

Description

The ST4581D4 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The ST4581D4 complies with the IEC 61000-4-2 (ESD) standard with $\pm 15\text{kV}$ air and $\pm 8\text{kV}$ contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free DFN package. The small size and high ESD surge protection make ST4581D4 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Features

- ◆ Ultra small package: 1.0x0.6x0.5mm
- ◆ Protects one data or power line
- ◆ Ultra low leakage: nA level
- ◆ Low operating voltage: 4.5V
- ◆ Low clamping voltage
- ◆ 2-Pin leadless package
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 30\text{kV}$
Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 40A (8/20 μs)
- ◆ RoHS Compliant

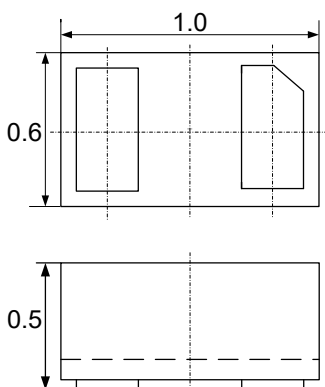
Mechanical Characteristics

- ◆ Package: DFN1006-2 (1.0x0.6x0.5mm)
- ◆ Lead Finish: NiPdAu
- ◆ Case Material: “Green” Molding Compound.
- ◆ UL Flammability Classification Rating 94V-0
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

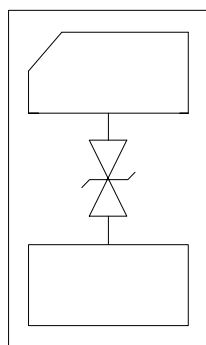
Applications

- ◆ Cellular Handsets and Accessories
- ◆ Personal Digital Assistants
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ Peripherals
- ◆ Audio Players
- ◆ Keypads, Side Keys, LCD Displays

Dimensions



Package Dimensions



Circuit and Pin Schematic

Schematic and PIN Configuration

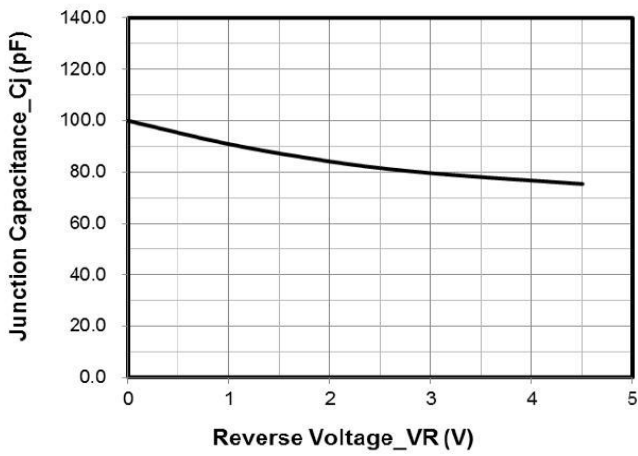
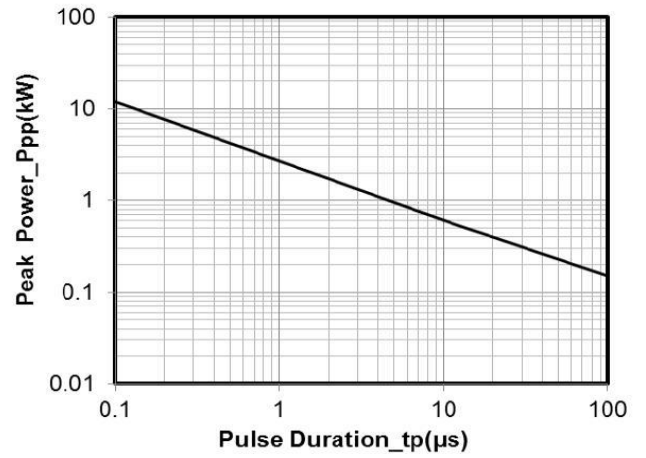
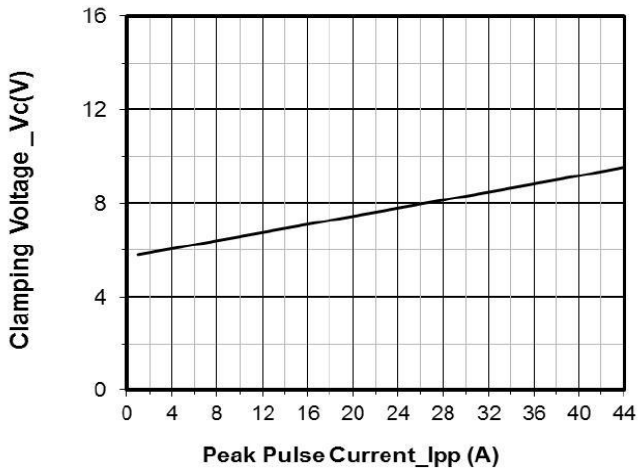
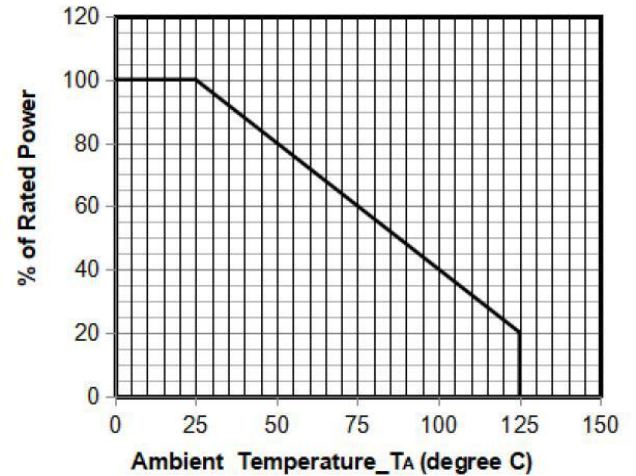
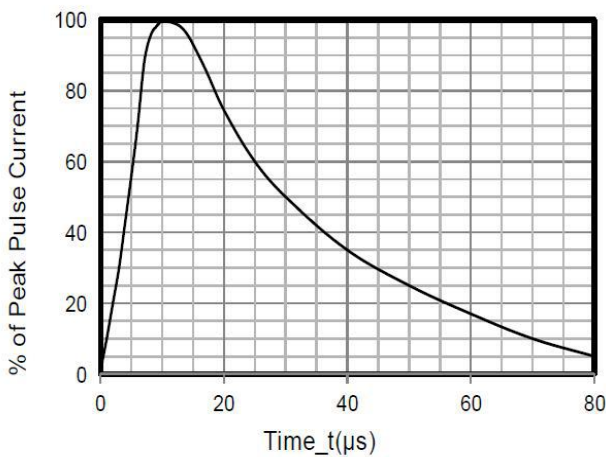
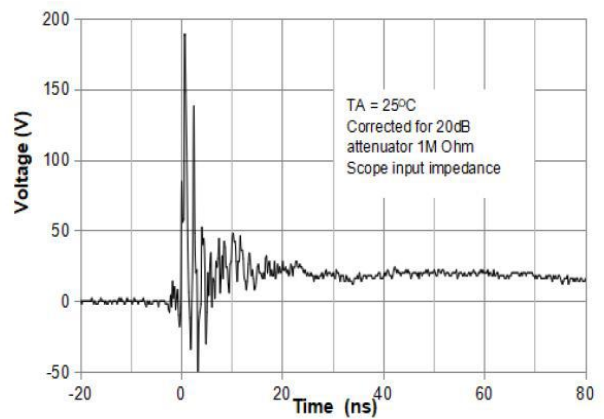
Part Number	Packaging	Reel Size
ST4581D4	10000/Tape & Reel	7 inch

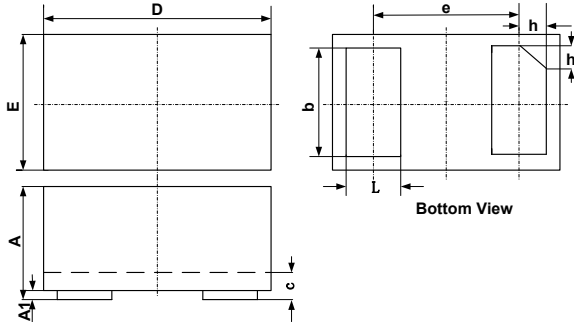
Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	400	W
Peak Pulse Current (8/20μs)	Ipp	40	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	-55 to +125	°C
Storage Temperature Range	Tstg	-55 to +150	°C

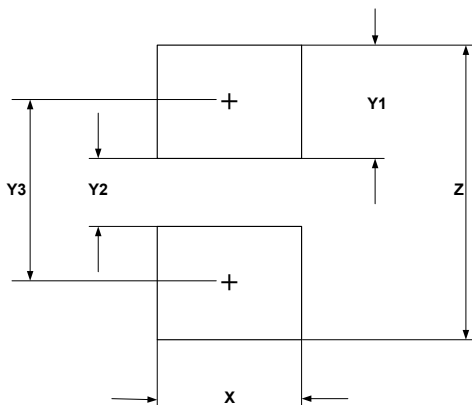
Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			4.5	V	
Breakdown Voltage	VBR	5			V	IT = 1mA
Reverse Leakage Current	IR			0.2	μA	VRWM = 4.5V
Clamping Voltage	VC			6	V	I _{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	VC			10	V	I _{PP} = 40A (8 x 20μs pulse)
Junction Capacitance	CJ		95		pF	VR = 0V, f = 1MHz

Typical Performance Characteristics (TA=25°C unless otherwise specified)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current (tp = 8/20μs)

Power Derating Curve

8 X 20μs Pulse Waveform

**ESD Clamping Voltage
8 kV Contact per IEC61000-4-2**

DFN1006-2 Package Outline Drawing


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	0.45	0.50	0.55	0.018	0.020	0.022
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
h	0.07	0.12	0.17	0.003	0.005	0.007

Suggested Land Pattern


SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052

Contact Information

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