ESD7Z SERIES

List

ESD7Z SERIES

Surface Mount Uni-Directional TVS For ESD Protection Diode - 3.3V - 5.0V

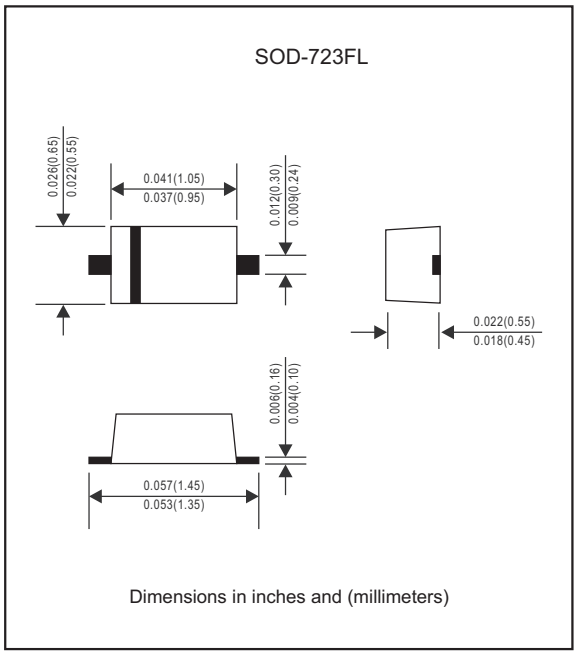
Features

- Small body outline dimensions: 0.039" X 0.024"(1.0mm X 0.60mm).
- Low body height: 0.017"(0.43mm)max.
- Stand-off voltage: 3.3V-5.0V.
- Low leakage.
- Response time is typically < 1ns.
- ESD rating of class 3 (> 16kV) per human body Model.
- IEC61000-4-2 level 4 ESD protection
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex.ESD7Z3.3-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-723FL
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.0008 gram

Package outline



Applications

- Cellular phones audio
- MP3 players
- Digital cameras
- Portable applicationss
- mobile telephone

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

PARAMETER	CONDITIONS	Symbol	Value	UNIT
Total power dissipation	on FR-5 board(Note1)@ T_A=25°C	P_D	150	mW
ESC61000-4-2(ESD)	air discharge contact discharge		±15 ±8	kV
ESD voltage	per human body model	V_{ESD}	16	kV
Lead solder temperature-maximum	10 second duration	T_L	260	°C
Operating junction temperature range		T_J	-55~+150	°C
Storage temperature range		T_{STG}	-55~+150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.
1. FR-5 = 1.0 * 0.75 * 0.62 in.

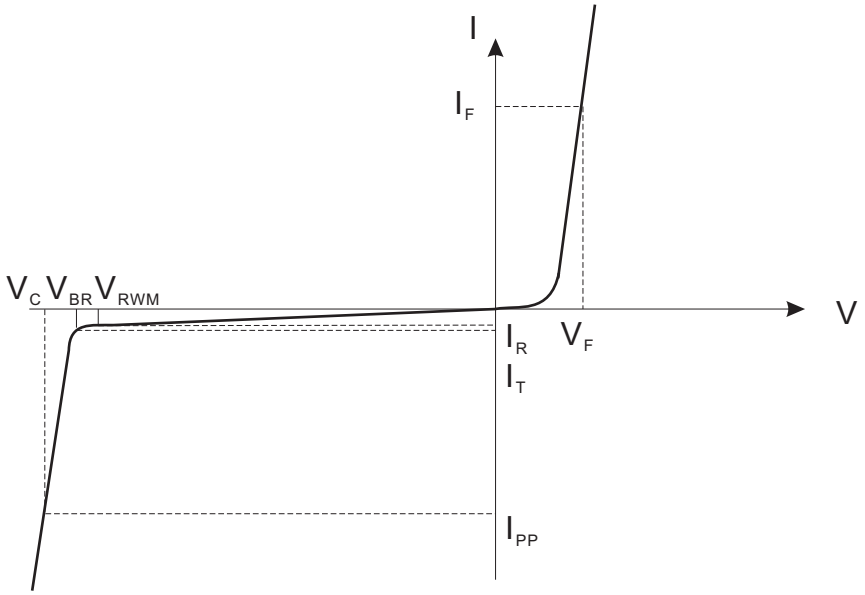
Electrical characteristics (at T_A=25°C unless otherwise noted, V_F = 0.9V Max. @I_F = 10mA)

Part No.	V_{RWM} (V) Max	I_R(uA) @V_{RWM} Max	V_{BR}(V)@I_T (Note 2) Min	I_T (mA)	I_{PP}(Note 3) (A) Typ	V_C(V)(Note 3) @Max I_{PP} Max	P_{PK} (W) (8 X 20 us) Max	C_J(pF) V_R=0V and f=1MHz Typ.
ESD7Z3.3	3.3	2.5	5.0	1.0	9.8	10.4	102	80
ESD7Z5.0	5.0	1.0	6.2	1.0	8.7	12.3	107	65

Over voltage available upon request.
2. V_{BR} is measured with a pulse test current I_T at anambient temperature of 25°C.
3.Surge current waveform per Figure 2.

ESD7Z SERIES

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



Uni-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
I_F : Forward Current
V_F : Forward Voltage @ I_F
C_J : Capacitance @V_R = 0V and f = 1MHz

Rating and characteristic curves (ESD7Z SERIES)

Fig.1- TYPICAL BREAKDOWN VOLTAGE VERSUS TEMPERATURE

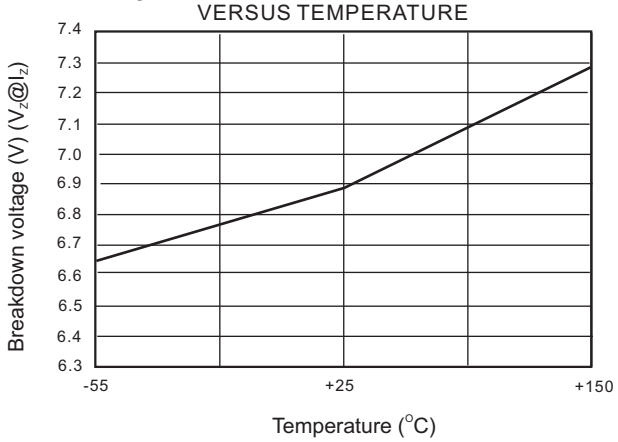
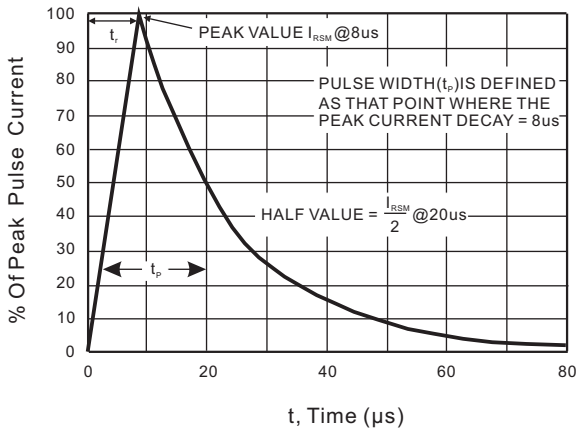
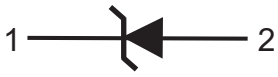


FIG.2-8 X 20us PULSE WAVEFORM



ESD7Z SERIES

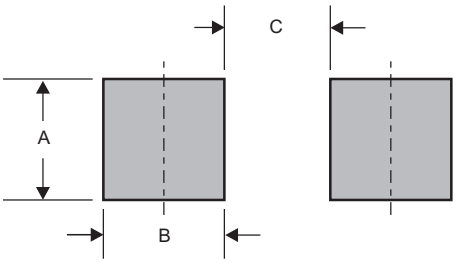
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
ESD7Z3.3	A
ESD7Z5.0	F

Suggested solder pad layout

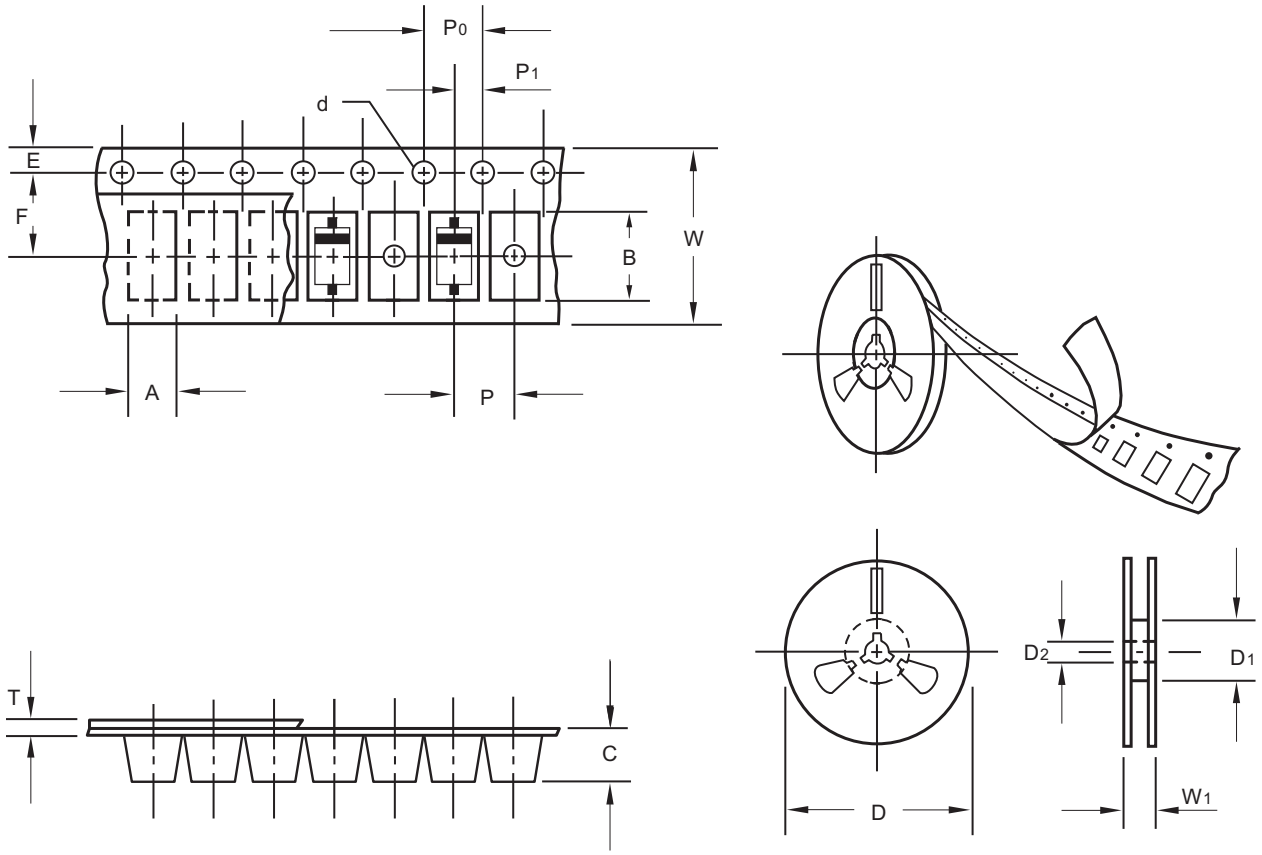


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-723FL	0.018 (0.45)	0.020 (0.50)	0.035 (0.90)

ESD7Z SERIES

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-723FL
Carrier width	A	0.1	0.68
Carrier length	B	0.1	1.71
Carrier depth	C	0.1	0.59
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	50.00
Feed hole diameter	D_2	0.2	13.0
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	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	11.4

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

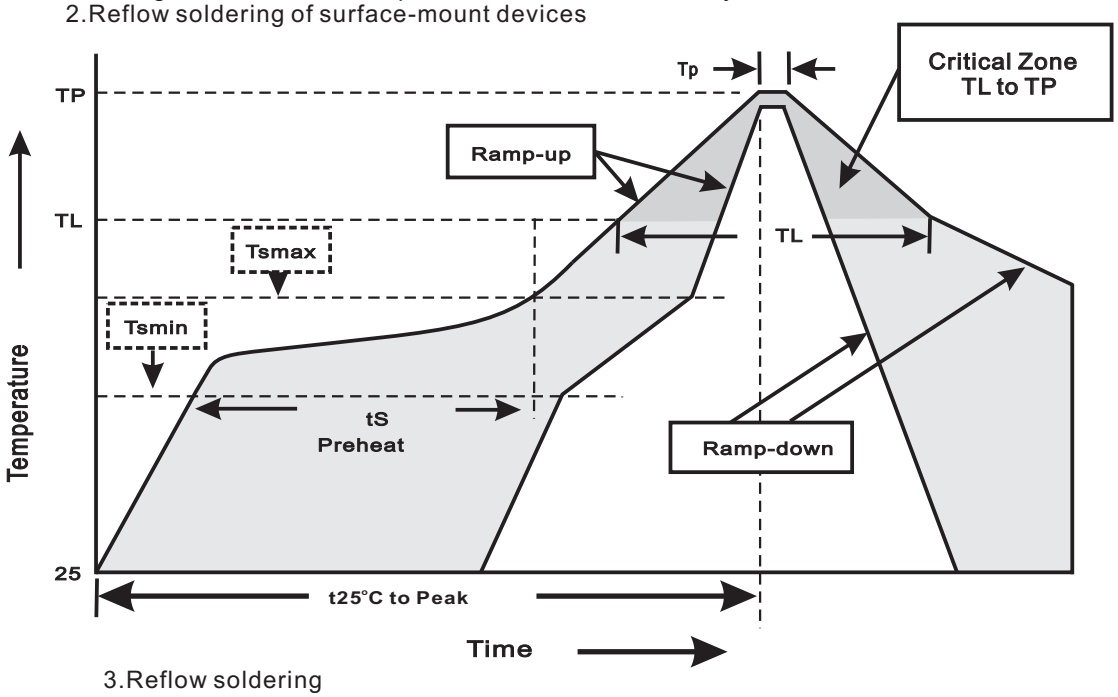
ESD7Z SERIES

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-723FL	7"	4,000	2.0	40,000	183*183*123	178	382*262*387	320,000	9.5

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(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

ESD7Z SERIES

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec. immerse body into solder 1/16"±1/32"	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_{RWM}=80% rate at T_J=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