

Features

- ❑ Transient protection for high-speed data lines
IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air)
 $\pm 25\text{kV}$ (Contact)
IEC 61000-4-4 (EFT) 40A (5/50 ns)
Cable Discharge Event (CDE)
- ❑ Small package ($1.6\text{mm} \times 1.6\text{mm} \times 0.75\text{mm}$)
- ❑ Protects two data lines
- ❑ Low leakage current: $0.1\mu\text{A}$ @ V_{RWM} (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge
- ❑ Halogens and Pb free

Description

TT0502PF is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 5.0pF only, TT0502PF is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

TT0502PF uses small SOT-523 package. Each TT0502PF device can protect two high-speed data lines. The low clamping voltage of the TT0502PF guarantees a minimum stress on the protected IC.

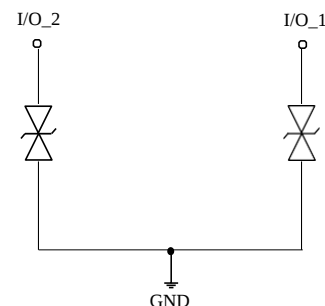
Applications

- ❑ Mobile Phones and accessories
- ❑ Desktops, Servers and Notebook
- ❑ Hand held portable
- ❑ Digital Cameras
- ❑ Computer Interfaces Protection
- ❑ Serial and Parallel Ports Protection
- ❑ Control Signal Lines Protection

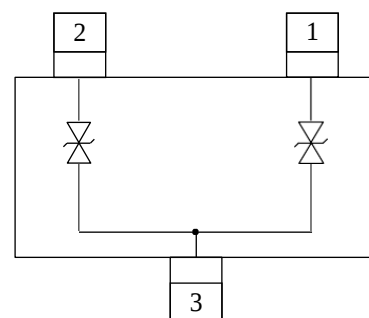
Mechanical Characteristics

- ❑ SOT-523 package
- ❑ Flammability Rating: UL 94V-0
- ❑ Marking: Part number
- ❑ Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



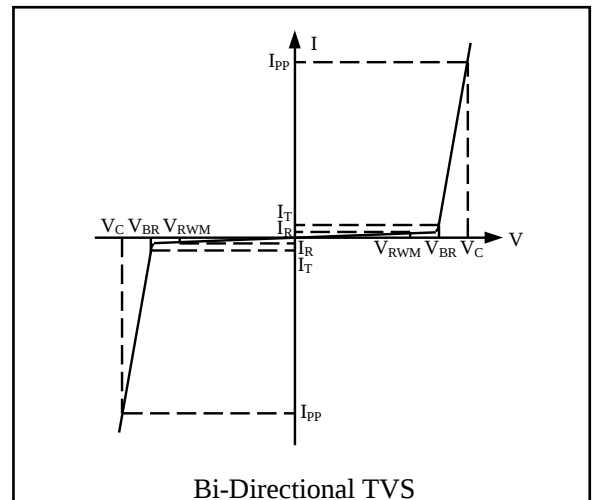
SOT-523

(Top View, not to scale)

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air)	± 30	kV
	ESD per IEC 61000-4-2 (Contact)	± 25	
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

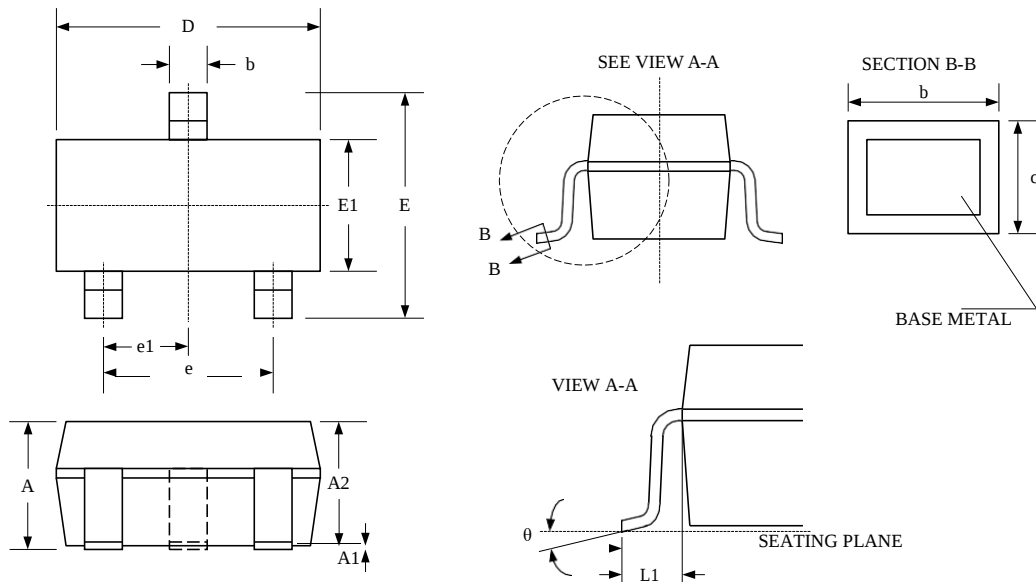
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency



Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5.0	V
I_R	$V_{RWM} = 5V$, T = 25°C Between I/O_1 and I/O_2		0.1	1.0	μA
V_{BR}	$I_T = 1mA$ Between I/O_1 and I/O_2	6.0	6.8	8.0	V
V_C	$I_{PP} = 1A$, $t_p = 8/20\mu s$ Between I/O_1 and I/O_2			9	V
V_C	$I_{PP} = 4A$, $t_p = 8/20\mu s$ Between I/O_1 and I/O_2			13	V
C_{ESD}	$V_R = 0V$, f = 1MHz Between I/O_1 and I/O_2		5	7	pF
R_{dyn}	IEC61000-4-2 0-8KV T=25°C		0.4		Ω
V_C	$I_{PP} = 8.0A$, $t_p = 100ns$		10.0		V
	$I_{PP} = 16.0A$, $t_p = 100ns$		13.5		V

Package Outline

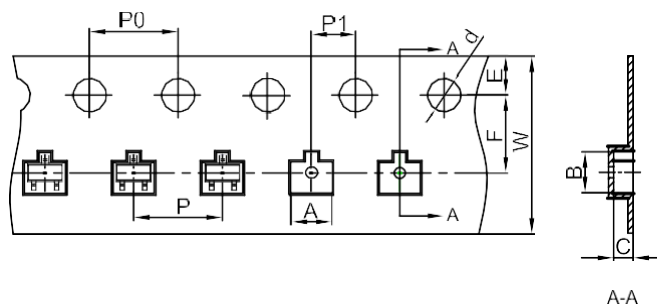
□ SOT-523 package



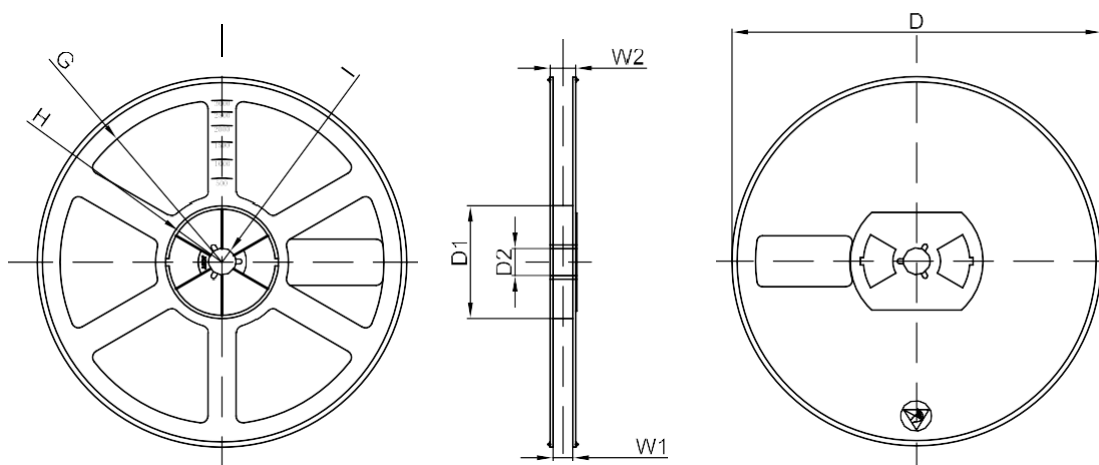
Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions (mm)			Dimensions (Inches)		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
A	0.600	—	0.900	0.023	—	0.035
A1	0.000	—	0.100	0.000	—	0.004
A2	0.600	0.750	0.800	0.023	0.030	0.031
b	0.150	—	0.300	0.005	—	0.012
c	0.100	—	0.200	0.003	—	0.008
D	1.500	1.600	1.700	0.059	0.063	0.067
e	1.00 BSC			0.039 BSC		
e1	0.50 BSC			0.020 BSC		
E	1.450	1.600	1.750	0.057	0.063	0.069
E1	0.750	0.800	0.850	0.029	0.031	0.033
L1	0.220 REF			0.009 REF		
θ	0°	—	8°	0°	—	8°

Tape and Reel Specification

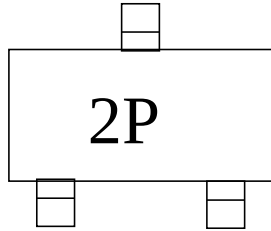


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-523	1.85	1.85	0.875	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	+/-2	+/-1	+/-1	+/-1	+/-1	+/-1	+/-1	+/-1

Marking Codes



Note:

(1) "2P" is part number, fixed.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT0502PF	5V	3,000	7 Inch