KAMAYA OHM

No.:	SPC–K–HTS-0001 /5
Date:	2017. 4. 21

Data sheet

Title: ESD SUPPRESSOR; RECTANGULAR TYPE

Style: SPC06, 10

AEC-Q200 qualified

RoHS COMPLIANCE ITEM
Halogen and Antimony Free

Note: ・Stock conditions
Temperature: +5°C ~ +35°C
Relative humidity: 25% ~ 75%
The period of guarantee: Within 2 year from shipmen t by the company.
Solderability shall be satisfied.

・Product specification contained in this data sheet
are subject to change at any time without notice

・If you have any questions or a Purchasing Specification for any quality Agreement is necessary, please contact our sales staff.

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KAMAYA ELECTRIC CO., LTD.
Hokkaido Research Center
Approval by: T. Sannomiya
Drawing by: M. Shibuya

1. Scope

1.1 This data sheet covers the detail requirements for ESD suppressor; rectangular type, style of SPC06, 10.

2. Classification

Type designation shall be the following form.

(Example) SPC (1) 10 (2) 501 (3) A (4) 01 (5) TH (6)

1 ESD suppressor; rectangular type
2 Size
Style

3 Peak voltage

Symbol	Peak voltage
501	50×10^{1}V

4 Rated voltage

Symbol	Rated voltage
A	30V max
C	50V max

5 Optional code

Symbol	Optional code
01	Capacitance: 0.1 pF max.

6 Packaging form

B	Bulk (loose package)
PA	Press pocket taping
TH	Paper taping

3. Rating

3.1 The ratings shall be in accordance with Table–1.

Table–1

Style	ESD capability *1			Rated voltage (V)	Capacitance (pF) *2	Leakage current (μA)
	Peak voltage (V)	Clamping voltage (V)	ESD pulse withstand (pulses)			
SPC06	500 max.	100 max.	50	30 max.	0.1 max.	1 max.
SPC10	500 max.	100 max.	100	30 max. 50 max.	0.1 max.	1 max.

Style	Category temperature range (°C)
SPC06	–55 to +125
SPC10	

*1 Peak voltage: IEC61000-4-2, 8kV, Contact discharge, The peak voltage shall be measured.
Clamping voltage: IEC61000-4-2, 8kV, Contact discharge, The voltage value shall be measured after 30ns from the peak voltage.
ESD pulse withstand: IEC61000-4-2, 8kV, Contact discharge, The pulse withstand.
*2 Capacitance: 25°C, 1MHz, 1Vrms

4. Packaging form

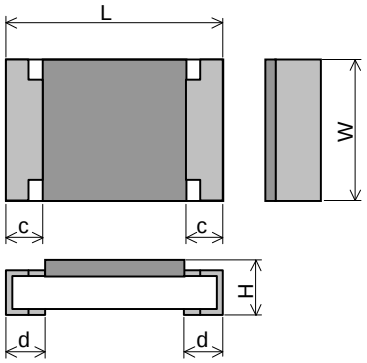
The standard packaging form shall be in accordance with Table–2.

Table–2

Symbol	Packaging form		Standard packaging quantity / units	Application
B	Bulk (loose package)		1,000 pcs.	SPC06, 10
PA	Press pocket taping (paper taping)	8mm width, 2mm pitches	15,000 pcs.	SPC06
TH	Paper taping	8mm width, 2mm pitches	10,000 pcs.	SPC10

5. Dimensions

5.1 The suppressor shall be of the design and physical dimensions in accordance with Figure–1 and Table–3.

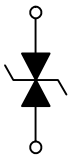


Figure–1

Table–3 Unit : mm

Style	L	W	H	c	d
SPC06	0.6±0.03	0.3±0.03	0.23±0.03	0.15±0.10	0.15±0.10
SPC10	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.10	0.25±0.10

5.2 Equivalent circuits



6. Performance

6.1 Unless otherwise specified, the standard range of atmospheric conditions for tests is as follows;
Ambient temperature: 5 °C to 35 °C, Relative humidity: 45 % to 85 %, Air presser: 86 kPa to 106 kPa
If there is any doubt the results, measurements shall be made within the following:
Ambient temperature: 20 °C ± 2 °C, Relative humidity: 60 % to 70 %, Air presser: 86 kPa to 106 kPa

6.2 The performance shall be satisfied in Table–4.

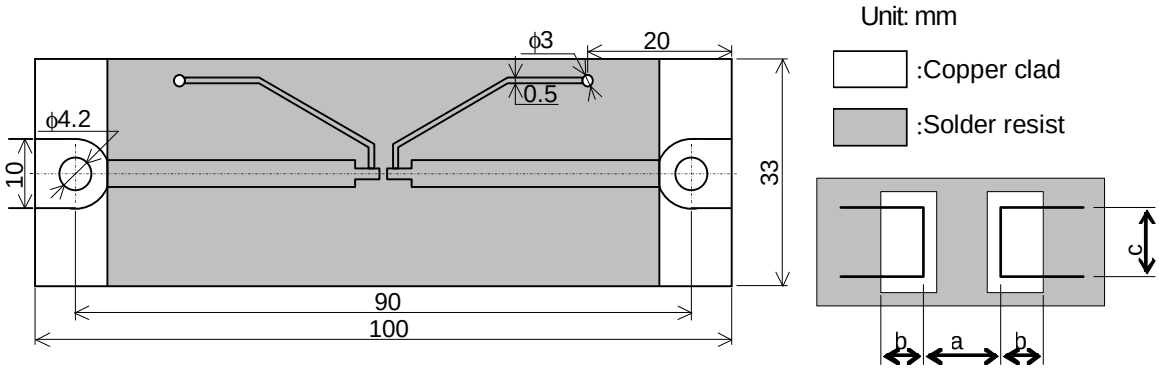
Table–4(1)

No.	Test items	Condition of test	Performance requirements
1	ESD capability Peak voltage	IEC61000-4-2 The suppressor shall be mounted on the test substrate as shown in Figure–2. Test condition: 8kV, Contact discharge Measurement: The peak voltage shall be measured.	500V max.
2	ESD capability Clamp voltage	IEC61000-4-2 The suppressor shall be mounted on the test substrate as shown in Figure–2. Test condition: 8kV, Contact discharge Measurement: The voltage value shall be measured after 30ns from the peak voltage.	100V max.
3	ESD capability ESD pulse withstand	IEC61000-4-2 The suppressor shall be mounted on the test substrate as shown in Figure–2. Test condition: 8kV, Contact discharge Applied pulses: SPC06: 20 pulses, SPC10: 100 pulses Measurement: After examination, the current value when the rated voltage is applied is measured.	10μA max.
4	Capacitance	Measurement condition: Frequency: 1MHz±10% Voltage: 1 Vrms±0.2Vrms Ambient temperature:25°C± 2 °C	0.1pF max.
5	Leakage current	Measurement voltage: Rated voltage Measurement: The current value when the measurement voltage is applied is measured.	1μA max.
6	Terminal bond strength of the face plating	JIS C 60068-2-21 The suppressor shall be mounted on the test substrate as shown in Figure–2. Bending value: 3 mm (Among the fulcrums: 90 mm) Duration: 10 s ± 1 s	Leakage current: 10μA max. No evidence of mechanical damage.
7	Resistance to soldering heat	JIS C 60068-2-58 Test by a piece. Temp. of solder bath: 260 °C ± 5 °C Immersion time: 10 s ± 1 s After immersion into solder, leaving the room temp. for 48h or more, and then measure the leakage current.	Leakage current: 10μA max. No evidence of appearance damage
		• Reflow soldering Pre–heating: 150 °C ~ 180 °C, 120 s max. Peak: 260 °C ± 5 °C, 10 s max. Reflow cycle: 2 times After immersion into solder, leaving the room temp. for 48h or more, and then measure the leakage current.	
8	Solderability	JIS C 60068-2-58 Test by a piece Flux: Rosin–Methanol Temp. of solder: bath: 235 °C ± 5 °C Immersion time: 2 s ± 0.5 s	The surface of terminal immersed shall be min. of 95 % covered with a new coating of solder.

Table–4(2)

9	Solvent	JIS C 60068-2-45 The specimen shall be cleansed at normal temperature for 90s using Isopropyl alcohol.	No evidence of appearance damage
10	Rapid change temperature	JIS C 60068-2-14 The suppressor shall be mounted on the test substrate as shown in Figure–2. Lower temperature: –55 °C Upper temperature: +125 °C Duration of exposure at each temperature: 30 min. Number of cycles: 100 cycles After examination, leaving the room temp. for 48h or more, and then measure the leakage current.	Leakage current: 10μA max. No evidence of appearance damage
11	Humidity (Steady state)	JIS C 60068-2-78 The suppressor shall be mounted on the test substrate as shown in Figure–2. Test temp. & relative humidity: 60±2°C & 90~95% RH. Test period: 1,000 $^{+48}_{0}$ h After examination, leaving the room temp. for 48h or more, and then measure the leakage current.	Leakage current: 10μA max. No evidence of appearance damage
12	Load life in humidity	The suppressor shall be mounted on the test substrate as shown in Figure–2. Test temp. & relative humidity: 60±2°C & 90~95% R.H. Test voltage: Rated voltage shall be applied continuously. Test period: 1,000 $^{+48}_{0}$ h After examination, leaving the room temp. for 48h or more, and then measure the leakage current.	Leakage current: 10μA max. No evidence of appearance damage
13	Endurance at 85 °C	The suppressor shall be mounted on the test substrate as shown in Figure–2. Test temp.: 85±2°C Test voltage: Rated voltage shall be applied continuously. Test period: 1,000 $^{+48}_{0}$ h After examination, leaving the room temp. for 48h or more, and then measure the leakage current.	Leakage current: 10μA max. No evidence of appearance damage

7. Test substrate



Style	a	b	c
SPC06	0.3	0.35	0.35
SPC10	0.6	0.65	0.7

Figure–2 SPC TEST SUBSTRATE

Remark 1). Material: Epoxide woven glass
Thickness: 1. 6mm Thickness of copper clad: 0. 035mm

8. Taping

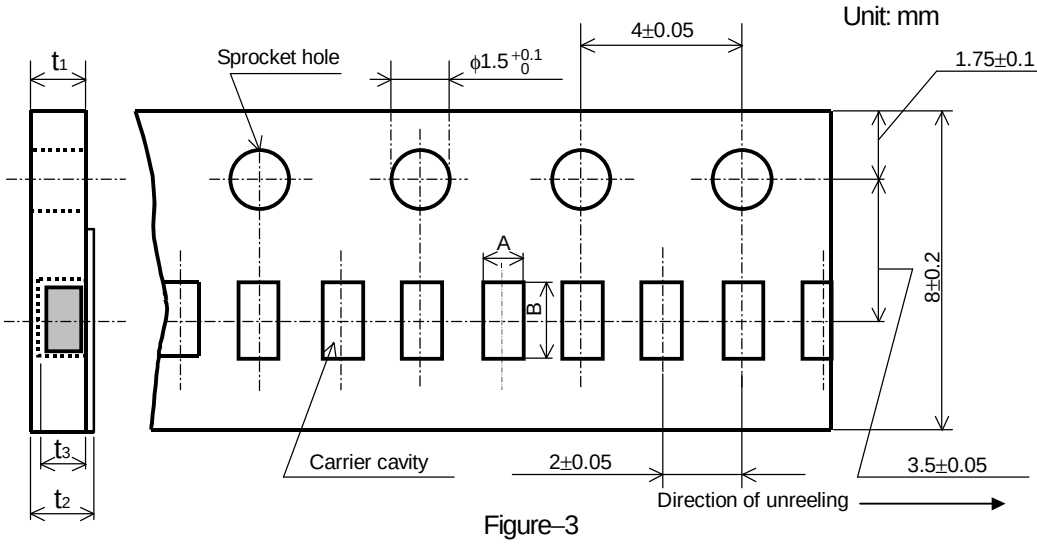
8.1 Applicable documents JIS C 0806–3: 2014, EIAJ ET–7200C: 2010.

8.2 Taping dimensions

8.2.1 Press pocket taping (Paper taping, 8mm width, 2mm pitches)

Taping dimensions shall be in accordance with Figure–3 and Table–5.

Unit: mm



Figure–3

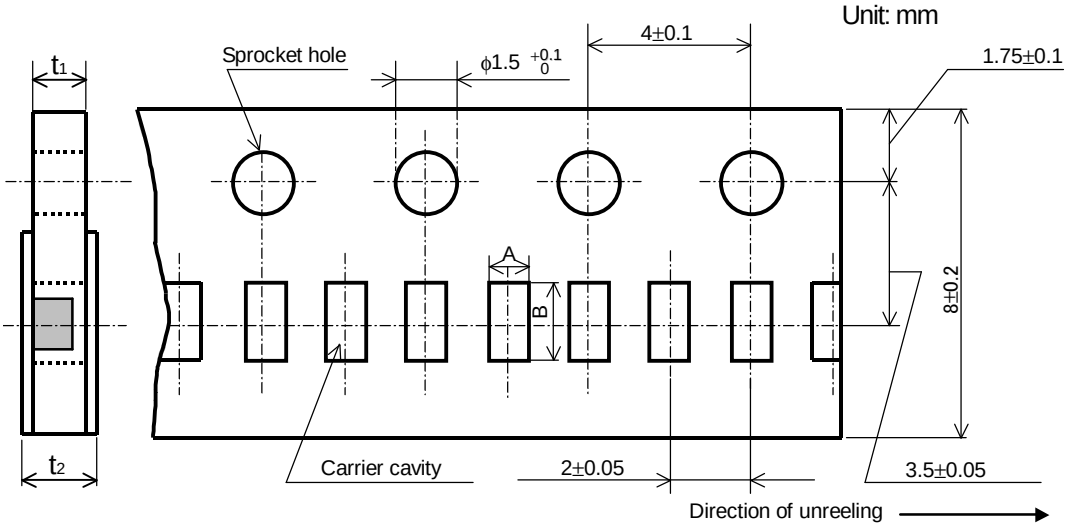
Table–5 Unit: mm

Style	A	B	t_1	t_2	t_3
SPC06	0.37±0.05	0.67±0.05	0.42±0.03	0.45±0.05	0.27± 0.02

8.2.2 Paper taping (8mm width, 2mm pitches)

Taping dimensions shall be in accordance with Figure–4 and Table–6.

Unit: mm

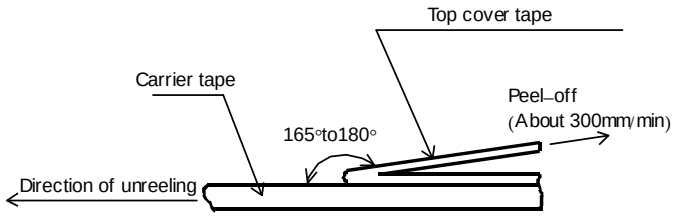


Figure–4

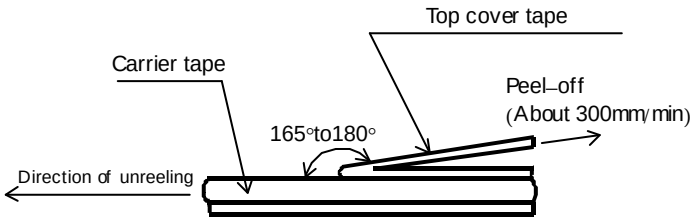
Table–6 Unit: mm

Style	A	B	t_1	t_2
SPC10	$0.65^{+0.05}_{-0.10}$	$1.15^{+0.05}_{-0.10}$	0.4 ± 0.05	0.5max.

1). The cover tapes shall not cover the sprocket holes.
2). Tapes in adjacent layers shall not stick together in the packing.
3). Components shall not stick to the carrier tape or to the cover tape.
4). Pitch tolerance over any 10 pitches ±0.2mm.
5). The peel strength of the top cover tape shall be with in 0.1N to 0.5N on the test method as shown in the following SPC06: Figure–5, SPC10: Figure–6.
6). When the tape is bent with the minimum radius for 25 mm, the tape shall not be damaged and the components shall maintain their position and orientation in the tape.
7). In no case shall there be two or more consecutive components missing.
The maximum number of missing components shall be one or 0.1%, whichever is greater.
8). The suppressors shall be faced to upward at the over coating side in the carrier cavity.



Figure–5

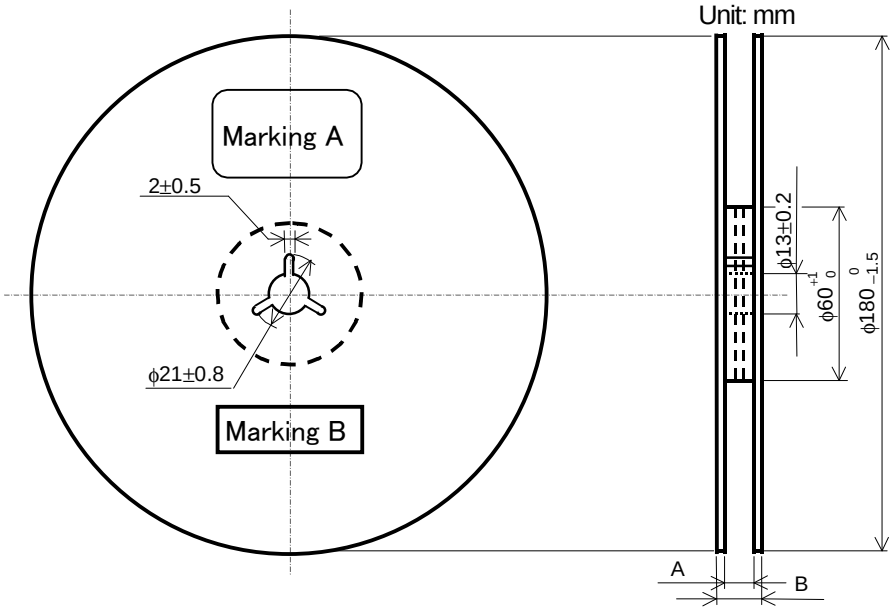


Figure–6

8.3 Reel dimension

Reel dimensions shall be in accordance with the following Figure–7 and Table–7.

Plastic reel (Based on EIAJ ET–7200C)



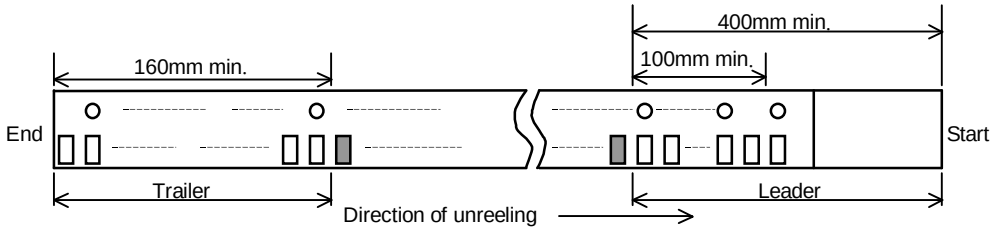
Figure–7

Table–7 Unit: mm

Style	A	B	Note
SPC06,10	9 +1.0 0	11.4±1.0	Injection molding
		13±1.0	Vacuum forming

Note: Marking label shall be marked on a place of Marking A or two place of marking A and B.

8.4 Leader and trailer tape.



Figure–8

9. Marking on package

The label of a minimum package shall be legibly marked with follows.

9.1 Marking A

(1) Classification (Style, Peak voltage, Rated voltage, Optional code, Packaging form) (2) Quantity (3) Lot number

(4) Manufacturer's name or trade mark (5) Others

9.2 Marking B (KAMAYA Control label)