

ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1**List**

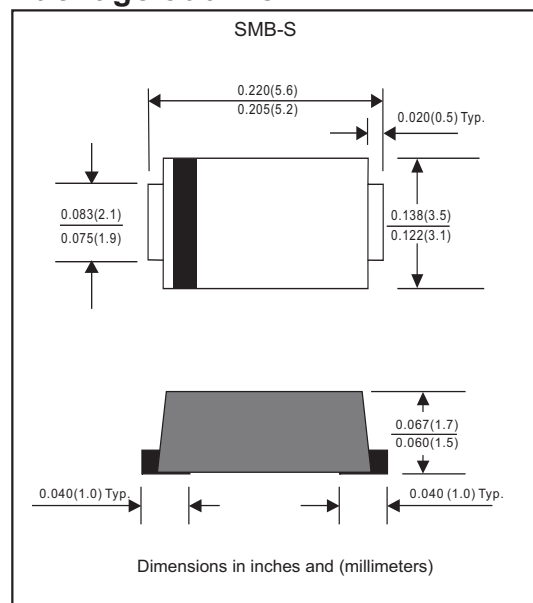
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ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1**3.0W Surface Mount Zener
Diodes 5.6V-200V****Features**

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance
- Glass passivated chip junction
- Standard zener voltage tolerance $\pm 5\%$
- Low inductance
- Low profile package
- Built-in strain relief
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen-free part, ex. ZGFM305V6B-BS-Q1-H

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SMB-S
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.072 gram

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

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Forward voltage	$I_F = 200\text{mA}$	V_F			1.20	V
Power dissipation	$T_L = 75^\circ\text{C}$	P_D			3.0	W
Operating junction temperature range		T_J	-55		+150	$^\circ\text{C}$
Storage temperature range		T_{STG}	-65		+175	$^\circ\text{C}$

Thermal characteristics

Parameter	Symbol	Limit	Unit
Typical thermal resistance junction to ambient	$R_{\theta JA}$	80	$^\circ\text{C/W}$
Typical thermal resistance junction to case	$R_{\theta JC}$	20	$^\circ\text{C/W}$
Typical thermal resistance junction to lead	$R_{\theta JL}$	10	$^\circ\text{C/W}$

Note 1: Mounted on FR-4 PCB

ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1

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 (Volts) @ I _{ZT}				I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R
		Min.	Nom.	Max.	mA	Max. (Ω)	Max. (Ω)	mA	Max.(μA)	Volts
ZGFM305V6B-BS-Q1	3Z5V6	5.32	5.6	5.88	134	2.5	600	1.00	5.0	2.0
ZGFM306V2B-BS-Q1	3Z6V2	5.89	6.2	6.51	121	1.5	700	1.00	5.0	3.0
ZGFM306V8B-BS-Q1	3Z6V8	6.46	6.8	7.14	110	2.0	700	1.00	5.0	4.0
ZGFM307V5B-BS-Q1	3Z7V5	7.13	7.5	7.88	100	2.0	700	0.50	5.0	5.0
ZGFM308V2B-BS-Q1	3Z8V2	7.79	8.2	8.61	91	2.0	700	0.50	5.0	6.0
ZGFM308V7B-BS-Q1	3Z8V7	8.27	8.7	9.14	85	2.0	700	0.50	4.0	6.6
ZGFM309V1B-BS-Q1	3Z9V1	8.65	9.1	9.56	82	3.0	700	0.50	3.0	7.0
ZGFM3010B-BS-Q1	3Z10	9.50	10	10.50	75	4.0	700	0.50	3.0	7.6
ZGFM3011B-BS-Q1	3Z11	10.45	11	11.55	68	4.0	700	0.25	1.0	8.4
ZGFM3012B-BS-Q1	3Z12	11.40	12	12.60	63	4.5	700	0.25	1.0	9.1
ZGFM3013B-BS-Q1	3Z13	12.35	13	13.65	58	5.0	700	0.25	0.5	9.9
ZGFM3015B-BS-Q1	3Z15	14.25	15	15.75	50	7.0	700	0.25	0.5	11.4
ZGFM3016B-BS-Q1	3Z16	15.20	16	16.80	47	8.0	700	0.25	0.5	12.2
ZGFM3018B-BS-Q1	3Z18	17.10	18	18.90	42	10.0	750	0.25	0.5	13.7
ZGFM3020B-BS-Q1	3Z20	19.00	20	21.00	37	11.0	750	0.25	0.5	15.2
ZGFM3022B-BS-Q1	3Z22	20.90	22	23.10	34	12.0	750	0.25	0.5	16.7
ZGFM3024B-BS-Q1	3Z24	22.80	24	25.20	31	13.0	750	0.25	0.5	18.2
ZGFM3027B-BS-Q1	3Z27	25.65	27	28.35	28	18.0	750	0.25	0.5	20.6
ZGFM3030B-BS-Q1	3Z30	28.50	30	31.50	25	20.0	1000	0.25	0.5	22.8
ZGFM3033B-BS-Q1	3Z33	31.35	33	34.65	23	23.0	1000	0.25	0.5	25.4
ZGFM3036B-BS-Q1	3Z36	34.20	36	37.80	21	25.0	1000	0.25	0.5	27.4
ZGFM3039B-BS-Q1	3Z39	37.05	39	40.95	19	30.0	1500	0.25	0.5	29.7
ZGFM3043B-BS-Q1	3Z43	40.85	43	45.15	17	35.0	1500	0.25	0.5	32.7
ZGFM3047B-BS-Q1	3Z47	44.65	47	49.35	16	40.0	1500	0.25	0.5	35.8
ZGFM3051B-BS-Q1	3Z51	48.45	51	53.55	15	48.0	1500	0.25	0.5	38.8
ZGFM3056B-BS-Q1	3Z56	53.20	56	58.80	13	55.0	2000	0.25	0.5	42.6
ZGFM3062B-BS-Q1	3Z62	58.90	62	65.10	12	60.0	2000	0.25	0.5	47.1
ZGFM3068B-BS-Q1	3Z68	64.60	68	71.40	11	75.0	2000	0.25	0.5	51.7
ZGFM3075B-BS-Q1	3Z75	71.25	75	78.75	10	90.0	2000	0.25	0.5	56.0
ZGFM3082B-BS-Q1	3Z82	77.90	82	86.10	9.1	100	3000	0.25	0.5	62.2
ZGFM3091B-BS-Q1	3Z91	86.45	91	95.55	8.2	125	3000	0.25	0.5	69.2
ZGFM30100B-BS-Q1	3Z100	95.00	100	105.0	7.5	175	3000	0.25	0.5	76.0
ZGFM30110B-BS-Q1	3Z110	104.50	110	115.5	6.8	250	4000	0.25	0.5	83.6
ZGFM30120B-BS-Q1	3Z120	114.00	120	126.0	6.3	325	4500	0.25	0.5	91.2
ZGFM30130B-BS-Q1	3Z130	123.50	130	136.5	5.8	400	5000	0.25	0.5	98.8
ZGFM30150B-BS-Q1	3Z150	142.50	150	157.5	5.0	575	6000	0.25	0.5	114.0
ZGFM30160B-BS-Q1	3Z160	152.00	160	168.0	4.7	650	6500	0.25	0.5	121.6
ZGFM30180B-BS-Q1	3Z180	171.00	180	189.0	4.2	725	7000	0.25	0.5	136.8
ZGFM30200B-BS-Q1	3Z200	190.00	200	210.0	3.7	900	8000	0.25	0.5	152.0

Note : 5% tolerance of Zener voltage for suffix "B" ex: ZGFM305V6B-BS-Q1 is 5.6V 5%

Rating and characteristic curves (ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1)

FIG.1 Typical Thermal Response L

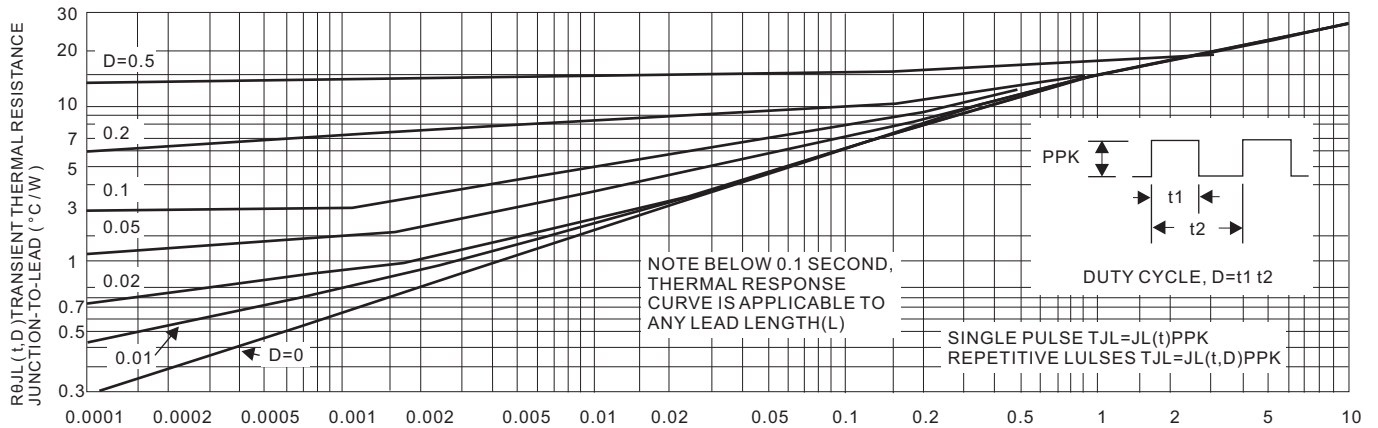


FIG. 2 Maximum Surge Power

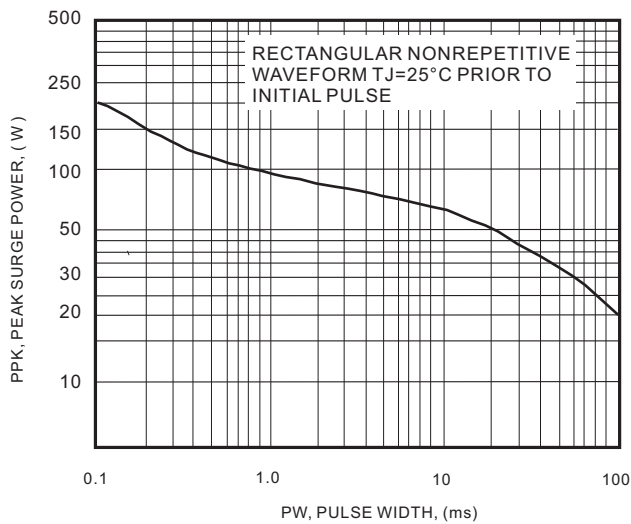


FIG. 3 Maximum Surge Power

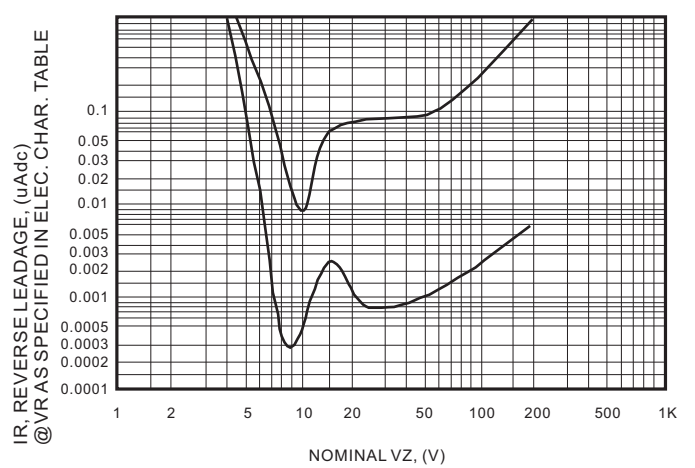


FIG.4 Units To 12 Volts

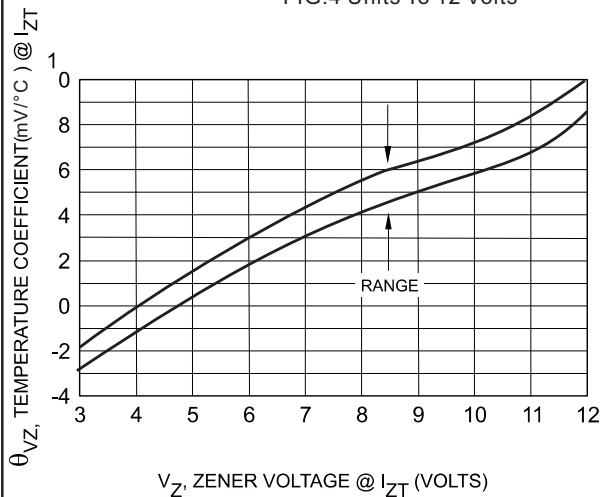
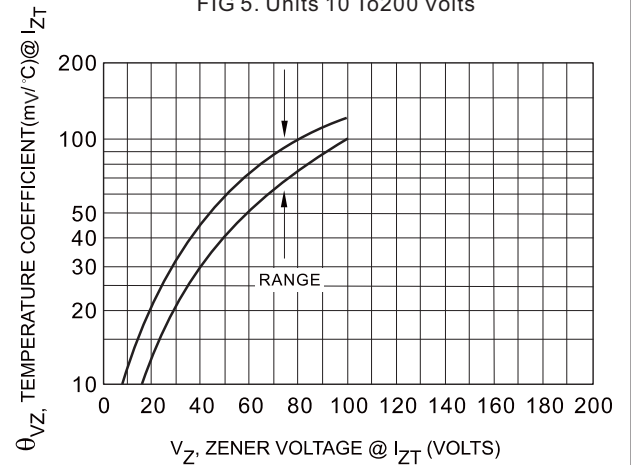


FIG 5. Units 10 To200 Volts



Rating and characteristic curves (ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1)

FIG.6 To 10 Volts

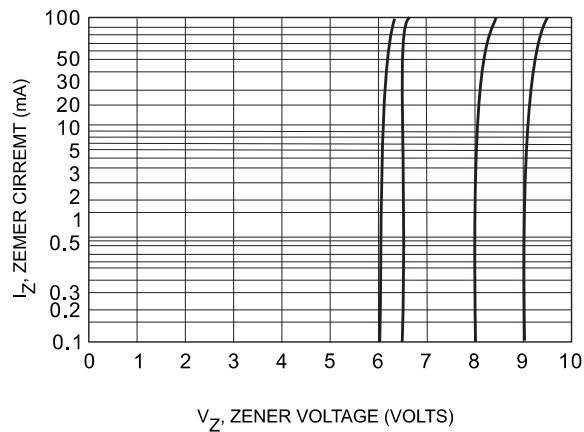
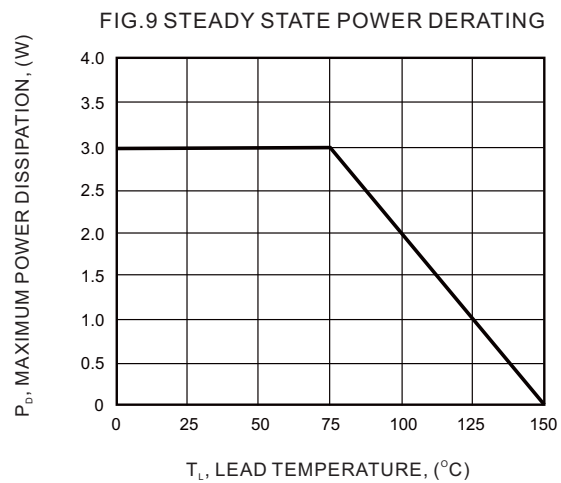
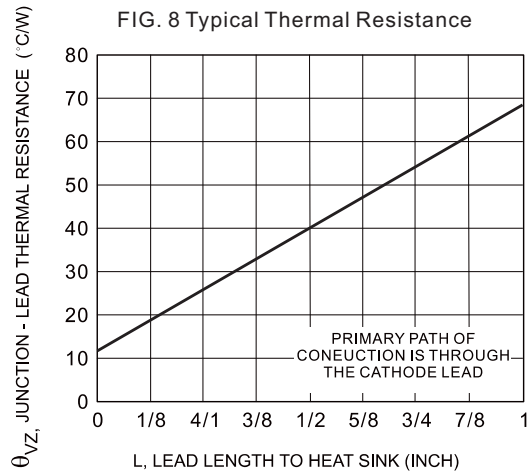
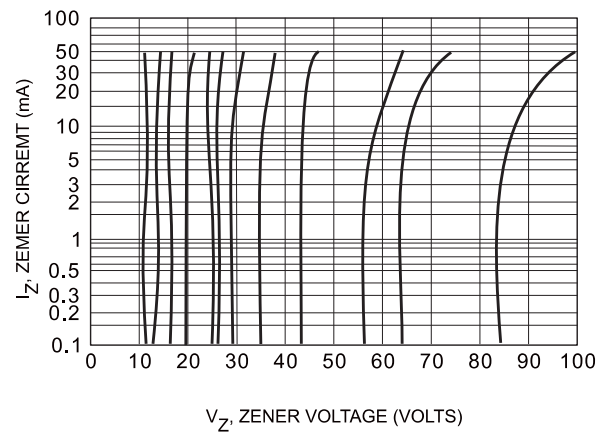


FIG.7 $V_Z = 12$ Thru 82 Volts

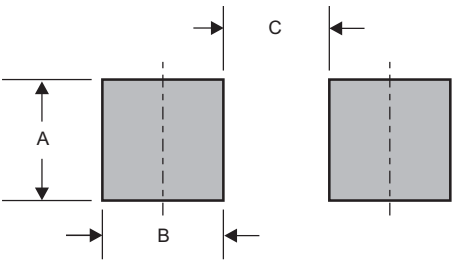


ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1

Pinning information

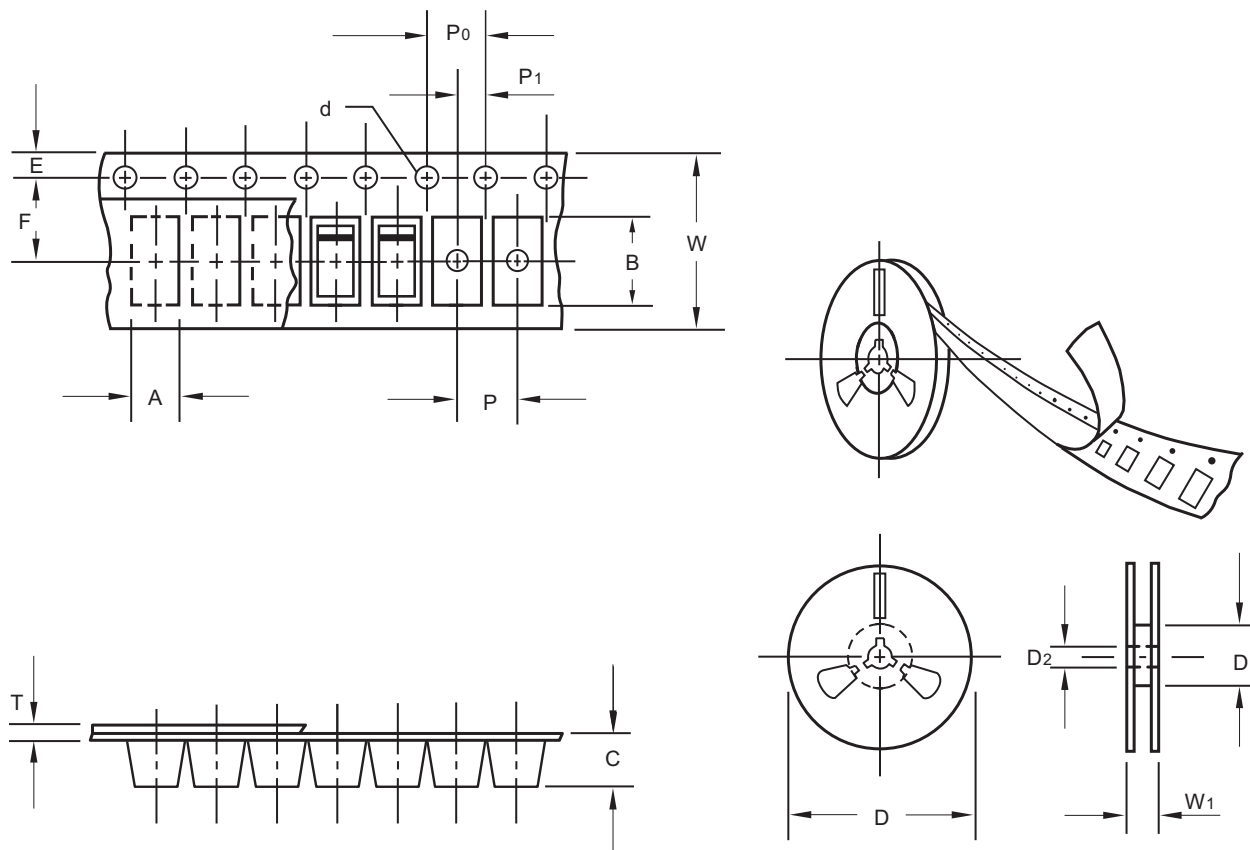
Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMB-S	0.096 (2.45)	0.063 (1.60)	0.130 (3.30)

ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1**Packing information**

unit:mm

Item	Symbol	Tolerance	SMB-S
Carrier width	A	0.1	3.81
Carrier length	B	0.1	5.74
Carrier depth	C	0.1	2.24
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	8.00
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.

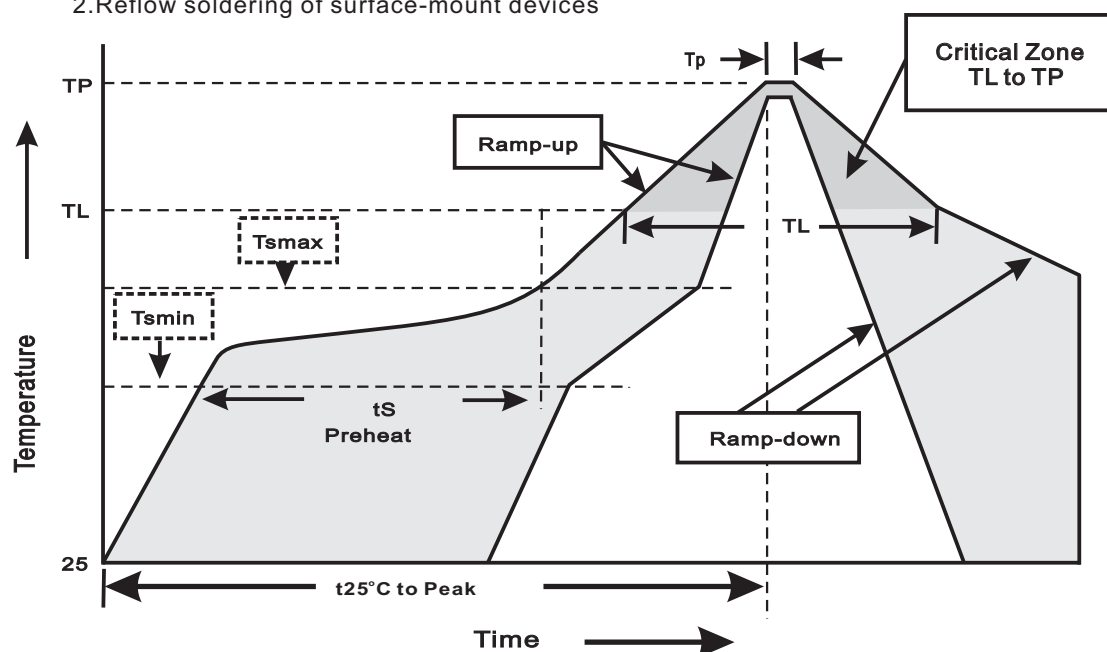
ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-Q1**Reel packing**

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)
SMB-S	13"	4,000	8.0	8,000	335*335*38	330	350*330*360	64,000	13.0

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)	$<3^{\circ}\text{C/sec}$
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	$<3^{\circ}\text{C/sec}$
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	$<6^{\circ}\text{C/sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$

ZGFM305V6B-BS-Q1 THRU ZGFM30200B-BS-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