

ESD Suppressor

Type: **EZAEG**

EZAEG1A, 2A, 3A

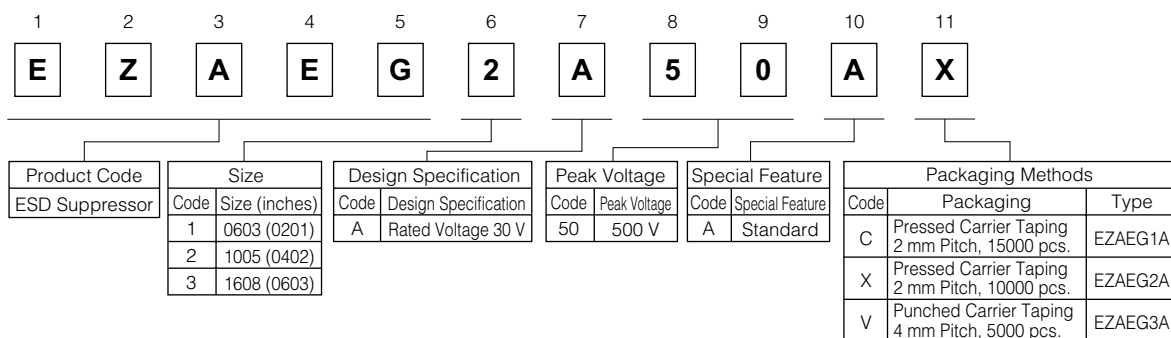
■ Features

- ESD protection of high-speed data lines
- Low capacitance
(1608 size : 0.1 pF, 1005 size : 0.05 pF, 0603 size : 0.04 pF)
- Good ESD suppression characteristics
- Good ESD withstanding

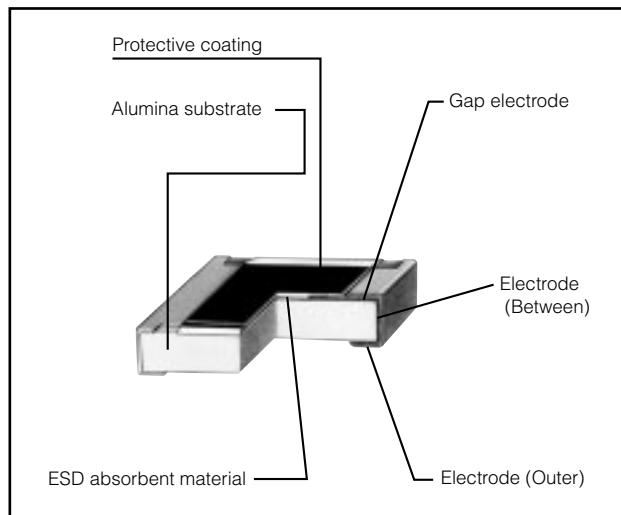
■ Recommended Applications

- High-Speed Data Lines
(HDMI, Serial ATA, USB, IEEE1394, Display Port)
- Antenna Circuitry and RF Modules (Cellular Phones)

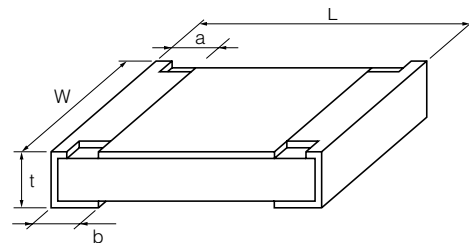
■ Explanation of Part Numbers



■ Construction

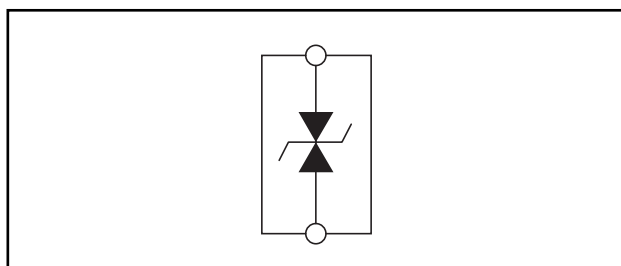


■ Dimensions in mm (not to scale)



Type (inches)	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
EZAEG1A (0201)	0.60±0.03	0.30±0.03	0.15±0.10	0.15±0.10	0.23±0.03	0.12
EZAEG2A (0402)	1.00±0.10	0.50±0.05	0.20±0.10	0.25±0.10	0.38±0.05	0.6
EZAEG3A (0603)	1.60±0.15	0.80±0.15	0.30±0.20	0.30±0.20	0.50±0.10	2.2

■ Circuit Configuration



■ Ratings

Type (inches)	Capacitance ⁽¹⁾	Peak Voltage ⁽²⁾	Clamping Voltage ⁽³⁾	Rated Voltage	Category Temperature Range (Operating Temperature Range)
EZAEG1A (0201)	0.04 ^{+0.04} _{-0.03} pF	500 V max. (350 V typ.)	100 V max.	30 V max	-55 to +125 °C
EZAEG2A (0402)	0.05 ^{+0.05} _{-0.04} pF				
EZAEG3A (0603)	0.10 ^{+0.10} _{-0.08} pF				

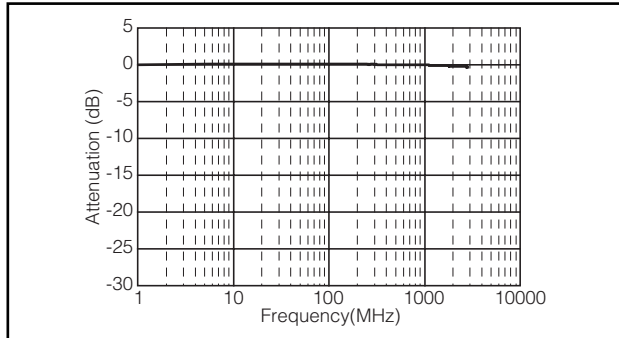
(1) Capacitance = The capacitance value shall be measured under the conditions specified below.

Frequency : 1 MHz±10 %, Voltage : 1 Vrms±0.2 Vrms, Temperature : 25 °C±2 °C

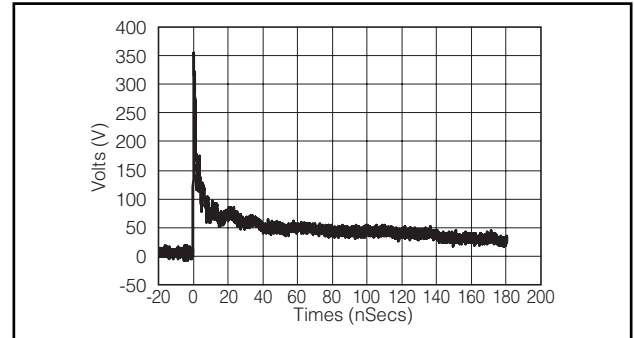
(2) Peak Voltage = The peak voltage value shall be measured under the following conditions. ESD test conditions : IEC61000-4-2, 8 kV contact discharge

(3) Clamping Voltage = The clamping voltage value shall be measured at 30 ns after initiation of pulse and measured under the conditions specified below. ESD test conditions : IEC61000-4-2, 8 kV contact discharge

■ Frequency Characteristics

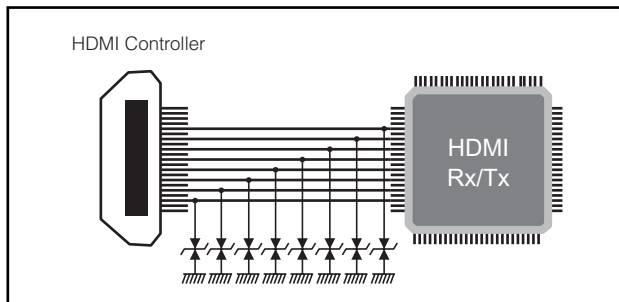


■ ESD Suppression Voltage Waveform

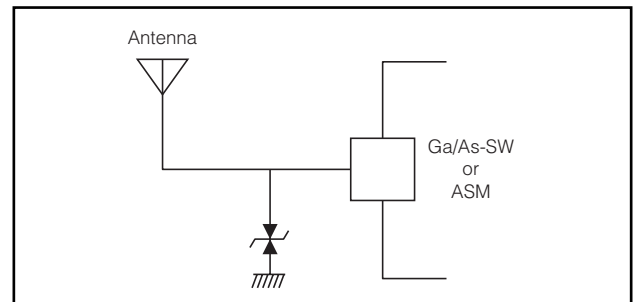


■ Typical Circuits Requiring Protection

● HDMI circuit



● Antenna circuit



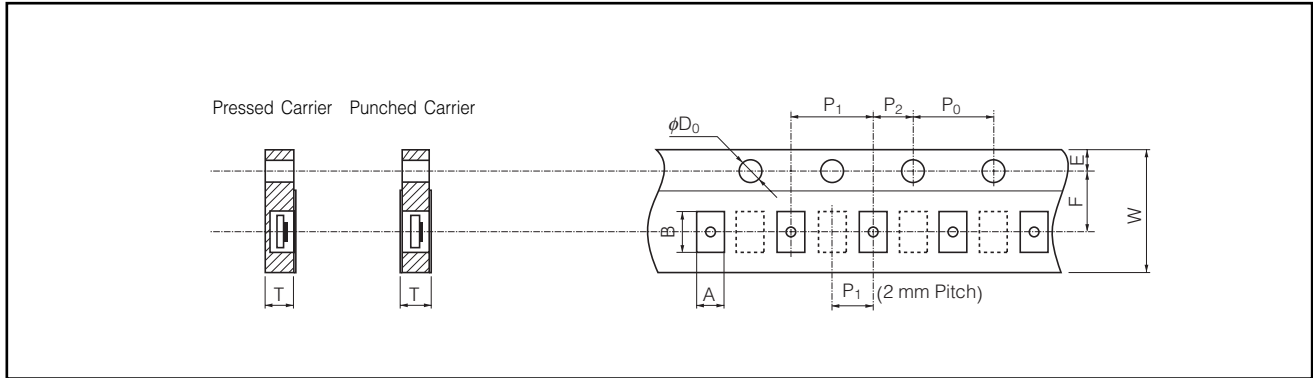
■ Packaging Methods (Taping)

● Standard Quantity

Type	Kind of Taping	Pitch (P ₁)	Quantity
EZAEG1A	Pressed Carrier Taping	2 mm	15000 pcs./reel
EZAEG2A			10000 pcs./reel
EZAEG3A	Punched Carrier Taping	4 mm	5000 pcs./reel

● Carrier Taping

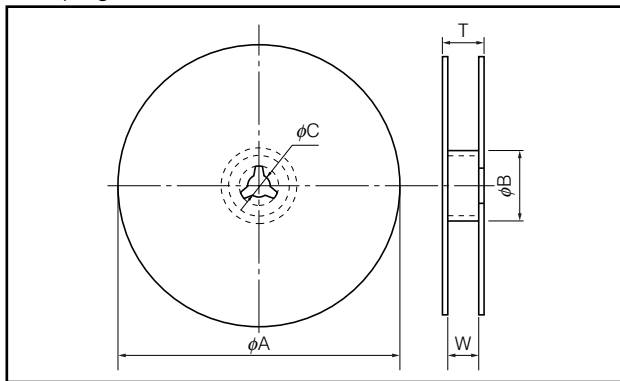
(Unit : mm)



Type	A	B	W	F	E	P ₁	P ₂	P ₀	ϕD_0	T
EZAEG1A	0.38 ^{+0.05}	0.68 ^{+0.05}	8.00 ^{+0.20}	3.50 ^{+0.05}	1.75 ^{+0.10}	2.00 ^{+0.10}	2.00 ^{+0.05}	4.00 ^{+0.10}	1.50 ^{+0.10}	0.42 ^{+0.05}
EZAEG2A	0.70 ^{+0.05}	1.20 ^{+0.05}				4.00 ^{+0.10}				0.60 ^{+0.05}
EZAEG3A	1.10 ^{+0.10}	1.90 ^{+0.10}				0.70 ^{+0.05}				

● Taping Reel

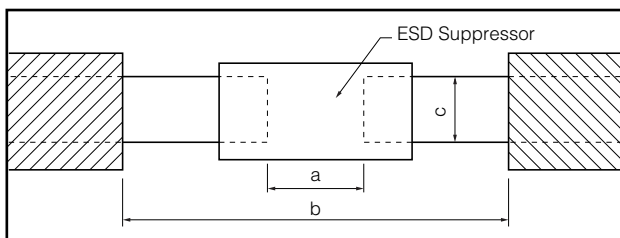
(Unit : mm)



Type	ϕA	ϕB	ϕC	W	T
EZAEG1A	180.0 ⁺⁰ _{-3.0}	60 min.	13.0 ^{+1.0}	9.0 ^{+1.0}	11.4 ^{+1.0}
EZAEG2A					
EZAEG3A					

■ Recommended Land Pattern

In case of flow soldering, the land width must be smaller than the ESD Suppressor width to properly control the solder amount properly. Generally, the land width should be 0.7 to 0.8 times (W) of the width of ESD Suppressor. In case of reflow soldering, solder amount can be adjusted, therefore the land width should be set to 1.0 to 1.3 times ESD Suppressor width (W).

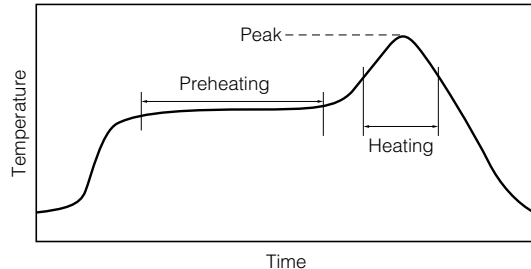


Type (inches)	Dimensions (mm)		
	a	b	c
EZAEG1A (0201)	0.3 to 0.4	0.8 to 0.9	0.25 to 0.35
EZAEG2A (0402)	0.5 to 0.6	1.4 to 1.6	0.4 to 0.6
EZAEG3A (0603)	0.7 to 0.9	2.0 to 2.2	0.8 to 1.0

■ Recommended Soldering Conditions

Recommendations and precautions are described below.

- Recommended soldering conditions for reflow
 - Reflow soldering shall be performed a maximum of two times.
 - Please contact us for additional information when used in conditions other than those specified.
 - Please measure the temperature of the terminals and study every kind of solder and printed circuit board for solderability before actual use.



For soldering (Example : Sn/Pb)

	Temperature	Time
Preheating	140 °C to 160 °C	60 s to 120 s
Main heating	Above 200 °C	30 s to 40 s
Peak	235 ± 5 °C	max. 10 s

For lead-free soldering (Example : Sn/Ag/Cu)

	Temperature	Time
Preheating	150 °C to 180 °C	60 s to 120 s
Main heating	Above 230 °C	30 s to 40 s
Peak	max. 260 °C	max. 10 s

⚠ Safety Precautions

The following are precautions for individual products. Please also refer to the precautions common to EMI Filters, ESD Suppressors, Fuses, and MR Sensors shown on page EL113 of this catalog.

1. If a large electric surge (especially, one which is larger than an ESD) is expected to be applied, be sure to test and confirm proper ESD Suppressor (hereafter called the suppressors) functionality when mounted on your board. When the applied load is more than the allowable rated power under normal load conditions, it may impair performance and/or the reliability of the suppressors. Never exceed the rated power. If the product will be used under these special conditions, be sure to contact a Panasonic representative first.
2. Do not use halogen-based or other high-activity flux. Otherwise, the residue may impair the suppressors' performance and/or reliability.
3. When soldering with a soldering iron, never touch the suppressors' bodies with the tip of the soldering iron. When using a soldering iron with a high temperature tip, finish soldering as quickly as possible (within three seconds at 350 °C max.).
4. Avoid excessive bending of printed circuit boards in order to protect the suppressors from abnormal stress.
5. Do not immerse the suppressors in solvent for a long time. Before using solvent, carefully check the effects of immersion.