

1-Line, Bi-directional, Transient Voltage Suppressors

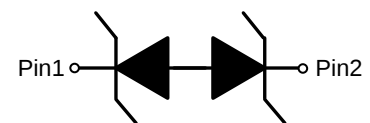
Descriptions

The ESD4V5H201TA is a uni-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components that may be subjected to ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning. It is particularly well-suited for cellular phones, portable device, digital cameras, power supplies and many other portable applications because of its small package

The ESD4V5H201TA is available in DFN1610-2L package. Standard products are Pb-free and Halogen-free.



DFN1610-2L



Circuit diagram

Features

- Stand-off voltage: $\pm 4.5\text{V}$ Max
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 30\text{KV}$ Air, $\pm 30\text{KV}$ contact
IEC61000-4-5 (Surge): 160 A (8/20 μs)
- Solid-state silicon technology
- Low leakage current

Applications

- Cell phone handsets and accessories
- Personal Digital Assistants (PDAs)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Digital Cameras
- CAR/MID DVD/MP3/MP4/PMP Players

Order information

Device	Marking	Shipping
ESD4V5H201TA		3000/Tape&Reel

Absolute maximum ratings

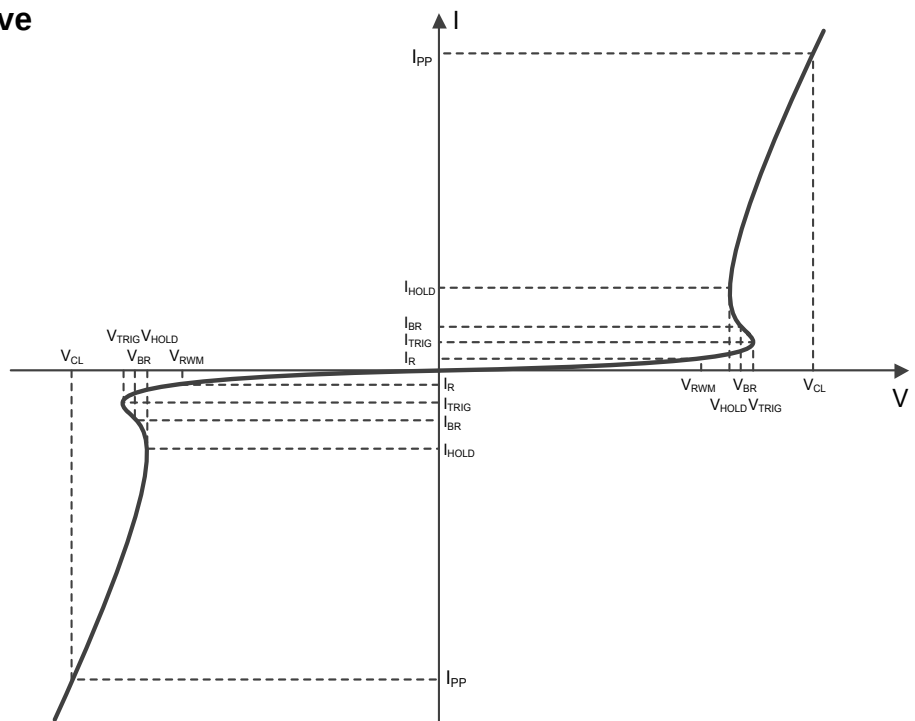
Parameter	Symbol	Rating	Unit
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	160	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 30	kV
ESD according to IEC61000-4-2 contact discharge		± 30	
Operating temperature	T_{OP}	-40~125	$^{\circ}C$
Operation junction temperature	T_J	125	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

Electrical characteristics (TA=25 $^{\circ}C$, unless otherwise noted)

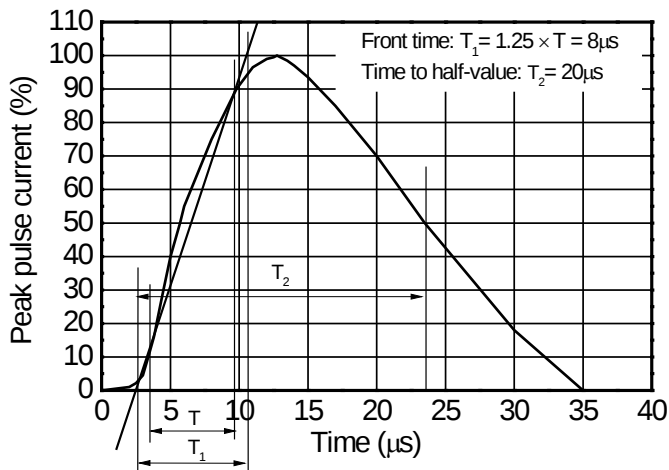
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			± 4.5	V	$I_R = 0.5\mu A$
Breakdown Voltage	V_{BR}	4.8			V	$I_T = 1mA$
Reverse Leakage Current	I_R			0.5	μA	$V_R = 4.5V$
Clamping Voltage	V_C			7.0	V	$I_{PP} = 20A(8/20\mu s \text{ pulse})$
			15.0	18.0	V	$I_{PP} = 160A(8/20\mu s \text{ pulse})$
Junction capacitance	C_J		250.0	500.0	pF	$V_R = 0V, f = 1MHz$

Electrical performance curve

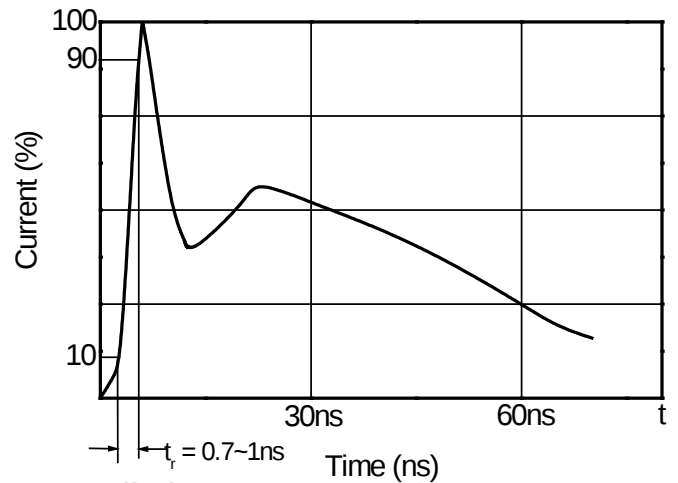
- V_{RWM} Reverse stand-off voltage
- I_R Reverse leakage current
- V_{CL} Clamping voltage
- I_{PP} Peak pulse current
- V_{TRIG} Reverse trigger voltage
- I_{TRIG} Reverse trigger current
- V_{BR} Reverse breakdown voltage
- I_{BR} Reverse breakdown current
- V_{HOLD} Reverse holding voltage
- I_{HOLD} Reverse holding current



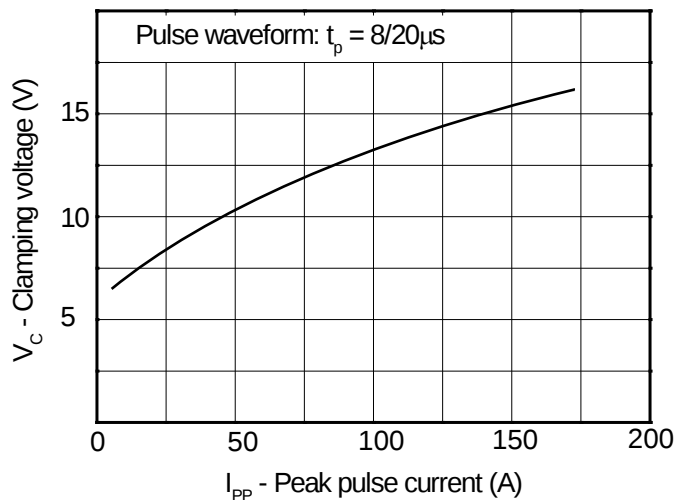
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)



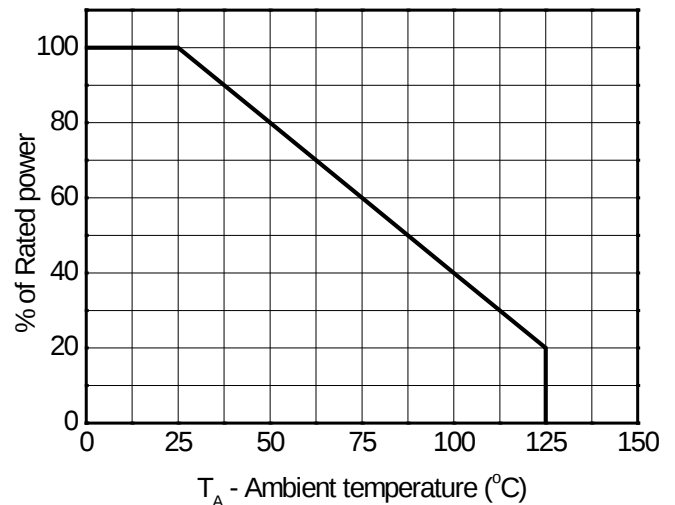
8/20 μs waveform per IEC61000-4-5



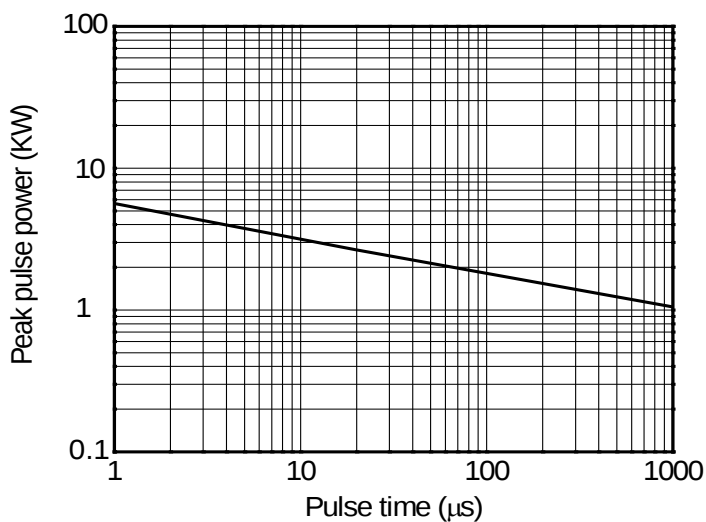
Contact discharge current waveform per IEC61000-4-2



Clamping voltage vs. Peak pulse current

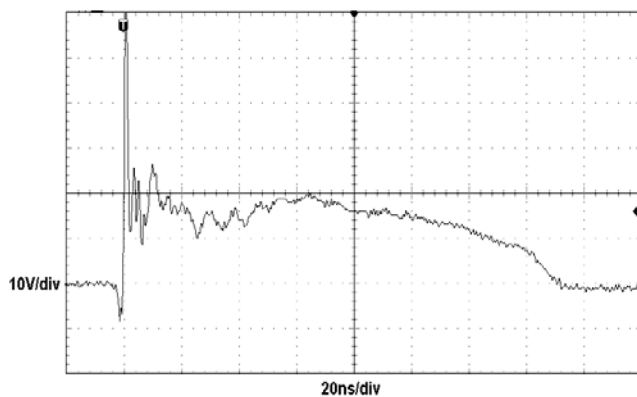
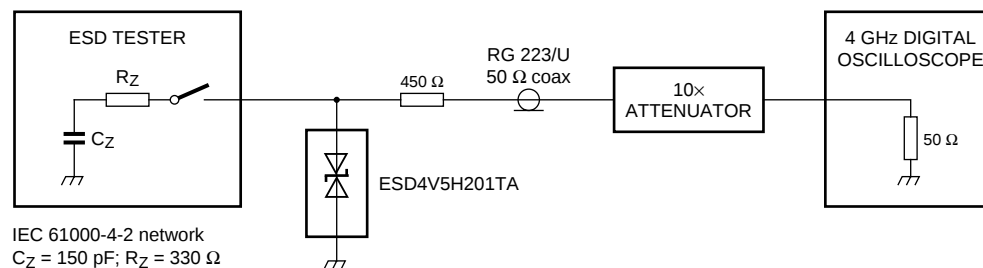


Power derating vs. Ambient temperature

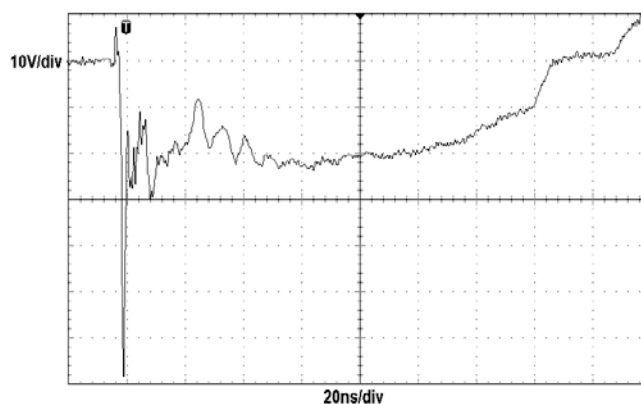


Non-repetitive peak pulse power vs. Pulse time

ESD clamping test setup and waveforms



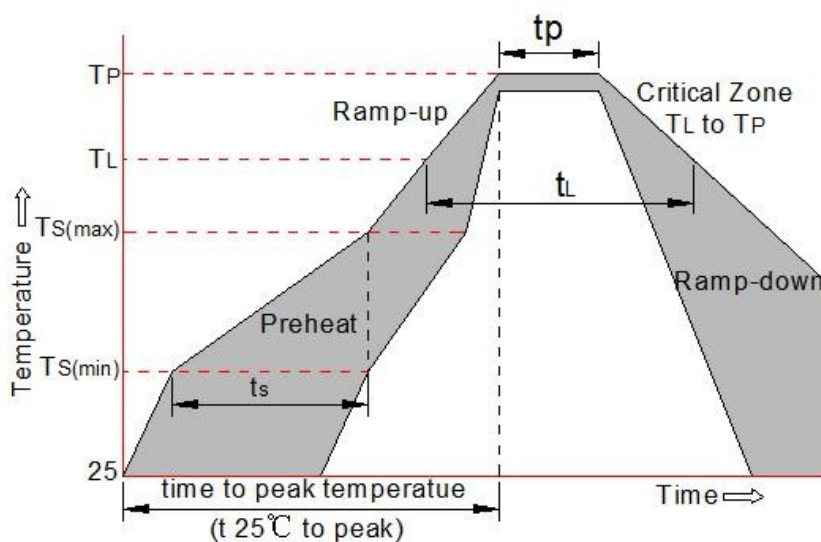
ESD clamping
(+8kV contact discharge per IEC61000-4-2)

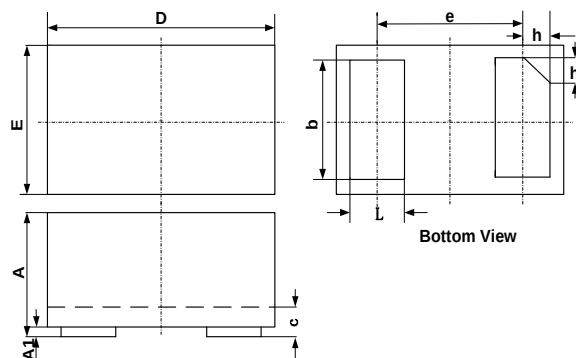


ESD clamping
(-8kV contact discharge per IEC61000-4-2)

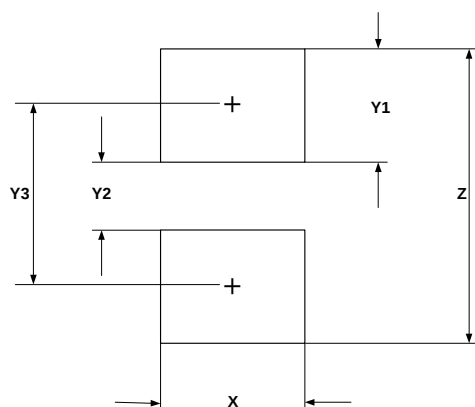
Soldering Parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C



DFN1610-2L Package Outline Drawing
DFN1610


SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.75	0.80	0.85	0.030	0.032	0.034
c	0.10	0.15	0.20	0.004	0.006	0.008
D	1.55	1.60	1.65	0.062	0.064	0.066
e	1.10 BSC			0.044 BSC		
E	0.95	1.00	1.05	0.038	0.040	0.042
L	0.35	0.40	0.45	0.014	0.016	0.018
h	0.15	0.20	0.25	0.006	0.008	0.010

Suggested Land Pattern


SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	1.00	0.040
Y1	0.62	0.025
Y2	0.60	0.024
Y3	1.22	0.049
Z	1.85	0.074