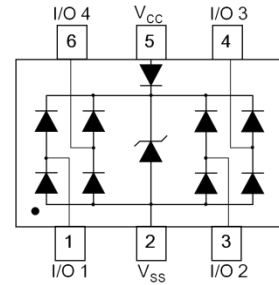


**Description**

The DT1446-04TS is a high performance device suitable for protecting four high speed I/Os and one V<sub>CC</sub>. These devices are assembled in SOT23-6 package. They have high ESD surge capability and low capacitance.



Device Schematic

**Features**

- IEC 61000-4-2 (ESD): Air – ±19kV, Contact – ±16kV
- Low Channel Input Capacitance of 0.55pF Max
- ESD Protection for four I/Os and one V<sup>CC</sup>

**Applications**

- Typically Used for High Speed Ports such as USB 2.0, IEEE1394, HDMI, Laptop and Personal Computers, Flat Panel Displays, Video Graphics Displays, SIM Ports

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current ,per IEC 61000-4-5	I <sub>PP_I/O</sub>	4.7	A	I/O to V <sub>SS</sub> , 8/20μs
Operating Voltage (DC)	V <sub>DC</sub>	6	V	V <sub>CC</sub> to V <sub>SS</sub>
ESD Protection – Contact Discharge	V <sub>ESD_I/O</sub>	±16	kV	I/O to V <sub>SS</sub> , per IEC 61000-4-2
	V <sub>ESD_VCC</sub>	±30	kV	V <sub>CC</sub> to V <sub>SS</sub> , per IEC 61000-4-2
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_I/O</sub>	±19	kV	I/O to V <sub>SS</sub> , per IEC 61000-4-2
	V <sub>ESD_VCC</sub>	±30	kV	V <sub>CC</sub> to V <sub>SS</sub> , per IEC 61000-4-2

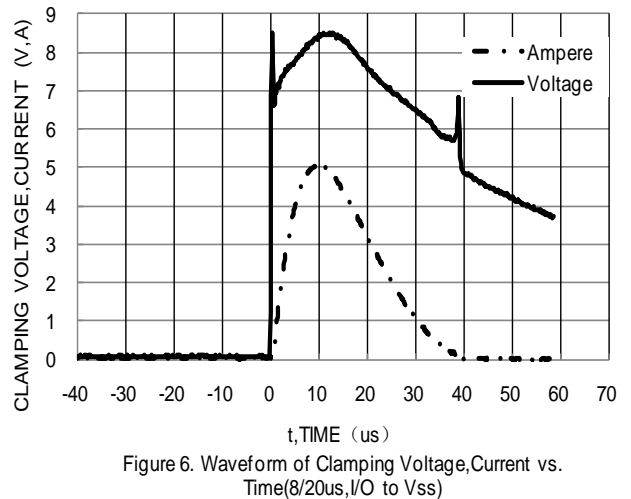
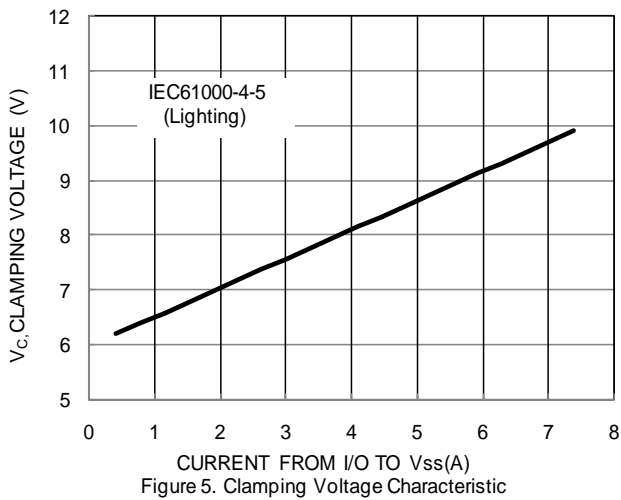
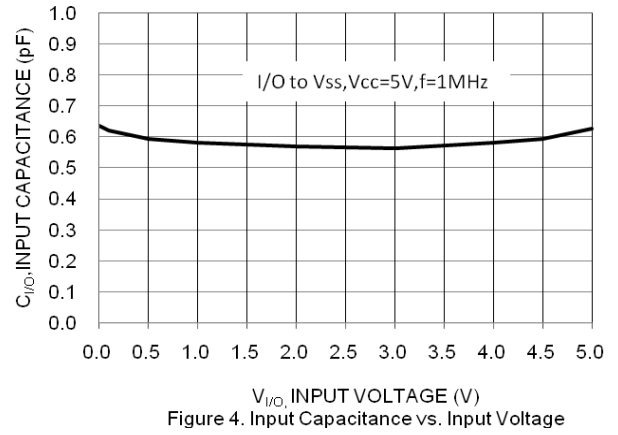
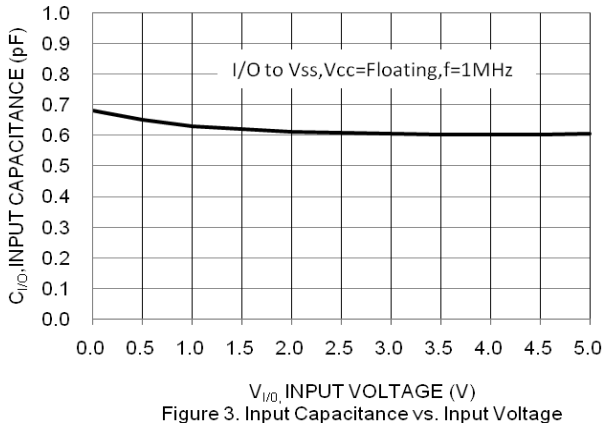
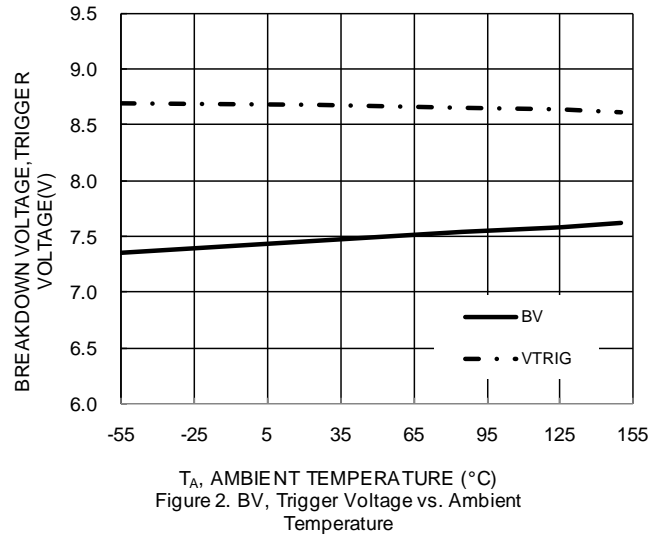
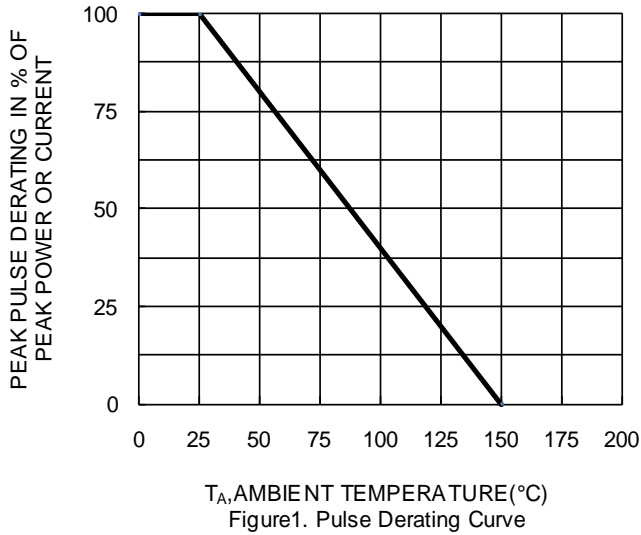
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R <sub>θJA</sub>	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V <sub>RWM</sub>			5.0	V	V <sub>CC</sub> to V <sub>SS</sub>
Reverse Current (Note 6)	I <sub>R</sub> (V <sub>CC</sub> to V <sub>SS</sub> )			5.0	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5V, V <sub>CC</sub> to V <sub>SS</sub>
Reverse Current (Note 6)	I <sub>R</sub> (I/O to V <sub>SS</sub> )			1.0	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5V, any I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	6.0		9.0	V	I <sub>R</sub> = 1mA, V <sub>CC</sub> to V <sub>SS</sub>
Forward Clamping Voltage	V <sub>F</sub>		0.8	1.0	V	I <sub>F</sub> = 15mA, V <sub>SS</sub> to V <sub>CC</sub>
Reverse Clamping Voltage (Note 7)	V <sub>C_I/O</sub>		8.5		V	I <sub>PP</sub> = 4.7A, I/O to V <sub>SS</sub> , 8/20μs
ESD Clamping Voltage	V <sub>ESD_VCC</sub>		10		V	TLP, 20A, tp = 100 ns, V <sub>CC</sub> to V <sub>SS</sub>
	V <sub>ESD_I/O</sub>		12		V	TLP, 20A, tp = 100 ns, I/O to V <sub>SS</sub>
Dynamic Resistance	R <sub>DIF_VCC</sub>		0.14		Ω	TLP, 20A, tp = 100 ns, V <sub>CC</sub> to V <sub>SS</sub>
	R <sub>DIF_I/O</sub>		0.3		Ω	TLP, 20A, tp = 100 ns, I/O to V <sub>SS</sub>
Channel Input Capacitance	C <sub>I/O to VSS</sub>		0.55	0.65	pF	V <sub>R</sub> = 2.5V, V <sub>CC</sub> = 5V, f = 1MHz
Channel Input Capacitance	C <sub>I/O to VSS</sub>		0.65		pF	V <sub>R</sub> = 2.5V, V <sub>CC</sub> = floating, f = 1MHz
Variation of Channel Input Capacitance	C <sub>I/OMAX</sub> -C <sub>I/OMIN</sub>		0.03		pF	V <sub>CC</sub> = 5V, V <sub>SS</sub> = 0V, I/O = 2.5V, f = 1MHz, T = +25°C, C <sub>I/OMAX</sub> - C <sub>I/OMIN</sub>
Variation of Channel Input Capacitance	C <sub>I/OMAX</sub> -C <sub>I/OMIN</sub>		0.05		pF	V <sub>CC</sub> = floating, V <sub>SS</sub> = 0V, I/O = 2.5V, f = 1MHz, T = +25°C, C <sub>I/OMAX</sub> - C <sub>I/OMIN</sub>

- Notes:
1. Device mounted on FR-4 PCB pad layout
  2. Short duration pulse test used to minimize self-heating effect.
  3. Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>pp</sub>) waveform.



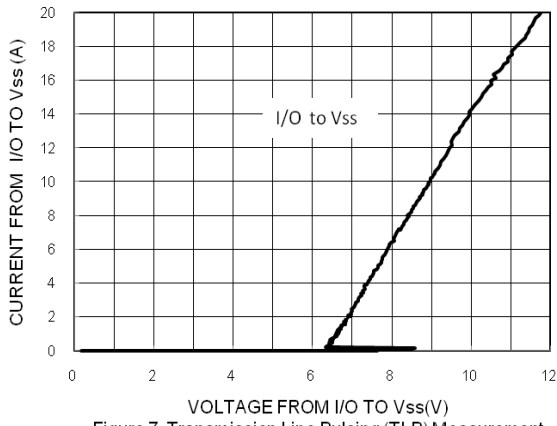


Figure 7. Transmission Line Pulsing (TLP) Measurement Current vs. Voltage

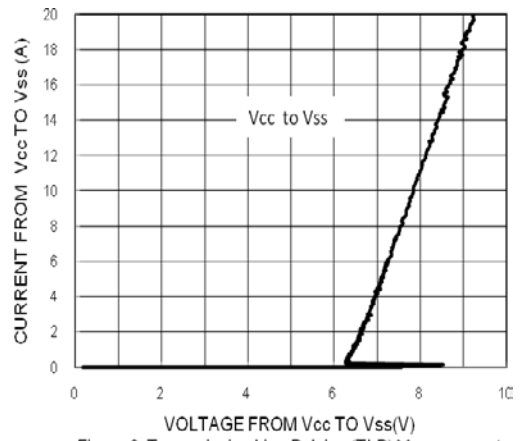


Figure 8. Transmission Line Pulsing (TLP) Measurement Current vs. Voltage

SOT23-6

## Marking

## Ordering information

Order code	Package	Base qty	Delivery mode
UMW DT1446-04TS-7	SOT23-6	3000	Tape and reel

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[P6KE13CA](#) [P6KE43CA](#) [P6KE6.8CA](#) [P6KE8.2](#) [P6SMBJ20CA](#) [JANTX1N6072A](#) [SR2835ESKG](#) [SA90CA](#)