

Specification

Title: ESD SUPPRESSOR; RECTANGULAR TYPE

Style: HSPC10, 16

RoHS COMPLIANCE ITEM

Halogen and Antimony Free

Product specification contained in this specification
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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Note: Stock conditions

Temperature: +5°C ~ +35°C

Relative humidity: 25% ~ 75%

The period of guarantee: Within 2 year from shipment by the company.

Solderability shall be satisfied.

1. Scope

1.1 This specification covers the detail requirements for ESD suppressor; rectangular type, style of HSPC10,16.

2. Classification

Type designation shall be the following form.

(Example)

| | | | | | |
|------|----|-----|---|----|----|
| HSPC | 16 | 701 | B | 02 | TP |
| 1 | 2 | 3 | 4 | 5 | 6 |

 Style

1 ESD suppressor; rectangular type  Style

2 Size

3 Peak voltage

| Symbol | Peak voltage |
|--------|--------------|
| 601 | 600V |
| 701 | 700V |

4 Rated voltage

| Symbol | Rated voltage |
|--------|---------------|
| A | 30V max |
| B | 20V max |
| C | 50V max |

5 Optional code

| Symbol | Optional code |
|--------|--------------------------|
| 01 | Capacitance: 0.1 pF max. |
| 02 | Capacitance: 0.2 pF max. |

6 Packaging form

| | |
|----|----------------------|
| B | Bulk (loose package) |
| TH | Paper taping |
| TP | |

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) | | | |
| HSPC10 | 600 max. | 100 max. | 100 | 30 max. | 0.1 max. | 1 max. |
| HSPC16 | 700 max. | 100 max. | 100 | 20 max. | 0.2 max. | 1 max. |
| | | | | 50 max. | | |

| Style | Category temperature range (°C) |
|--------|---------------------------------|
| HSPC10 | -55 to +125 |
| HSPC16 | |

*1 Peak voltage: IEC61000-4-2, 15kV, Aerial discharge, The peak voltage shall be measured.

Clamping voltage: IEC61000-4-2, 15kV, Aerial discharge, The voltage value shall be measured after 30ns from the peak voltage.

ESD pulse withstand: IEC61000-4-2, 15kV, Aerial 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. | HSPC10, 16 |
| TH | Paper taping | 8mm width, 2mm pitches | 10,000 pcs. | HSPC10 |
| TP | Paper taping | 8mm width, 4mm pitches | 5,000 pcs. | HSPC16 |

5. Dimensions

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

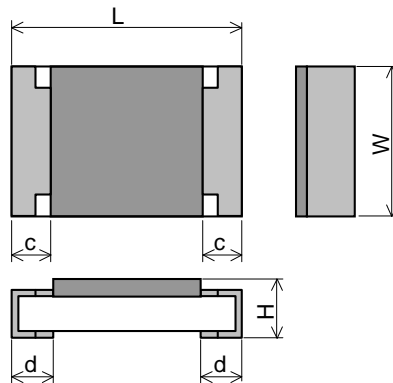


Figure-1

Table-3

Unit:mm

| Style | L | W | H | c | d |
|--------|----------|---------------------------------------|-----------|---------|-----------|
| HSPC10 | 1.0±0.05 | 0.5±0.05 | 0.35±0.05 | 0.2±0.1 | 0.25±0.10 |
| HSPC16 | 1.6±0.1 | 0.8 ^{+0.15} _{-0.05} | 0.5±0.1 | 0.3±0.1 | 0.3±0.1 |

5.2 Equivalent circuits



5.3 Net weight (Reference)

| Style | Net weight(mg) |
|--------|----------------|
| HSPC10 | 0.6 |
| HSPC16 | 2 |

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: 15kV, Aerial discharge Measurement: The peak voltage shall be measured. | See Table-1. |
| 2 | ESD capability Clamp voltage | IEC61000-4-2 The suppressor shall be mounted on the test substrate as shown in Figure-2. Test condition: 15kV, Aerial 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: 15kV, Aerial discharge Applied pulses: 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 | See Table-1. |
| 5 | Leakage current | Measurement voltage: The 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 61000-2-21 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. • 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. | Leakage current: 10μA max. No evidence of appearance damage |

Table-4(2)

| No. | Test items | Condition of test | Performance requirements |
|-----|----------------------------|---|--|
| 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. |
| 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: The 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: The 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

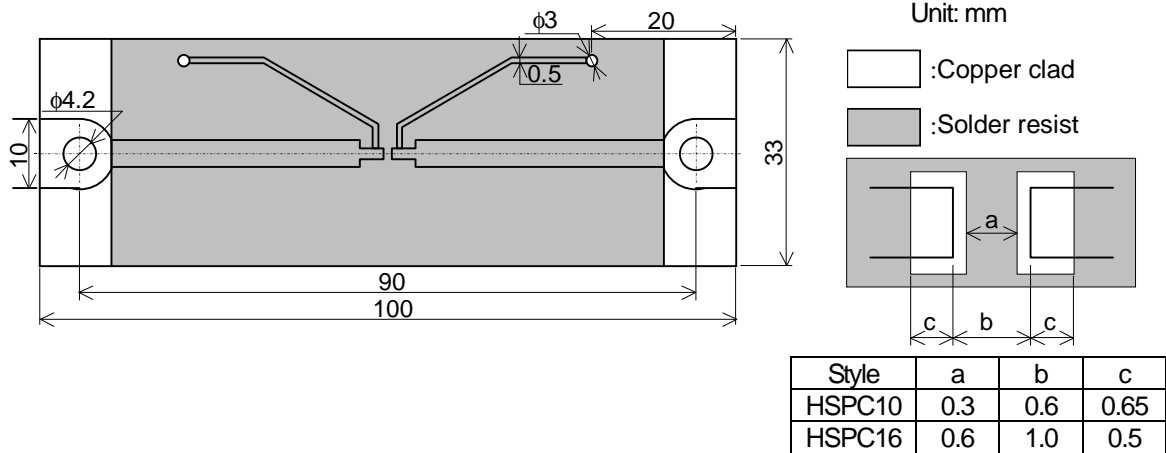


Figure-2 HSPC TEST SUBSTRATE

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 Paper taping (8mm width, 2mm pitches)

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

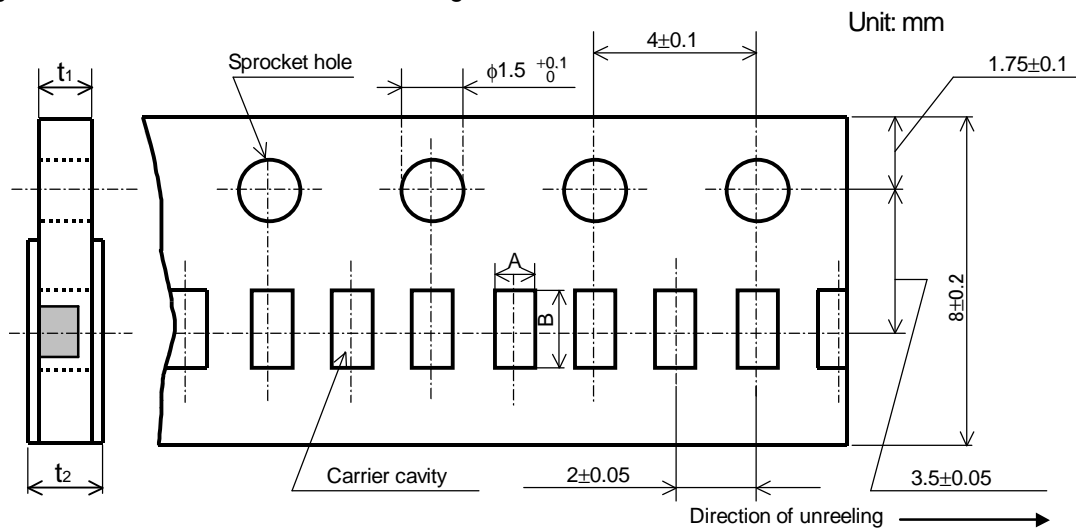


Figure-3

Table-5

Unit: mm

| Style | A | B | t ₁ | t ₂ |
|--------|--|--|----------------|----------------|
| HSPC10 | 0.65 ^{+0.05} / _{-0.10} | 1.15 ^{+0.05} / _{-0.10} | 0.4 ± 0.05 | 0.5max. |

8.2.2 Paper taping (8mm width, 4mm pitches)

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

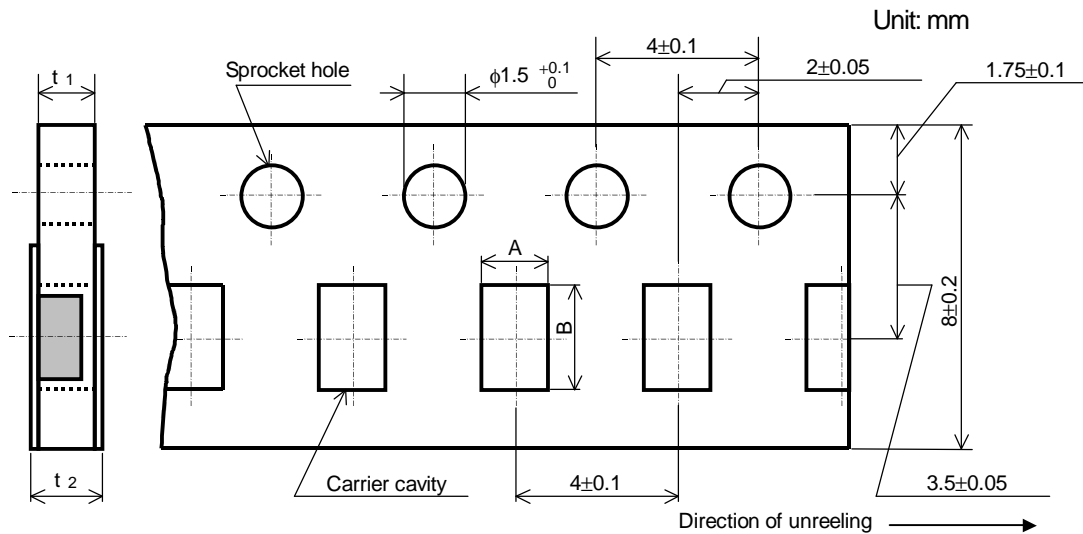


Figure-4

Table-6

Unit: mm

| Style | A | B | t ₁ | t ₂ |
|--------|-----------|---------|----------------|----------------|
| HSPC16 | 1.15±0.15 | 1.9±0.2 | 0.6±0.1 | 0.8max. |

- 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 ± 0.2 mm.
- 5). The peel strength of the top cover tape shall be within 0.1N to 0.5N on the test method as shown in the following Figure-5.
- 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.

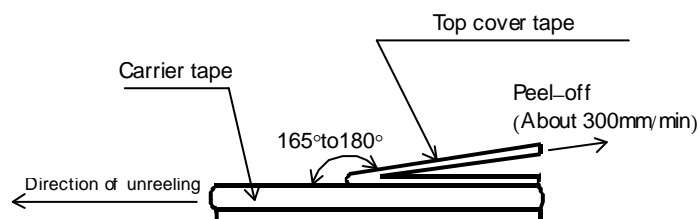


Figure-5