Icon	Description
<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003

### Schematic Symbol



BI-directional



UNI-directional

### Part Number and Electrical Parameter

Part Number		Marking		$V_R$ (V)	$V_{BR}$ min.(V)	$V_{BR}$ max.( V)	$I_t$ (mA)	Max $V_c@I_{PP}^{\text{①}}$ (V)	$I_{PP}^{\text{①}}$ (A)	$I_R@V_R$ (uA)
BI	UNI	BI	UNI							
BV-SMCJ5CA	BV-SMCJ5A	C5C	C5	5	6.4	7	10	9.2	163.0	800
BV-SMCJ6CA	BV-SMCJ6A	C6C	C6	6	6.67	7.37	10	10.3	145.7	800
BV-SMCJ6.5CA	BV-SMCJ6.5A	C6.5C	C6.5	6.5	7.22	7.98	10	11.2	134.0	500
BV-SMCJ7CA	BV-SMCJ7A	C7C	C7	7	7.78	8.6	10	12	125.0	200
BV-SMCJ7.5CA	BV-SMCJ7.5A	C7.5C	C7.5	7.5	8.33	9.21	1	12.9	116.3	100
BV-SMCJ8CA	BV-SMCJ8A	C8C	C8	8	8.89	9.83	1	13.6	110.3	50
BV-SMCJ8.5CA	BV-SMCJ8.5A	C8.5C	C8.5	8.5	9.44	10.4	1	14.4	104.2	20
BV-SMCJ9CA	BV-SMCJ9A	C9C	C9	9	10	11.1	1	15.4	97.4	10
BV-SMCJ10CA	BV-SMCJ10A	C10C	C10	10	11.1	12.3	1	17	88.3	5
BV-SMCJ11CA	BV-SMCJ11A	C11C	C11	11	12.2	13.5	1	18.2	82.5	1
BV-SMCJ12CA	BV-SMCJ12A	C12C	C12	12	13.3	14.7	1	19.9	75.4	1
BV-SMCJ13CA	BV-SMCJ13A	C13C	C13	13	14.4	15.9	1	21.5	69.8	1
BV-SMCJ14CA	BV-SMCJ14A	C14C	C14	14	15.6	17.2	1	23.2	64.7	1
BV-SMCJ15CA	BV-SMCJ15A	C15C	C15	15	16.7	18.5	1	24.4	61.5	1
BV-SMCJ16CA	BV-SMCJ16A	C16C	C16	16	17.8	19.7	1	26	57.7	1
BV-SMCJ17CA	BV-SMCJ17A	C17C	C17	17	18.9	20.9	1	27.6	54.4	1
BV-SMCJ18CA	BV-SMCJ18A	C18C	C18	18	20	22.1	1	29.2	51.4	1

Part Number		Marking		V <sub>R</sub> (V)	V <sub>BR</sub> min.(V)	V <sub>BR</sub> max.(V)	I <sub>t</sub> (mA)	Max V <sub>C@I<sub>PP</sub></sub> (V)	I <sub>PP</sub> <sup>①</sup> (A)	I <sub>R@V<sub>R</sub></sub> (uA)
BI	UNI	BI	UNI							
BV-SMCJ20CA	BV-SMCJ20A	C20C	C20	20	22.2	24.5	1	32.4	46.3	1
BV-SMCJ22CA	BV-SMCJ22A	C22C	C22	22	24.4	26.9	1	35.5	42.3	1
BV-SMCJ24CA	BV-SMCJ24A	C24C	C24	24	26.7	29.5	1	38.9	38.6	1
BV-SMCJ26CA	BV-SMCJ26A	C26C	C26	26	28.9	31.9	1	42.1	35.7	1
BV-SMCJ28CA	BV-SMCJ28A	C28C	C28	28	31.1	34.4	1	45.4	33.1	1
BV-SMCJ30CA	BV-SMCJ30A	C30C	C30	30	33.3	36.8	1	48.4	31.0	1
BV-SMCJ33CA	BV-SMCJ33A	C33C	C33	33	36.7	40.6	1	53.3	28.2	1
BV-SMCJ36CA	BV-SMCJ36A	C36C	C36	36	40	44.2	1	58.1	25.9	1
BV-SMCJ40CA	BV-SMCJ40A	C40C	C40	40	44.4	49.1	1	64.5	23.3	1
BV-SMCJ43CA	BV-SMCJ43A	C43C	C43	43	47.8	52.8	1	69.4	21.7	1
BV-SMCJ45CA	BV-SMCJ45A	C45C	C45	45	50	55.3	1	72.7	20.6	1
BV-SMCJ48CA	BV-SMCJ48A	C48C	C48	48	53.3	58.9	1	77.4	19.4	1
BV-SMCJ51CA	BV-SMCJ51A	C51C	C51	51	56.7	62.7	1	82.4	18.2	1
BV-SMCJ54CA	BV-SMCJ54A	C54C	C54	54	60	66.3	1	87.1	17.3	1
BV-SMCJ58CA	BV-SMCJ58A	C58C	C58	58	64.4	71.2	1	93.6	16.1	1
BV-SMCJ60CA	BV-SMCJ60A	C60C	C60	60	66.7	73.7	1	96.8	15.5	1
BV-SMCJ64CA	BV-SMCJ64A	C64C	C64	64	71.1	78.6	1	103	14.6	1
BV-SMCJ70CA	BV-SMCJ70A	C70C	C70	70	77.8	86	1	113	13.3	1
BV-SMCJ75CA	BV-SMCJ75A	C75C	C75	75	83.3	92.1	1	121	12.4	1
BV-SMCJ78CA	BV-SMCJ78A	C78C	C78	78	86.7	95.8	1	126	11.9	1
BV-SMCJ85CA	BV-SMCJ85A	C85C	C85	85	94.4	104	1	137	11.0	1
BV-SMCJ90CA	BV-SMCJ90A	C90C	C90	90	100	111	1	146	10.3	1
BV-SMCJ100CA	BV-SMCJ100A	C100C	C100	100	111	123	1	162	9.3	1
BV-SMCJ110CA	BV-SMCJ110A	C110C	C110	110	122	135	1	177	8.5	1
BV-SMCJ120CA	BV-SMCJ120A	C120C	C120	120	133	147	1	193	7.8	1
BV-SMCJ130CA	BV-SMCJ130A	C130C	C130	130	144	159	1	209	7.2	1
BV-SMCJ150CA	BV-SMCJ150A	C150C	C150	150	167	185	1	243	6.2	1
BV-SMCJ160CA	BV-SMCJ160A	C160C	C160	160	178	197	1	259	5.8	1
BV-SMCJ170CA	BV-SMCJ170A	C170C	C170	170	189	209	1	275	5.5	1
BV-SMCJ180CA	BV-SMCJ180A	C180C	C180	180	201	222	1	292	5.1	1
BV-SMCJ200CA	BV-SMCJ200A	C200C	C200	200	224	247	1	324	4.6	1
BV-SMCJ220CA	BV-SMCJ220A	C220C	C220	220	246	272	1	356	4.2	1
BV-SMCJ250CA	BV-SMCJ250A	C250C	C250	250	279	309	1	405	3.7	1
BV-SMCJ300CA	BV-SMCJ300A	C300C	C300	300	335	371	1	486	3.1	1
BV-SMCJ350CA	BV-SMCJ350A	C350C	C350	350	391	432	1	567	2.6	1
BV-SMCJ400CA	BV-SMCJ400A	C400C	C400	400	447	494	1	648	2.3	1
BV-SMCJ440CA	BV-SMCJ440A	C440C	C440	440	492	543	1	713	2.1	1

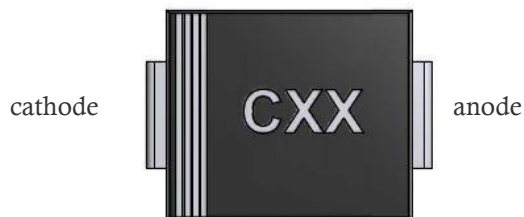
Note: absolute maximum ratings measured at T= 25°C RH = 45%-75% (unless otherwise noted).

① Surge Waveform: 10/1000μ S

Mark



BI:CXXC



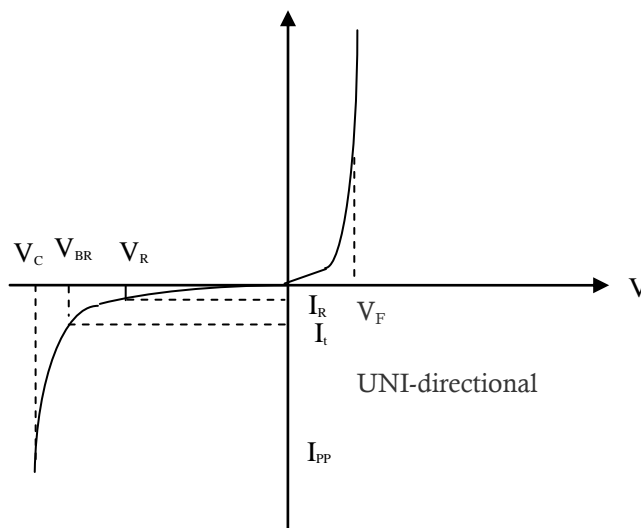
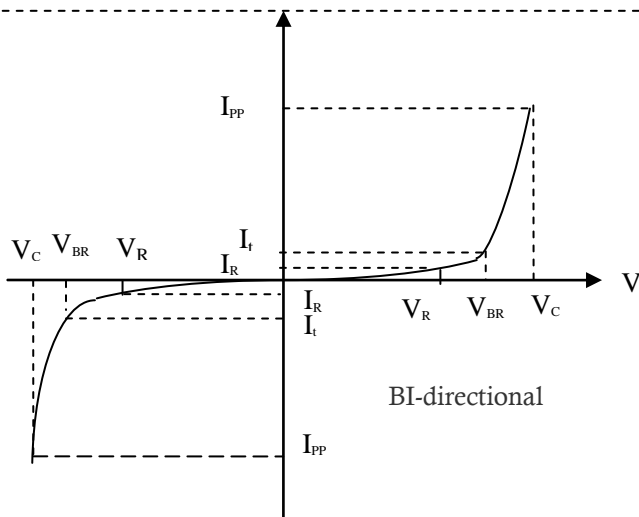
UNI:CXX

### Part Number System

BV SMCJ XX C A  
 (1) (2) (3) (4) (5)

- (1) Bencent Transient Voltage Suppressor
- (2) Series Code
- (3)  $V_R=XXV$
- (4) BI-directional
- (5) Suffix 'A' denotes 5% tolerance devices

### V-I Curve



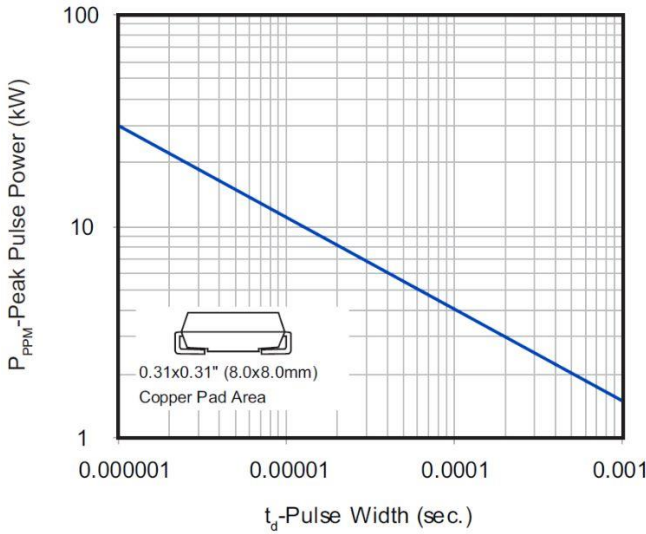
Parameters	Definition
$V_F$	Forward Voltage drop for UNI-directional
$V_C$	Clamping Voltage
$I_{pp}$	Surge Waveform 10/1000 $\mu$ s
$V_R$	Stand-off Voltage
$V_{BR}$	Breakdown Voltage
$I_R$	Reverse Leakage Current
$I_t$	Test Current
$P_{pp}$	Peak Pulse Power Dissipation

### Thermal Considerations

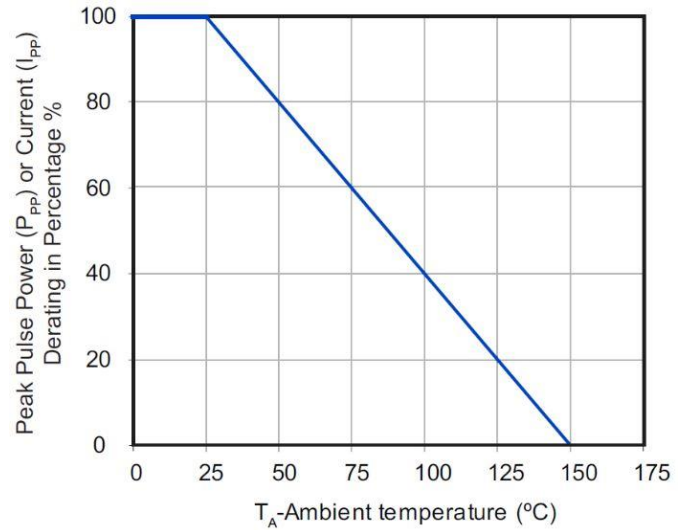
symbol	Parameter	Value	Unit
$T_J$	Operating Junction Temperature Range	-55 to +150	$^{\circ}C$
$T_S$	Storage Temperature Range	-55 to +150	$^{\circ}C$

#### Typical Characteristics

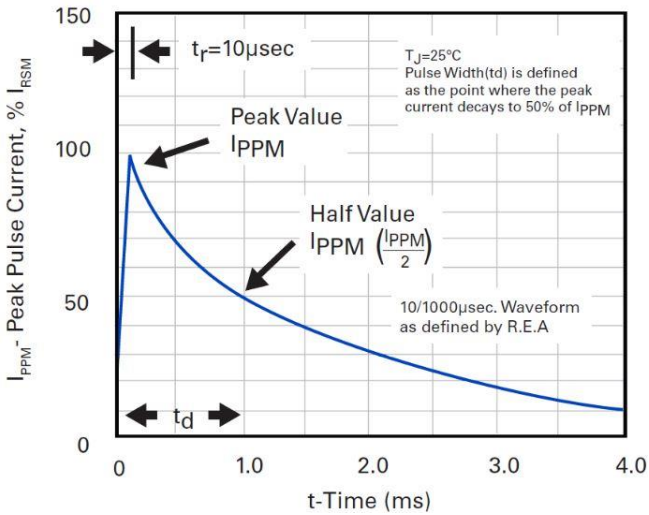
Peak Pulse Power Rating Curve



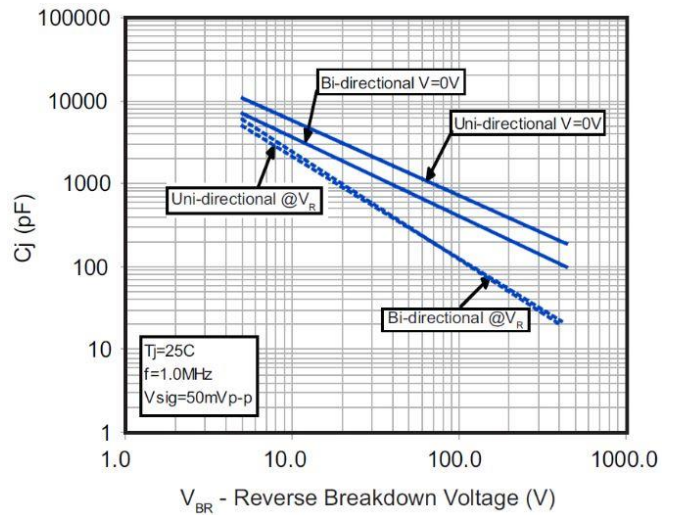
Pulse Derating Curve



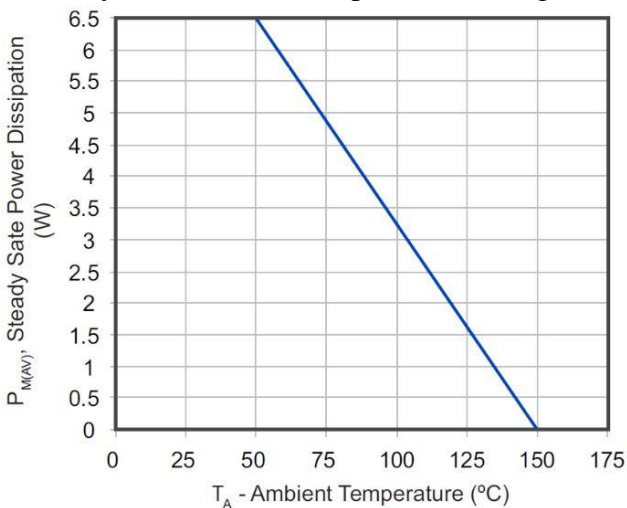
Pulse Waveform



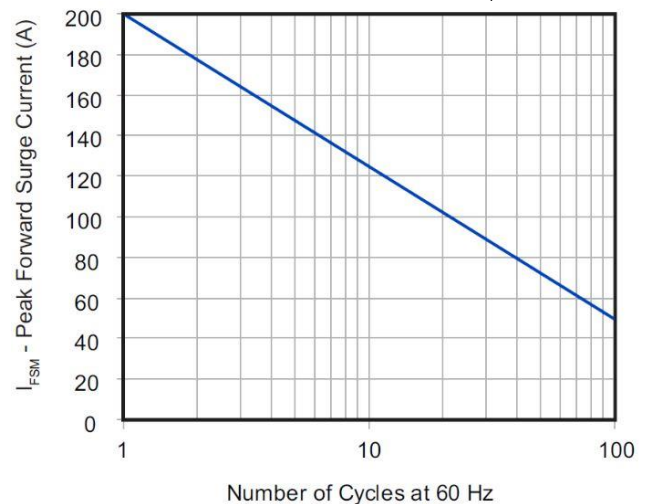
Typical Junction Capacitance



Steady State Power Dissipation Derating Curve



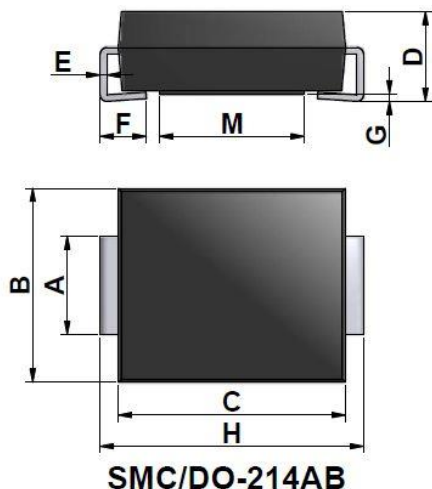
Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



## Transient Voltage Suppressor

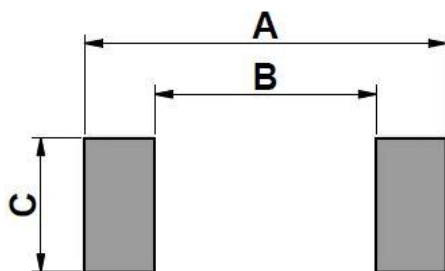
Version: A7 2018/6/15

### Product Dimensions



REF	mm	inch
A	$3 \pm 0.1$	$0.118 \pm 0.004$
B	$6 \pm 0.2$	$0.236 \pm 0.008$
C	$7 \pm 0.2$	$0.276 \pm 0.008$
D	$2.7 \pm 0.3$	$0.106 \pm 0.012$
E	$0.2 \pm 0.1$	$0.008 \pm 0.004$
F	$1.3 \pm 0.3$	$0.051 \pm 0.012$
G	$0 \sim 0.4$	$0.000 \sim 0.016$
H	$8 \pm 0.25$	$0.315 \pm 0.010$
M	$4.4 \pm 0.2$	$0.173 \pm 0.008$

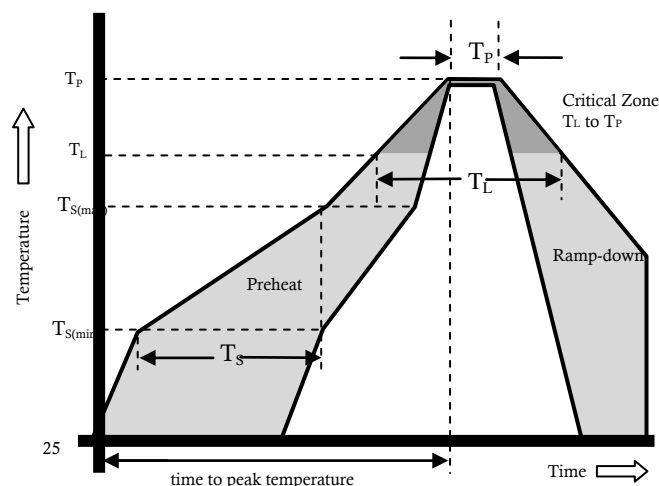
### Recommended Soldering Pad



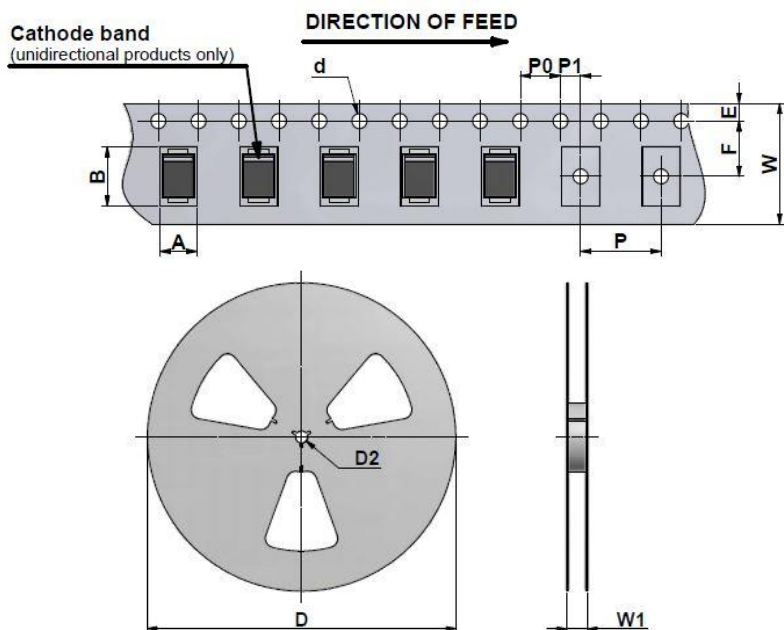
REF	mm	inch
A	8.25	0.325
B	5.05	0.199
C	3.05	0.120

### Reflow Profile

Reflow Condition		Pb-Free Assembly
Pre Heat	Temperature Min.	+150°C
	Temperature Max.	+200°C
	Time(Min to Max)	60 – 180 seconds
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
Ts(max) to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $T_L$ )	60 – 150 seconds
Peak Temp ( $T_P$ )		260+0/-5 °C
Time within 5°C of actual Peak Temp ( $T_P$ )		8-15 seconds
Ramp-down Rate		6°C/s max
Time 25°C to peak Temp ( $T_P$ )		8 min max.
Do not exceed		260°C



### Package Reel Information



REF.	mm	inch
A	6.1±0.3	0.240±0.012
B	8.3±0.3	0.327±0.012
d	1.5±0.1	0.059±0.004
D	330.0	13.0
D2	13±1.5	0.512±0.059
E	1.7±0.3	0.067±0.012
F	7.5±0.3	0.295±0.012
P	8±0.3	0.315±0.012
P0	4±0.3	0.157±0.012
P1	2±0.3	0.079±0.012
W	16±0.5	0.630±0.020
W1	23±3	0.906±0.118

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3,000	48,000	330	360	360	385