

ESD3Z8.0

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Surface Mount Uni-Directional TVS For ESD Protection Diode:8V

Features

- 400 Watts Peak pulse power per Line(tp=8/20us).
- Low reverse clamping voltage
- Low leakage current
- Provide transient protection:
IEC 61000-4-2 (ESD) Contact $\pm 30\text{KV}$ /Air $\pm 30\text{KV}$
IEC 61000-4-4 (EFT) 40A (5/50ns)
IEC 61000-4-5 (Lighting) 16A (8/20us)
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex.ESD3Z8.0-H.

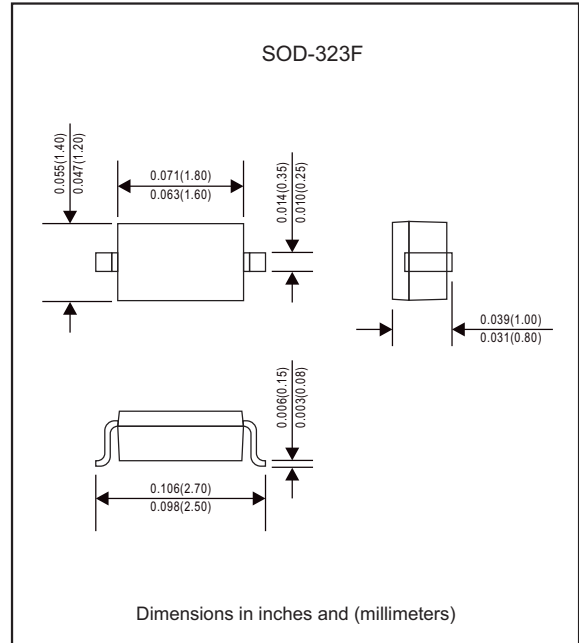
Applications

- Notebooks and Handhelds.
- Digital cameras.
- Personal digital assistants (PDAs).
- Cellular handsets and accessories.
- Portable instrumentation.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-323F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.005 gram

Package outline



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

PARAMETER	SYMBOL	Limit	UNIT
Peak pulse power (Note1)	PPP	400	Watt
Peak pulse current (Note1)	I _{PP}	16	A
Lead solder temperature-maximum (10 second duration)	TL	260	°C
IEC 61000-4-2 ESD air model contact model	V _{ESD}	± 30 ± 30	kV
Operating junction temperature range	T _J	-55 to +125	°C
Storage temperature range	T _{STG}	-55 to +150	°C

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand off voltage		V _{RWM}			8	V
Reverse breakdown voltage	I _T = 1mA	V _{BR}	9			V
Forward voltage	V _F = 10mA	V _F			1.5	V
Reverse leakage current	V _{RWM} = 8V	I _R			0.5	μA
Clamping voltage(Note 1)	I _{PP} =1A, tp=8/20μs	V _C		12		V
	I _{PP} =16A, tp=8/20μs			20	24	
Dynamic Resistance(Note 2'3)	TLP=0.2/100ns	R _{DYN}		0.25		Ω
ESD Clamping voltage(Note 2)	I _{PP} =4A, tp=0.2/100ns (TLP)	V _C		12		V
	I _{PP} =16A, tp=0.2/100ns (TLP)			15		
Junction capacitance	V _R =0V, f=1MHz	C _J		130	140	pF

Note:

1. Non-repetitive current pulse 8/20 us exponential decay waveform according to IEC 61000-4-5.
2. TLP Setting: tp=100ns, tr=0.2ns, I_{TLP} and V_{TLP} sample window: t1=70ns to t2=90ns.
3. Dynamic resistance calculated from I_{PP} = 4A to I_{PP}=16A using "Best Fit"

Rating and characteristic curves (ESD3Z8.0)

FIG.1 Non-Repetitive Peak Pulse Power vs. Pulse Time

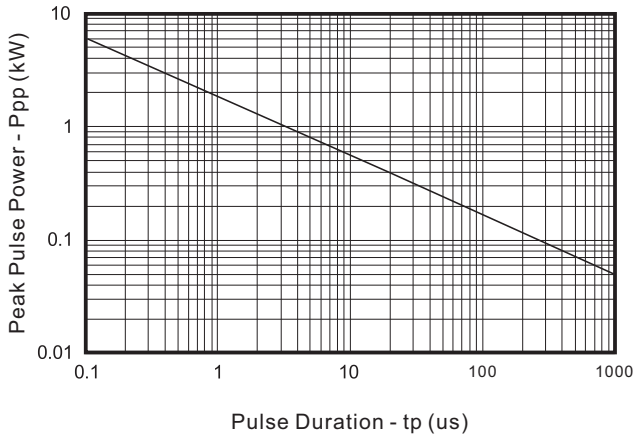


FIG.2 Power Derating Curve

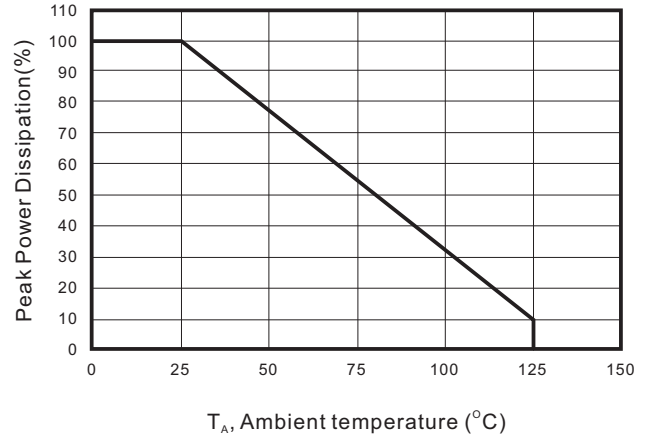


FIG.3 Pulse Waveform

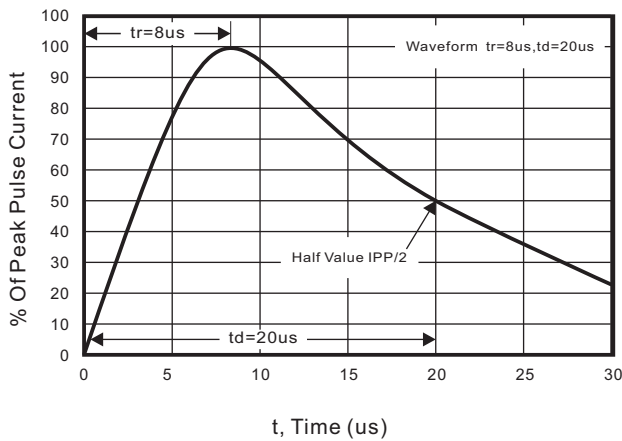


FIG.4 Normalized Junction Capacitance vs. Reverse Voltage

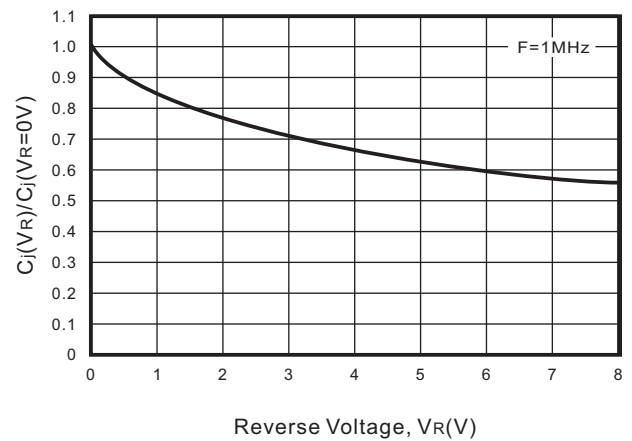


FIG.5 Clamping Voltage vs. Peak Pulse Current

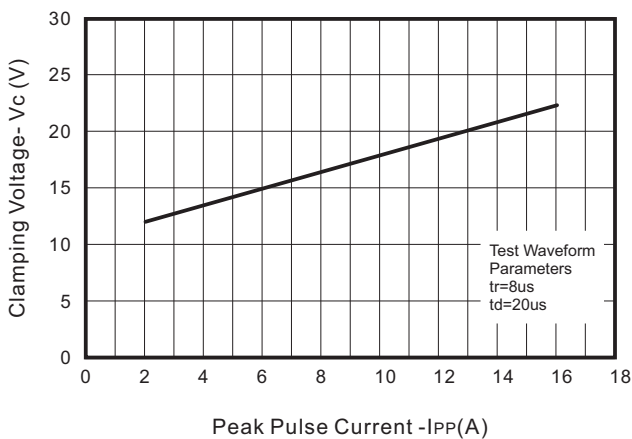
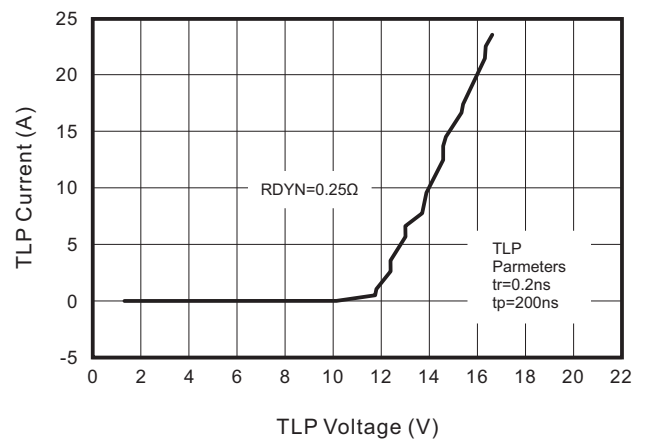


FIG.6 TLP I-V Curve

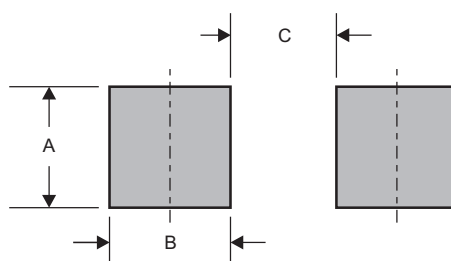


ESD3Z8.0**Pinning information**

Pin	Simplified outline	Symbol
Uni-Directional Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
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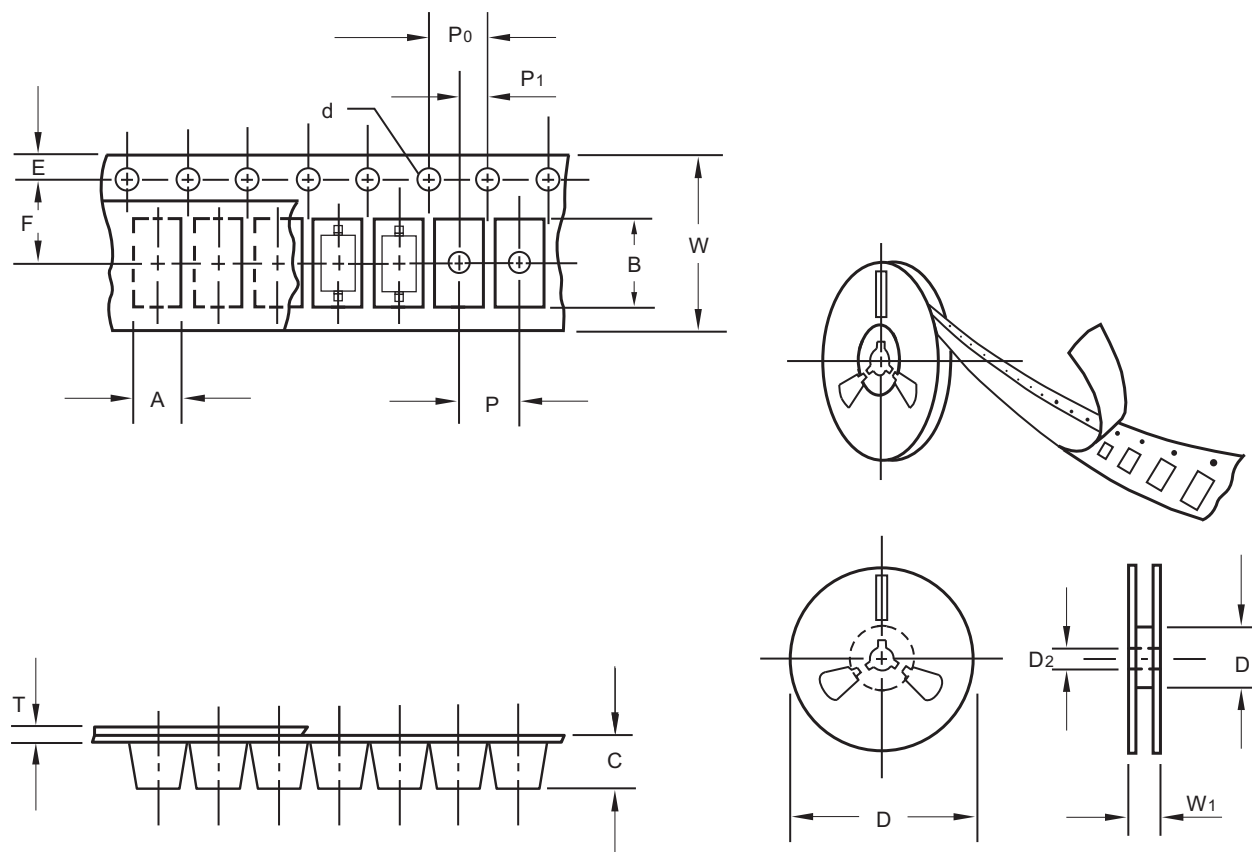
Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323F	0.033 (0.83)	0.025 (0.63)	0.063 (1.60)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOD-323F
Carrier width	A	0.1	1.48
Carrier length	B	0.1	3.30
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D ₁	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	55.00
Feed hole diameter	D ₂	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	9.50

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

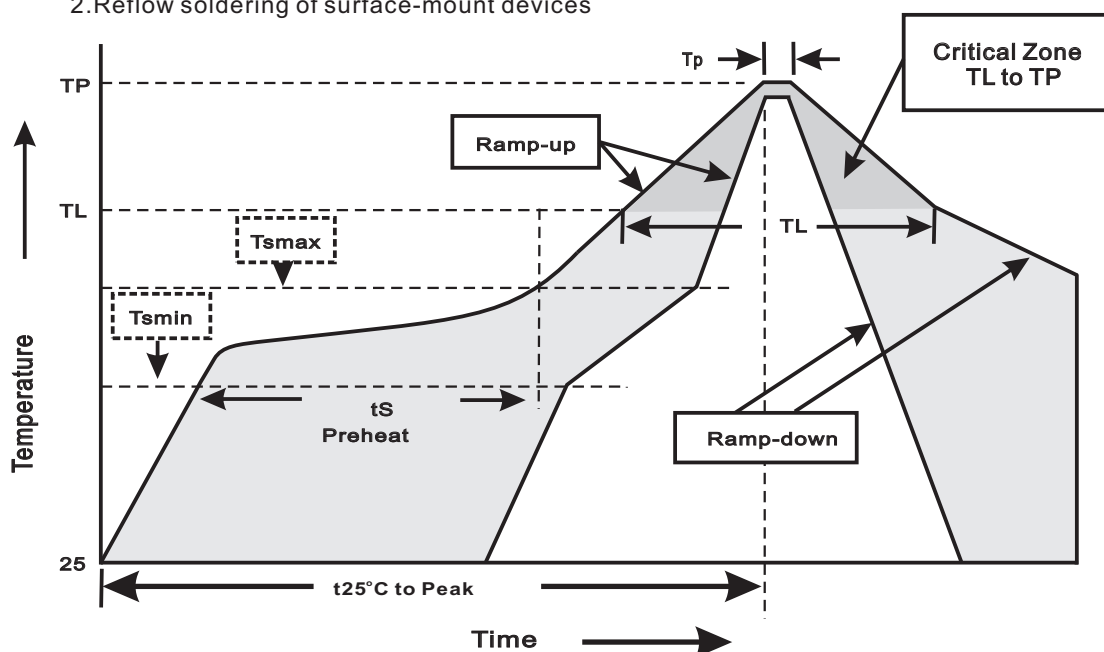
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Reel packing

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-323F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	8.0

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 _{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°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 $T_{\text{J}} = 150^{\circ}\text{C}$ 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 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031