

Surface Mount ESD Suppressors

GcDiode® ESD Suppressors



Features:

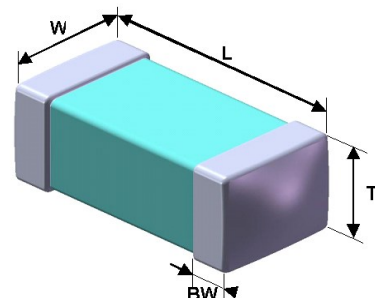
- Glass ceramic monolithic structure
- Ultra low capacitance (0.25 pF typical)
- Low leakage current (<0.1 nA)
- Fast response time (<1 ns)
- Bi-directional flip-chip design
- Low clamping voltage
- Silver termination with nickel and tin plating
- Withstands multiple 8 kV ESD strikes
- 100% lead-free and RoHS compliant

Electrical Characteristics:

Characteristic	Value
IEC61000-4-2 Direct Discharge	Level 4 – 8 kV
IEC61000-4-2 Air Discharge	Level 4 – 15 kV
Trigger Voltage	300 V (typical) (measured per IEC61000-4-2, Level 4, 8 kV)
Clamping Voltage	30 V (typical) (measured per IEC61000-4-2, Level 4, 8 kV)
Response Time	Less than 1 ns
Capacitance (1 GHz)	0.25 pF (typical)
Leakage Current	Less than 0.1 nA (typical) (measured at 14 VDC)
Rated Voltage	14 VDC (max.)
ESD Pulse Withstand	1000 Pulses (typical)

Shape and Dimensions:

Size	L	W	T	BW
0402 (1005)	0.039 ± 0.004 (1.00 ± 0.10)	0.020 ± 0.004 (0.51 ± 0.10)	0.020 ± 0.004 (0.51 ± 0.10)	0.010 ± 0.004 (0.25 ± 0.10)
0603 (1608)	0.063 ± 0.006 (1.60 ± 0.15)	0.031 ± 0.006 (0.80 ± 0.15)	0.031 ± 0.006 (0.80 ± 0.15)	0.014 ± 0.006 (0.36 ± 0.15)

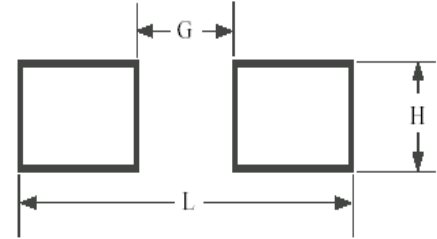


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Recommended PC Board Land Pattern:

Chip Size	L Inch (mm)	G Inch (mm)	H Inch (mm)
0402 (1005)	0.063 (1.60)	0.016 (0.40)	0.028 (0.70)
0603 (1608)	0.087 (2.20)	0.031 (0.80)	0.039 (1.00)

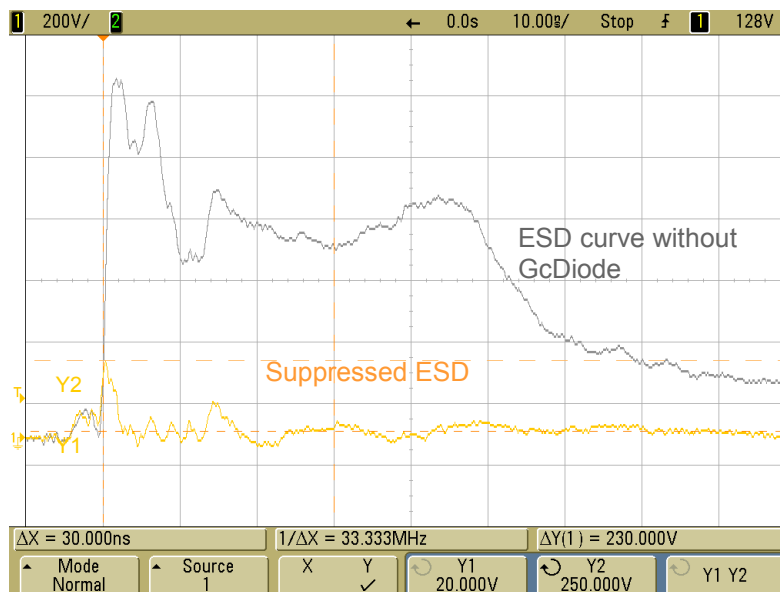


Product Identification:

ES 0603 V014 C I
 (1) (2) (3) (4) (5)

- (1) Category code
- (2) Dimension code: L x W (inch)
 The first two digits - L (length)
 The last two digits - W (width)
- (3) Rated voltage code: V014 -14 VDC
- (4) Series code
- (5) Package code:
 T - Tape & Reel
 B - Bulk

Representative Test Waveform Per IEC61000-4-2 Level 4, 8kV:



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Reliability Tests:

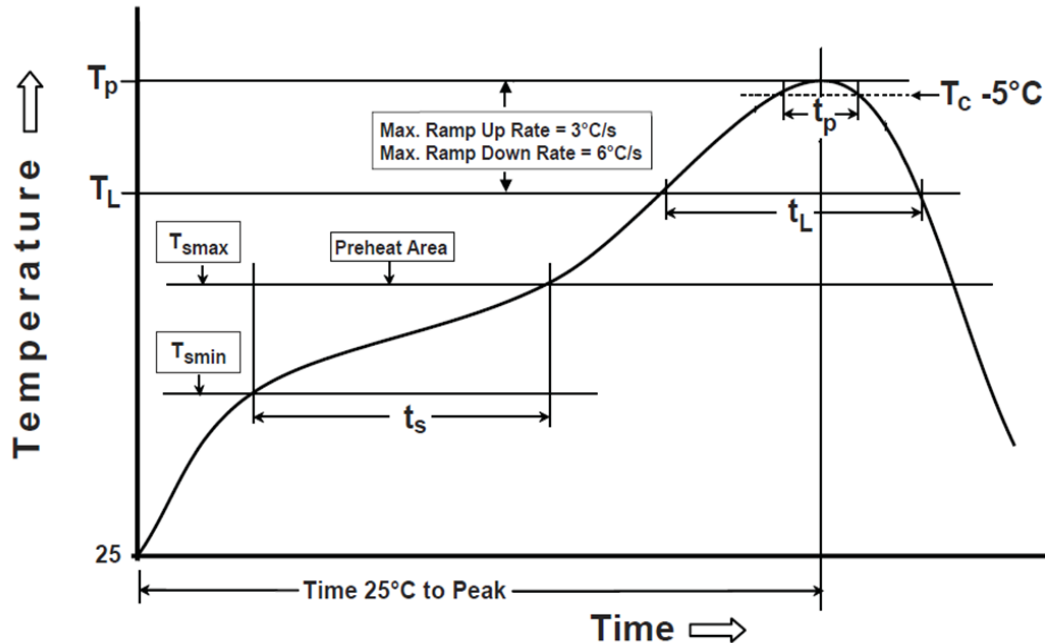
Reliability Test	Test Conditions and Requirements	Test Reference
Flexure Strength	2 mm bend, meet triggering voltage and clamping voltage requirements while being bent, and meet leakage current requirement after bending.	IEC60068-2-21
Solderability	255°C, 5 seconds 90% coverage min.	MIL-STD-202 Method 208
Soldering Heat Resistance	260°C, 10 seconds No mechanical damage Pass ESD test.	MIL-STD-202 Method 210
Thermal Shock	100 cycles between -65°C and +125°C No mechanical damage Pass ESD test	MIL-STD-202 Method 107
Mechanical Vibration	0.4" D.A. or 30 G between 5-3000 Hz No mechanical damage Pass ESD test	MIL-STD-202 Method 204
Mechanical Shock	1500 G, 0.5 ms, half-sine shocks No mechanical damage Pass ESD test	MIL-STD-202 Method 213
Salt Spray	48 hour exposure No excessive corrosion Pass ESD test	MIL-STD-202 Method 101
Moisture Resistance	10 cycles No excessive corrosion Pass ESD test	MIL-STD-202 Method 106
Endurance	85°C, 1000 hours, rated voltage Leakage current less than 100 nA	Refer to AEM QIQ159

Packaging Data:

Chip Size	Parts on 7 inch (178 mm) Reel
0402 (1005)	10,000
0603 (1608)	4,000

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Recommended Reflow Soldering Profile:



Profile Feature	Pb-Free Assembly
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	150°C 200°C 60~120 seconds
Ramp-up rate (T_L to T_p)	3°C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217°C 60~150 seconds
Peak package body temperature (T_p)	260°C
Time (t_p)* within 5°C of the specified classification temperature (T_c)	30 seconds *
Ramp-down rate (T_p to T_L)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.
* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum	

Recommended Conditions for Hand Soldering:

1. Appropriate temperature (max.) of soldering iron tip/soldering time (max.): 280°C/10s or 350°C/ 3s.
2. Using hot air rework station with tip that can melt the solder on both terminations at the same time is strongly recommended. Do

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