

ESD5LL5.0C

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Surface Mount Bi-Directional TVS For ESD Protection Diode 5.0V

Features

- 100Watts peak pulse power per line ($t_p=8/20\mu s$).
- Protects one I/O or power line.
- Provide transient protection :
IEC 61000-4-2 (ESD) $\pm 25KV$ (Air).
IEC 61000-4-2 (ESD) $\pm 22KV$ (Contact).
IEC 61000-4-5 (Lightning) 4A (8/20 μs).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.ESD5LL5.0C-H.

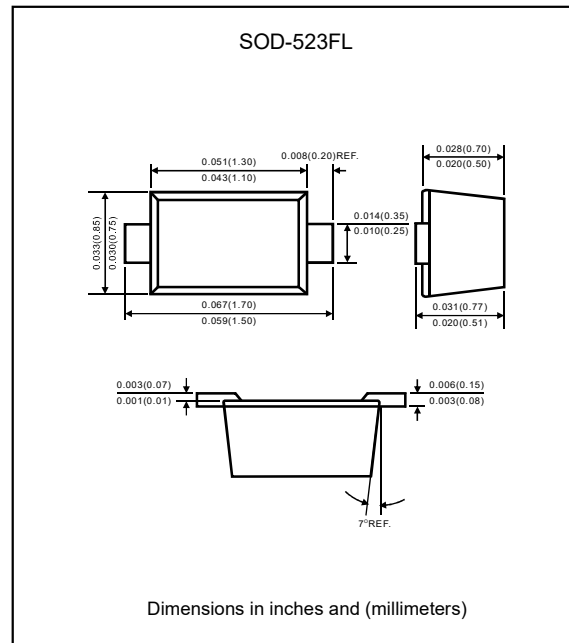
Applications

- Cellular Handsets & Accessories
- Display Ports.
- MDDI Ports.
- USB Ports.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-523FL
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.002 gram

Package outline



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

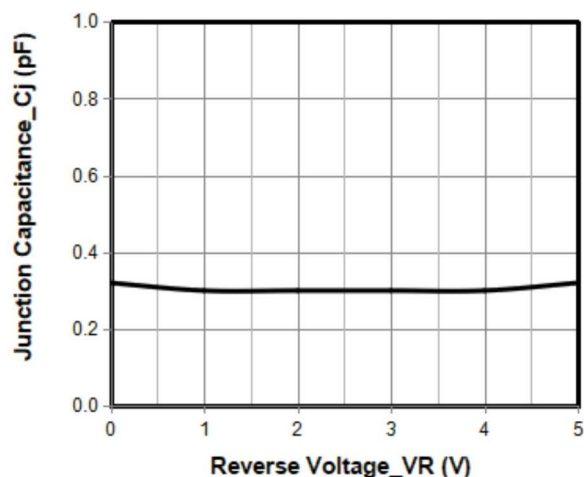
Parameter	Symbol	Ratings	Unit
Peak pulse power ($t_p=8/20\mu s$)	P_{PK}	100	W
Peak pulse current ($t_p=8/20\mu s$)	I_{PP}	2	A
ESD per IEC 61000-4-2 (Air discharge)	ESD	± 25	KV
ESD per IEC 61000-4-2 (Contact discharge)		± 22	KV
Operating junction temperature range	T_J	$-55 \sim 125$	$^\circ C$
Storage temperature range	T_{STG}	$-55 \sim 150$	$^\circ C$

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

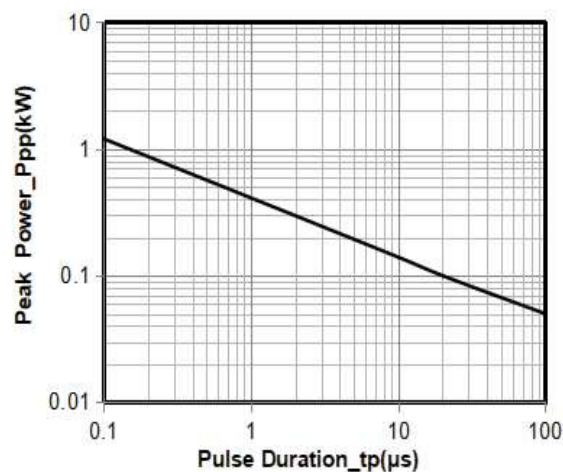
Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Nominal reverse working voltage	V_{RWM}				5.0	V
Breakdown voltage	V_{BR}	$I_T=1mA$	6.0		9.5	V
Reverse leakage current	I_R	$V_{RWM}=5.0V$			200	nA
Clamping voltage	V_C	$I_{PP}=1A, t_p=8/20\mu s$			12	V
		$I_{PP}=4A, t_p=8/20\mu s$			25	
Junction capacitance	C_J	$V_R=0V, f=1MHz$		0.3	0.5	pF

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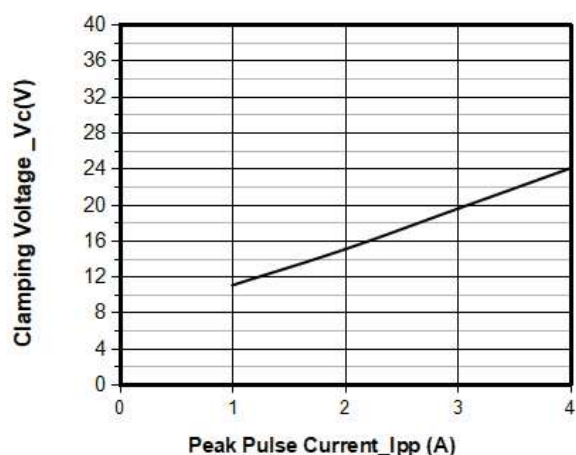
Rating and characteristic curves



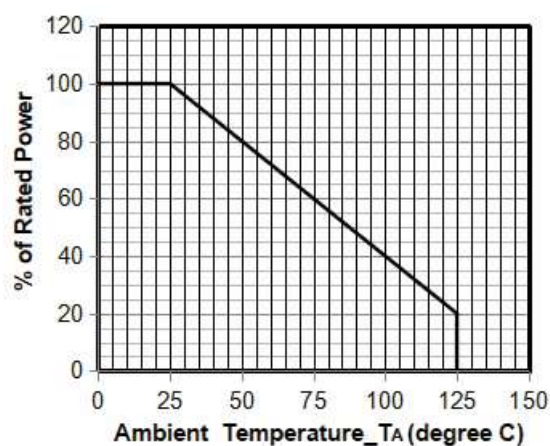
Junction Capacitance vs. Reverse Voltage



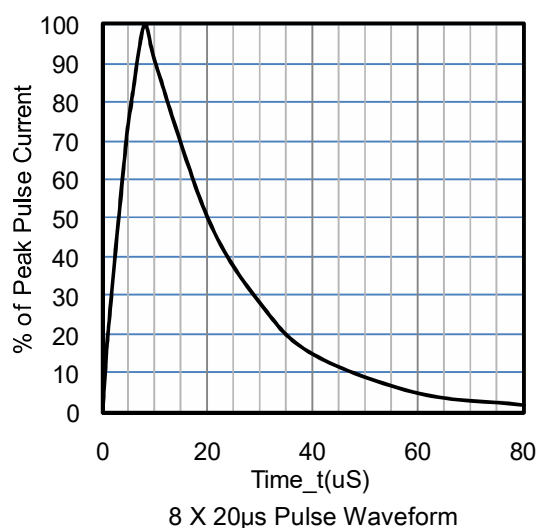
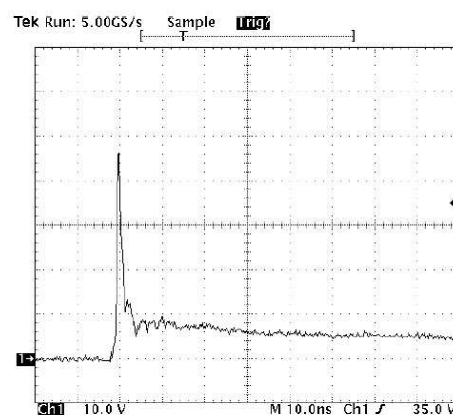
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current



Power Derating Curve

8 X 20 μ s Pulse Waveform

Note : Data is taken with a 10x attenuator

ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

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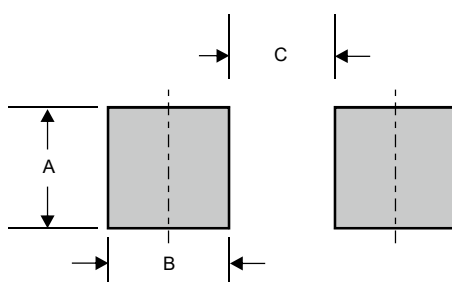
Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

Marking

Type number	Marking code
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Suggested solder pad layout

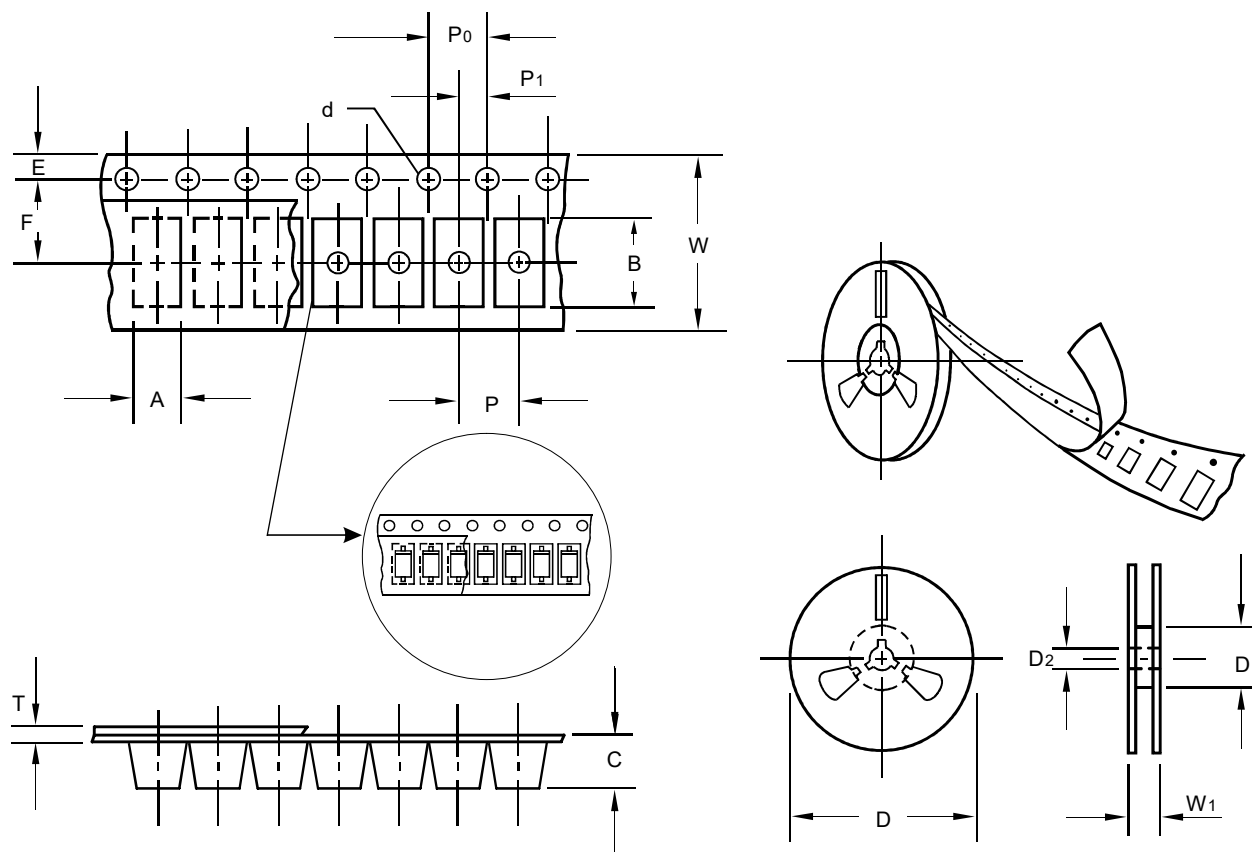


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-523FL	0.032 (0.80)	0.024 (0.60)	0.044 (1.10)

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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
Reel width	W1	1.0	9.50

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

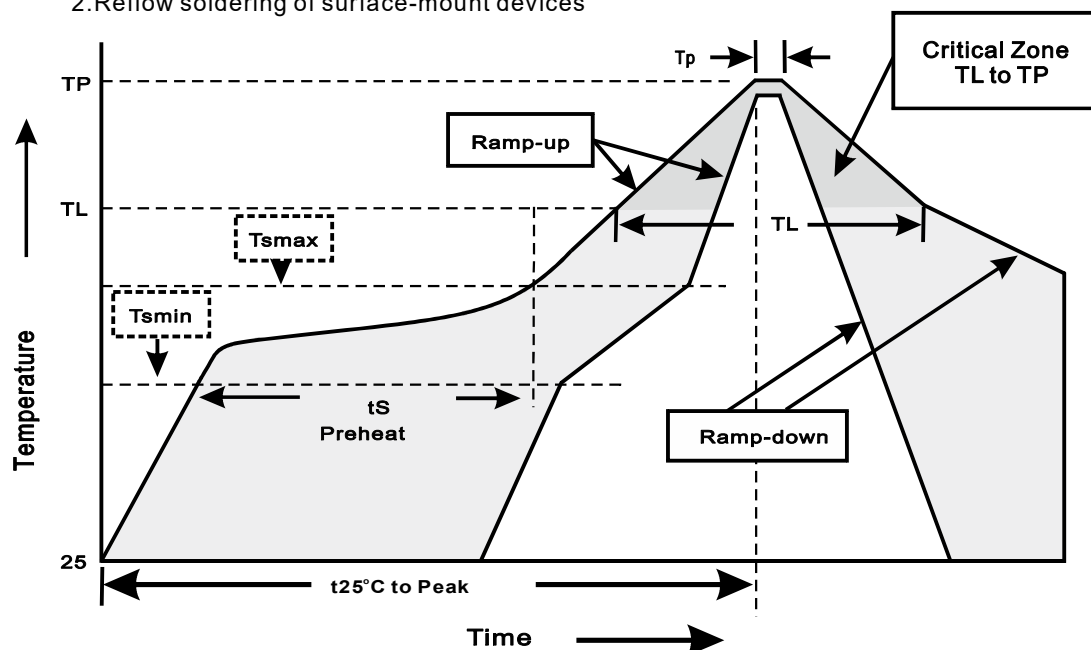
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Reel packing

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)	APPROX. GROSS WEIGHT (kg)
SOD-523FL	7"	5,000	2.0	50,000	183*123*183	178	382*257*387	400,000	13.5

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°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°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°C/sec
Time 25°C to Peak Temperature	<6minutes

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260\pm 5^{\circ}\text{C}$ for $10\pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245\pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_{\text{BR}}=V_{\text{BR MIN}}*80\%$ at $T_{\text{J}}=125^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ at $T_{\text{A}}=121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at $T_{\text{A}}=85^{\circ}\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031