

1.Description

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

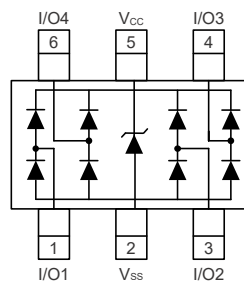
3.Features

- IEC 61000-4-2 (ESD): Air – $\pm 19\text{kV}$,
Contact – $\pm 16\text{kV}$
- ESD Protection for four I/Os and one V_{CC}

2.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

4.Pinning information



SOT23-6

5.Thermal resistance rating

Parameter	Symbol	Value	Units
Power Dissipation Typical (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	$R_{\theta JA}$	417	$^{\circ}\text{C/W}$
Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$



6. Absolute Maximum Ratings $T_A = 25^\circ\text{C}$

Parameter	Symbol	Value	Units	Conditions
Peak Pulse Current, per IEC 61000-4-5	$I_{PP_I/O}$	4.7	A	I/O to V_{SS} , 8/20 μs
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
	$V_{ESD_V_{CC}}$	± 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
	$V_{ESD_V_{CC}}$	± 30	kV	V_{CC} to V_{SS} , per IEC 61000-4-2



7. Electrical Characteristic ($T_A=25^\circ\text{C}$ unless otherwise noted)

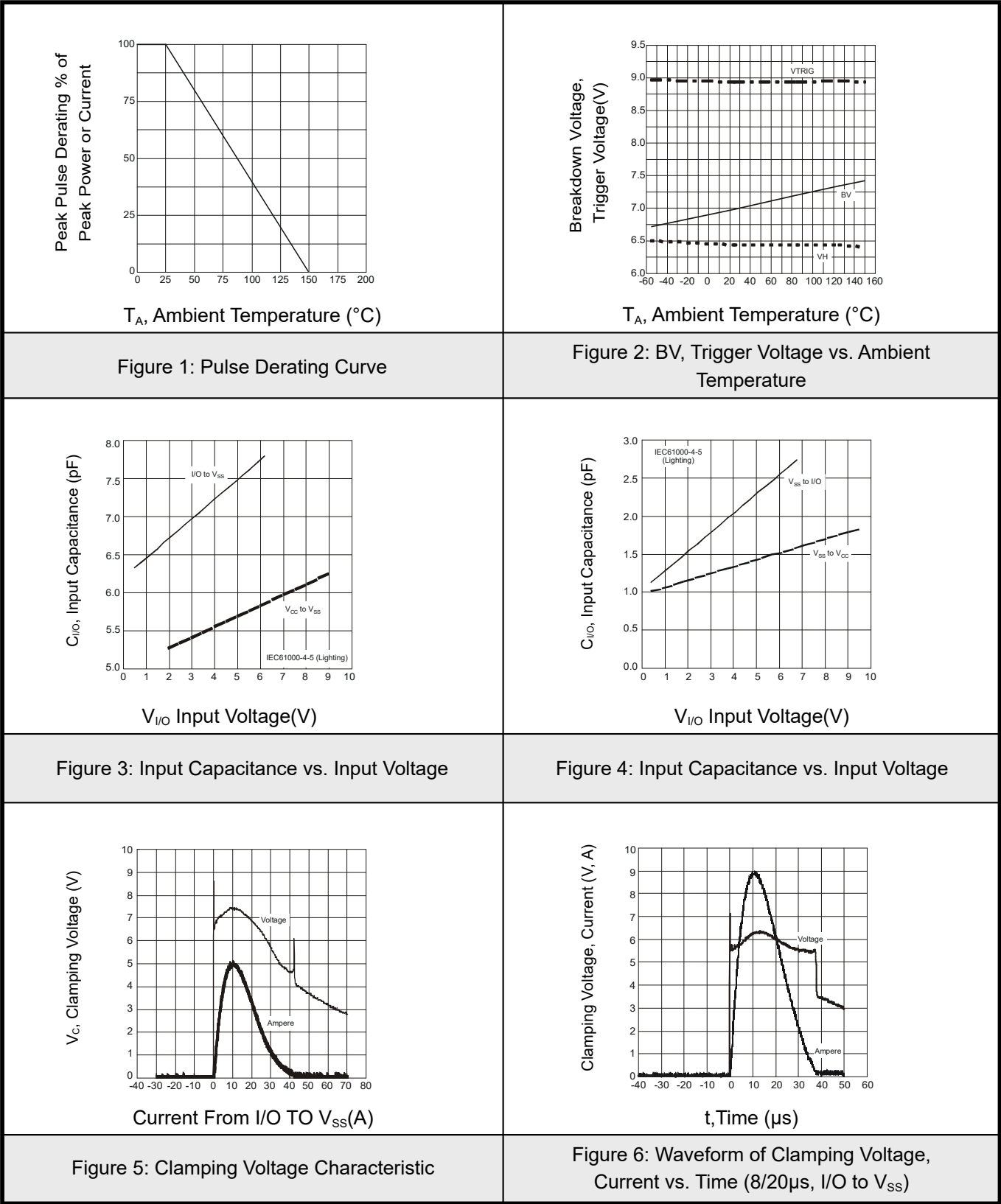
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse Working Voltage	V_{RWM}	V_{CC} to V_{SS}			5	V
Reverse Current (Note 6)	$I_{RR}(V_{CC} \text{ to } V_{SS})$	$V_R=V_{RWM}=5V$, V_{CC} to V_{SS}			5	μA
Reverse Current (Note 6)	$I_{R(I/O \text{ to } V_{SS})}$	$V_R=V_{RWM}=5V$, any I/O to V_{SS}			1	μA
Reverse Breakdown Voltage	V_{BR}	$I_R=1\text{mA}$, V_{CC} to V_{SS}	6		9	V
Forward Clamping Voltage	V_F	$I_F=15\text{mA}$, V_{SS} to V_{CC}		0.8	1	V
Reverse Clamping Voltage	$V_{C_I/O}$	$I_{PP}=4.7\text{A}$, I/O to V_{SS} , 8/20 μs		8.5		V
ESD Clamping Voltage	$V_{ESD_V_{CC}}$	TLP, 20A, $t_p=100\text{ns}$, V_{CC} to V_{SS}		10		V
	$V_{ESD_I/O}$	TLP, 20A, $t_p=100\text{ns}$, I/O to V_{SS}		12		V
Dynamic Resistance	$R_{DIF_V_{CC}}$	TLP, 20A, $t_p=100\text{ns}$, V_{CC} to V_{SS}		0.14		Ω
	$R_{DIF_I/O}$	TLP, 20A, $t_p=100\text{ns}$, I/O to V_{SS}		0.3		Ω
Channel Input Capacitance	$C_{I/O \text{ to } V_{SS}}$	$V_R=2.5V$, $V_{CC}=5V$, $f=1\text{MHz}$		0.55	0.65	pF
Channel Input Capacitance	$C_{I/O \text{ to } V_{SS}}$	$V_R=2.5V$, $V_{CC}=\text{floating}$, $f=1\text{MHz}$		0.65		pF
Variation of Channel Input Capacitance	$C_{I/OMAX}-C_{I/OMIN}$	$V_{CC}=5V$, $V_{SS}=0V$, I/O=2.5V, $f=1\text{MHz}$ $T=+25^\circ\text{C}$, $C_{I/OMAX}-C_{I/OMIN}$		0.03		pF
Variation of Channel Input Capacitance	$C_{I/OMAX}-C_{I/OMIN}$	$V_{CC}=\text{floating}$, $V_{SS}=0V$, I/O=2.5V, $f=1\text{MHz}$ $T=+25^\circ\text{C}$, $C_{I/OMAX}-C_{I/OMIN}$		0.05		pF

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 8x20 μs peak pulse current (I_{PP}) waveform.

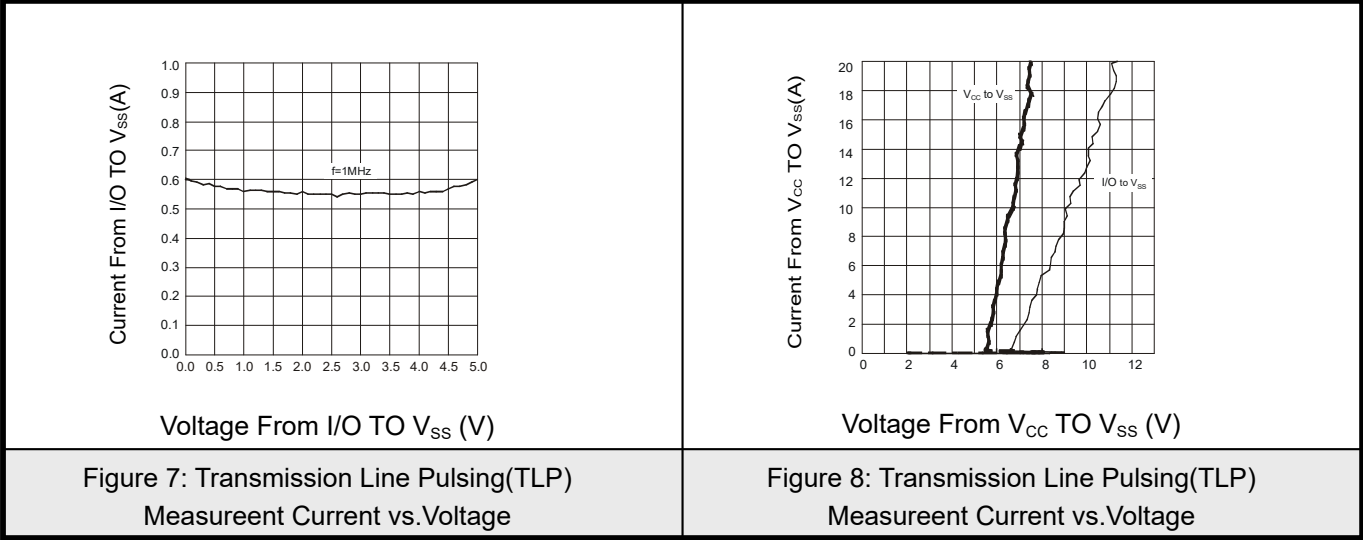


8.1Typical characteristic



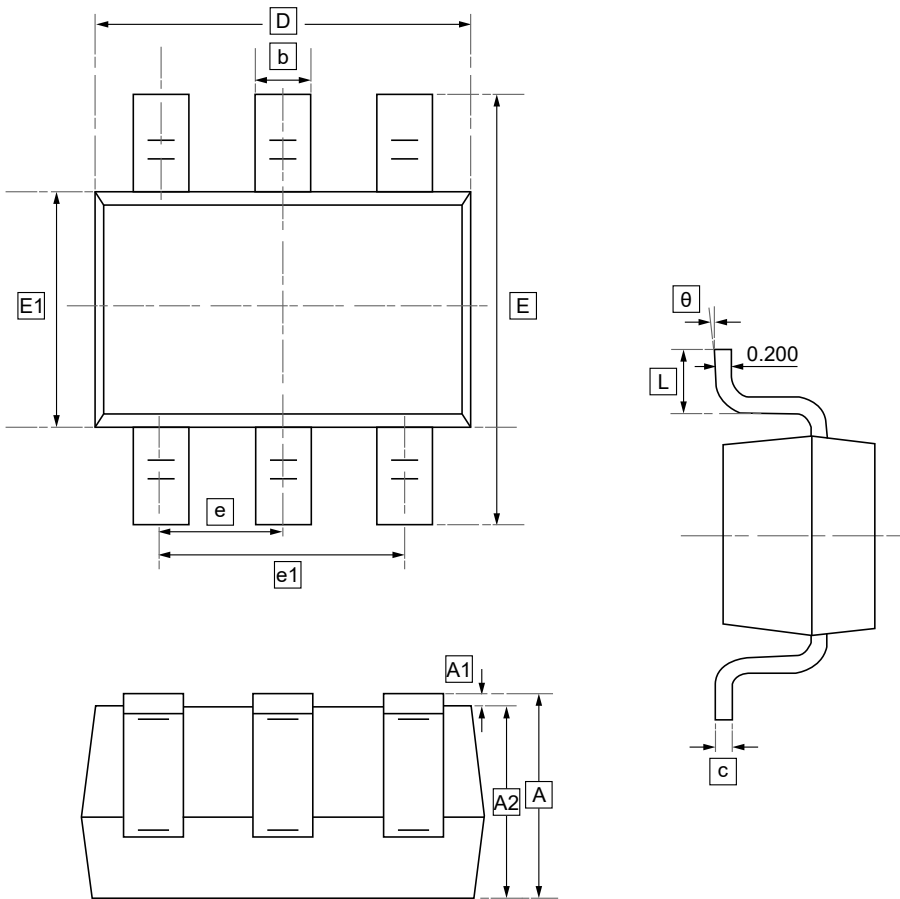


8.2Typical characteristic





9.SOT-23-6 Package Outline Dimensions

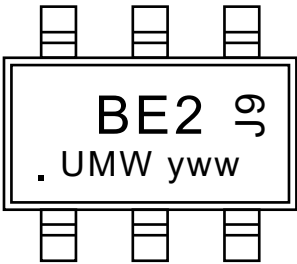


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E1	E	e	e1	L	θ
Min	1.050	0.000	1.050	0.300	0.100	2.820	1.500	2.650	0.950	1.800	0.300	0°
Max	1.250	0.100	1.150	0.500	0.200	3.020	1.700	2.950	BSC	2.000	0.600	8°



10.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW DT1446-04TS-7	SOT23-6	3000	Tape and reel



11.Disclaimer

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