

ZGFM5919B THRU ZGFM5956B

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ZGFM5919B THRU ZGFM5956B

1.5W Surface Mount Zener
Diodes 5.6V-200V

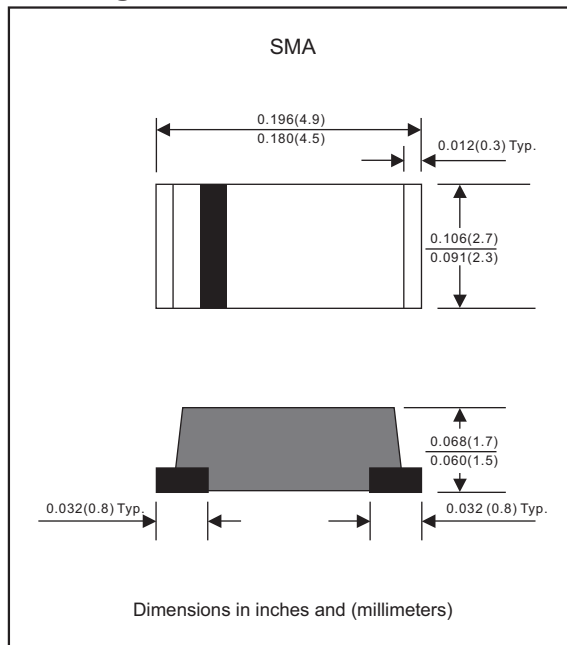
Features

- Wide zener reverse voltage range 5.6V to 200V
- 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.ZGFM5919B-H

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AC/ SMA
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.05gram

Package outline



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

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Power dissipation at $T_L=75^{\circ}\text{C}$		P_D			1.5	W
Forward voltage	$I_F=200\text{mA}$	V_F			1.5	V
Operating junction temperature range		T_J	-55		+150	$^{\circ}\text{C}$
Storage temperature range		T_{STG}	-65		+175	$^{\circ}\text{C}$

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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
ZGFM5919B	5919	5.32	5.6	5.88	66.9	2.0	250	1.00	5	3.0
ZGFM5920B	5920	5.89	6.2	6.51	60.5	2.0	200	1.00	5	4.0
ZGFM5921B	5921	6.46	6.8	7.14	55.1	2.5	200	1.00	5	5.2
ZGFM5922B	5922	7.13	7.5	7.88	50.0	3.0	400	0.50	5	6.0
ZGFM5923B	5923	7.79	8.2	8.61	45.7	3.5	400	0.50	5	6.5
ZGFM5924B	5924	8.65	9.1	9.56	41.2	4.0	500	0.50	5	7.0
ZGFM5925B	5925	9.50	10	10.50	37.5	4.5	500	0.25	5	8.0
ZGFM5926B	5926	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4
ZGFM5927B	5927	11.40	12	12.60	31.2	6.5	550	0.25	1	9.1
ZGFM5928B	5928	12.35	13	13.65	28.8	7	550	0.25	1	9.9
ZGFM5929B	5929	14.25	15	15.75	25.0	9	600	0.25	1	11.4
ZGFM5930B	5930	15.20	16	16.80	23.4	10	600	0.25	1	12.2
ZGFM5931B	5931	17.10	18	18.90	20.8	12	650	0.25	1	13.7
ZGFM5932B	5932	19.00	20	21.00	18.7	14	650	0.25	1	15.2
ZGFM5933B	5933	20.90	22	23.10	17.0	18	650	0.25	1	16.7
ZGFM5934B	5934	22.80	24	25.20	15.6	19	700	0.25	1	18.2
ZGFM5935B	5935	25.65	27	28.35	13.9	23	700	0.25	1	20.6
ZGFM5936B	5936	28.50	30	31.50	12.5	26	750	0.25	1	22.8
ZGFM5937B	5937	31.35	33	34.65	11.4	33	800	0.25	1	25.1
ZGFM5938B	5938	34.20	36	37.80	10.4	38	850	0.25	1	27.4
ZGFM5939B	5939	37.05	39	40.95	9.6	45	900	0.25	1	29.7
ZGFM5940B	5940	40.85	43	45.15	8.7	53	950	0.25	1	32.7
ZGFM5941B	5941	44.65	47	49.35	8.0	67	1000	0.25	1	35.8
ZGFM5942B	5942	48.45	51	53.55	7.3	70	1100	0.25	1	38.8
ZGFM5943B	5943	53.20	56	58.80	6.7	86	1300	0.25	1	42.6
ZGFM5944B	5944	58.90	62	65.10	6.0	100	1500	0.25	1	47.1
ZGFM5945B	5945	64.60	68	71.40	5.5	120	1700	0.25	1	51.7
ZGFM5946B	5946	71.25	75	78.75	5.0	140	2000	0.25	1	56.0
ZGFM5947B	5947	77.90	82	86.10	4.6	160	2500	0.25	1	62.2
ZGFM5948B	5948	86.45	91	95.55	4.1	200	3000	0.25	1	69.2
ZGFM5949B	5949	95.00	100	105.0	3.7	250	3100	0.25	1	76.0
ZGFM5950B	5950	104.5	110	115.5	3.4	300	4000	0.25	1	83.6
ZGFM5951B	5951	114.0	120	126.0	3.1	380	4500	0.25	1	91.2
ZGFM5952B	5952	123.5	130	136.5	2.9	450	5000	0.25	1	98.8
ZGFM5953B	5953	142.5	150	157.5	2.5	600	6000	0.25	1	114.0
ZGFM5954B	5954	152.0	160	168.0	2.3	700	6500	0.25	1	121.6
ZGFM5955B	5955	171.0	180	189.0	2.1	900	7000	0.25	1	136.8
ZGFM5956B	5956	190.0	200	210.0	1.9	1200	8000	0.25	1	152.0

Note : 5% tolerance of Zener voltage

Rating and characteristic curves (ZGFM5919B THRU ZGFM5956B)

FIG.1 STEADY STATE POWER DERATING

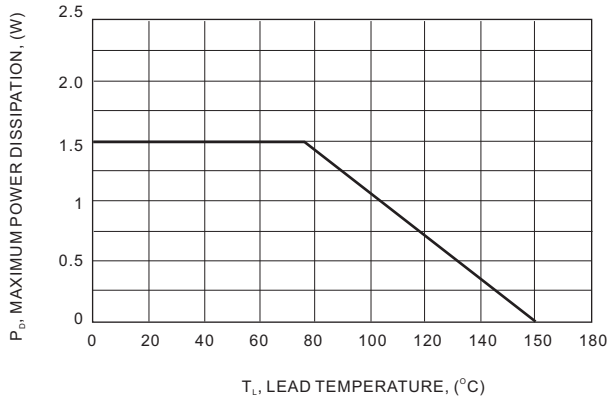


FIG.2 ZENER VOLTAGE TO 12 VOLTS

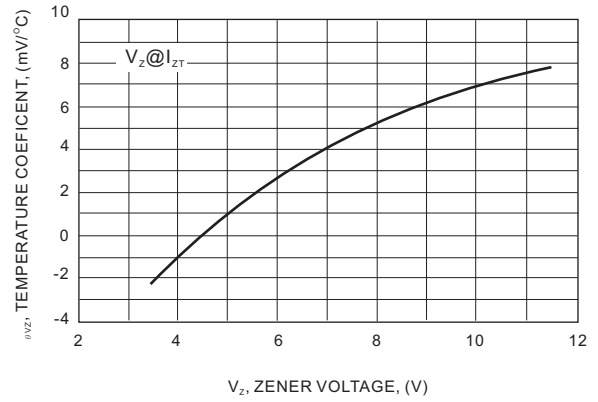


FIG.3 ZENER VOLTAGE 12 TO 68 VOLTAGE

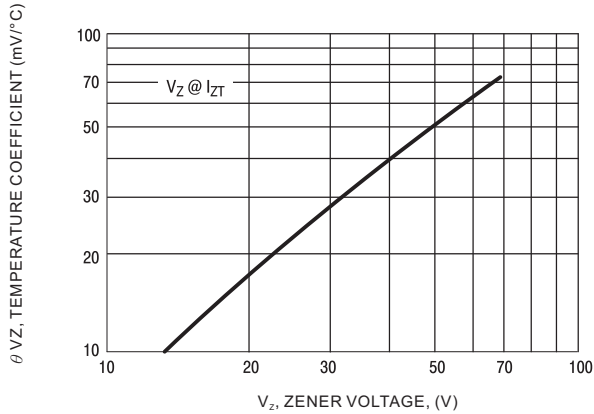


FIG.4 EFFECT OF ZENER CURRENT

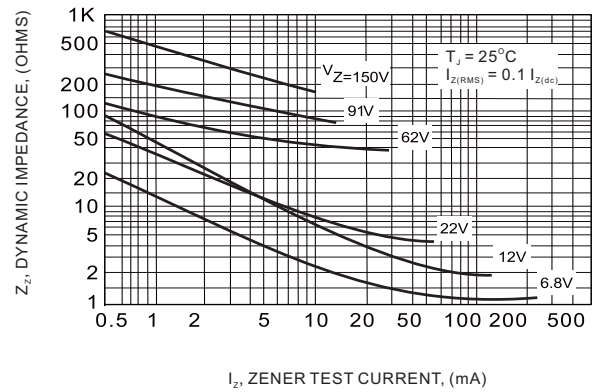


FIG.5 EFFECT OF ZENER VOLTAGE

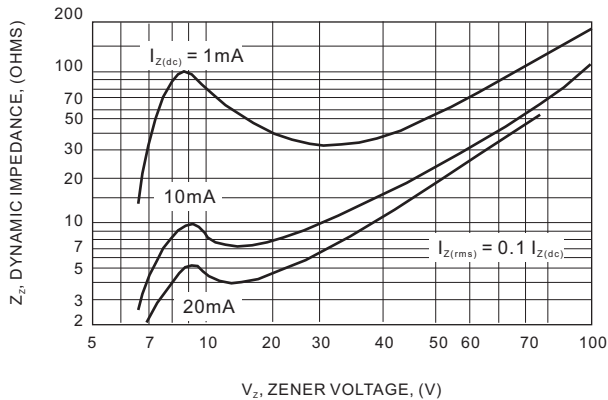
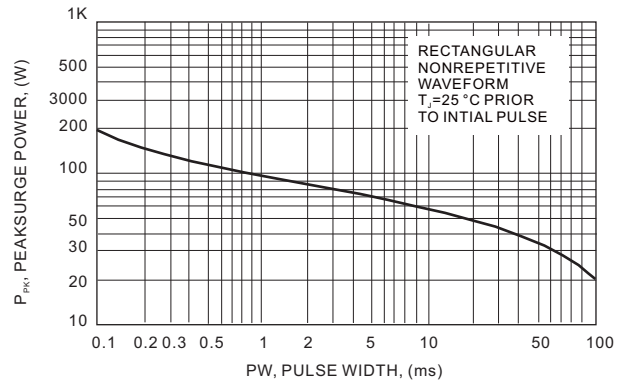
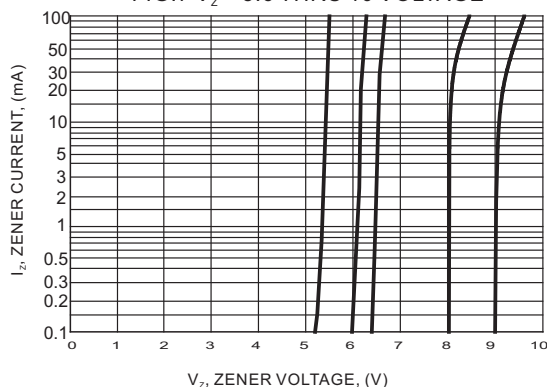
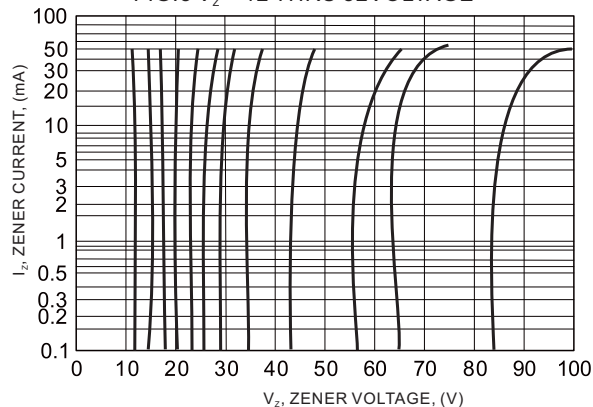
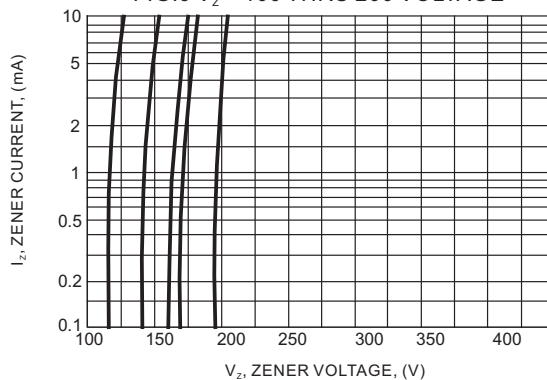


FIG.6 MAXIMUM SURGE POWER



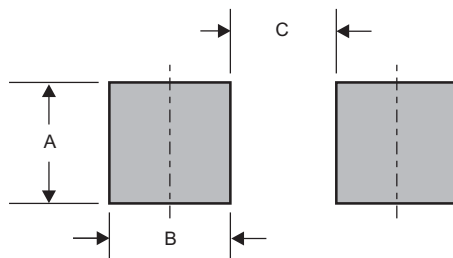
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FIG.7 $V_z = 5.6$ THRU 10 VOLTAGEFIG.8 $V_z = 12$ THRU 82VOLTAGEFIG.9 $V_z = 100$ THRU 200 VOLTAGE

Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

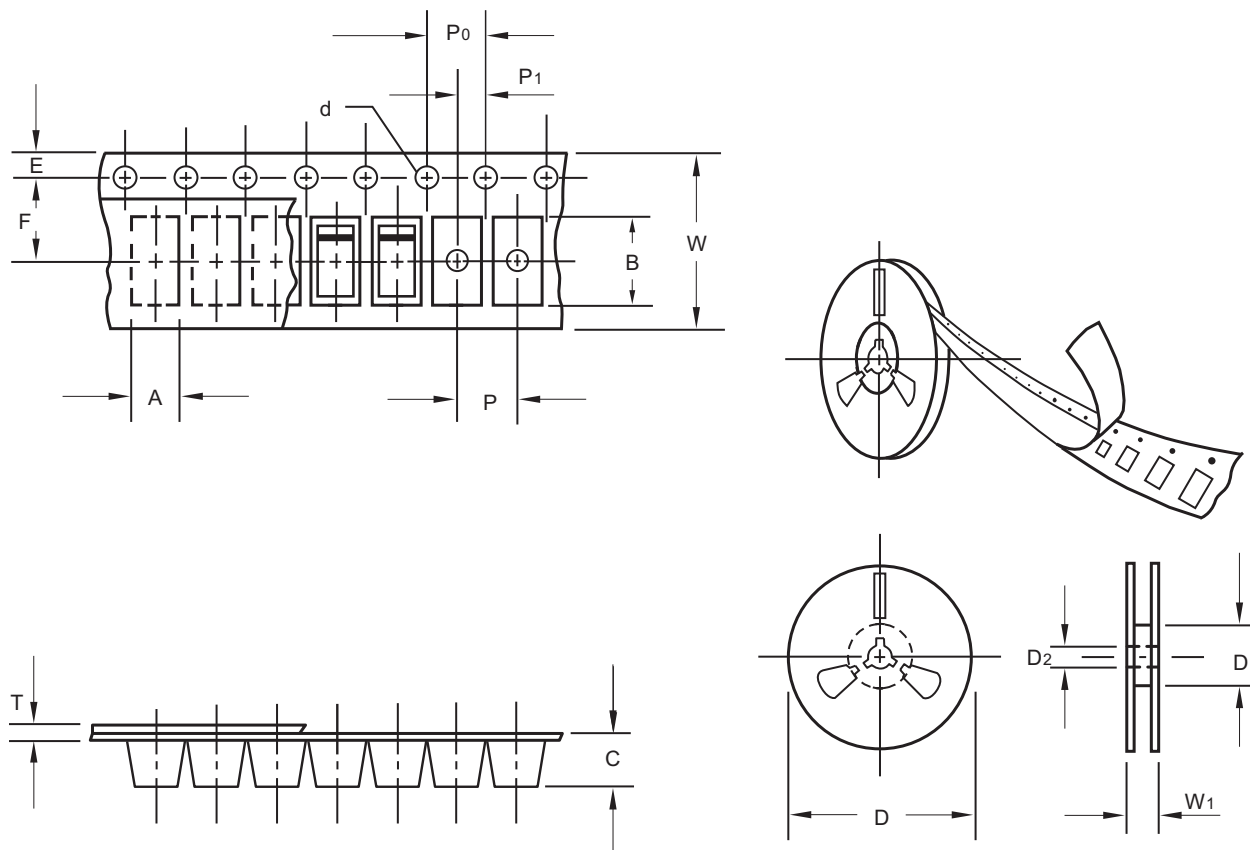


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMA	0.110 (2.80)	0.063 (1.60)	0.087 (2.20)

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Packing information



unit:mm

Item	Symbol	Tolerance	SMA
Carrier width	A	0.1	2.80
Carrier length	B	0.1	5.00
Carrier depth	C	0.1	1.90
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
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	5.50
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	12.00
Reel width	W1	1.0	18.00

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

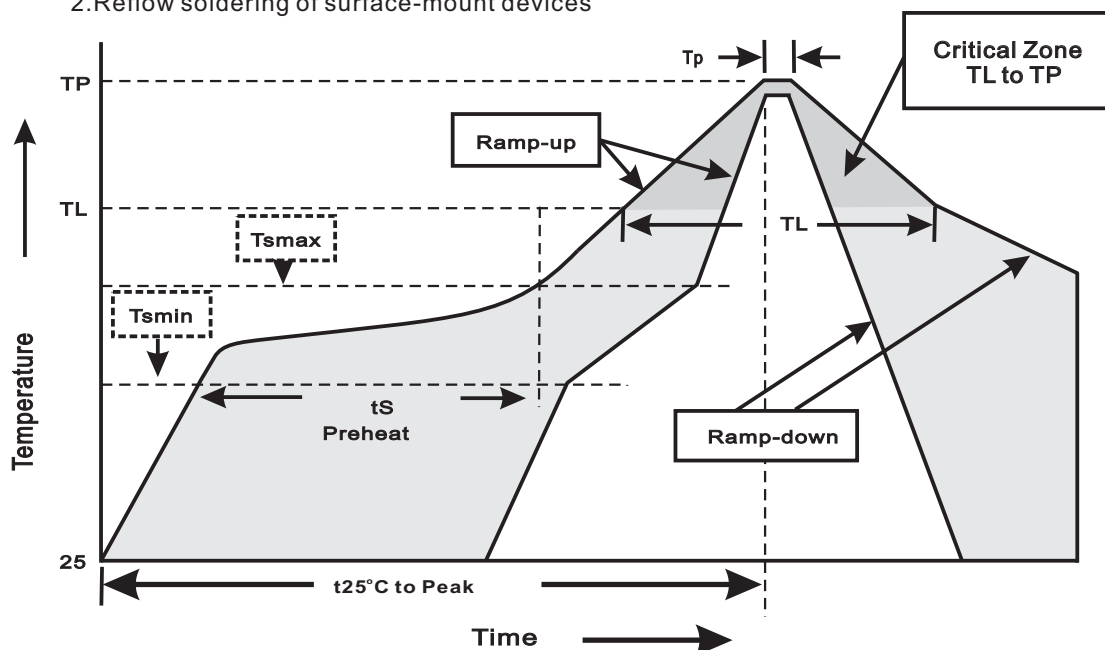
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Reel packing

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)
SMA	7"	2,000	4.0	20,000	183*155*183	178	382*356*392	160,000	16.0
SMA	13"	7,500	4.0	15,000	335*335*38	330	350*330*360	120,000	14.5

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	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

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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