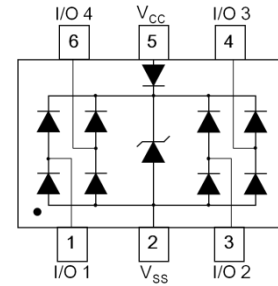


Description

The DT1446-04TS is a high performance device suitable for protecting four high speed I/Os and one V_{CC} . 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 – $\pm 19kV$, Contact – $\pm 16kV$
- Low Channel Input Capacitance of 0.55pF Max
- ESD Protection for four I/Os and one V_{CC}

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_A = +25°C, unless otherwise specified.)

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

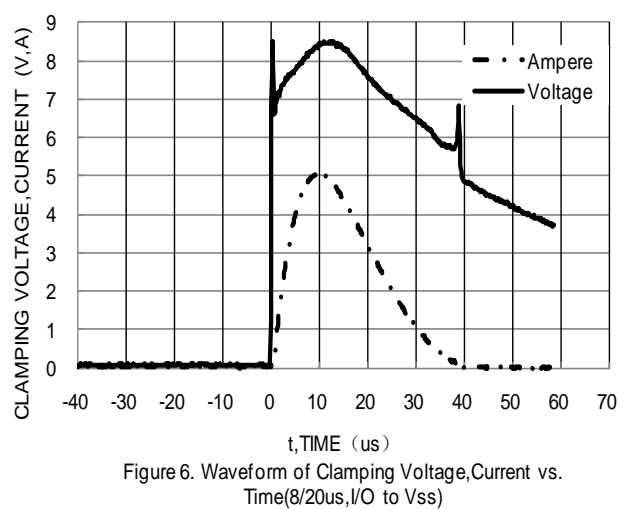
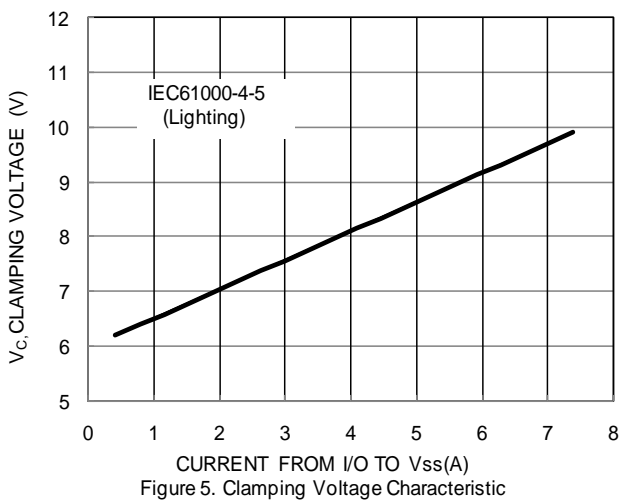
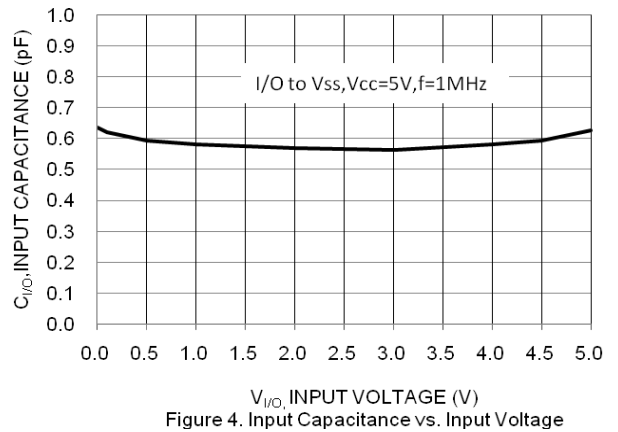
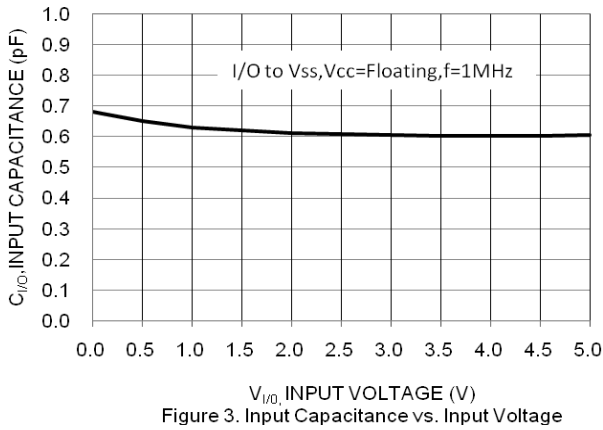
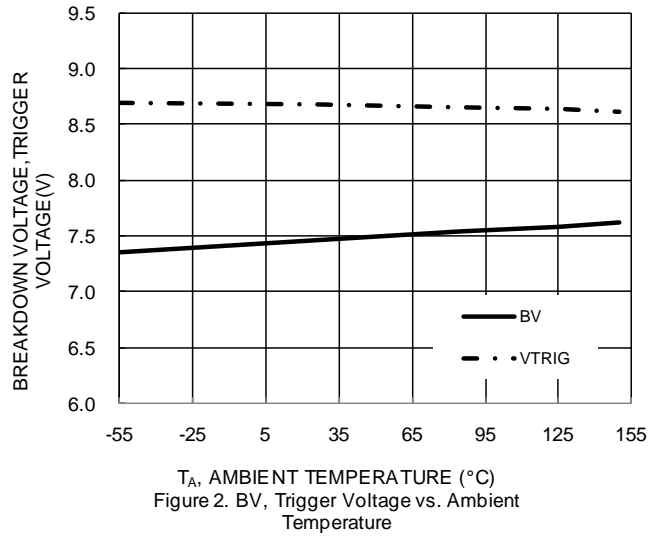
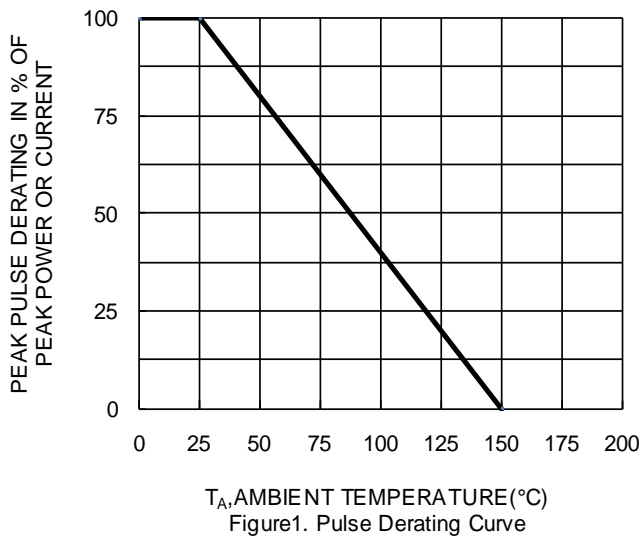
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R _{θJA}	417	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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

- 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_{pp}) waveform.



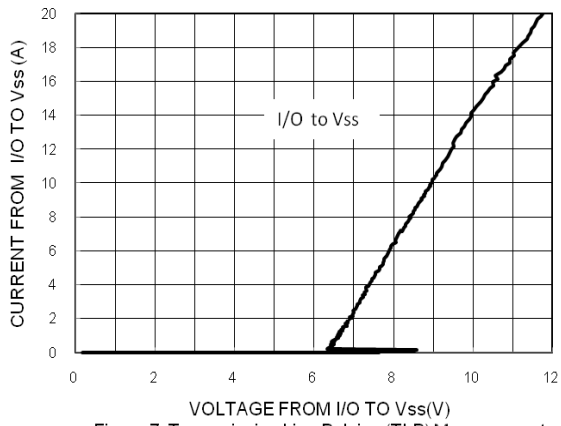


Figure 7. Transmission Line Pulsing (TLP) Measurement Current vs. Voltage

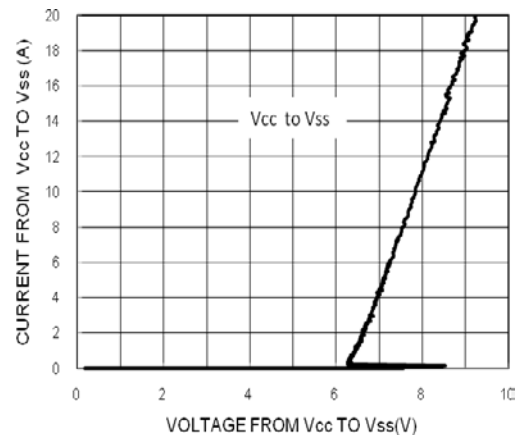
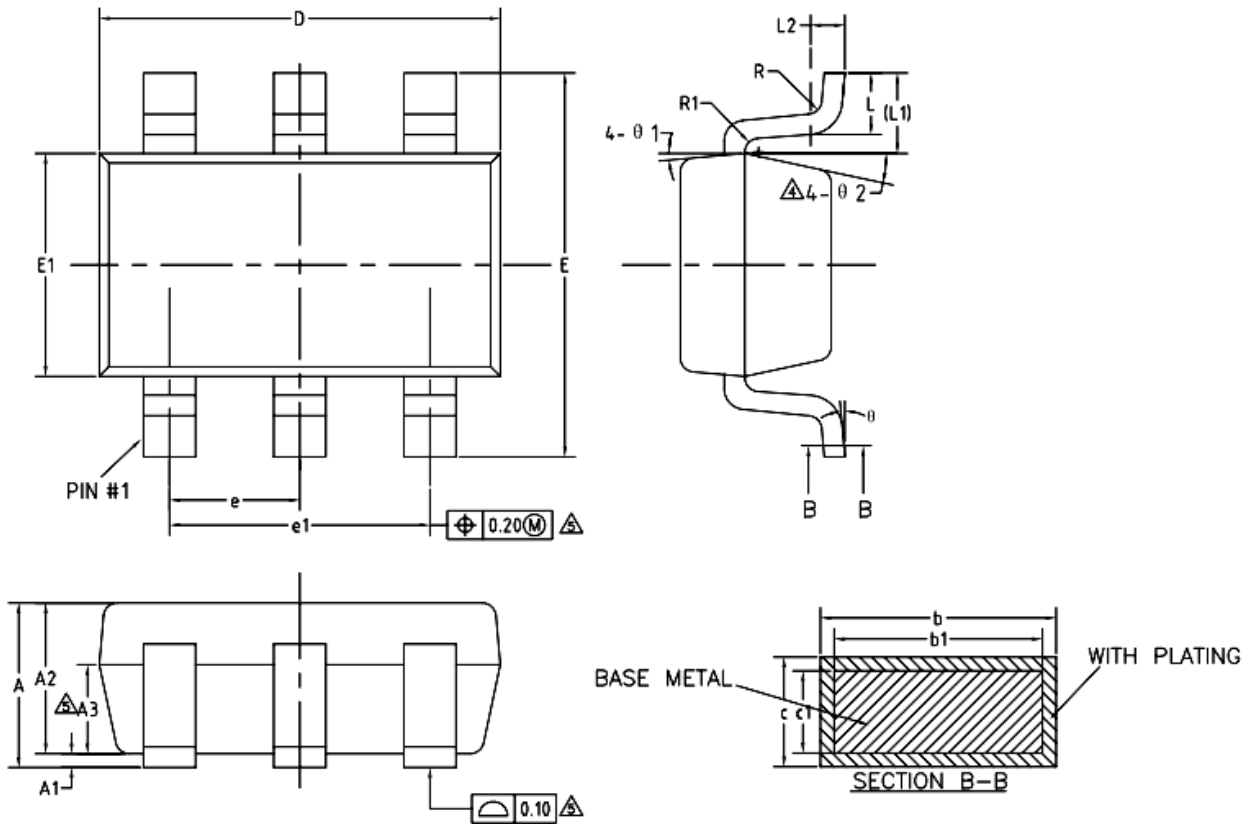


Figure 8. Transmission Line Pulsing (TLP) Measurement Current vs. Voltage

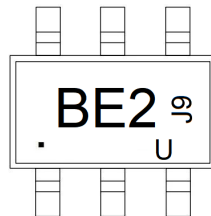
SOT23-6



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	—	—	1.25
A1	0	—	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	—	0.50
b1	0.36	0.38	0.45
c	0.14	—	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
Δ e	0.90	0.95	1.00
Δ e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
Δ R	0.10	—	—
Δ R1	0.10	—	0.20
θ	0°	—	8°
$\theta 1$	3°	5°	7°
Δ $\theta 2$	6°	—	14°

Marking



Ordering information

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