

## 1-Line, Bi-directional, Transient Voltage Suppressors

### Descriptions

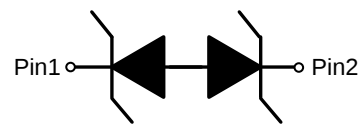
The ESD24D250TA is a bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components that may be subjected to ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning. It is particularly well-suited for cellular phones, portable device, digital cameras, power supplies and many other portable applications because of its small package and low weight.

The ESD24D250TA may be used to provide ESD protection up to 30KV Air, 30KV contact compliance to IEC61000 -4-2, and withstand peak pulse current up to 4.0 A(8/20μs) according to IEC61000-4-5.

The ESD24D250TA is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.



DFN1006-2L



Circuit diagram

### Features

- Stand-off voltage:  $\pm 24V$  Max
- Transient protection for each line according to IEC61000-4-2 (ESD): 30KV Air, 30KV contact IEC61000-4-5 (surge): 4.0 A (8/20μs)

### Applications

- Cell phone handsets and accessories
- Personal Digital Assistants (PDAs)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Digital Cameras
- Car entertainment systems, automotive instrumentation

### Order information

| Device      | Marking | Package    | Shipping        |
|-------------|---------|------------|-----------------|
| ESD24D250TA | CG4     | DFN1006-2L | 10000/Tape&Reel |

### Absolute maximum ratings

| Parameter                                       | Symbol    | Rating   | Unit        |
|-------------------------------------------------|-----------|----------|-------------|
| Peak pulse power ( $t_p = 8/20\mu s$ )          | $P_{pk}$  | 180      | W           |
| Peak pulse current ( $t_p = 8/20\mu s$ )        | $I_{pp}$  | 4.0      | A           |
| ESD according to IEC61000-4-2 air discharge     | $V_{ESD}$ | $\pm 30$ | kV          |
| ESD according to IEC61000-4-2 contact discharge |           | $\pm 30$ |             |
| Operation junction temperature                  | $T_J$     | -50~125  | $^{\circ}C$ |
| Lead temperature                                | $T_L$     | 260      | $^{\circ}C$ |
| Storage temperature                             | $T_{STG}$ | -65~150  | $^{\circ}C$ |

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

| Parameter                 | Symbol    | Condition                             | Min. | Typ. | Max.     | Unit    |
|---------------------------|-----------|---------------------------------------|------|------|----------|---------|
| Reverse stand-off voltage | $V_{RWM}$ |                                       |      |      | $\pm 24$ | V       |
| Reverse leakage current   | $I_R$     | $V_{RWM} = 24$ V                      |      |      | 0.5      | $\mu A$ |
| Reverse breakdown voltage | $V_{BR}$  | $I_T = 1$ mA                          | 25.5 | 27.0 | 32.0     | V       |
| Clamping voltage          | $V_C$     | $I_{pp} = 1$ A $t_p = 8/20\mu s$      |      | 34.0 | 36.0     | V       |
|                           |           | $I_{ppMax} = 4.0$ A $t_p = 8/20\mu s$ |      | 44.0 | 46.0     | V       |
| Junction capacitance      | $C_J$     | $V_R = 0$ V, $f = 1$ MHz              |      | 20.0 | 35.0     | pF      |

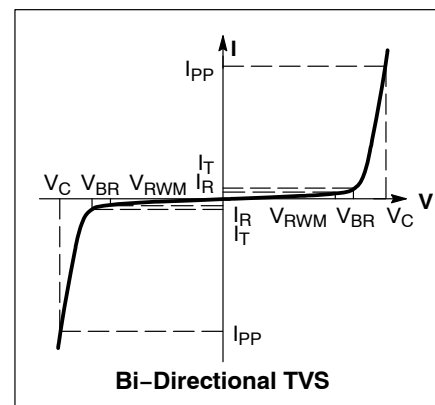
### Electrical performance curve

$V_C$  : Maximum clamping voltage

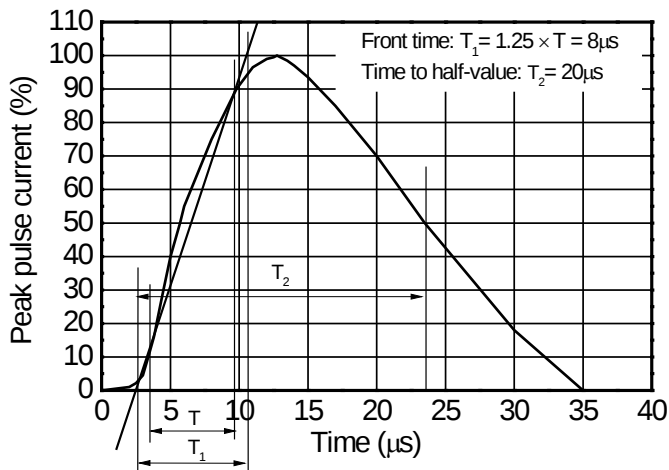
$V_{br}$  : Reverse breakdown voltage

$V_{RWM}$  : Working voltage

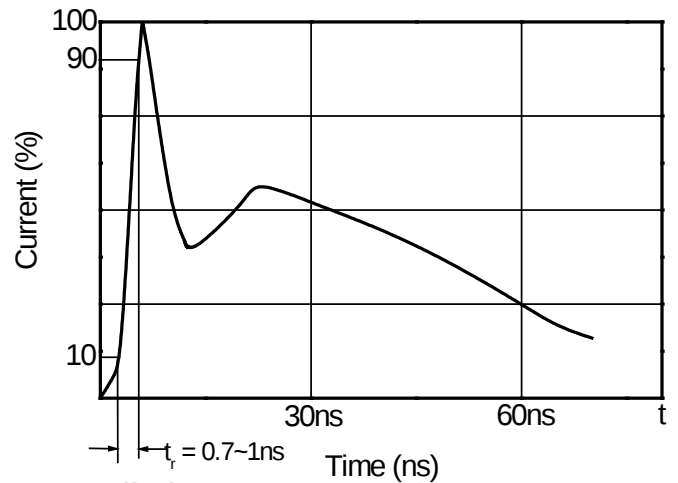
$I_{pp}$  : Maximum peak current



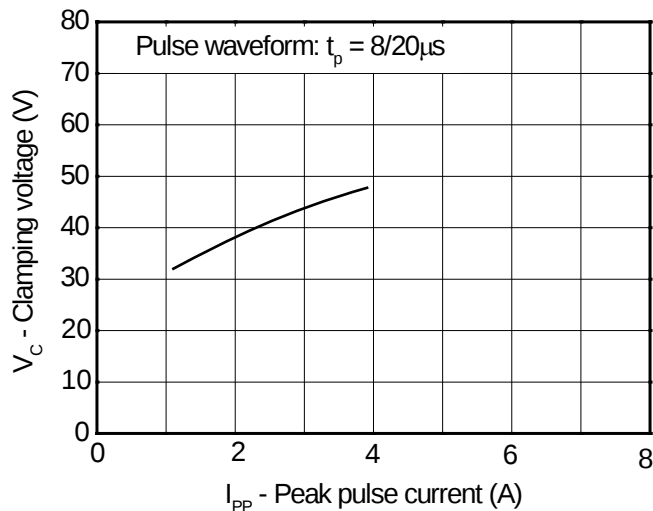
Typical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)



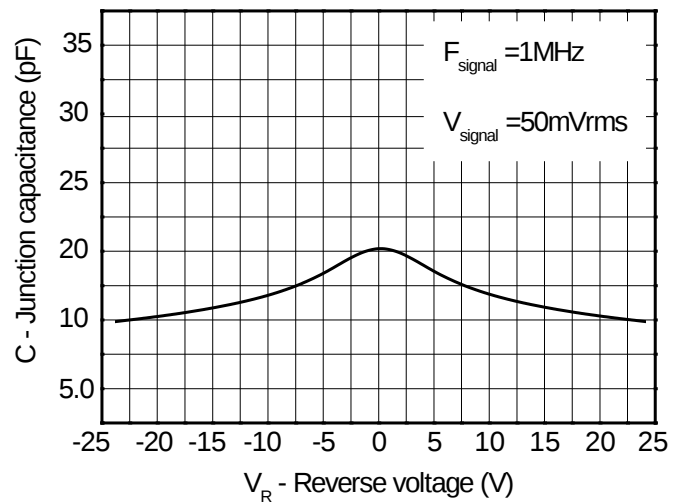
8/20 $\mu\text{s}$  waveform per IEC61000-4-5



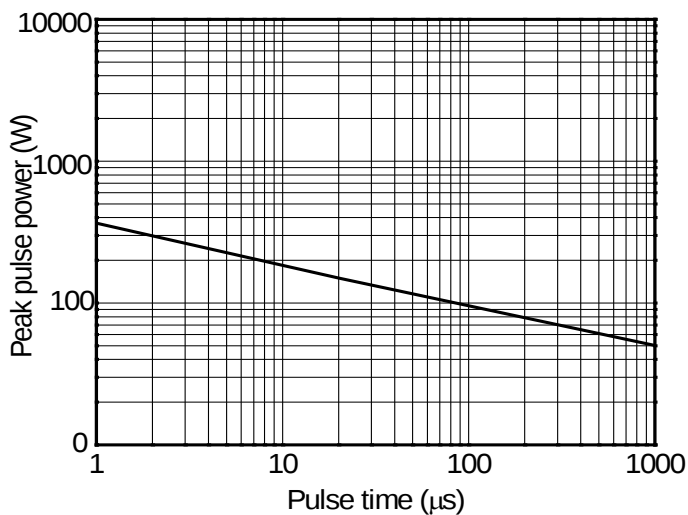
Contact discharge current waveform per IEC61000-4-2



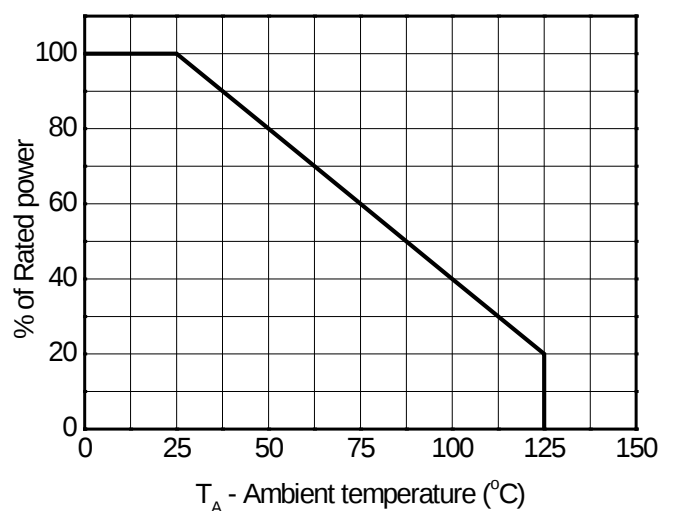
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

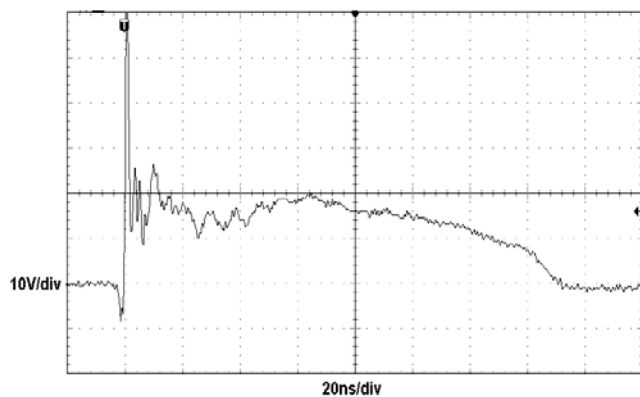
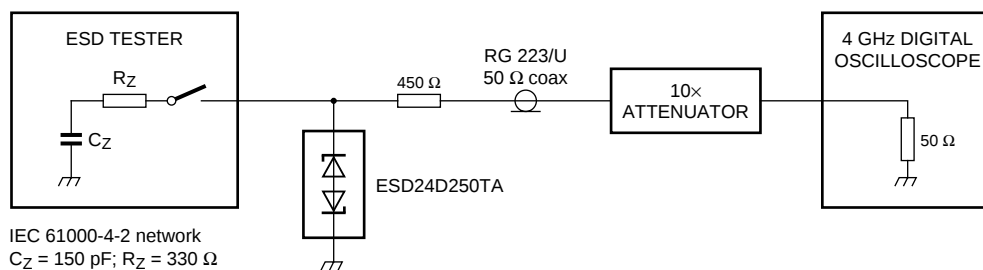


Non-repetitive peak pulse power vs. Pulse time

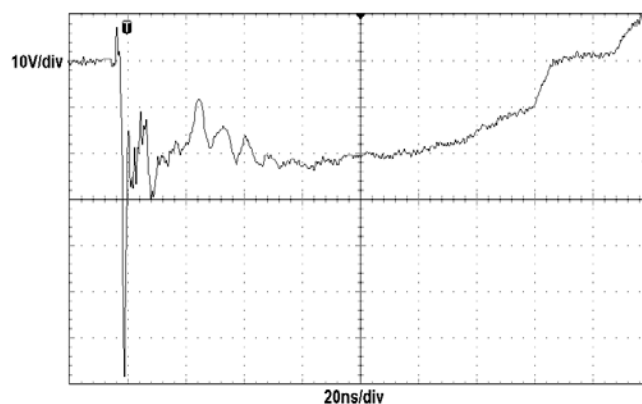


Power derating vs. Ambient temperature

### ESD clamping test setup and waveforms



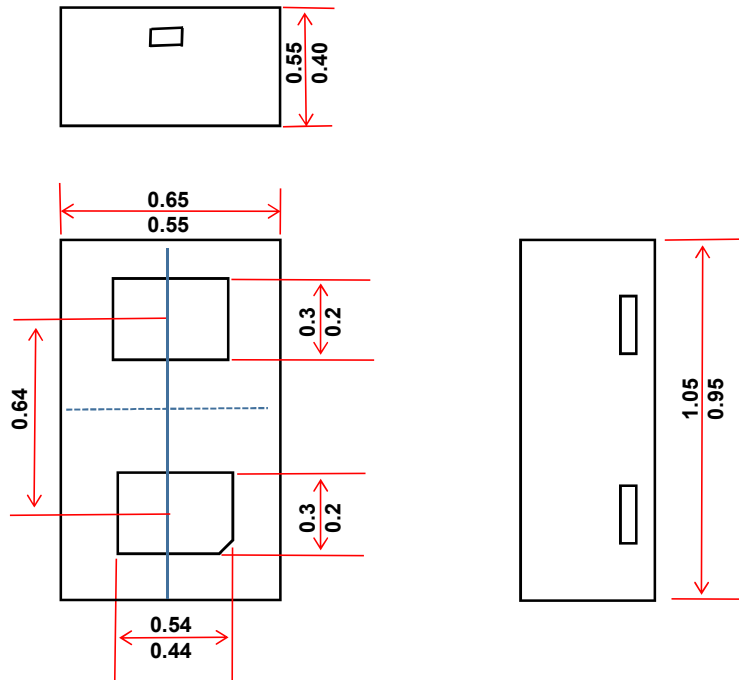
**ESD clamping**  
(+8kV contact discharge per IEC61000-4-2)



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

**Package outline dimensions**

**DFN1006-2L**



**Recommended Mounting Pad Layout** Unit:mm

