

# ZGFM103V3B-M THRU ZGFM10330B-M

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# ZGFM103V3B-M THRU ZGFM10330B-M

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

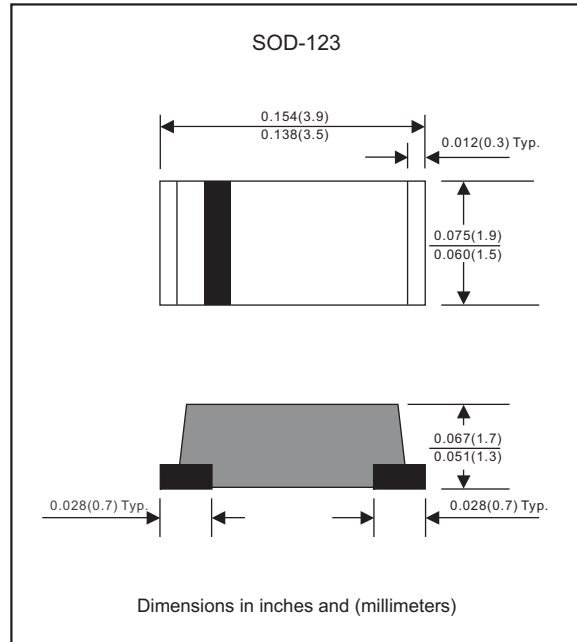
## Features

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- 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 environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex. ZGFM103V3B-M-H

## Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-123
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.018 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 (Note 1)	$R_{\theta JA}$		55		$^\circ\text{C}/\text{W}$
Typical Thermal resistance Junction to case (Note 1)	$R_{\theta JC}$		35		$^\circ\text{C}/\text{W}$
Operating junction temperature range	$T_J$	-55		+150	$^\circ\text{C}$
Storage temperature range	$T_{STG}$	-65		+175	$^\circ\text{C}$

Note : 1. Mounted on 0.2"x0.2"(5x5mm)FR-4 PCB

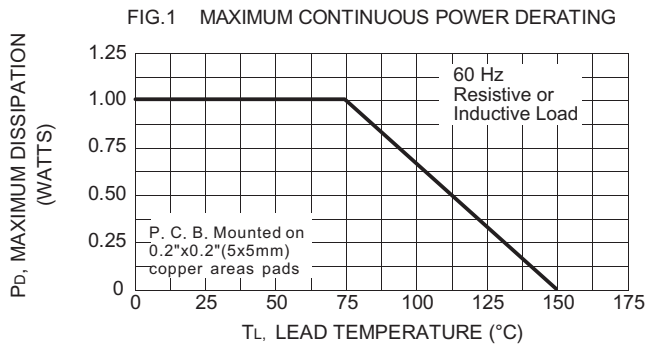
## Electrical characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

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	( $\Omega$ )Max	( $\Omega$ )Max	mA	( $\mu\text{A}$ )Max	Volts
ZGFM103V3B-M	X1	3.1	3.3	3.5	76	10	400	1.00	100	1.0
ZGFM103V6B-M	X2	3.4	3.6	3.8	69	10	400	1.00	100	1.0
ZGFM103V9B-M	X3	3.7	3.9	4.1	64	9	400	1.00	50	1.0
ZGFM104V3B-M	X4	4.1	4.3	4.5	58	9	400	1.00	10	1.0
ZGFM104V7B-M	X5	4.5	4.7	4.9	53	8	500	1.00	10	1.0
ZGFM105V1B-M	X6	4.8	5.1	5.4	49	7	550	1.00	10	1.0
ZGFM105V6B-M	X7	5.3	5.6	5.9	45	5	600	1.00	10	2.0
ZGFM106V2B-M	X8	5.9	6.2	6.5	41	2	700	1.00	10	3.0
ZGFM106V8B-M	X9	6.5	6.8	7.1	37	3.5	700	1.00	10	4.0
ZGFM107V5B-M	Y1	7.1	7.5	7.9	34	4.0	700	0.50	10	5.0
ZGFM108V2B-M	Y2	7.8	8.2	8.6	31	4.5	700	0.50	10	6.0
ZGFM109V1B-M	Y3	8.6	9.1	9.6	28	5	700	0.50	10	7.0
ZGFM1010B-M	Y4	9.5	10	10.5	25	7	700	0.25	10	7.6
ZGFM1011B-M	Y5	10.5	11	11.6	23	8	700	0.25	5	8.4
ZGFM1012B-M	Y6	11.4	12	12.6	21	9	700	0.25	5	9.1
ZGFM1013B-M	Y7	12.4	13	13.7	19	10	700	0.25	5	9.9
ZGFM1015B-M	Y8	14.3	15	15.8	17	14	700	0.25	5	11.4
ZGFM1016B-M	Y9	15.2	16	16.8	15.5	16	700	0.25	5	12.2
ZGFM1018B-M	Z1	17.1	18	18.9	14	20	750	0.25	5	13.7
ZGFM1020B-M	Z2	19.0	20	21.0	12.5	22	750	0.25	5	15.2
ZGFM1022B-M	Z3	20.9	22	23.1	11.5	23	750	0.25	5	16.7
ZGFM1024B-M	Z4	22.8	24	25.2	10.5	25	750	0.25	5	18.2
ZGFM1027B-M	Z5	25.7	27	28.4	9.5	35	750	0.25	5	20.6
ZGFM1030B-M	Z6	28.5	30	31.5	8.5	40	1000	0.25	5	22.8
ZGFM1033B-M	Z7	31.4	33	34.7	7.5	45	1000	0.25	5	25.4
ZGFM1036B-M	Z8	34.2	36	37.8	7.0	50	1000	0.25	5	27.4
ZGFM1039B-M	Z9	37.1	39	41.0	6.5	60	1000	0.25	5	29.7
ZGFM1043B-M	ZA	40.9	43	45.2	6.0	70	1500	0.25	0.1	32.7
ZGFM1047B-M	ZB	44.7	47	49.4	5.5	80	1500	0.25	0.1	35.8
ZGFM1051B-M	ZC	48.5	51	53.6	5.0	95	1500	0.25	0.1	38.8
ZGFM1056B-M	ZD	53.2	56	58.8	4.5	110	2000	0.25	0.1	42.6
ZGFM1062B-M	ZE	58.9	62	65.1	4.0	125	2000	0.25	0.1	47.1
ZGFM1068B-M	ZF	64.6	68	71.4	3.7	150	2000	0.25	0.1	51.7
ZGFM1075B-M	ZG	71.3	75	78.8	3.3	175	2000	0.25	0.1	56.0
ZGFM1082B-M	ZH	77.9	82	86.1	3.0	200	3000	0.25	0.1	62.2
ZGFM1091B-M	ZJ	86.5	91	95.6	2.8	250	3000	0.25	0.1	69.2
ZGFM10100B-M	ZK	95.0	100	105.0	2.5	350	3000	0.25	0.1	76.0
ZGFM10110B-M	ZL	104.5	110	115.5	2.3	450	4000	0.25	0.1	83.6
ZGFM10120B-M	ZM	114.0	120	126.0	2.0	550	4500	0.25	0.1	91.2
ZGFM10130B-M	ZN	123.5	130	136.5	1.9	700	5000	0.25	0.1	98.8
ZGFM10150B-M	ZO	142.5	150	157.5	1.7	1000	6000	0.25	0.1	114.0
ZGFM10160B-M	ZP	152.0	160	168.0	1.6	1100	6500	0.25	0.1	121.6
ZGFM10180B-M	ZQ	171.0	180	189.0	1.4	1200	7000	0.25	0.1	136.8
ZGFM10200B-M	ZR	190.0	200	210.0	1.2	1900	8000	0.25	0.1	152.0
ZGFM10220B-M	ZS	209.0	220	231.0	1.0	1600	8000	0.25	0.1	167.2
ZGFM10240B-M	ZT	228.0	240	252.0	0.9	1800	8500	0.25	0.1	182.4
ZGFM10250B-M	ZU	237.5	250	262.5	0.9	2000	9000	0.25	0.1	190.0
ZGFM10270B-M	ZV	256.5	270	283.5	0.8	2100	9000	0.25	0.1	205.0
ZGFM10300B-M	ZW	285.0	300	315.0	0.8	2300	9500	0.25	0.1	228.0
ZGFM10330B-M	ZX	313.5	330	346.5	0.7	2500	9500	0.25	0.1	250.2

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





## Rating and characteristic curves (ZGFM103V3B-M THRU ZGFM10330B-M)

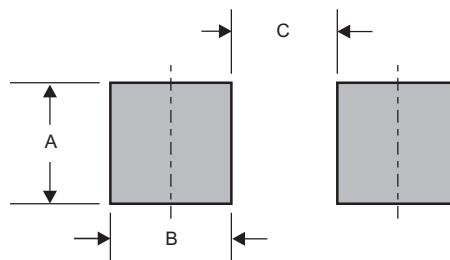


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## Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

## Suggested solder pad layout

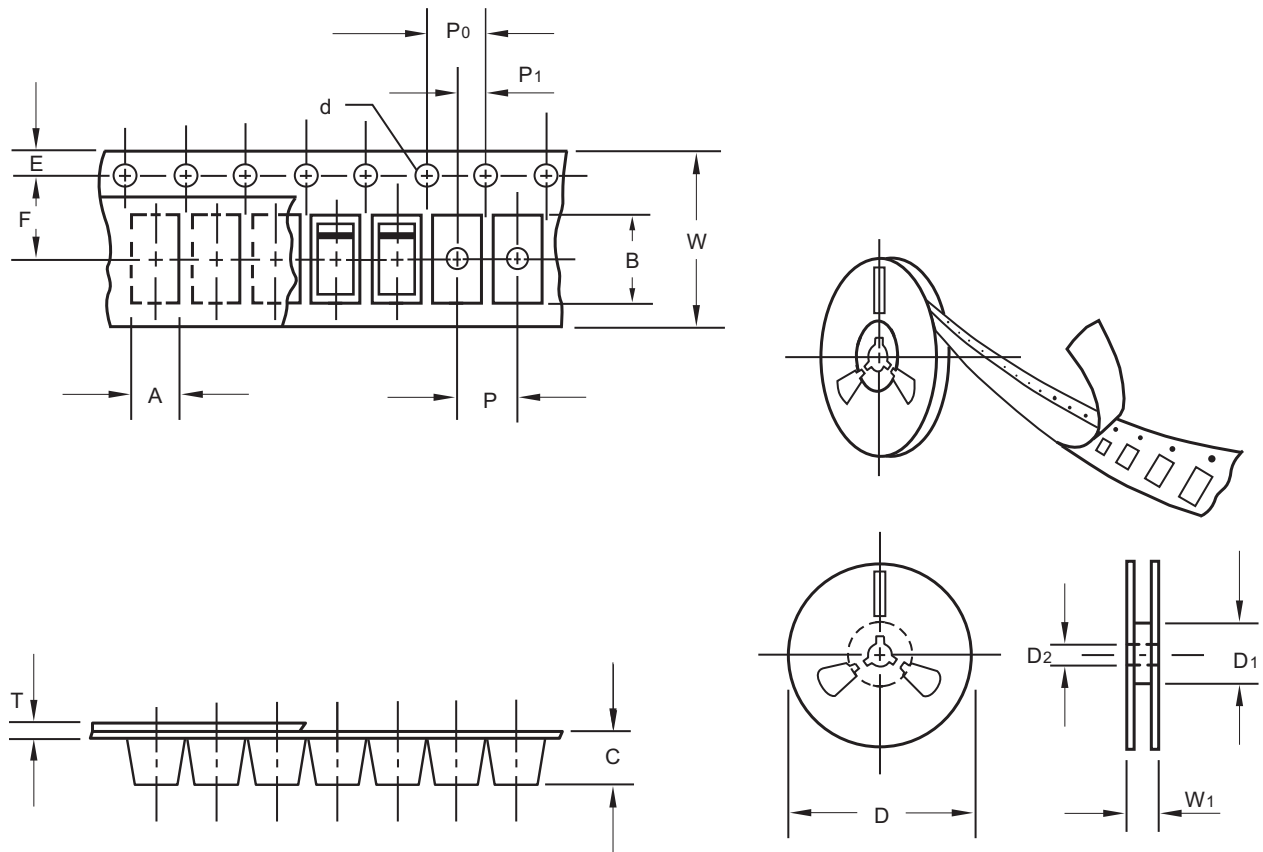


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-123	0.075 (1.90)	0.055 (1.40)	0.075 (1.90)

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## Packing information



unit:mm

Item	Symbol	Tolerance	SOD-123
Carrier width	A	0.1	1.90
Carrier length	B	0.1	3.90
Carrier depth	C	0.1	1.68
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.

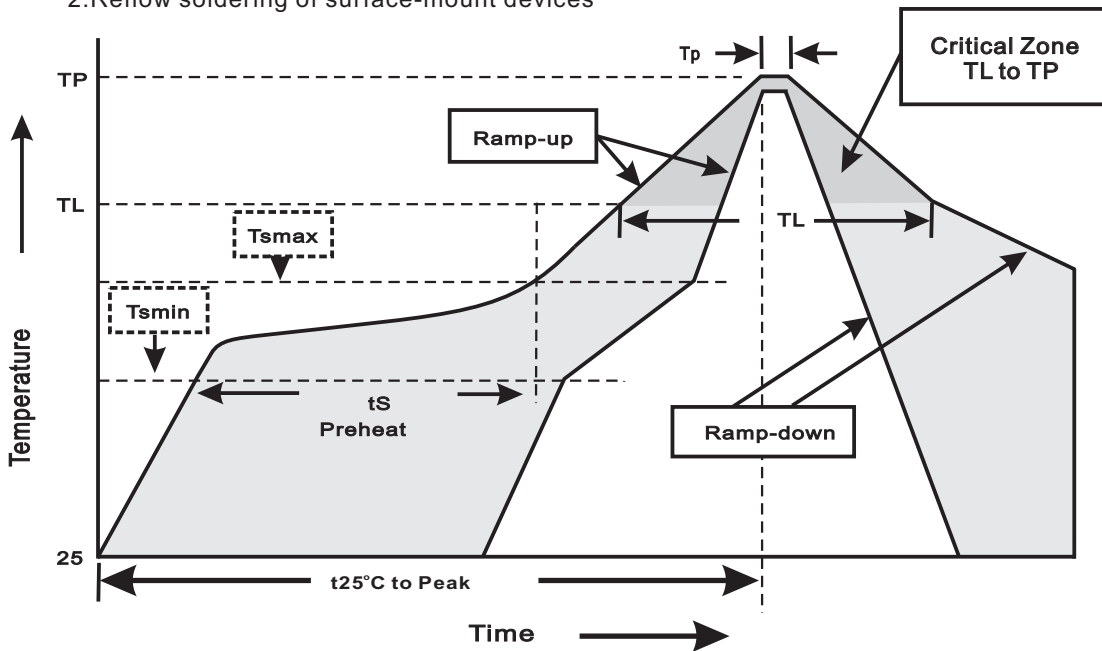
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## Reel packing

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-123	7"	2,500	4.0	25,000	183*123*183	178	382*257*387	200,000	10.5

## 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 <sub>L</sub> to T <sub>P</sub> )	<3°C/sec
Preheat -Temperature Min(T <sub>sm</sub> ) -Temperature Max(T <sub>sm</sub> ) -Time(min to max)(t <sub>s</sub> )	150°C 200°C 60~120sec
T <sub>sm</sub> to T <sub>L</sub> -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T <sub>L</sub> ) -Time(t <sub>L</sub> )	217°C 60~260sec
Peak Temperature(T <sub>P</sub> )	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t <sub>p</sub> )	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

**ZGFM103V3B-M THRU ZGFM10330B-M****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	$V_z = V_{z,Nom} * 80\%$ at $T_j = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{SIE}$ at $T_A = 121^\circ\text{C}$ 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 $T_A = 85^\circ\text{C}$ , 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