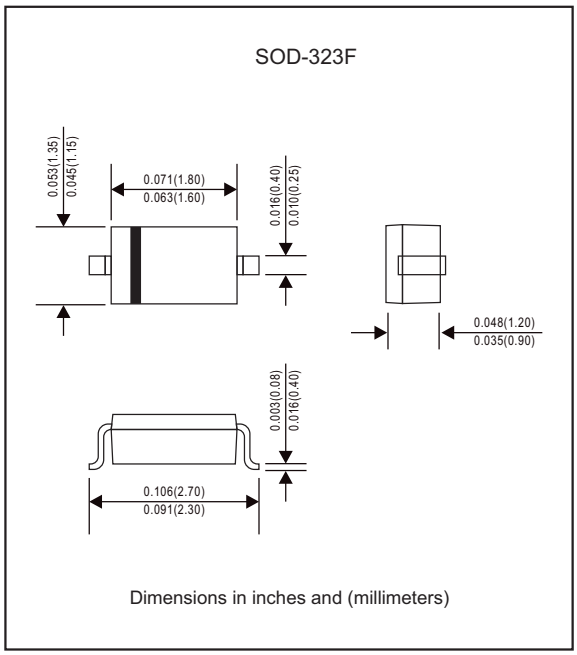
UDZ2.4B-Q1 THRU UDZ36B-Q1

200mW Surface Mount Zener Diodes 2.4V-36V

Features

- Silicon epitaxial planar chip structure
- Wide zener reverse voltage range 2.4V to 36V
- Very small package size for high density applications
- Ideally suited for automated assembly processes
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen-free part, ex.UDZ2.4B-Q1-H

Package outline



Mechanical data

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

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

Parameter	Condition	Symbol	MIN.	TYP.	MAX.	Unit
Power dissipation at T_A=25°C		P_D			200	mW
Forward voltage at I_F=10mA	I_F=10mA	V_F			0.9	V
Thermal resistance from Junction to ambient Junction to case		$R_{\theta JA}$ $R_{\theta JC}$		635 475		°C/W °C/W
Junction temperature		T_J			+150	°C
Storage temperature range		T_{STG}	-55		+150	°C
Operating temperature range		T_{OPR}	-55		+150	°C

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

Part No.	Marking code	Zener voltage		Test current	Zener impedance			Leakage current	
		Vz @ Izt		Izt	Zzt @ Izt	Zzk @ Izk	Izk	Ir	Vr
		Min.(V)	Max.(V)	mA	Max.(Ω)	Max.(Ω)	mA	Max. (μA)	Volts
UDZ2.4B-Q1	DT	2.43	2.63	5	100	1000	0.5	100	1.0
UDZ2.7B-Q1	DU	2.69	2.91	5	110	1000	0.5	100	1.0
UDZ3.0B-Q1	DV	3.01	3.22	5	120	1000	0.5	50.0	1.0
UDZ3.3B-Q1	DW	3.32	3.53	5	120	1000	0.5	20.0	1.0
UDZ3.6B-Q1	D0	3.60	3.845	5	100	1000	1.0	10.0	1.0
UDZ3.9B-Q1	D1	3.89	4.16	5	100	1000	1.0	5.0	1.0
UDZ4.3B-Q1	D2	4.17	4.43	5	100	1000	1.0	5.0	1.0
UDZ4.7B-Q1	D3	4.55	4.75	5	100	800	0.5	2.0	1.0
UDZ5.1B-Q1	D4	4.98	5.20	5	80	500	0.5	2.0	1.5
UDZ5.6B-Q1	D5	5.49	5.73	5	60	200	0.5	1.0	2.5
UDZ6.2B-Q1	D6	6.06	6.33	5	60	100	0.5	1.0	3.0
UDZ6.8B-Q1	D7	6.65	6.93	5	40	60	0.5	0.5	3.5
UDZ7.5B-Q1	D8	7.28	7.60	5	30	60	0.5	0.5	4.0
UDZ8.2B-Q1	D9	8.02	8.36	5	30	60	0.5	0.5	5.0
UDZ9.1B-Q1	DA	8.85	9.23	5	30	60	0.5	0.5	6.0
UDZ10B-Q1	DB	9.77	10.21	5	30	60	0.5	0.1	7.0
UDZ11B-Q1	DC	10.76	11.22	5	30	60	0.5	0.1	8.0
UDZ12B-Q1	DE	11.74	12.24	5	30	80	0.5	0.1	9.0
UDZ13B-Q1	DF	12.91	13.49	5	37	80	0.5	0.1	10.0
UDZ15B-Q1	DG	14.34	14.98	5	42	80	0.5	0.1	11.0
UDZ16B-Q1	DH	15.85	16.51	5	50	80	0.5	0.1	12.0
UDZ18B-Q1	DJ	17.56	18.35	5	65	80	0.5	0.1	13.0
UDZ20B-Q1	DK	19.52	20.39	5	85	100	0.5	0.1	15.0
UDZ22B-Q1	DL	21.54	22.47	5	100	100	0.5	0.1	17.0
UDZ24B-Q1	DM	23.72	24.78	5	120	120	0.5	0.1	19.0
UDZ27B-Q1	DN	26.19	27.53	5	150	150	0.5	0.1	21.0
UDZ30B-Q1	DP	29.19	30.69	5	200	200	0.5	0.1	23.0
UDZ33B-Q1	DR	32.15	33.79	5	250	250	0.5	0.1	25.0
UDZ36B-Q1	DS	35.07	36.87	5	300	300	0.5	0.1	27.0

Notes 1: The Zener voltage(Vz) is measured 40ms after power is supplied.
2: The operating resistances(Zzt, Zzk) are measured by superimposing a minute alternaring current on the regulated current(I_{ZT},I_{ZK}).

Rating and characteristic curves (UDZ2.4B-Q1 THRU UDZ36B-Q1)

FIG.1-ZENER VOLTAGE CHARACTERISTICS

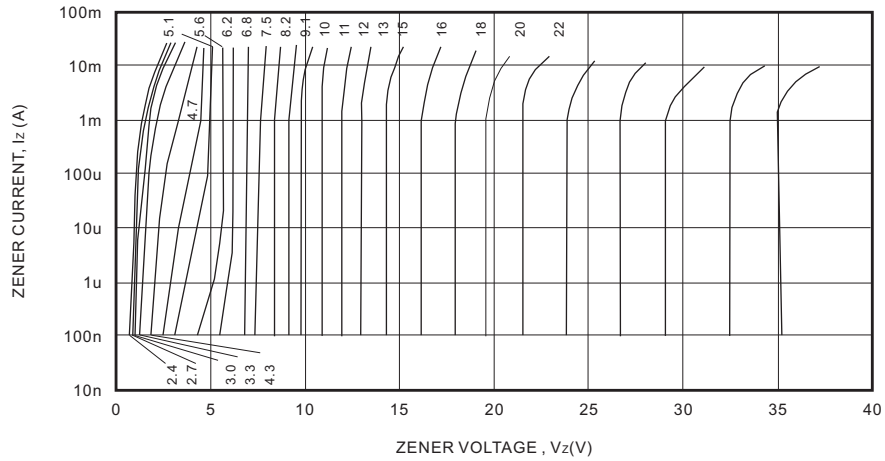


FIG. 2-DRATING CURVE

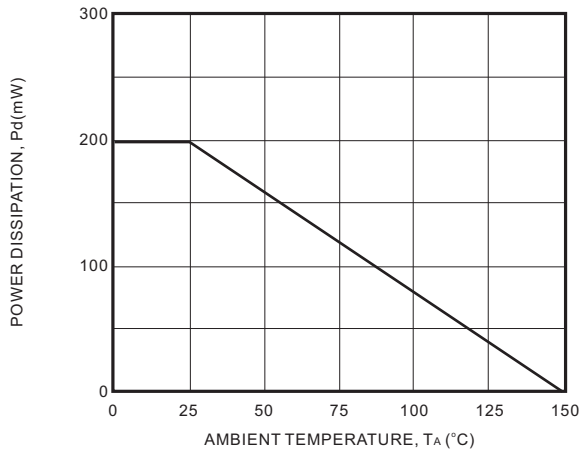


FIG. 3-ZENER VOLTAGE-TEMP COEFFICIENT CHARACTERISTICS

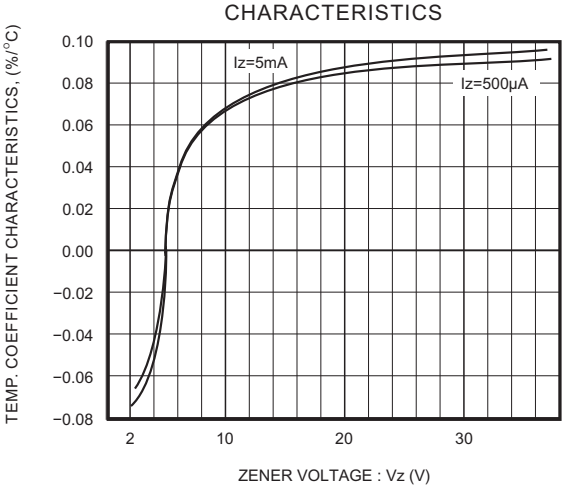
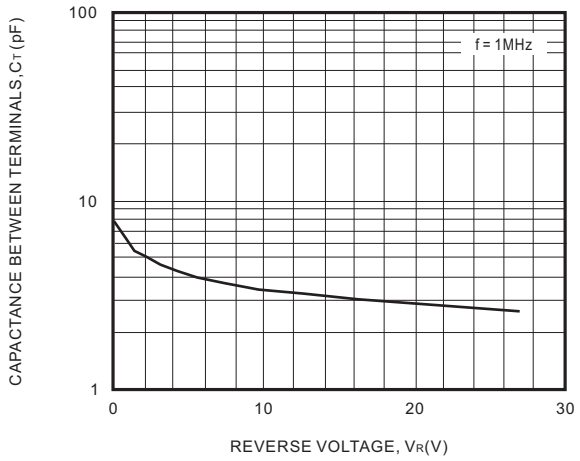


FIG. 4-VR-CT CHARACTERISTICS



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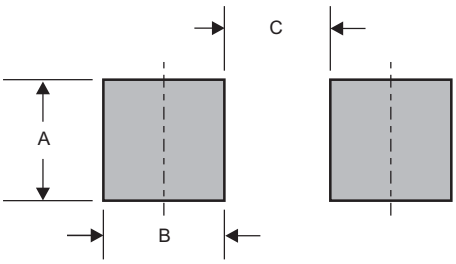
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

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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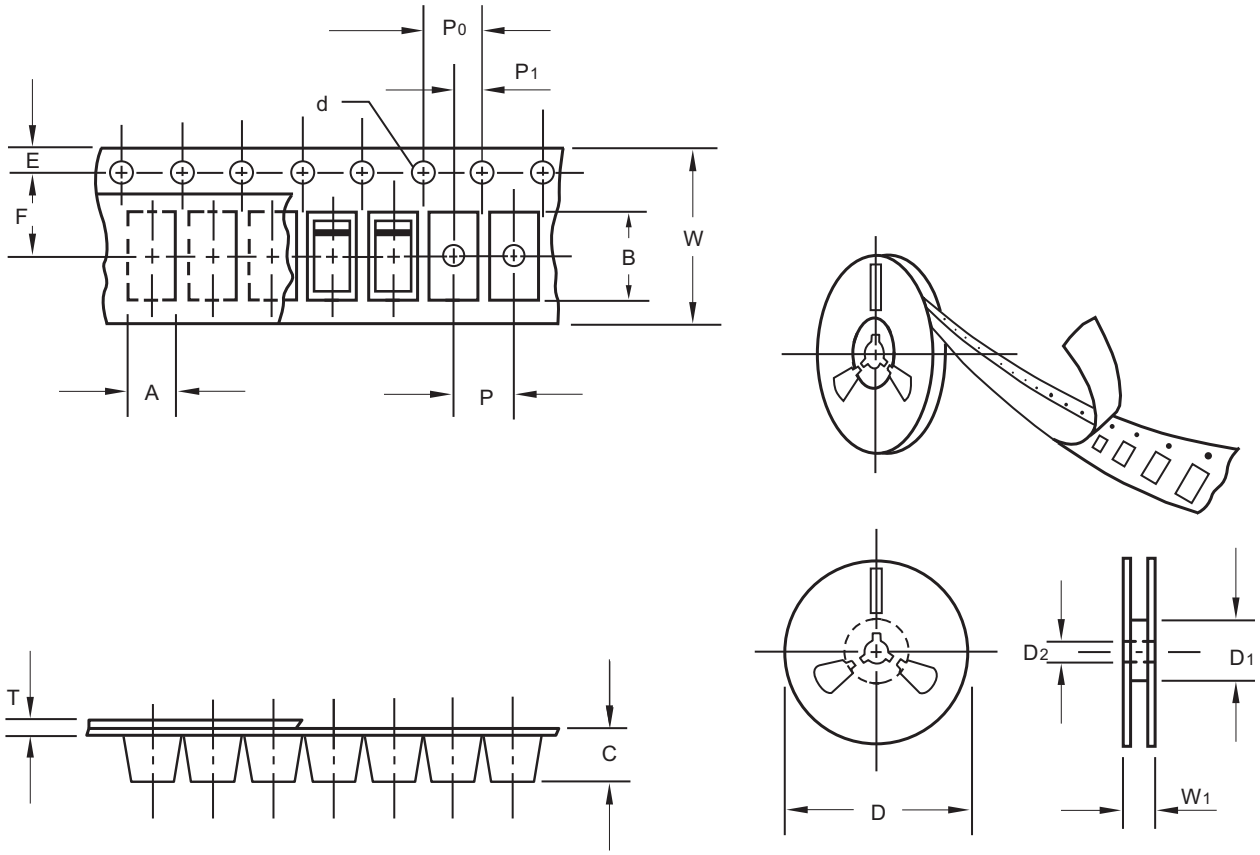
Packing information



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
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	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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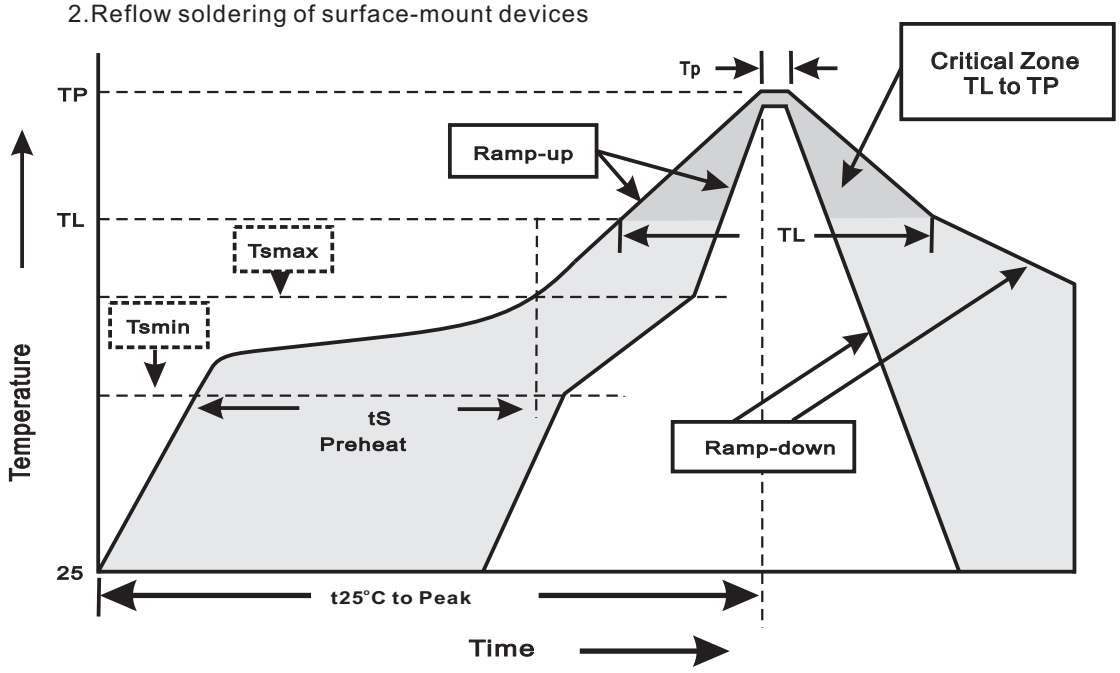
Reel packing

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)	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(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. MSL Preconditioning	24hr bake@125℃+168hrs@85℃ /85%RH+3xIR@260℃+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	Vz=Vz MIN*80% (Tj=150°C)Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	Ta=125℃ Test Duration:1000hrs	JESD22 A-103
4. Temperature Cycle	-55℃(15min) to 150℃(15min)Test Cycles:1000cycles	JESD22 A-104
5. Autoclave	P=2atm Ta=121℃ RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5℃ for 5sec	J-STD-002
7. Moisture Resistance	Ta=85℃/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5℃ for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	Ta=85℃, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101