佳邦科技股份有限公司
INPAQ TECHNOLOGY CO., LTD.

# EGA10603V05B0
# Data Sheet

| | |
|---|---|
| Product Name | EGA10603V05B0 |
| Series | ESD Suppressor |
| Size | EIA 0603 |
| Version | A5 |

# 製/修訂履歷表 Revision History

| Version | Designed by | Description of Changes | Modify Date |
|---|---|---|---|
| A5 | James | 表單改版 | 2023/05/22 |
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# 1. Scope

This specification is applied to electrostatic discharge (ESD) protection. It is designed to protect the high-speed data lines against ESD transients. It has very low capacitance and fast turn on times makes it ideal for data and transmission lines with high data rates.

According to the special property of device, we recommend not to use on such application as: DC/AC power line, keypad, and button circuit.

For RoHS Compliance.

## Feature

- Protection against ESD voltages and currents (IEC61000-4-2 Level 4)
- Extremely quick response time (<1ns) present ideal ESD protection
- Extremely low capacitance (0.2pF typical)
- Extremely low leakage current
- Bi-directional device
- SMD (Surface Mount Device)
- MSL Level:Level 1

## Applications

EGA10603V05B0 is applied to high speed signal interface.

- Antenna circuit
- USB2.0/3.0
- IEEE-1394
- DVI
- HDMI

## Product Model

- Digital Video Equipment
- Mobile Phone
- GPS Antenna
- Bluetooth Communication Equipment

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## 2. Explanation of Part Number

| E | G | A | 1 | 0 | 6 | 0 | 3 | V | 0 | 5 | B | 0 | — | □ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | | | 4 | | 5 | | | | 6 |

- 1：ESDGUARD Series
- 2：Single element
- 3：Chip size, EIA 0603
- 4：Max rated voltage,VDC
- 5：”B0”： Model Code (B: Pb free type)
- 6：Suffix for Special Code

## 3. Circuit symbol



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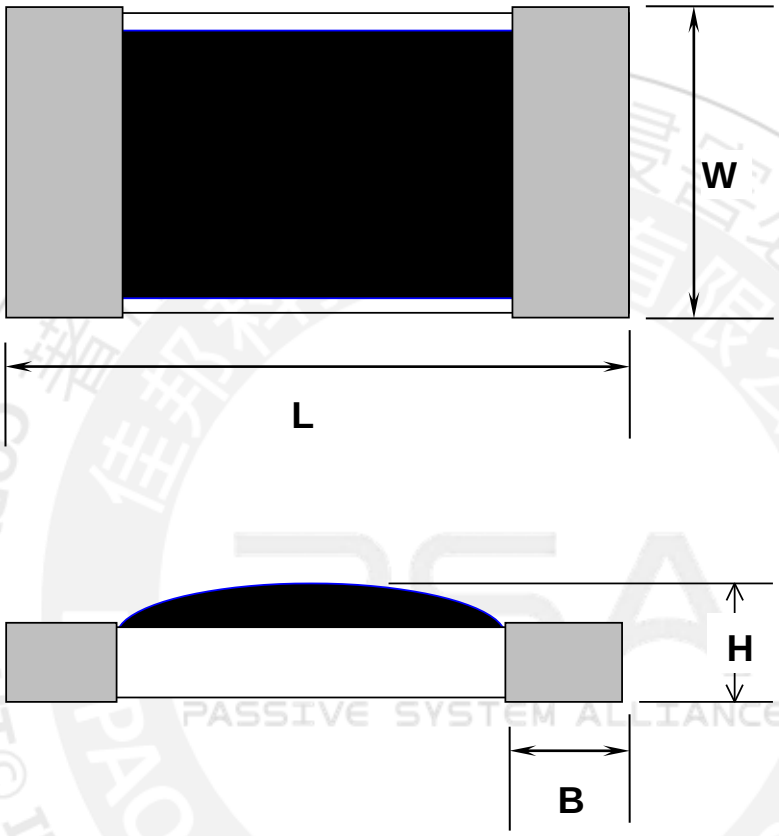
# 4. Construction & Dimensions

## 4.1. Substrate : Ceramic (Alumina)

## 4.2. Encapsulate : Polymer

## 4.3. End termination : Ag/Ni/Sn

## 4.4. Construction & Dimension :




Unit: mm

| L | W | H | B |
|---|---|---|---|
| 1.60±0.10 | 0.85±0.15 | 0.51±0.05 | 0.30±0.20 |

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## 5. Performance Characteristics

| Characteristics | Symbol | Unit | Min. | Typical | Max. |
|---|---|---|---|---|---|
| Rated voltage | VDC | V | | | 5 |
| Leakage current | IL | μA | | 0.01 | |
| Peak voltage | Vp | V | | 300 | |
| Trigger voltage | Vt | V | | 300 | |
| Clamping voltage | Vc | V | | 30 | |
| Capacitance, @1MHz | Cp | pF | | 0.2 | 0.5 |
| Response time | | ns | | | 1 |
| ESD voltage capability, Contact discharge mode | | kV | | 8 | |
| ESD voltage capability, Air discharge mode | | kV | | 15 | |
| ESD pulse withstand | | pulses | | 1000 | |

Rated voltage - IL measurement rated voltage

Vp – The peak voltage value shall be measured under the following conditions. ESD test conditions : IEC61000-4-2, 8 kV contact discharge

Vt – measurement by using Transmission Line Pulse (TLP)

Vc –measurement by using Transmission Line Pulse (TLP)

Cp – Device capacitance measured with 1Vrms

# 6. General specifications

## 6.1. Temperature Specifications

Operating Temperature range : -55℃ to + 125℃

Storage Temperature range : -55℃ to + 125℃

## 6.2. Temperature Specifications

| Item | Specifications | Test condition | Reference |
|---|---|---|---|
| Bias humidity | $I_L$ ≦10 μA | 85%RH, 85℃, rated voltage, 1000hrs | MIL-STD-202 Method 103 |
| Thermal Shock | $I_L$ ≦10 μA | -55℃ to 125℃, 30 min. cycle, 5 cycles | JIS C 0025 (1998)Test Na |
| High Temperature load voltage | $I_L$ ≦10 μA | Rated voltage, 85℃, 1000hrs | MIL-STD-202G Method 108 |
| Solder leach resistance | $I_L$ ≦10 μA | 260℃, 10s | MIL-STD-202G Method 210F |

$I_L$ – Leakage current at rated voltage, the maximum leakage current was measured afterreliability test.

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# 7. Taping Package and Label Marking

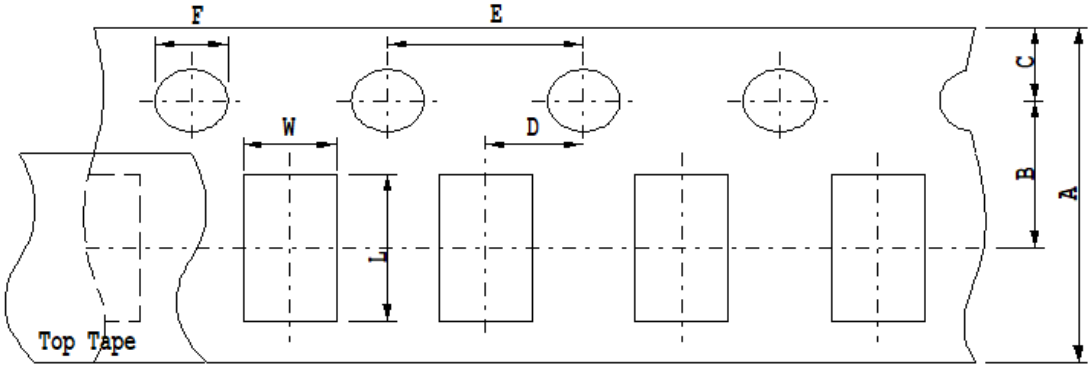
## 7.1. Packaging method

7.1.1. Products shall be heat-sealed in the chip pocket, spacing pitch 4-mm of carrier tape with cover tape, and the carrier tape shall be reeled to the reel.

7.1.2. Tape material to be paper. Tape thickness to be 0.6±0.03mm.

7.1.3. Cover tape adhesion to be 35±25grams.

## 7.2. Carrier tape dimensions




Unit: mm

| Unit: mm | 0603 |
|---|---|
| A | 8.00±0.30 |
| B | 3.50±0.05 |
| C | 1.75±0.10 |
| D | 2.00±0.05 |
| E | 4.00±0.10 |
| F | 1.50±0.10 |
| L | 1.90±0.20 |
| W | 1.05±0.20 |
| T | 0.60±0.03 |

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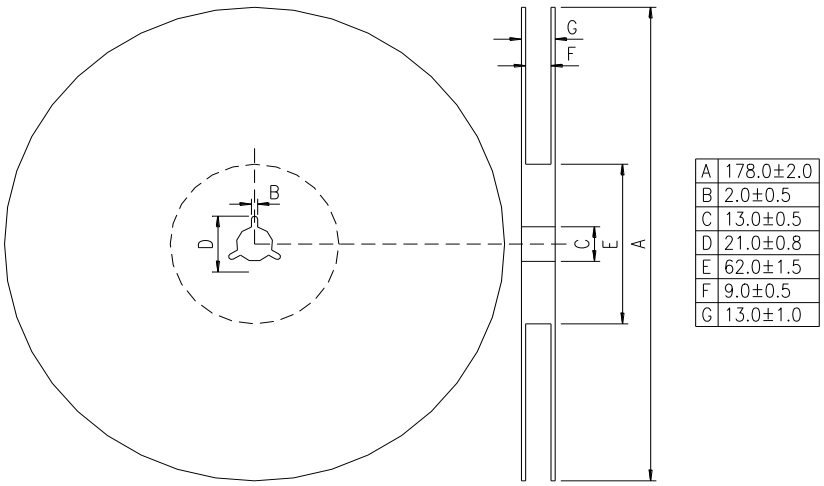
## 7.3. Taping reel dimensions




| | |
|---|---|
| A | 178.0±2.0 |
| B | 2.0±0.5 |
| C | 13.0±0.5 |
| D | 21.0±0.8 |
| E | 62.0±1.5 |
| F | 9.0±0.5 |
| G | 13.0±1.0 |

## 7.4. Taping specifications

There shall be the portion having no product in both the head and the end of taping, and there shall be the cover tape in the head of taping.

## 7.5. Label Marking

The label specified as follows shall be put on the side of reel.

(1) Part No.

(2) Quantity

(3) Lot No.

* Part No. And Quantity shall be marked on outer packaging.

## 7.6. Quantity of products in the taping package

(1) Standard quantity：5000pcs/Reel

(2) Shipping quantity is a multiple of standard quantity.

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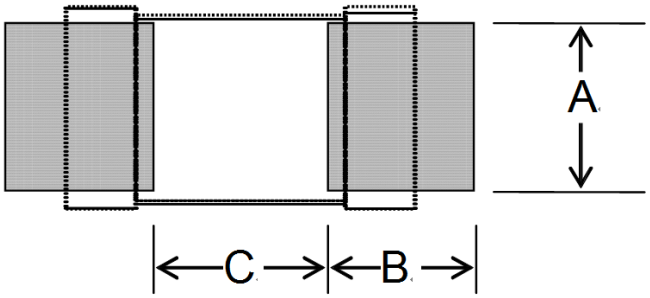
# 8. Precautions for Handling

## 8.1. Solder cream in reflow soldering

Refer to the recommendable land pattern as printing mask pattern for solder cream.
Print solder in a thickness of 0.15 to 0.20mm.




Unit: mm (inch)

| | |
|---|---|
| A | 0.75±0.1(0.03±0.004) |
| B | 0.75±0.1(0.03±0.004) |
| C | 0.75±0.1(0.03±0.004) |

## 8.2. Precaution for handling of substrate

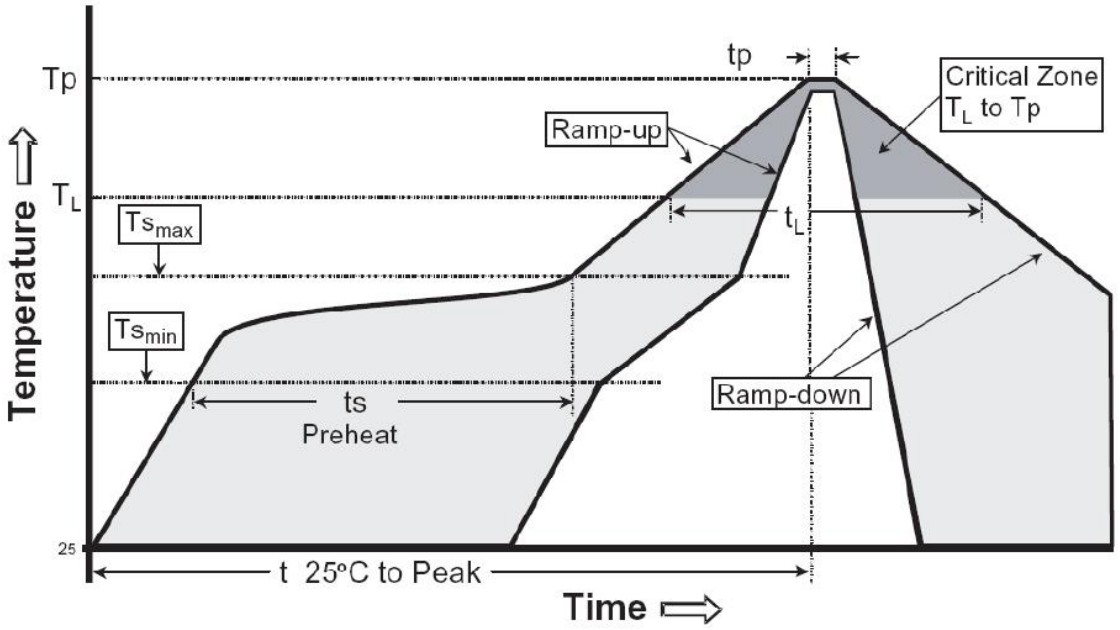
Do not exceed to bend the board after soldering this product extremely.
(Reference examples)

- Mounting place must be as far as possible from the position, which is close to the break line of board, or on the line of large holes of board.
- Do not bend extremely the board, in mounting other components. If necessary, use back-up pin (support pin) to prevent from bending extremely.
- Do not break the board by hand. We recommend using the machine or the jig to break it.

## 8.3. Precaution for soldering

Note that this product will be easily damaged by rapid heating, rapid cooling or local heating.
Do not give heat shock over 100℃ in the process of soldering. We recommend to take preheating and gradual cooling.

## 8.4. Recommendable reflow soldering




Reference IPC-J-STD-020D.1

| Profile Feature | Pb free Assembly |
|---|---|
| Average Ramp Rate (Ts max to Tp) | 3℃/second max |
| Preheat<br>- Temperature Min ($T_{smin}$)<br>- Temperature Min ($T_{smax}$)<br>- Time($t_{smin}$ to $t_{smin}$) | <br>150℃<br>200℃<br>60-120 seconds |
| Time maintained above:<br>- Temperature (TL)<br>- Time (tL) | <br>217℃<br>60-150 seconds |
| Peak Temperature ($T_p$) | 260℃ +0/-5℃ |
| Time within 5℃ of actual Peak Temperature ($T_p$) | 30 seconds |
| Ramp-Down Rate | 6℃/second max. |
| Time 25℃ to Peak Temperature | 8 minutes max |

### 8.5. Soldering gun procedure

Note the follows, in case of using solder gun for replacement.

(1) The tip temperature must be less than 280℃ for the period within 3 seconds by using soldering gun under 30W.

(2) The soldering gun tip shall not touch this product directly.

### 8.6. Soldering volume

Note that excess of soldering volume will easily get crack the body of this product.

### 8.7. Taping Package Storage Condition

Storage Temperature: 5 to 40℃

Relative Humidity: < 65%RH

Storage Time: 12 months max

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