

ESD5Z5.0D

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Surface Mount Uni-Directional TVS For ESD Protection 5.0V

Features

- Package optimized for high-speed lines.
- Protects one data, control or power line.
- Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ (Contact discharge).
- Transient protection for high-speed data lines
 - IEC61000 -4-2 (ESD) $\pm 25\text{kV}$ (Air), $\pm 20\text{kV}$ (Contact).
 - IEC 61000-4-4 (EFT) 40A (5/50ns).
 - Cable discharge event (CDE).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen-free part, ex.ESD5Z5.0D-H.

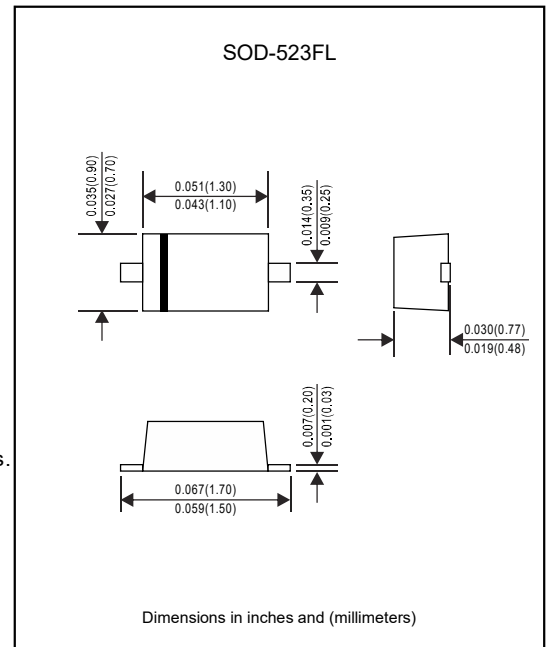
Applications

- Cell phone handsets, accessories, notebook, desktops and servers.
- Microprocessor based equipment and personal digital assistants (PDA's).
- Portable instrumentation, networking and telecom, serial and parallel ports.
- Peripherals.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOD-523FL.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse current (8/20 μs)	I_{PP}	11	A
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 25	KV
ESD per IEC 61000-4-2 (Contact)		± 20	
Operating junction temperature	T_J	+125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

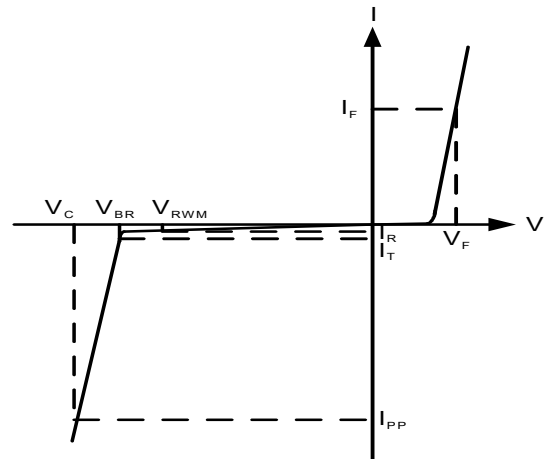
Electrical characteristics (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Reverse working voltage		V_{RWM}			5	V
Breakdown voltage	$I_T=1\text{mA}$ (Between I/O and GND)	V_{BR}	6		8	V
Reverse leakage current	$V_{RWM}=5\text{V}$, $T=25^\circ\text{C}$ (Between I/O and GND)	I_R			0.1	μA
Clamping voltage	$I_{PP}=11\text{A}$, $t_p=8/20\mu\text{s}$ (Between I/O and GND)	V_C			13	V
Parasitic capacitance	$V_R=0\text{V}$, $f=1.0\text{MHz}$ (Between I/O and GND)	C_{ESD}		80		pF

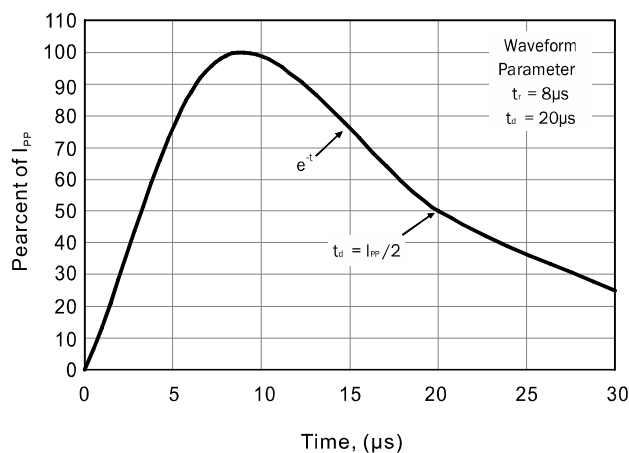
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Rating and characteristic curves

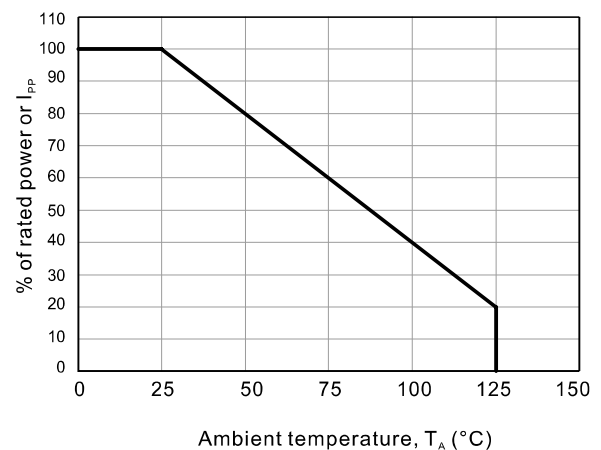
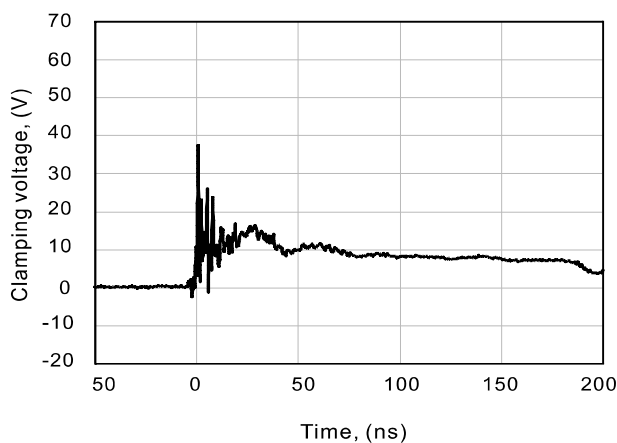
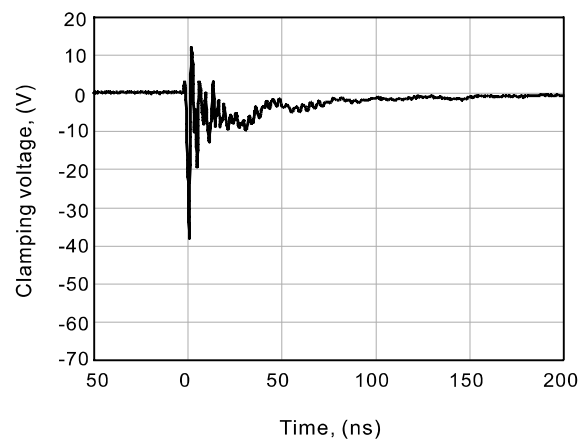
Symbol	Parameter
V_{RWM}	Nominal reverse working voltage
I_R	Reverse leakage current@ V_{RWM}
V_{BR}	Reverse breakdown voltage@ I_T
I_T	Test current for reverse breakdown
V_R	Reverse voltage
V_F	Forward voltage @ I_F
V_C	Clamping voltage@ I_{PP}
C_{ESD}	Parasitic capacitance
I_{PP}	Maximum peak pulse current
I_F	Forward current @ I_F
f	Small signal frequency



Pulse waveform



Power derating curve

ESD clamping of I/O to GND
(+8kV contact per IEC 61000-4-2)ESD clamping of I/O to GND
(-8kV contact per IEC 61000-4-2)

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Pinning information

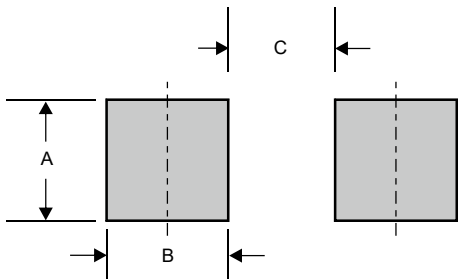
Pin	Simplified outline	Symbol
Pin 1 Cathode Pin 2 Anode		

Marking

Type number	Marking code
ESD5Z5.0D	ZF

* "ZF" is part number, fixed.

Suggested solder pad layout

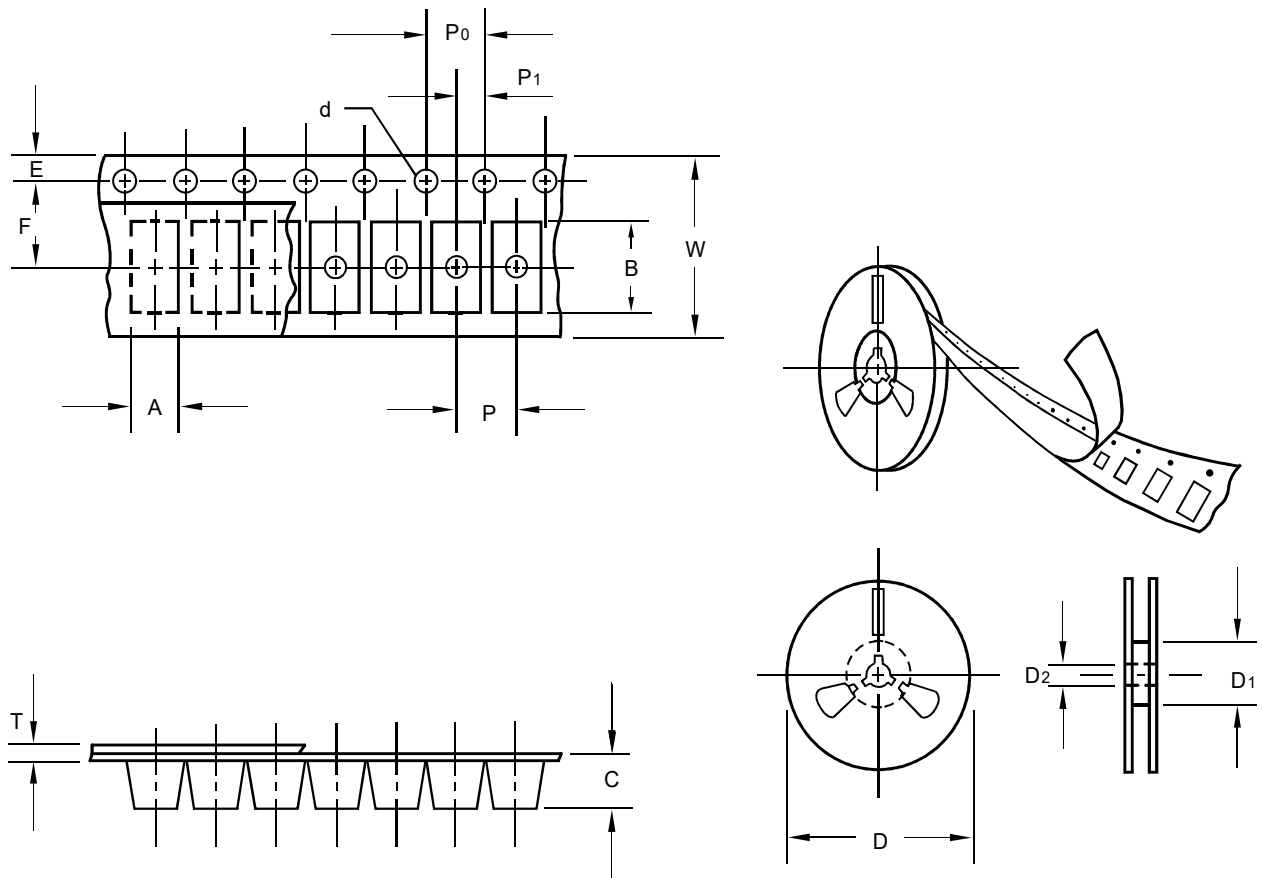


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-523FL	0.018 (0.45)	0.033 (0.85)	0.024 (0.60)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOD-523FL
Carrier width	A	0.1	0.90
Carrier length	B	0.1	1.94
Carrier depth	C	0.1	0.76
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	50.00
Feed hole diameter	D2	0.2	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

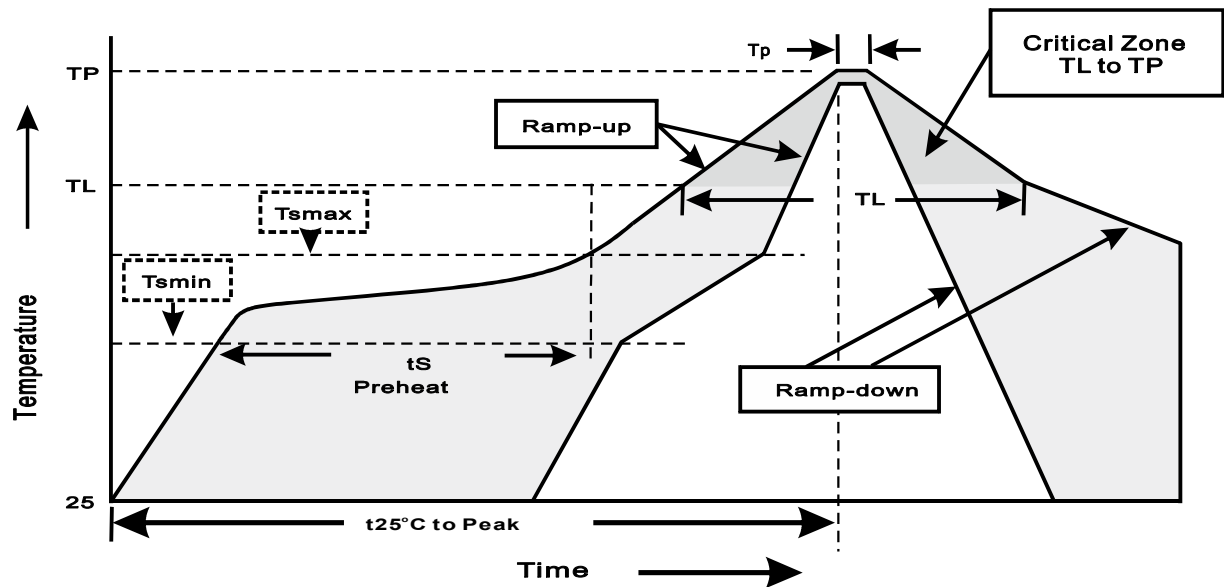
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SOD-523FL	7"	3,000	2.0	30,000	183*123*183	178	382*257*387	240,000

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$< 3^\circ\text{C/sec}$
Preheat - Temperature Min(T_{smin}) - Temperature Max(T_{smax}) - Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} to T_L - Ramp-upRate	$< 3^\circ\text{C/sec}$
Time maintained above: - Temperature(T_L) - Time(t_L)	217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	$< 6^\circ\text{C/sec}$
Time 25°C to Peak Temperature	< 6 minutes