ESD3ZxxC SERIES

List

ESD3ZxxC SERIES

Surface Mount Bi-Directional TVS For ESD Protection Diode 3.3V~36V

Features

- This series is designed for average power 350W approximated ESD protection, different V_{RWM}, different peak pulse power available
- Protects one I/O or power line
- Low clamping voltage
- Working voltages: 3.3V, 5.0V, 12V, 15V, 24V, 36V
- Low leakage current
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free part, ex.ESD3Z3.3C-H

IEC compatibility

- IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ηs)
- IEC61000-4-5 (Lightning) (8/20μs)

Applications

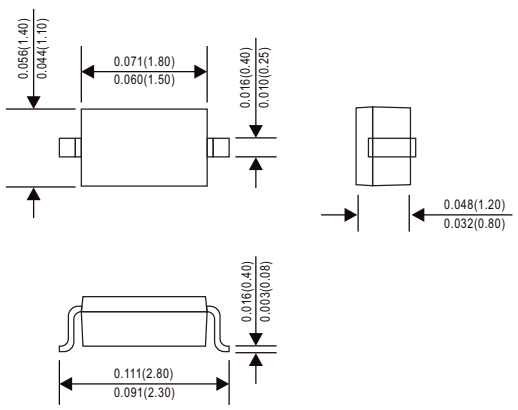
- Cell phone handsets and accessories
- Microprocessor based equipment
- Personal digital assistants (PDA's)
- Notebooks, desktops, and servers
- Portable instrumentation
- Peripherals
- Pagers

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

SOD-323F



Dimensions in inches and (millimeters)

Maximum ratings (at T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Value	Unit
ESD voltage	Per IEC 61000-4-2(Air) Per IEC 61000-4-2(Contact)	V_{ESD}	±15 ±8	kV
Lead solder temperature-maximum	10 second duration	T_L	260	°C
Operating junction temperature range		T_J	-55 to +150	°C
Storage temperature range		T_{STG}	-55 to +150	°C

Electrical characteristics (at T_A=25°C unless otherwise noted)

Part No.	V_{RWM} (V) (Max.)	I_R(μA) @V_{RWM} (Max.)	V_{BR}(V) @I_T (Note 3) (Min.)	I_T (mA)	V_C(V) @I_{PP}=1.0A (Note 2) (Max.)	I_{PP} (A) (Note 2) (Max.)	V_C(V) @ I_{PP} (Max.)	P_{PK} (W) (Note 1) (Max.)	C_J (pF) (Note 4) (Max.)
ESD3Z3.3C	3.3	40	4.0	1.0	7.5	20.0	13.0	260	450
ESD3Z5.0C	5.0	10	6.0	1.0	9.8	17.0	18.0	306	200
ESD3Z12C	12	1	13.3	1.0	19.0	11.0	32.0	352	75
ESD3Z15C	15	1	16.7	1.0	24.0	10.0	38.0	380	68
ESD3Z24C	24	1	26.7	1.0	43.0	7.0	52.0	364	50
ESD3Z36C	36	1	38.0	1.0	60.0	4.5	75.0	338	35

Notes 1. Surge current waveform per Fig.1
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5
3. V_{BR} is measured with a pulse test current I_T at an ambient temperature of 25°C
4. V_R=0V,f=1MHz

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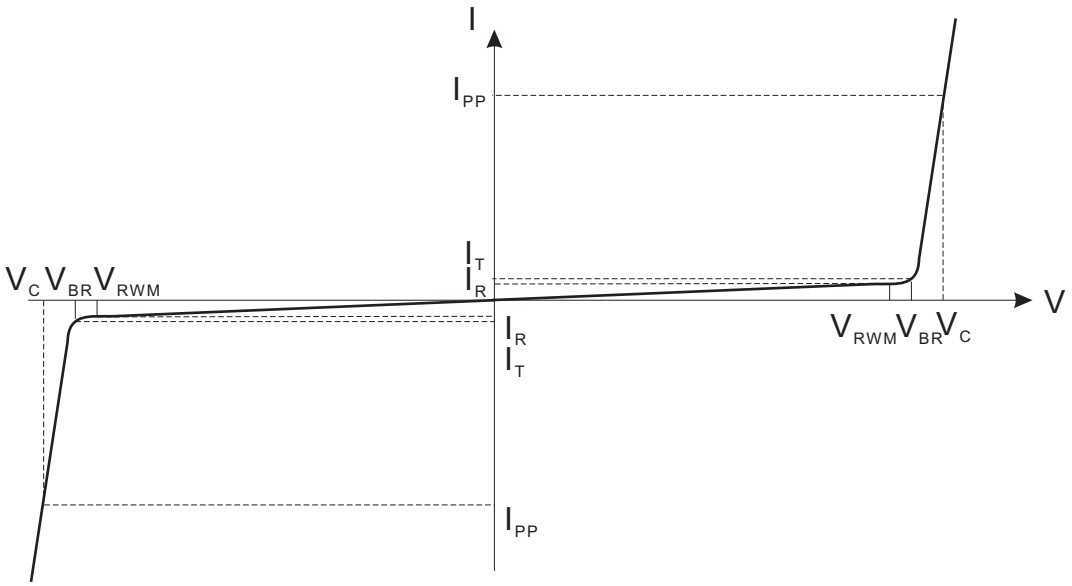
Typical characteristics (at T_A=25°C unless otherwise noted)



Bi-Directional TVS

V_C : Clamping voltage @ I_{PP}
I_{PP} : Maximum reverse peak pulse current
V_{RWM} : Maximum working peak reverse voltage
I_R : Maximum reverse leakage current @V_{RWM}
V_{BR} : Breakdown voltage @I_T
I_T : Test current
C_J : Max. capacitance @V_R=0V and f=1MHz

Rating and characteristic curves (ESD3ZxxC SERIES)

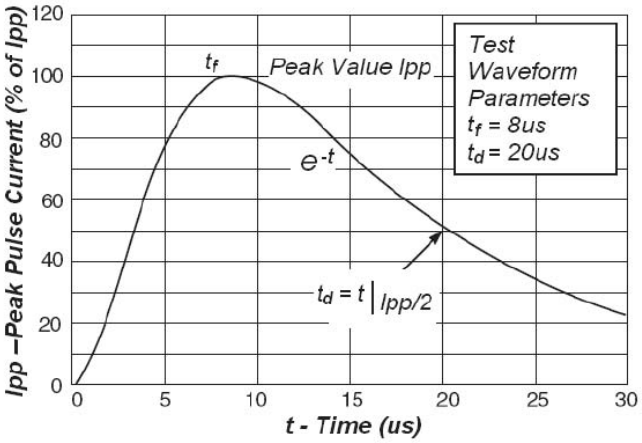


Fig1. Pulse Waveform

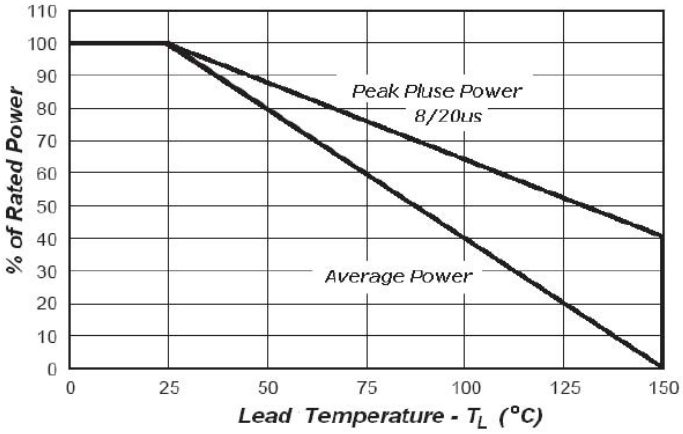


Fig2.Power Derating

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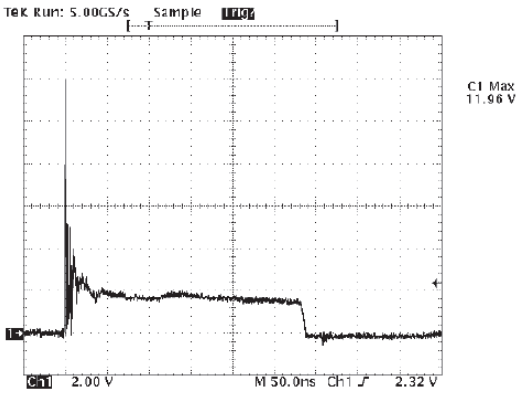
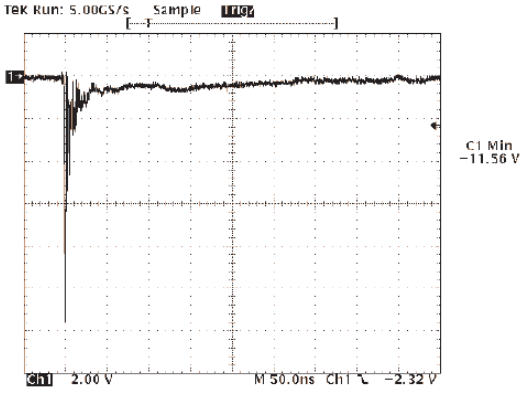
ESD Clamping
(8kV Contact per IEC 61000-4-2)



ESD Clamping
(-8kV Contact per IEC 61000-4-2)



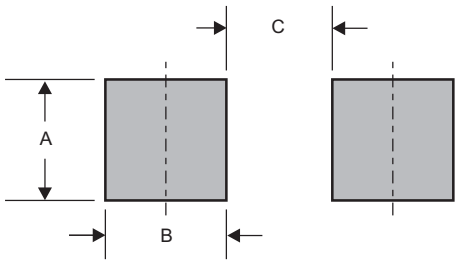
Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

Marking

Type number	Marking code
ESD3Z3.3C	2A,03B
ESD3Z5.0C	2B,05B
ESD3Z12C	2D,12B
ESD3Z15C	2J,15B
ESD3Z24C	2H,24B
ESD3Z36C	2N,36B

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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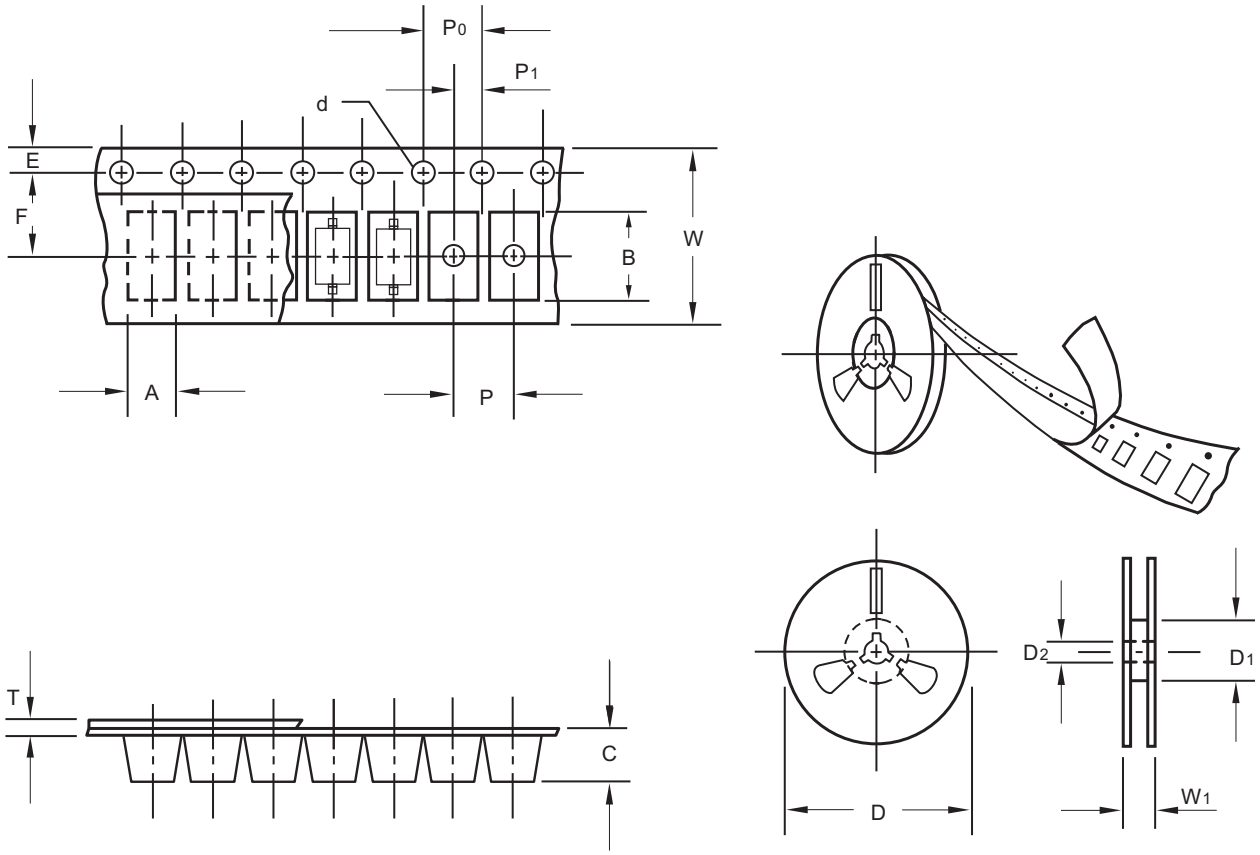
Packing information



unit:mm

Item	Symbol	Tolerance	SOD-323F
Carrier width	A	0.1	1.46
Carrier length	B	0.1	2.95
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	62.00
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	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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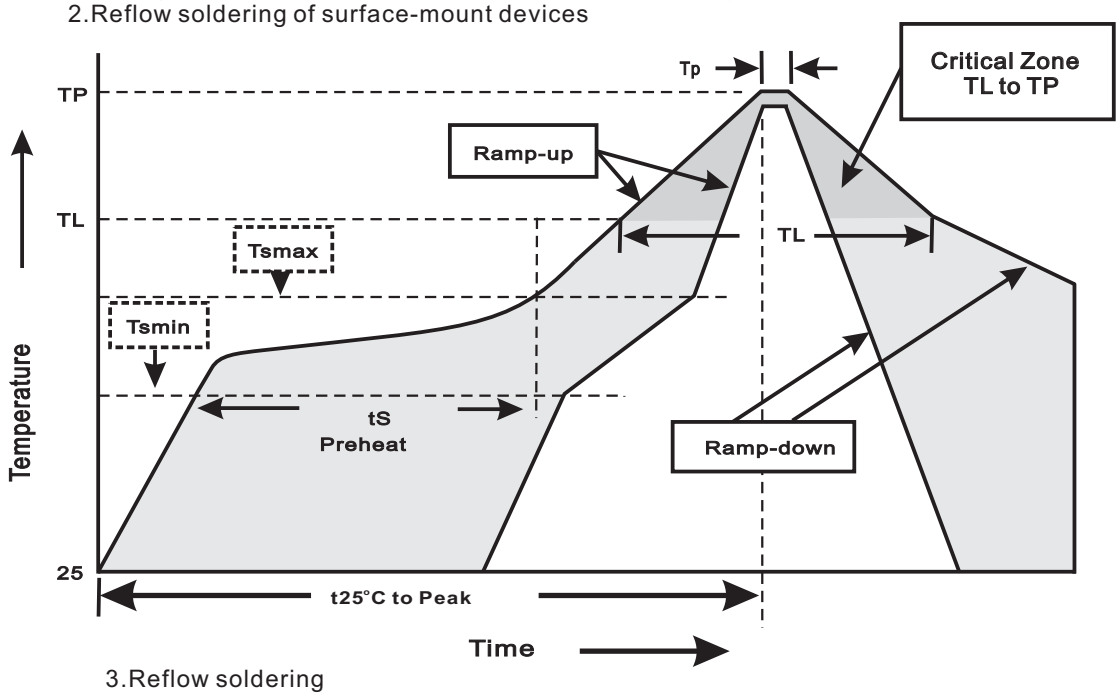
Reel packing

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-323F	7"	3,000	4.0	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°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_{BR}=V_{BR} Min*80% at T_{Jmax}=150°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P_{SIG} at T_A=121°C for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at T_A=85°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