

ZGFM103V3B-MST THRU ZGFM10330B-MST**List**

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Rating and characteristic curves.....	4
Pinning information.....	5
Suggested solder pad layout.....	5
Packing information.....	6
Reel packing.....	7
Suggested thermal profiles for soldering processes.....	7
High reliability test capabilities.....	8

ZGFM103V3B-MST THRU ZGFM10330B-MST

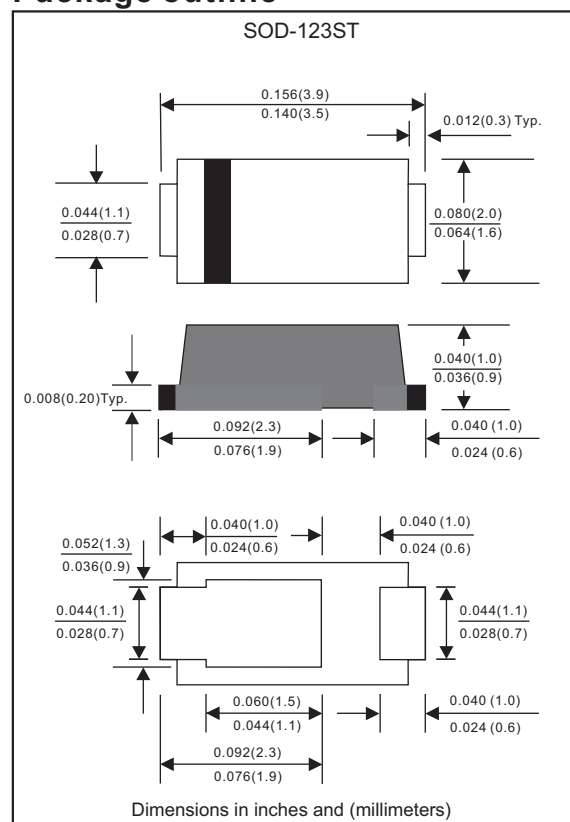
**1000mW Surface Mount Zener
Diodes 3.3V-330V**

Features

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance
- Well package design with solder pad on the bottom for best thermal performance
- 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
- Suffix "-H" indicates Halogen-free part, ex. ZGFM103V3B-MST-H

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-123ST / 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 (Note 1)	$R_{\theta JA}$		48		$^{\circ}\text{C/W}$
Typical thermal resistance junction to case (Note 1)	$R_{\theta JC}$		28		$^{\circ}\text{C/W}$
Operating junction temperature range	T_J	-55		+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-65		+175	$^{\circ}\text{C}$

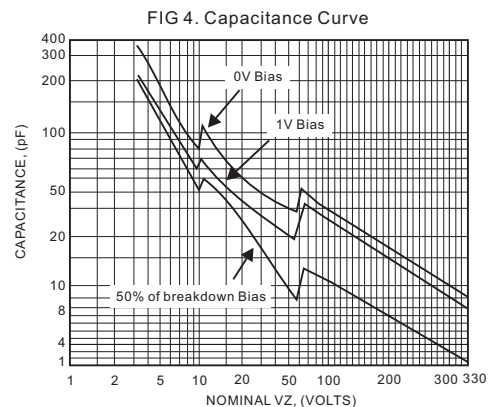
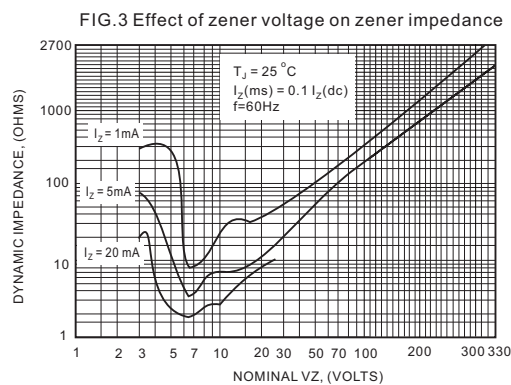
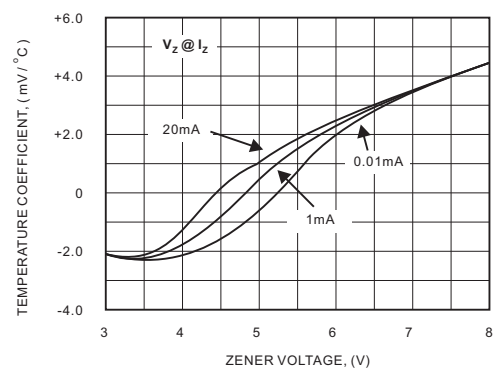
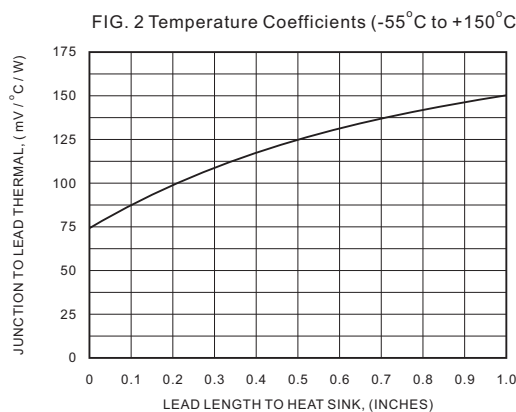
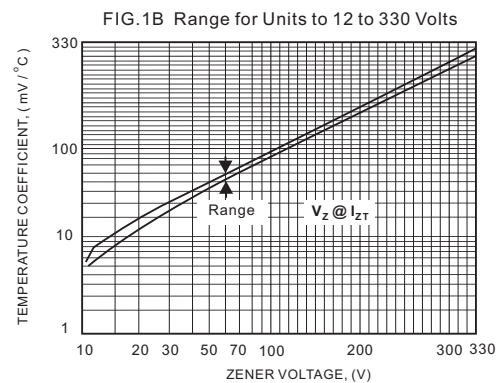
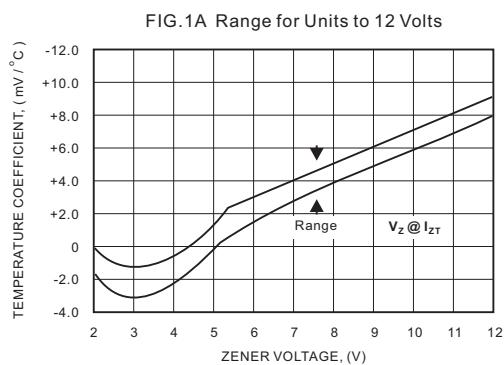
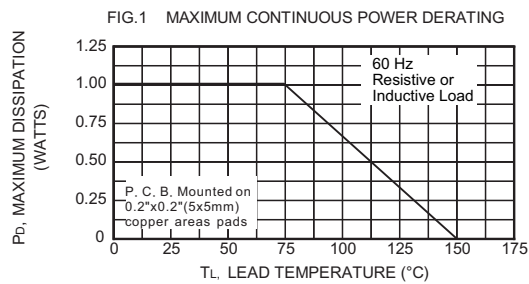
Note 1: Mounted on 0.2"x0.2" (5x5mm) FR-4 PCB

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

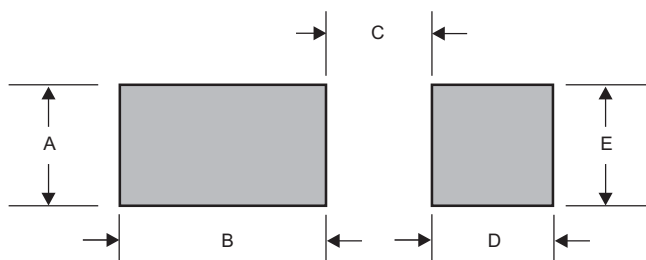
Note : 5% tolerance of Zener voltage for suffix "B" ex: ZGFM103V6B-MST is 3.6V 5%

Rating and characteristic curves (ZGFM103V3B-MST THRU ZGFM10330B-MST)



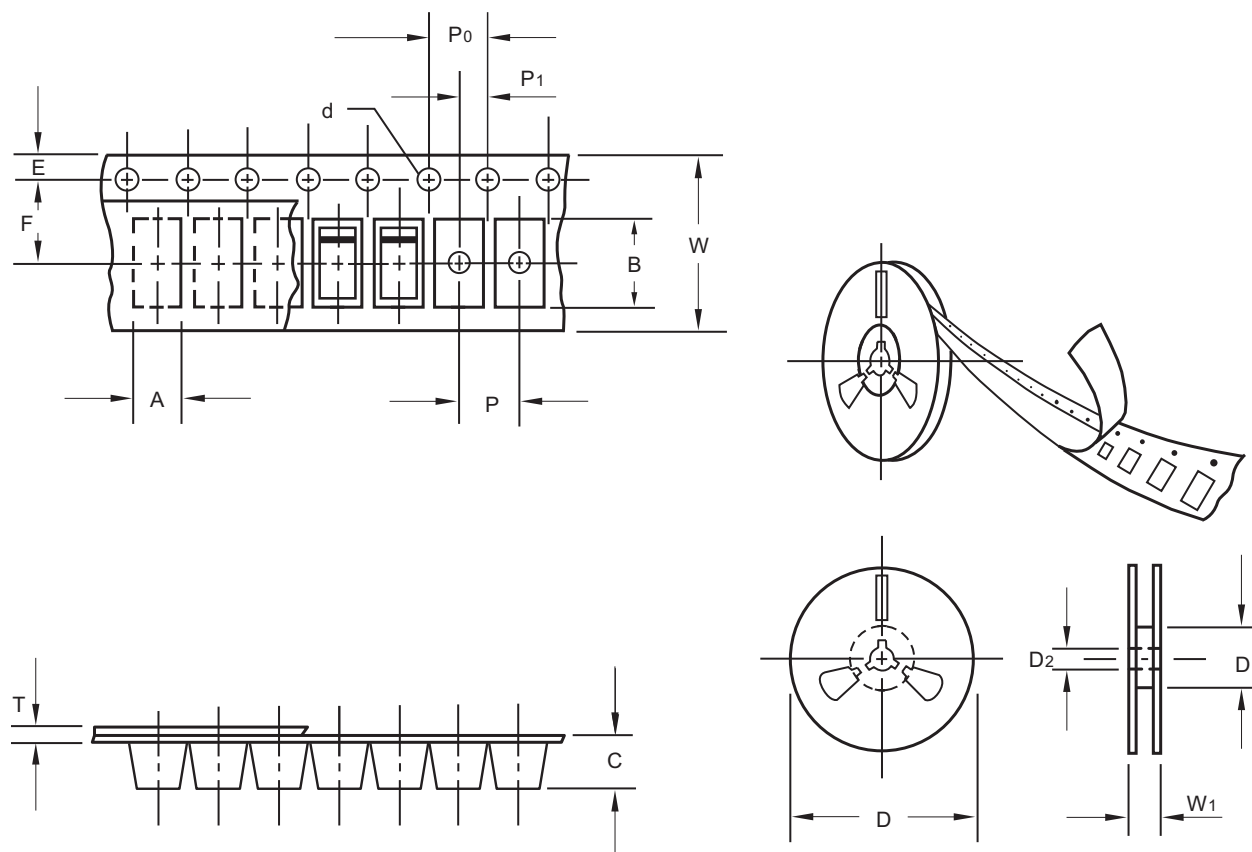
ZGFM103V3B-MST THRU ZGFM10330B-MST**Pinning information**

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C	D	E
SOD-123ST	0.060 (1.50)	0.095 (2.40)	0.020 (0.50)	0.044 (1.10)	0.049 (1.25)

ZGFM103V3B-MST THRU ZGFM10330B-MST**Packing information**

unit:mm

Item	Symbol	Tolerance	SOD-123ST
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

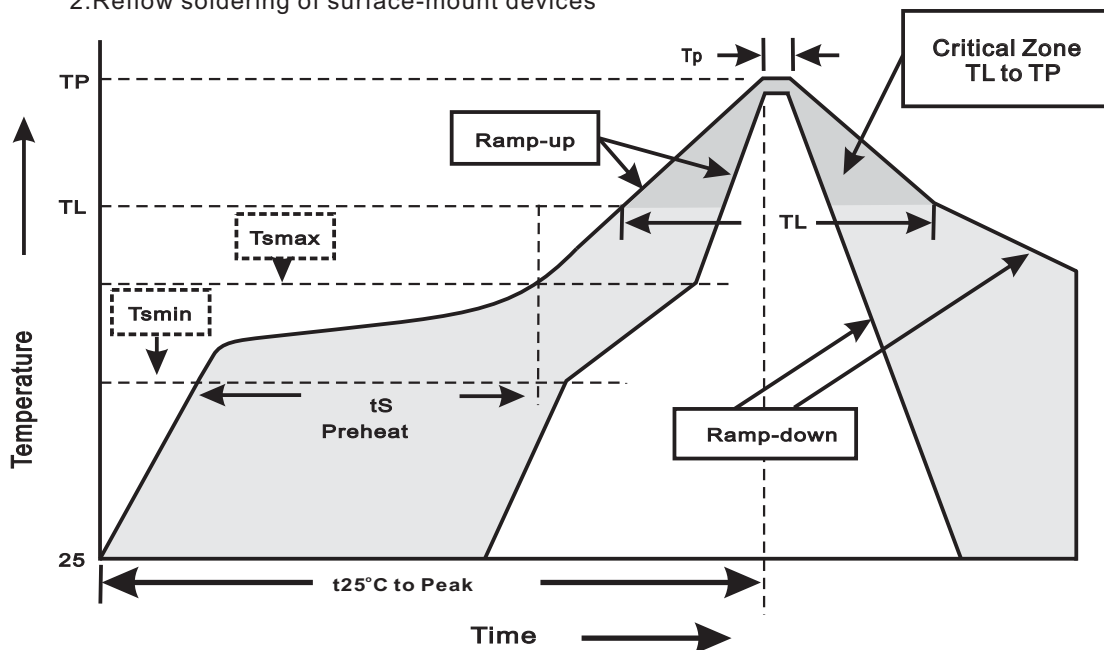
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

ZGFM103V3B-MST THRU ZGFM10330B-MST**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-123ST	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°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} 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	<3°C/sec
Time 25°C to Peak Temperature	<6minutes

ZGFM103V3B-MST THRU ZGFM10330B-MST**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_z = V_{z, \text{Nom}} * 80\%$ at $T_J = 150^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ at $T_A = 121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ 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