

ZGFM5913B-AF-Q1 Thru ZGFM5956B-AF-Q1**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

ZGFM5913B-AF-Q1 Thru ZGFM5956B-AF-Q1

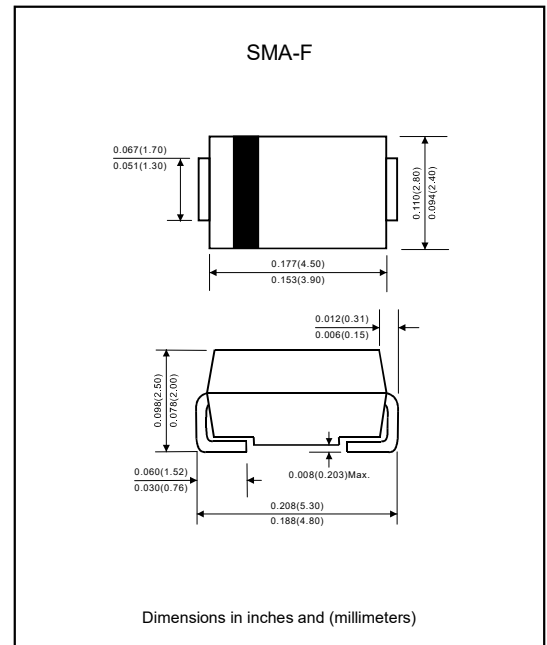
1.5W Surface Mount Zener Diodes
3.3V ~ 200V

Features

- Zener reverse voltage range 3.3V to 200V.
- Glass passivated chip.
- Built-in strain relief.
- Low inductance.
- High peak reverse power dissipation.
- Low reverse leakage.
- For use in stabilizing and clipping with high power rating.
- Lead-free parts meet RoHS requirements.
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen-free part, ex.ZGFM5913B-AF-Q1-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : older plastic, DO-214AC / SMA-F.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.

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

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

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Electrical characteristics

At $T_A=25^{\circ}\text{C}$ (Devices listed in bold, italic are on semiconductor preferred devices) $(T_L=30^{\circ}\text{C}$ unless otherwise noted, $V_F=1.5\text{V}$ Max. @ $I_F=200\text{mA}(\text{DC})$ for all types)

Type	Marking	Nominal Zener Voltage				Zener Impedance			Leakage Current		Maximum DC Zener Current
		V _z			I _{zT}	Z _{zT} @I _{zT}	Z _{zK} @I _{zK}		I _R @V _R		
		Min(V)	Nom(V)	Max(V)	(mA)	(Ω)	(Ω)	(mA)	(μA)	(V)	
ZGFM5913B-AF-Q1	913A	3.13	3.3	3.47	113.6	10	500	1	100	1	454
ZGFM5914B-AF-Q1	914A	3.42	3.6	3.78	104.2	9	500	1	75	1	416
ZGFM5915B-AF-Q1	915A	3.70	3.9	4.1	96.1	7.5	500	1	25	1	384
ZGFM5916B-AF-Q1	916A	4.08	4.3	4.52	87.2	6	500	1	5	1	348
ZGFM5917B-AF-Q1	917A	4.46	4.7	4.94	79.8	5	500	1	5	1.5	319
ZGFM5918B-AF-Q1	918A	4.84	5.1	5.36	73.5	4	350	1	5	2	294
ZGFM5919B-AF-Q1	919A	5.32	5.6	5.88	66.9	2	250	1	5	3	267
ZGFM5920B-AF-Q1	920A	5.89	6.2	6.51	60.5	2	200	1	5	4	241
ZGFM5921B-AF-Q1	921A	6.46	6.8	7.14	55.1	2.5	200	1	5	5.2	220
ZGFM5922B-AF-Q1	922A	7.12	7.5	7.88	50	3	400	0.5	5	6	200
ZGFM5923B-AF-Q1	923A	7.79	8.2	8.61	45.7	3.5	400	0.5	5	6.5	182
ZGFM5924B-AF-Q1	924A	8.64	9.1	9.56	41.2	4	500	0.5	5	7	164
ZGFM5925B-AF-Q1	925A	9.5	10	10.5	37.5	4.5	500	0.25	5	8	150
ZGFM5926B-AF-Q1	926A	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136
ZGFM5927B-AF-Q1	927A	11.4	12	12.6	31.2	6.5	550	0.25	1	9.1	125
ZGFM5928B-AF-Q1	928A	12.35	13	13.65	28.8	7	550	0.25	1	9.9	115
ZGFM5929B-AF-Q1	929A	14.25	15	15.75	25	9	600	0.25	1	11.4	100
ZGFM5930B-AF-Q1	930A	15.2	16	16.8	23.4	10	600	0.25	1	12.2	93
ZGFM5931B-AF-Q1	931A	17.1	18	18.9	20.8	12	650	0.25	1	13.7	83
ZGFM5932B-AF-Q1	932A	19	20	21	18.7	14	650	0.25	1	15.2	75
ZGFM5933B-AF-Q1	933A	20.9	22	23.1	17	17.5	650	0.25	1	16.7	68
ZGFM5934B-AF-Q1	934A	22.8	24	25.2	15.6	19	700	0.25	1	18.2	62
ZGFM5935B-AF-Q1	935A	25.65	27	28.35	13.9	23	700	0.25	1	20.6	55
ZGFM5936B-AF-Q1	936A	28.5	30	31.5	12.5	28	750	0.25	1	22.8	50
ZGFM5937B-AF-Q1	937A	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45
ZGFM5938B-AF-Q1	938A	34.2	36	37.8	10.4	38	850	0.25	1	27.4	41
ZGFM5939B-AF-Q1	939A	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38
ZGFM5940B-AF-Q1	940A	40.85	43	45.15	8.7	53	950	0.25	1	32.7	34
ZGFM5941B-AF-Q1	941A	44.65	47	49.35	8	67	1000	0.25	1	35.8	31
ZGFM5942B-AF-Q1	942A	48.45	51	53.55	7.3	70	1100	0.25	1	38.8	29
ZGFM5943B-AF-Q1	943A	53.2	56	58.8	6.7	86	1300	0.25	1	42.6	26
ZGFM5944B-AF-Q1	944A	58.9	62	65.1	6	100	1500	0.25	1	47.1	24
ZGFM5945B-AF-Q1	945A	64.6	68	71.4	5.5	120	1700	0.25	1	51.7	22
ZGFM5946B-AF-Q1	946A	71.25	75	78.75	5	140	2000	0.25	1	56	20
ZGFM5947B-AF-Q1	947A	77.9	82	86.1	4.6	160	2500	0.25	1	62.2	18
ZGFM5948B-AF-Q1	948A	86.45	91	95.55	4.1	200	3000	0.25	1	69.2	16
ZGFM5949B-AF-Q1	949A	95	100	105	3.7	250	3100	0.25	1	76	15
ZGFM5950B-AF-Q1	950A	104.5	110	115.5	3.4	300	4000	0.25	1	83.6	13
ZGFM5951B-AF-Q1	951A	114	120	126	3.1	380	4500	0.25	1	91.2	12
ZGFM5952B-AF-Q1	952A	123.5	130	136.5	2.9	450	5000	0.25	1	98.8	11
ZGFM5953B-AF-Q1	953A	142.5	150	157.5	2.5	600	6000	0.25	1	114	10
ZGFM5954B-AF-Q1	954A	152	160	168	2.3	700	6500	0.25	1	121.6	9
ZGFM5955B-AF-Q1	955A	171	180	189	2.1	900	7000	0.25	1	136.8	8
ZGFM5956B-AF-Q1	956A	190	200	210	1.9	1200	8000	0.25	1	152	7

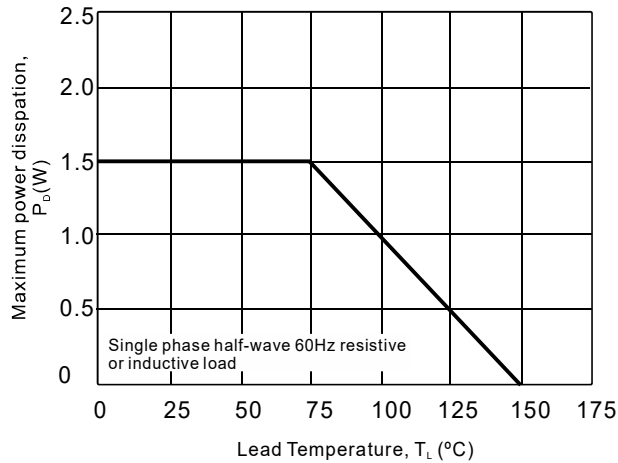
Note: 1. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%.

2. Zener voltage (V_Z) measurement nominal zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25°C .3. Zener impedance (Z_Z) derivation: Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied.The specified limits are for $I_Z(\text{AC})=0.1 I_Z(\text{DC})$ with the AC frequency = 60 Hz.4. $T_L=30^{\circ}\text{C}$ unless otherwise noted, $V_F=1.5\text{V}$ Max. @ $I_F=200\text{mA}(\text{DC})$ for all types.

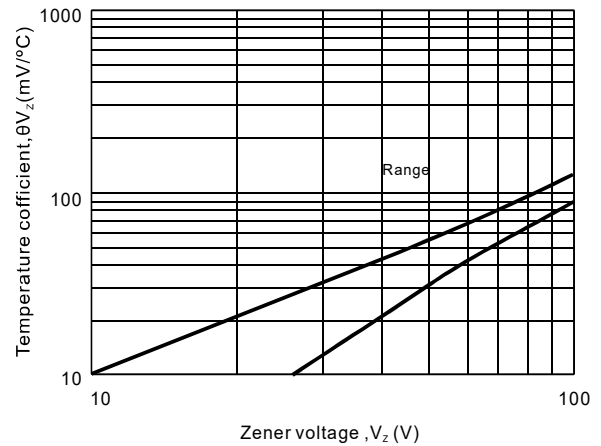
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Rating and characteristic curves

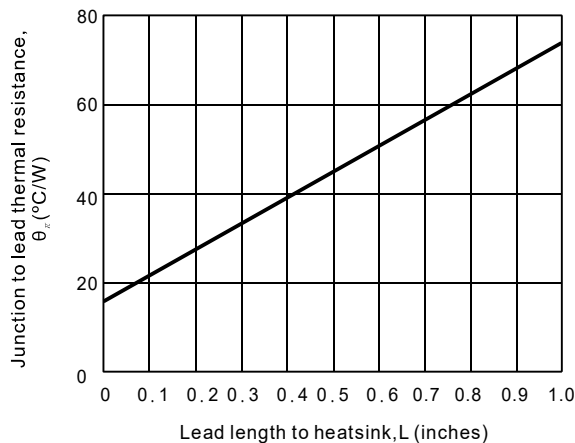
Forward current derating curve



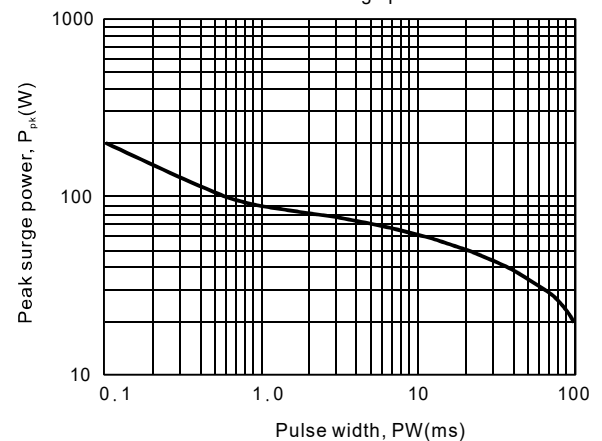
Temperature coefficient vs. Zener voltage



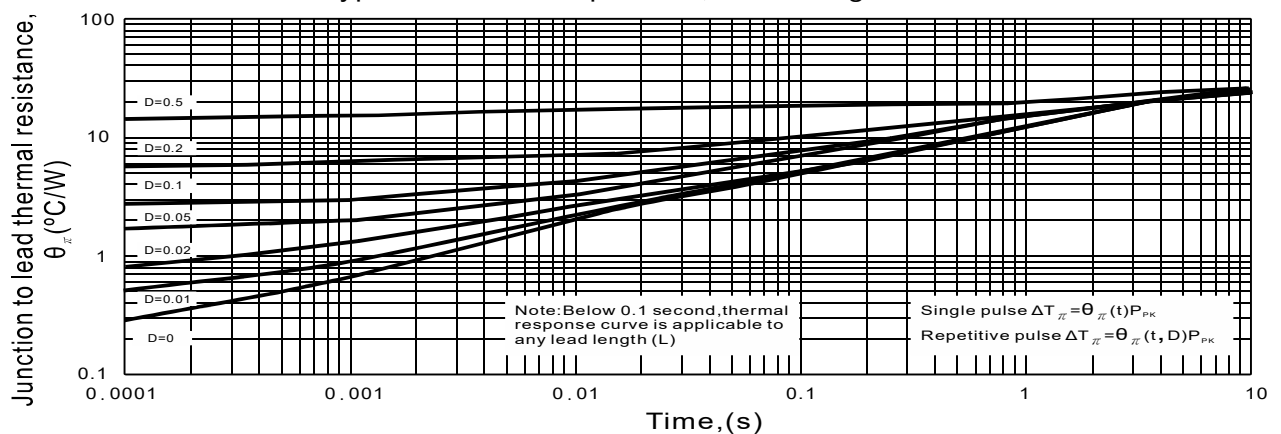
Typical thermal resistance vs. Lead length



Maximum surge power

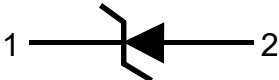


Typical thermal response L, Lead Length = 3/8 inch

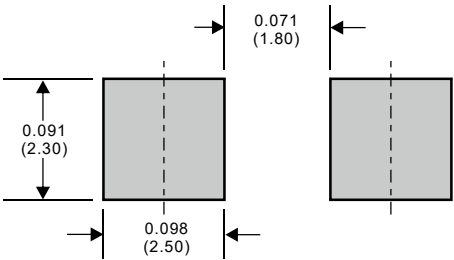


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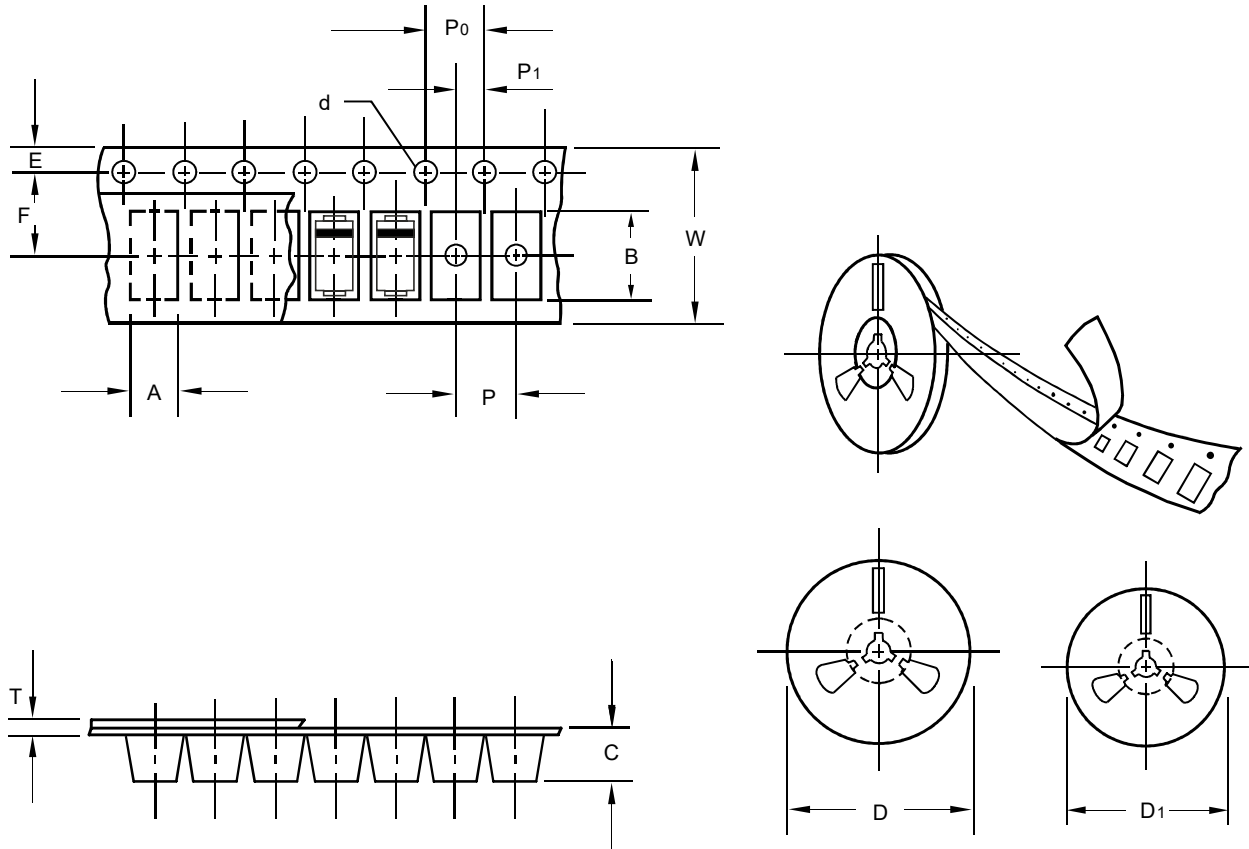
Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Suggested solder pad layout



Dimensions in inches and (millimeters)

ZGFM5913B-AF-Q1 Thru ZGFM5956B-AF-Q1**Packing information**

unit:mm

Item	Symbol	Tolerance	SMA-F
Carrier width	A	0.1	2.80
Carrier length	B	0.1	5.30
Carrier depth	C	0.1	2.36
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	330.00
11" Reel outside diameter	D1	2.0	278.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.25
Tape width	W	0.3	12.00

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

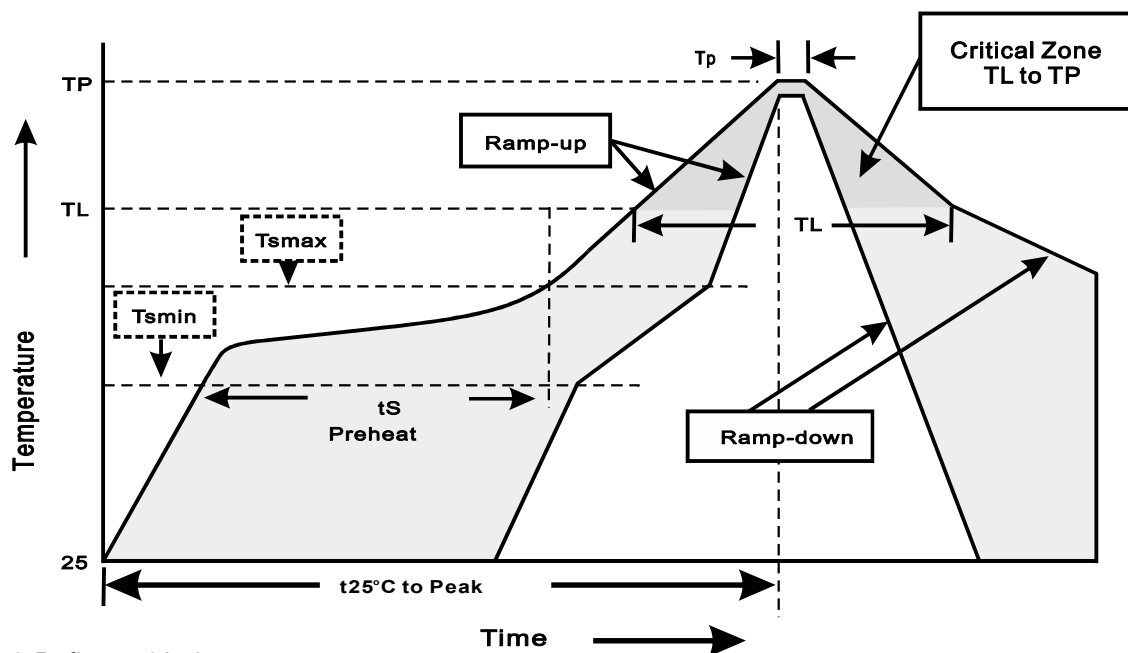
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SMA-F	11"	5,000	10,000	285	278	355*310*310	80,000
	13"	7500	15,000	340	330	360*360*360	120,000

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_{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°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