

ZGFM103V3B-MS-Q1 THRU ZGFM10330B-MS-Q1**List**

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ZGFM103V3B-MS-Q1 THRU ZGFM10330B-MS-Q1

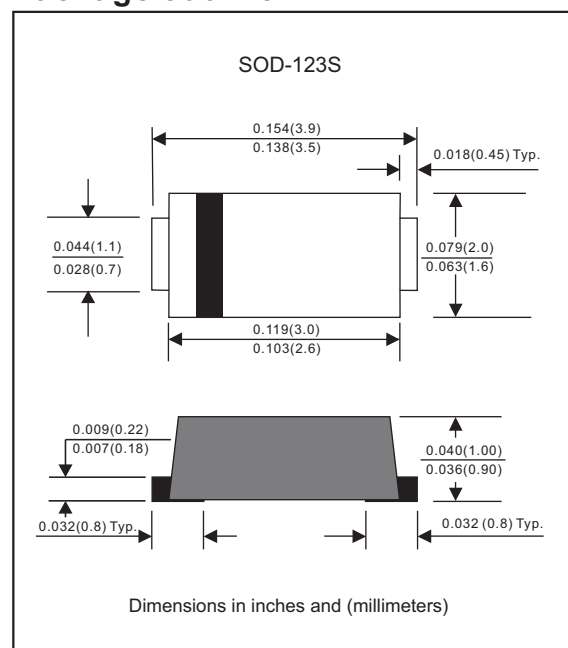
**1000mW Surface Mount
Zener Diodes 3.3V-330V**

Features

- Wide zener reverse voltage range 3.3V to 330V
- Standard zener voltage tolerance $\pm 5\%$
- 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. ZGFM103V3B-MS-Q1-H

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-123S/MINI SMA
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.0155 gram

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Forward voltage at $I_F=200\text{mA}$	V_F			1.20	V
Power dissipation at $T_L=75^\circ\text{C}$	P_D			1000	mW
Typical thermal resistance junction to ambient	$R_{\theta JA}$		50		$^\circ\text{C/W}$
Typical thermal resistance junction to case	$R_{\theta JC}$		30		$^\circ\text{C/W}$
Operating junction temperature range	T_J	-55		+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-65		+175	$^\circ\text{C}$

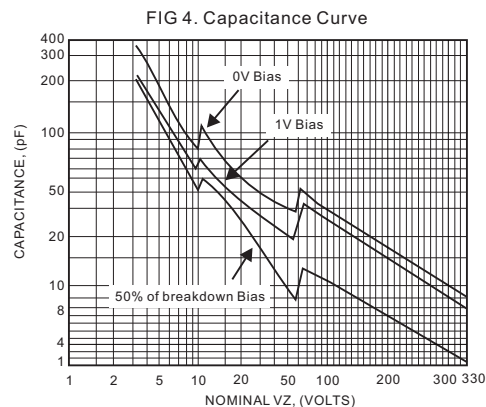
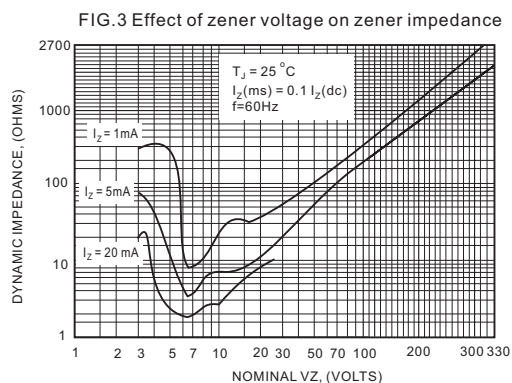
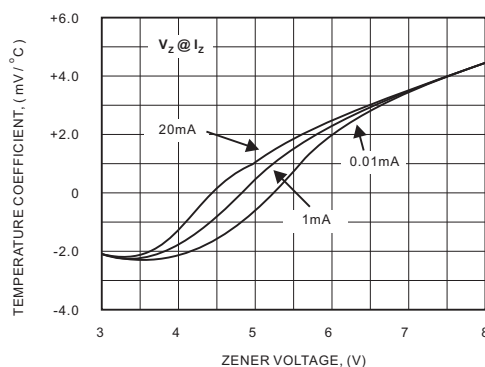
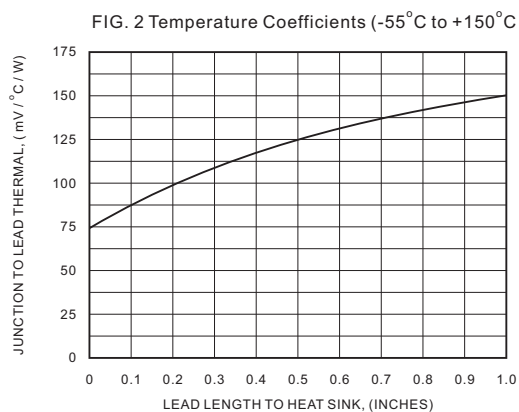
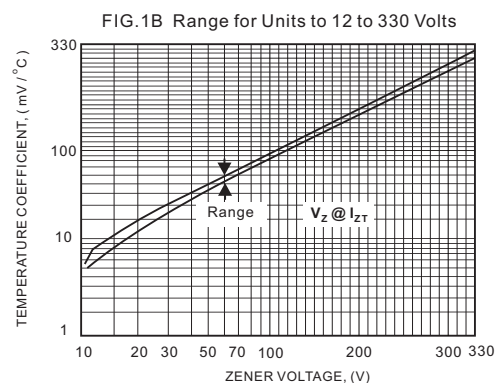
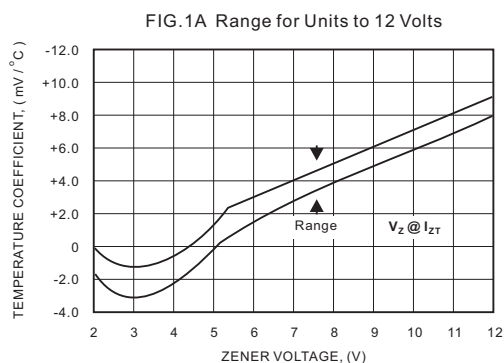
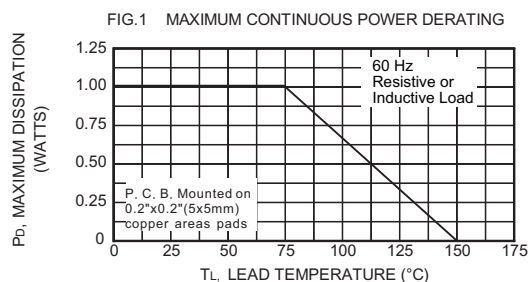
Electrical characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part No.	Marking code	Zener voltage			Test current	Zener impedance			Leakage current	
		V _Z @ I _{ZT} (Volts)				I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R
		Min.	Nom.	Max.	mA	(Ω)Max	(Ω)Max	mA	(μA)Max	Volts
ZGFM103V3B-MS-Q1	X1	3.1	3.3	3.5	76	10	400	1.00	100	1.0
ZGFM103V6B-MS-Q1	X2	3.4	3.6	3.8	69	10	400	1.00	100	1.0
ZGFM103V9B-MS-Q1	X3	3.7	3.9	4.1	64	9	400	1.00	50	1.0
ZGFM104V3B-MS-Q1	X4	4.1	4.3	4.5	58	9	400	1.00	10	1.0
ZGFM104V7B-MS-Q1	X5	4.5	4.7	4.9	53	8	500	1.00	10	1.0
ZGFM105V1B-MS-Q1	X6	4.8	5.1	5.4	49	7	550	1.00	10	1.0
ZGFM105V6B-MS-Q1	X7	5.3	5.6	5.9	45	5	600	1.00	10	2.0
ZGFM106V2B-MS-Q1	X8	5.9	6.2	6.5	41	2	700	1.00	10	3.0
ZGFM106V8B-MS-Q1	X9	6.5	6.8	7.1	37	3.5	700	1.00	10	4.0
ZGFM107V5B-MS-Q1	Y1	7.1	7.5	7.9	34	4.0	700	0.50	10	5.0
ZGFM108V2B-MS-Q1	Y2	7.8	8.2	8.6	31	4.5	700	0.50	10	6.0
ZGFM109V1B-MS-Q1	Y3	8.6	9.1	9.6	28	5	700	0.50	10	7.0
ZGFM1010B-MS-Q1	Y4	9.5	10	10.5	25	7	700	0.25	10	7.6
ZGFM1011B-MS-Q1	Y5	10.5	11	11.6	23	8	700	0.25	5	8.4
ZGFM1012B-MS-Q1	Y6	11.4	12	12.6	21	9	700	0.25	5	9.1
ZGFM1013B-MS-Q1	Y7	12.4	13	13.7	19	10	700	0.25	5	9.9
ZGFM1015B-MS-Q1	Y8	14.3	15	15.8	17	14	700	0.25	5	11.4
ZGFM1016B-MS-Q1	Y9	15.2	16	16.8	15.5	16	700	0.25	5	12.2
ZGFM1018B-MS-Q1	Z1	17.1	18	18.9	14	20	750	0.25	5	13.7
ZGFM1020B-MS-Q1	Z2	19.0	20	21.0	12.5	22	750	0.25	5	15.2
ZGFM1022B-MS-Q1	Z3	20.9	22	23.1	11.5	23	750	0.25	5	16.7
ZGFM1024B-MS-Q1	Z4	22.8	24	25.2	10.5	25	750	0.25	5	18.2
ZGFM1027B-MS-Q1	Z5	25.7	27	28.4	9.5	35	750	0.25	5	20.6
ZGFM1030B-MS-Q1	Z6	28.5	30	31.5	8.5	40	1000	0.25	5	22.8
ZGFM1033B-MS-Q1	Z7	31.4	33	34.7	7.5	45	1000	0.25	5	25.4
ZGFM1036B-MS-Q1	Z8	34.2	36	37.8	7.0	50	1000	0.25	5	27.4
ZGFM1039B-MS-Q1	Z9	37.1	39	41.0	6.5	60	1000	0.25	5	29.7
ZGFM1043B-MS-Q1	ZA	40.9	43	45.2	6.0	70	1500	0.25	0.8	32.7
ZGFM1047B-MS-Q1	ZB	44.7	47	49.4	5.5	80	1500	0.25	0.8	35.8
ZGFM1051B-MS-Q1	ZC	48.5	51	53.6	5.0	95	1500	0.25	0.8	38.8
ZGFM1056B-MS-Q1	ZD	53.2	56	58.8	4.5	110	2000	0.25	0.8	42.6
ZGFM1062B-MS-Q1	ZE	58.9	62	65.1	4.0	125	2000	0.25	0.8	47.1
ZGFM1068B-MS-Q1	ZF	64.6	68	71.4	3.7	150	2000	0.25	0.8	51.7
ZGFM1075B-MS-Q1	ZG	71.3	75	78.8	3.3	175	2000	0.25	0.8	56.0
ZGFM1082B-MS-Q1	ZH	77.9	82	86.1	3.0	200	3000	0.25	0.8	62.2
ZGFM1091B-MS-Q1	ZJ	86.5	91	95.6	2.8	250	3000	0.25	0.8	69.2
ZGFM10100B-MS-Q1	ZK	95.0	100	105.0	2.5	350	3000	0.25	0.8	76.0
ZGFM10110B-MS-Q1	ZL	104.5	110	115.5	2.3	450	4000	0.25	0.8	83.6
ZGFM10120B-MS-Q1	ZM	114.0	120	126.0	2.0	550	4500	0.25	0.8	91.2
ZGFM10130B-MS-Q1	ZN	123.5	130	136.5	1.9	700	5000	0.25	0.8	98.8
ZGFM10150B-MS-Q1	ZO	142.5	150	157.5	1.7	1000	6000	0.25	0.8	114.0
ZGFM10160B-MS-Q1	ZP	152.0	160	168.0	1.6	1100	6500	0.25	0.8	121.6
ZGFM10180B-MS-Q1	ZQ	171.0	180	189.0	1.4	1200	7000	0.25	0.8	136.8
ZGFM10200B-MS-Q1	ZR	190.0	200	210.0	1.2	1900	8000	0.25	0.8	152.0
ZGFM10220B-MS-Q1	ZS	209.0	220	231.0	1.0	1600	8000	0.25	0.8	167.2
ZGFM10240B-MS-Q1	ZT	228.0	240	252.0	0.9	1800	8500	0.25	0.8	182.4
ZGFM10250B-MS-Q1	ZU	237.5	250	262.5	0.9	2000	9000	0.25	0.8	190.0
ZGFM10270B-MS-Q1	ZV	256.5	270	283.5	0.8	2100	9000	0.25	0.8	205.0
ZGFM10300B-MS-Q1	ZW	285.0	300	315.0	0.8	2300	9500	0.25	0.8	228.0
ZGFM10330B-MS-Q1	ZX	313.5	330	346.5	0.7	2500	9500	0.25	0.8	250.2

Note : 5% tolerance of Zener voltage for suffix "B" ex: ZGFM103V6B-MS-Q1 is 3.6V 5%



Rating and characteristic curves (ZGFM103V3B-MS-Q1 THRU ZGFM10330B-MS-Q1)

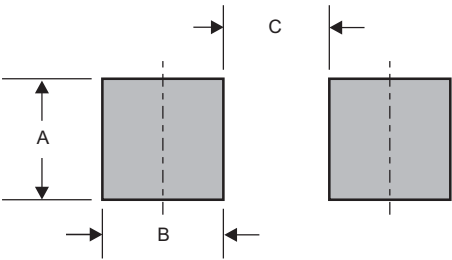


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Pinning information

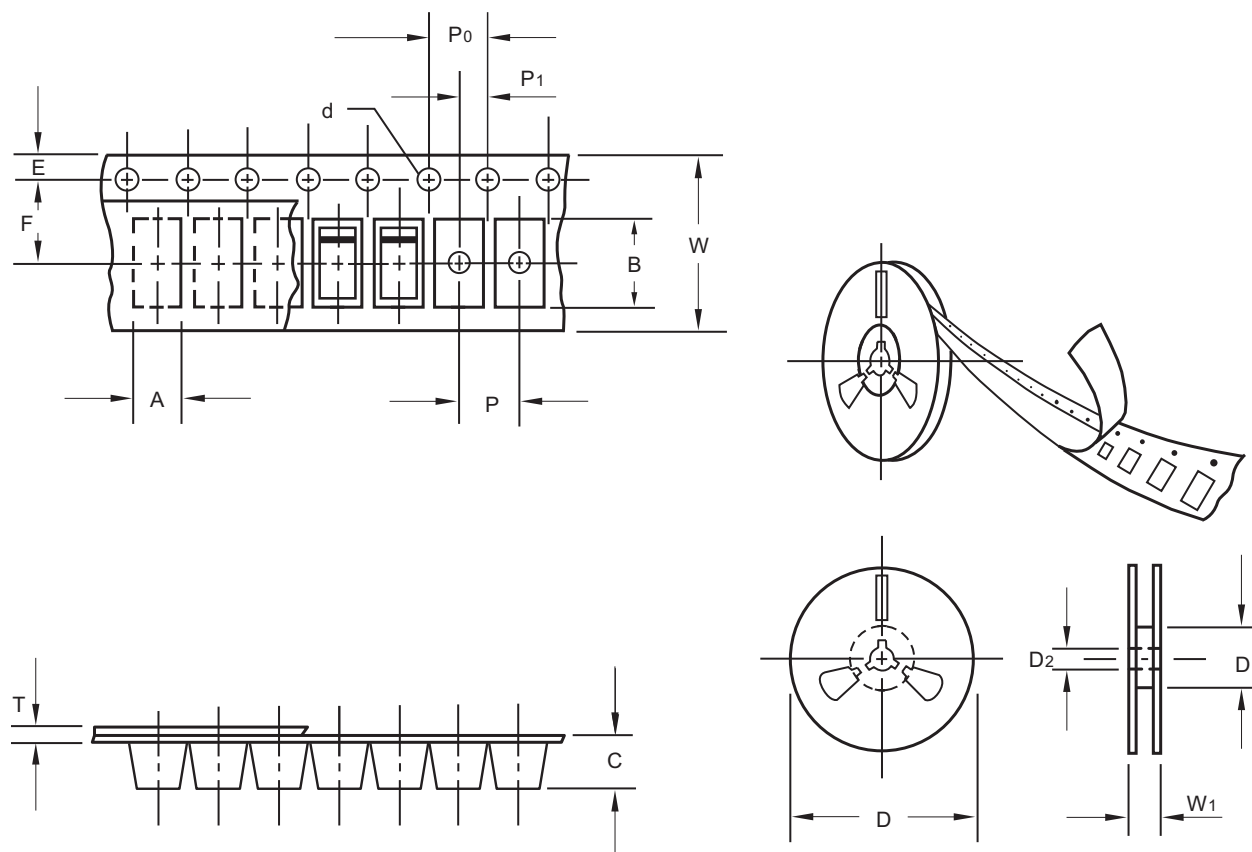
Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-123S	0.044 (1.10)	0.040 (1.00)	0.079 (2.00)

ZGFM103V3B-MS-Q1 THRU ZGFM10330B-MS-Q1**Packing information**

unit:mm

Item	Symbol	Tolerance	SOD-123S
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.85
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	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	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	11.40

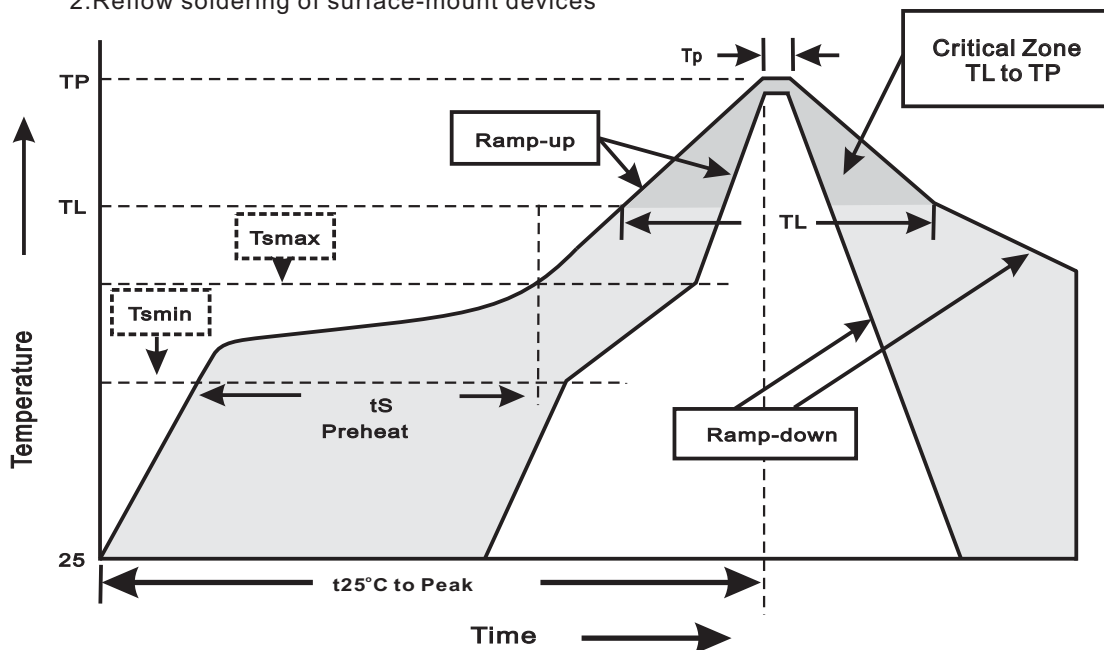
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

ZGFM103V3B-MS-Q1 THRU ZGFM10330B-MS-Q1**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-123S	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	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)	$<3^{\circ}\text{C}/\text{sec}$
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	$<3^{\circ}\text{C}/\text{sec}$
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	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$

ZGFM103V3B-MS-Q1 THRU ZGFM10330B-MS-Q1**High reliability test capabilities**

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	Vz=Vz Nom*80% (Tjmax=150°C) Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	Ta=125°C Test Duration:1000hrs	JESD22 A-103
4. Temperature Cycle	-55°C(15min) to 150°C(15min) Test Cycles:1000cycles	JESD22 A-104
5. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5°C for 5sec	J-STD-002
7. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	Ta=85°C, 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