Electronic Polymers, Inc.

EPI-FLO – PVS Surface Mount Devices 0402, 0201 Available in Limited Quantities

Description:

The EPI-FLO Polymer Voltage Suppressor (PVS) device provides a shunt for electro static-discharge (ESD) which protects sensitive electronic circuits from the damaging effects of over voltage and over current events.

EPI-FLO devices are capable of shunting voltages of up to 25 KV or more after trigger point is exceeded. While in the inactive state, EPI-FLO remains invisible to the electronic circuitry. Upon an ESD event trigger, conduction begins in less then <1nS, reaching full conduction in <2 nS.

Electronic Polymer's unique construction yields a total device thickness of <10 mils. This patented design contributes to capacitance values <500 fF (10^{-15} Farads).*

Devices are certified with Transmission Line Pulse (TLP) test procedures exceeding standard based testing commonly available.*

Features:

- Protection against ESD events
- High tolerance to repeated pulses
- Extremely fast response time
- Ultra-low capacitance (femto-Farads)
- Very low leakage current
- Bi-directional conduction
- Pick-and-place compatible (Tape & Reel)
- Available in EIA footprints
- Low profile (< 10 mils)
- Low cost

Electrical Specifications:

Parameter	Symbol	Test Conditions	Component Type	Min	Typ	Max	Units
Operating Voltage	VDC	continuous	1206/0805/0603/0402/0201			20	V
Trigger Voltage	V_T	TLP: Step increase in voltage to trigger point	1206/0805/0603/0402/0201		200 150 100		V
Clamping Voltage	V_C	TLP: 24 A, @ 30nS	1206/0805/0603/0402/0201			<50	V
Response Time	T_R		1206/0805/0603/0402/0201		200		pS
Input Capacitance	C_{IN}	VDC = 0 V, f = 1 MHz	1206/0805/0603/0402/0201	50	200	500	fF
Leakage Current	I_L	VDC = 12 V	1206/0805/0603/0402/0201			100	nA
ESD Withstand	# pulses	TLP: Pulse Width = 48nS, 24 A	1206/0805/0603/0402/0201	20	1,000-10,000		-
Operating Temperature	T_A	Humidity 55 ±10%	1206/0805/0603/0402/0201	-55	+25	+85	ºC

* Patents Pending

Device Selection:

The table details an approximate correlation between two ESD test methods: Transmission Line Pulser (TLP) ESD versus industry standard ESD test methods.

Transmission Line Pulser Method				Industry Specification Methods			
Pulse Width	**Source Impedance**	**V_{in}**	**I_{in}**	**Industry Specification**	**Source Impedance**	**V_{in}**	**I_{in}**
48ns	50Ω	150V	6A	HBM 4kV	1500Ω	4kV	2.7A
48ns	50Ω	250V	10A	HBM 8kV	1500Ω	8kV	5.3A
48ns	50Ω	300V	12A	IEC 61000-4-2-X	330Ω	4kV	12A
48ns	50Ω	500V	20A				
48ns	50Ω	600V	24A	IEC 61000-4-2-X	330Ω	8kV	24A
48ns	50Ω	1900V	76A	IEC 61000-4-2-X	330Ω	25kV	76A

Environmental Test:

- Moisture Resistance, steady state: MIL-STD-883, method 1004.7, 85% RH, 85ºC, 1000 hours.
- Thermal Shock: MIL-STD-202, Method 107G, -65ºC to 125ºC, 30 minute cycle, 10 cycles.
- Vibration: MIL-STD-202F, Method 201A, 10 to 55 Hz, 1 minute cycle, 2 hours each in x-y-z.
- Chemical Resistance: ASTM D-543, 4 hrs @ 40ºC, 3 solutions (H_20, detergent solution, defluxer)
- Operating Temperature Characteristics: measurement at 25ºC, 85ºC and –56ºC.
- Full Load Voltage: 20 VDC for 1000 hours at 25ºC
- Solder Leach Resistance and Terminal Adhesion: Per EIA-576
- Solderability: MIL-STD-202, Method 208 (95% coverage)
- Solder Shock: IPC-TM-650-2.4.13

Mechanical Specifications:

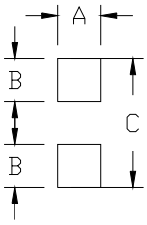

Figure 1. Recommended Pad Geometries

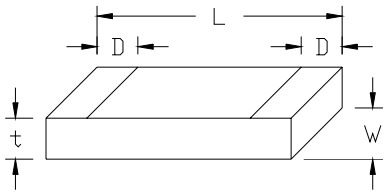

Figure 2. Part Dimensions Geometries

Dimensions – millimeters (inches)

Size	A	B	C	L	W	t	D
3216 (1206)	1.7 (.067)	0.9 (.035)	3.8 (0.15)	3.2 ±0.2 (0.126 ±.008)	1.6 ±0.15 (.063 ±.006)	<0.26 (<.01)	0.45 ±0.2 (.018 ±.008)
2012 (0805)	1.3 (.051)	0.7 (.028)	2.6 (0.102)	2.0 ±0.2 (.079 ±.008)	1.25 ±0.15 (.049 ±.006)	<0.26 (<.01)	0.35 ±0.15 (.014 ±.006)
1608 (0603)	0.9 (0.035)	0.5 (0.020)	2.0 (0.079)	1.6 ±0.1 (.063 ±.004)	0.85 ±0.1 (.033 ±.004)	<0.26 (<.01)	0.30 ±0.2 (.012 ±.008)
1005 (0402)	0.6 (.01)	0.4 (.016)	1.3 (.051)	1.0 ±0.05 (.039 ±.002)	0.5 ±0.05 (.02 ±.002)	<0.26 (<.01)	0.25 ±0.05 (.01 ±.002)
0525 (0201)	0.43 (.017)	0.28 (.011)	0.79 (.031)	0.6 ±0.05 (.024 ±.002)	0.3 ±0.05 (.012 ±.002)	<0.26 (<.01)	0.15 ±0.05 (.006 ±.002)

Ordering Information:

SM –xx – 0603 – 020 – 200 – A – 8KV – S – T

Series Type
- SM = Surface Mount

Protection Units
- xx
- xx

Chip Size (EIA for Surface Mount)
- 1206
- 0805
- 0603
- 0402
- 0201

Max Operating Voltage
- 006 = 6 volts
- 012 = 12 volts
- 020 = 20 volts

Trigger Voltage
- 050 = 50 volts
- 100 = 100 volts
- 150 = 150 volts
- 200 = 200 volts
- 400 = 400 volts
- 600 = 600 volts

Performance Standard
- A – IEC61000-4-2, 330 Ω source impedance
- B – HBM (Human Body Model), 1500 Ω source impedance
- C – MM (Machine Model)
- D – CDM (Charged Device Model)
- E – CDE (Cable Discharge Event)

ESD Voltage
- 2KV = 2 kilovolts, contact discharge
- 4KV = 4 kilovolts, contact discharge
- 8KV = 8 kilovolts, contact discharge
- 15KV = 15 kilovolts, air discharge
- 25KV = 25 kilovolts, air discharge

Special Requirements
- S = Standard EIA footprint
- CU = Custom

Packaging Options
- T = Tape & Reel
- B = Bulk
- P = Panel
- G = Gel pack

Notes:
Manufacturer specifications subject to change.
Measurements subject to change based upon test set up.
Measurements subject to change based upon application circuit filtering or parasitics.