



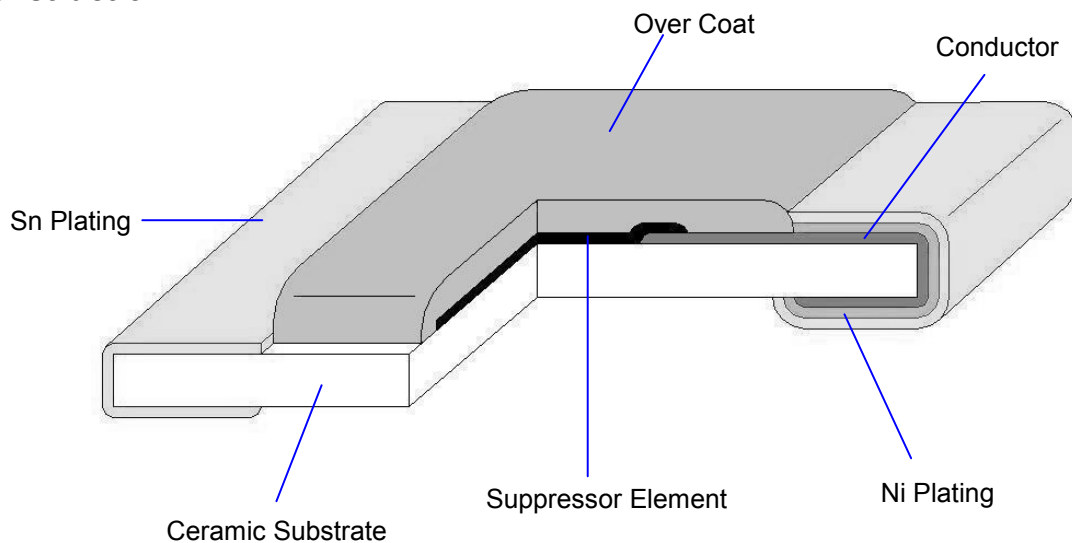
## MAX Guard® ESD Suppressor (Low Capacitance Series)

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### 1. Scope

Bi-directional MAX Guard ESD suppressors are designed for high frequency circuit applications. They are specifically produced to protect sensitive electronic circuit data lines against electrostatic discharge (ESD, as specified in IEC61000-4-2 and MIL-STD-883C). The low capacitances and leakage currents of these products are contributed by “micro air space discharge technology” designed by TA-I.

### 2. Construction



### 3. Type Designation

| GS                   | 06                                     | A                       | 12                                     | T                                    | 3                                  | V3                                  |
|----------------------|----------------------------------------|-------------------------|----------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|
| MAX Guard Suppressor | Size<br>04:0402(1005)<br>06:0603(1608) | A:Suit for IEC61000-4-2 | Operating Voltage<br>12:12V<br>Max:24V | Packaging<br>T:Paper<br>tape(5K/10K) | Typical Clamping Voltage<br>3: 35V | Typical Trigger Voltage<br>V3: 350V |



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### 4. Rating and Characteristics:

| Type        | Continuous Operating Voltage (Max.) | ESD Capability <sup>1</sup>                      | Trigger Voltage (Typ.) <sup>2</sup> | Clamping Voltage (Typ.) <sup>2</sup> | Capacitance (Typ.) <sup>3</sup> | Leakage Current (Typ.) | ESD Pulse Withstand (Typ.) <sup>4</sup> |
|-------------|-------------------------------------|--------------------------------------------------|-------------------------------------|--------------------------------------|---------------------------------|------------------------|-----------------------------------------|
| GS04A03T3V3 | 3.3 VDC                             | Direct Discharge: 8KV<br><br>Air Discharge: 15KV | 350V                                | 35V                                  | <0.2 pF                         | <30nA (12VDC)          | >500 pulses                             |
| GS06A03T3V3 |                                     |                                                  |                                     |                                      |                                 |                        |                                         |
| GS04A05T3V3 | 5.5 VDC                             |                                                  |                                     |                                      |                                 |                        |                                         |
| GS06A05T3V3 |                                     |                                                  |                                     |                                      |                                 |                        |                                         |
| GS04A12T3V3 | 12 VDC                              |                                                  |                                     |                                      |                                 |                        |                                         |
| GS06A12T3V3 |                                     |                                                  |                                     |                                      |                                 |                        |                                         |
| GS04A24T3V3 | 24 VDC                              |                                                  |                                     |                                      |                                 |                        |                                         |
| GS06A24T3V3 |                                     |                                                  |                                     |                                      |                                 |                        |                                         |

Note:

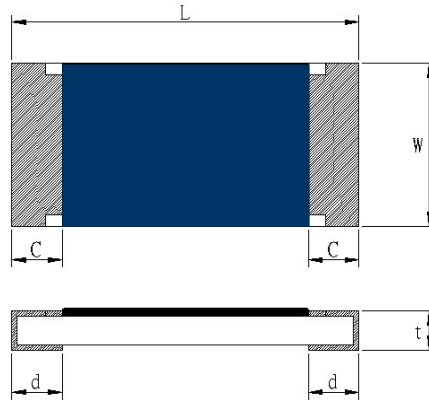
- (1) The function meets with the requirement of IEC 61000-4-2 specification.
- (2) Trigger measurement made using Transmission Line Pulse method.
- (3) Capacitance measured at 1 MHz.
- (4) Performing under IEC 61000-4-2 level 4 (8KV contact discharge, 15KV air discharge). Leakage current <1μA.



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### 5. Dimensions



| Type<br>(Inch Size Code) | Dimensions (mm) |           |         |          |           |
|--------------------------|-----------------|-----------|---------|----------|-----------|
|                          | L               | W         | C       | d        | t         |
| GS04<br>(0402)           | 1.0±0.1         | 0.52±0.05 | 0.2±0.1 | 0.25±0.1 | 0.36±0.05 |
| GS06<br>(0603)           | 1.6±0.1         | 0.8±0.1   | 0.3±0.2 | 0.35±0.2 | 0.45±0.1  |

### 6. Reliability Test

| Environmental Specification | Reference Standard         | Test Condition                                                     | Specification       |
|-----------------------------|----------------------------|--------------------------------------------------------------------|---------------------|
| Operating temperature       |                            | -55°C to 125°C                                                     | IL<1μA <sup>1</sup> |
| Full load voltage           |                            | 85°C for 1000 hrs at working voltage                               |                     |
| Resistance of solder heat   | MIL-STD-202 Method 210     | 260 ± 5°C for 10 ± 1 sec                                           |                     |
| Thermal shock               | MIL-STD-202 Method 107     | -55°C to 125°C, 5 cycles                                           |                     |
| Moisture resistance         | MIL-STD-883, Method 1004.7 | 85%RH, 85°C for 1000hrs at working voltage                         | 95% coverage        |
| Solderability               | MIL-STD-202, Method 208    | 245 ± 5°C solder, 2 ± 0.5 sec dwell.<br>Solder: Sn96.5/Ag3.0/Cu0.5 |                     |

Note: 1. IL is the simplification of Leakage Current



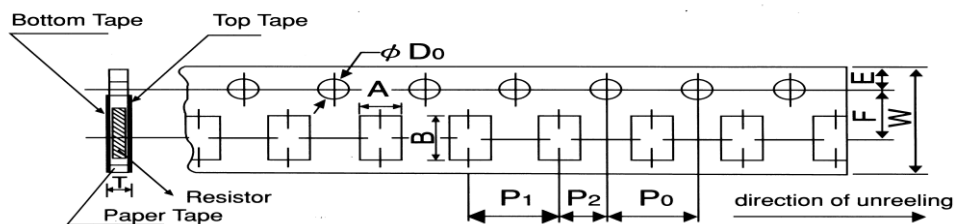
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### 7. Taping and Reel

#### 7.1 Taping Dimensions

4 mm pitch paper



| Packing    | Type | A        | B        | W       | F        | E        | P <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | D <sub>0</sub>         | T        |
|------------|------|----------|----------|---------|----------|----------|----------------|----------------|----------------|------------------------|----------|
| Paper Tape | GS04 | 0.7±0.05 | 1.2±0.05 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 2.0±0.1        | 2.0±0.05       | 4.0±0.1        | $\phi 1.5^{+0.1}_0$    | 0.45±0.1 |
| Paper Tape | GS06 | 1.1±0.1  | 1.9±0.1  | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 4.0±0.1        | 2.0±0.05       | 4.0±0.1        | $\phi 1.5^{+0.1}_{-0}$ | 0.64±0.1 |

Unit: mm

| Type | Size | Paper Tape |
|------|------|------------|
|      |      | 2 mm Pitch |
| GS   | 04   | 180mm/R    |
| GS   | 04   | 10000      |

| Type series |    | Paper Tape |
|-------------|----|------------|
|             |    | 4 mm Pitch |
| GS          | 06 | 180mm/R    |
| GS          | 06 | 5000       |

Unit: pcs



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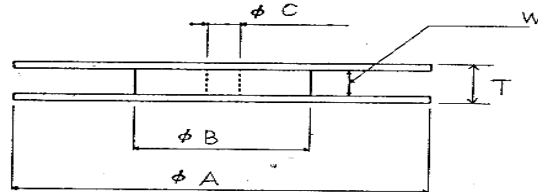
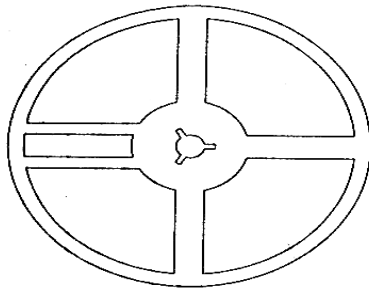
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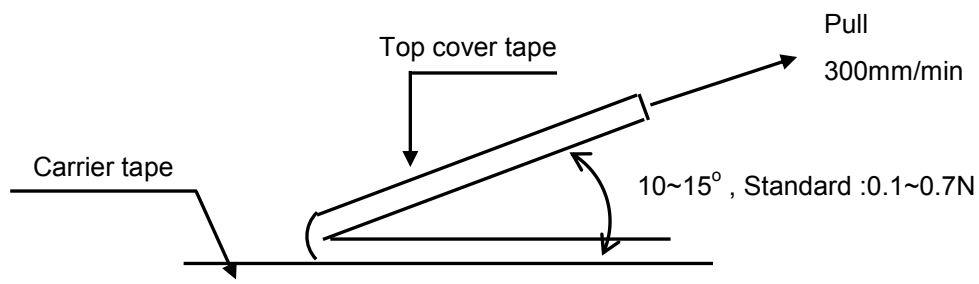
### 7.2 Reel Specifications



Unit: mm

| Series       | $\phi A$        | $\phi B$ | $\phi C$       | W             | T              |
|--------------|-----------------|----------|----------------|---------------|----------------|
| GS04<br>GS06 | $180^{+0}_{-3}$ | 60 min   | $13.0 \pm 1.0$ | $9.0 \pm 1.0$ | $11.4 \pm 2.0$ |

### 7.3 Peel –off force



### 8. Storage Conditions:

Temperature: 5°C~35°C, Humidity: 40%~75%

### 9. Shelf Life:

2 years from manufacturing date

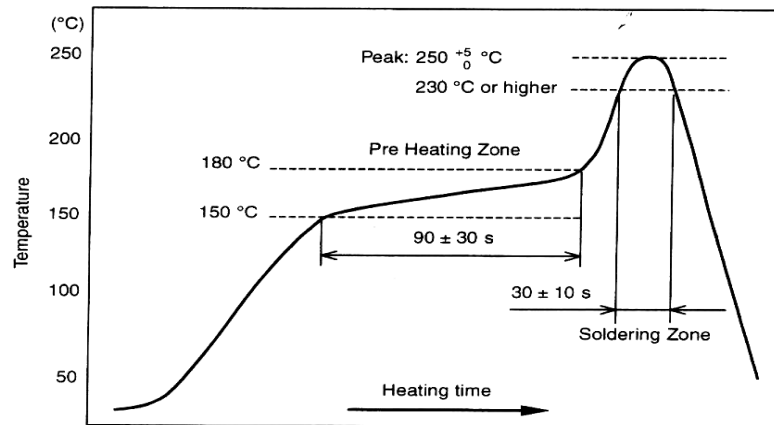




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### 12. Recommend IR – Reflow profile : (solder : Sn96.5 / Ag3 / Cu0.5)



Peak :  $250 \pm 5$  °C , 5 sec

Pre – heat Zone : 150 to 180°C ,  $90 \pm 30$  sec

Soldering Zone : 230°C or higher ,  $30 \pm 10$  sec

### 13. ECN

Engineering Change Notice: The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.

### 14. Manufacturing Country & City :

TA-I TECHNOLOGY CO., LTD. ( Taiwan – Tao Yuan )  
Tel: 886-3-3246169 Fax : 886-3-3246167

#### Associated companies :

(1) FORTUNE TASK RESISTOR FACTORY ( China – Dong Guan )  
Tel : 86-769-83394790 Fax : 86-769-83394794

(2) TA-I TECHNOLOGY ( SU ZHOU ) CO., LTD. ( China – Su Zhou )  
Tel : 86- 512-63457879 Fax : 86-512-63457869

(3) TAI OHM ELECTRONICS ( M ) SDN. BHD. ( Malaysia – Pulaupinang )  
Tel : 604- 3900480 Fax : 604-3901481

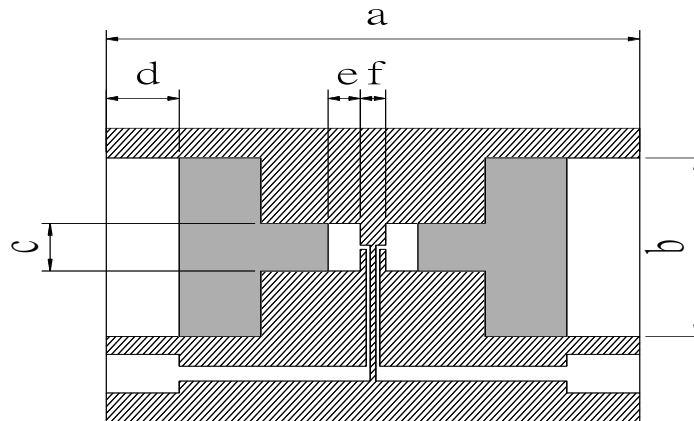
(4) P.T.TAI ELECTRONICS Indonesia ( Indonesia – Jakarta )  
Tel : 62-21-89830123 Fax : 62-21-89830703



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## **15. Test Circuit Board**



| Type   | a  | b | c    | d   | e    | f   |
|--------|----|---|------|-----|------|-----|
| GS0402 | 19 | 6 | 0.84 | 2.6 | 0.61 | 0.6 |
| GS0603 | 19 | 6 | 1.6  | 2.6 | 1.15 | 0.9 |

Unit: mm