

ZGFM305V6B THRU ZGFM30200B**List**

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ZGFM305V6B THRU ZGFM30200B

3.0W Surface Mount Zener
Diodes 5.6V-200V

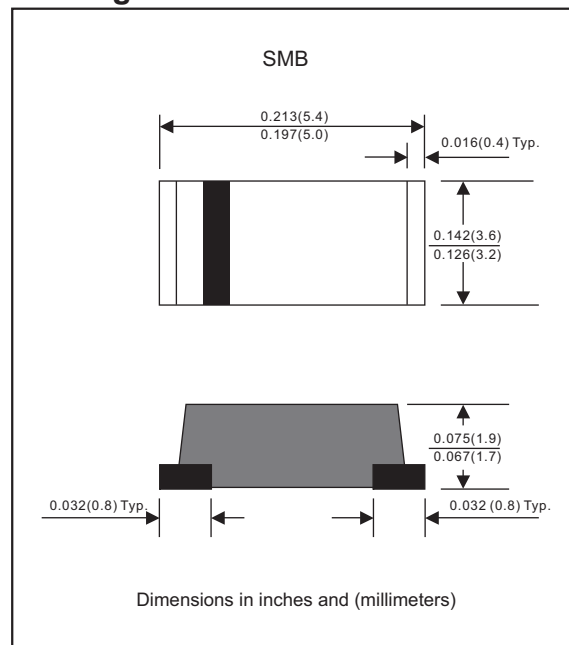
Features

- 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
- Suffix "-H" indicates Halogen-free part, ex. ZGFM305V6B-H

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SMB
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.09 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	$R_{\theta JA}$	85	$^\circ\text{C/W}$
Typical thermal resistance junction to case	$R_{\theta JC}$	25	$^\circ\text{C/W}$
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	$^\circ\text{C/W}$

Note 1: Mounted on FR-4 PCB

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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 (Volts) @ I _{ZT}			I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R	V _R
		Min.	Nom.	Max.	mA	Max.(Ω)	Max.(Ω)	mA	Max.(μA)	Volts
ZGFM305V6B	3Z5V6	5.32	5.6	5.88	134	2.5	600	1.00	5.0	2.0
ZGFM306V2B	3Z6V2	5.89	6.2	6.51	121	1.5	700	1.00	5.0	3.0
ZGFM306V8B	3Z6V8	6.46	6.8	7.14	110	2.0	700	1.00	5.0	4.0
ZGFM307V5B	3Z7V5	7.13	7.5	7.88	100	2.0	700	0.50	5.0	5.0
ZGFM308V2B	3Z8V2	7.79	8.2	8.61	91	2.0	700	0.50	5.0	6.0
ZGFM308V7B	3Z8V7	8.27	8.7	9.14	85	2.0	700	0.50	4.0	6.6
ZGFM309V1B	3Z9V1	8.65	9.1	9.56	82	3.0	700	0.50	3.0	7.0
ZGFM3010B	3Z10	9.50	10	10.50	75	4.0	700	0.50	3.0	7.6
ZGFM3011B	3Z11	10.45	11	11.55	68	4.0	700	0.25	1.0	8.4
ZGFM3012B	3Z12	11.40	12	12.60	63	4.5	700	0.25	1.0	9.1
ZGFM3013B	3Z13	12.35	13	13.65	58	5.0	700	0.25	0.5	9.9
ZGFM3015B	3Z15	14.25	15	15.75	50	7.0	700	0.25	0.5	11.4
ZGFM3016B	3Z16	15.20	16	16.80	47	8.0	700	0.25	0.5	12.2
ZGFM3018B	3Z18	17.10	18	18.90	42	10.0	750	0.25	0.5	13.7
ZGFM3020B	3Z20	19.00	20	21.00	37	11.0	750	0.25	0.5	15.2
ZGFM3022B	3Z22	20.90	22	23.10	34	12.0	750	0.25	0.5	16.7
ZGFM3024B	3Z24	22.80	24	25.20	31	13.0	750	0.25	0.5	18.2
ZGFM3027B	3Z27	25.65	27	28.35	28	18.0	750	0.25	0.5	20.6
ZGFM3030B	3Z30	28.50	30	31.50	25	20.0	1000	0.25	0.5	22.8
ZGFM3033B	3Z33	31.35	33	34.65	23	23.0	1000	0.25	0.5	25.4
ZGFM3036B	3Z36	34.20	36	37.80	21	25.0	1000	0.25	0.5	27.4
ZGFM3039B	3Z39	37.05	39	40.95	19	30.0	1500	0.25	0.5	29.7
ZGFM3043B	3Z43	40.85	43	45.15	17	35.0	1500	0.25	0.5	32.7
ZGFM3047B	3Z47	44.65	47	49.35	16	40.0	1500	0.25	0.5	35.8
ZGFM3051B	3Z51	48.45	51	53.55	15	48.0	1500	0.25	0.5	38.8
ZGFM3056B	3Z56	53.20	56	58.80	13	55.0	2000	0.25	0.5	42.6
ZGFM3062B	3Z62	58.90	62	65.10	12	60.0	2000	0.25	0.5	47.1
ZGFM3068B	3Z68	64.60	68	71.40	11	75.0	2000	0.25	0.5	51.7
ZGFM3075B	3Z75	71.25	75	78.75	10	90.0	2000	0.25	0.5	56.0
ZGFM3082B	3Z82	77.90	82	86.10	9.1	100	3000	0.25	0.5	62.2
ZGFM3091B	3Z91	86.45	91	95.55	8.2	125	3000	0.25	0.5	69.2
ZGFM30100B	3Z100	95.00	100	105.0	7.5	175	3000	0.25	0.5	76.0
ZGFM30110B	3Z110	104.50	110	115.5	6.8	250	4000	0.25	0.5	83.6
ZGFM30120B	3Z120	114.00	120	126.0	6.3	325	4500	0.25	0.5	91.2
ZGFM30130B	3Z130	123.50	130	136.5	5.8	400	5000	0.25	0.5	98.8
ZGFM30150B	3Z150	142.50	150	157.5	5.0	575	6000	0.25	0.5	114.0
ZGFM30160B	3Z160	152.00	160	168.0	4.7	650	6500	0.25	0.5	121.6
ZGFM30180B	3Z180	171.00	180	189.0	4.2	725	7000	0.25	0.5	136.8
ZGFM30200B	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 is 5.6V 5%

Rating and characteristic curves (ZGFM305V6B THRU ZGFM30200B)

FIG.1 Typical Thermal Response L

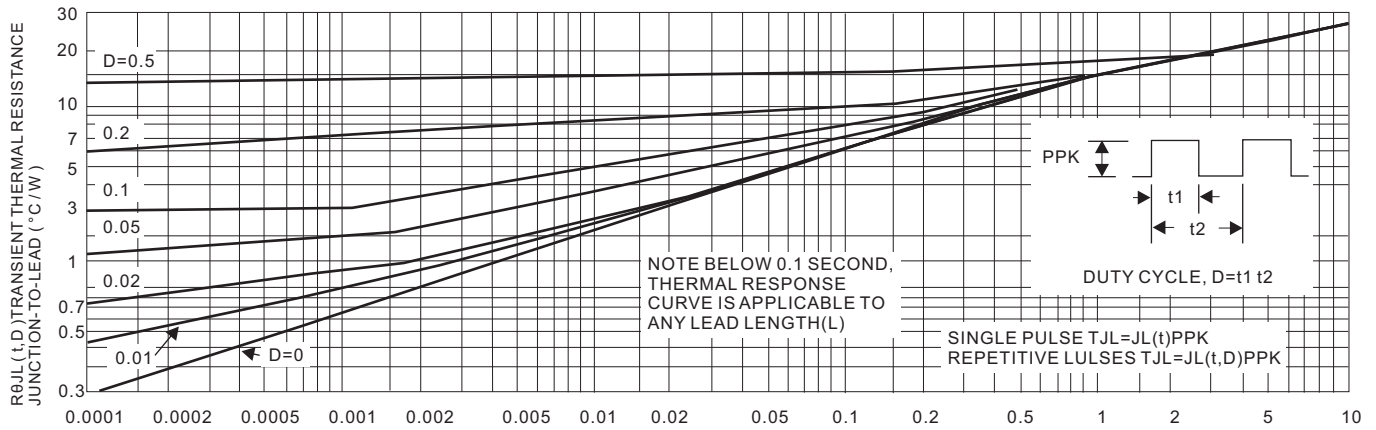


FIG. 2 Maximum Surge Power

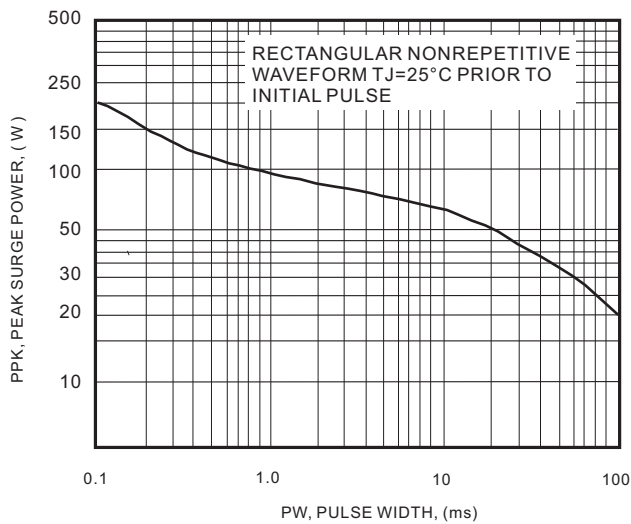


FIG. 3 Maximum Surge Power

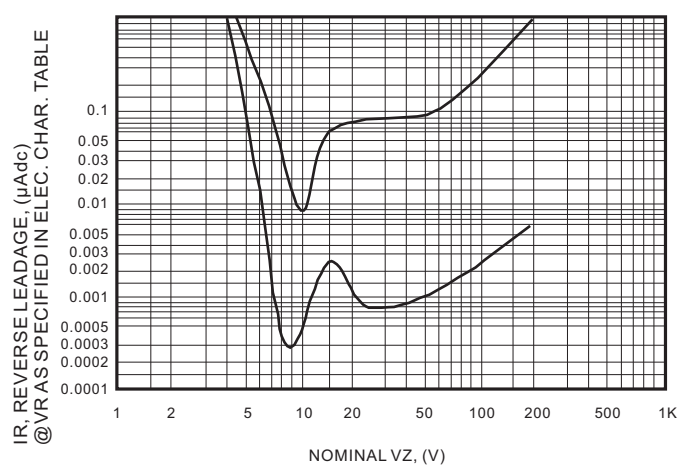


FIG.4 Units To 12 Volts

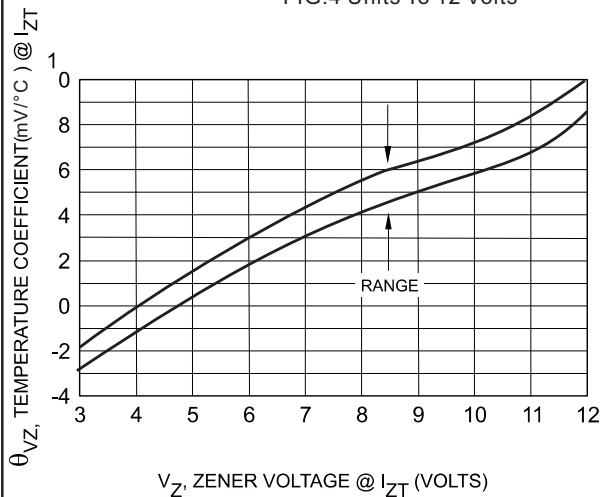
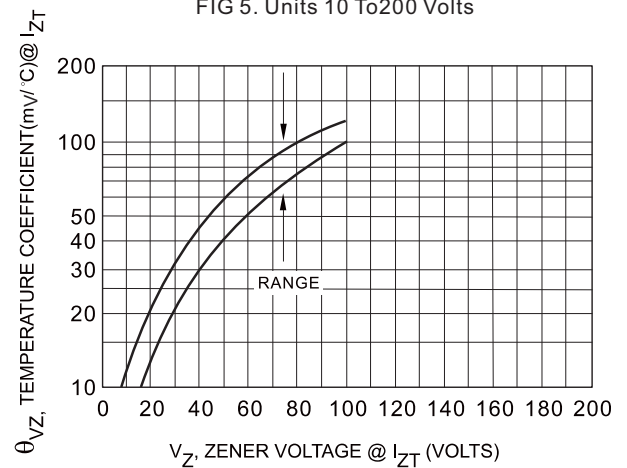


FIG 5. Units 10 To200 Volts



Rating and characteristic curves (ZGFM305V6B THRU ZGFM30200B)

FIG.6 To 10 Volts

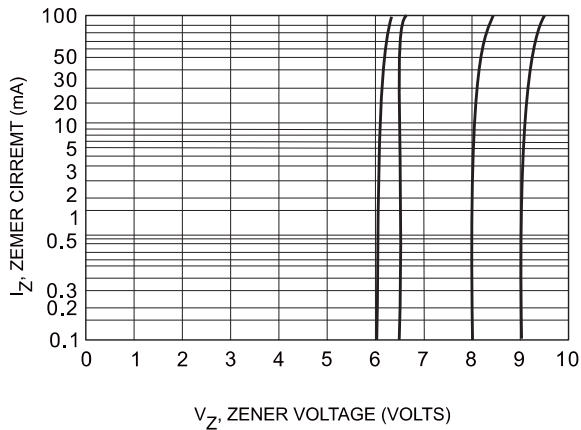


FIG.7 $V_Z = 12$ Thru 82 Volts

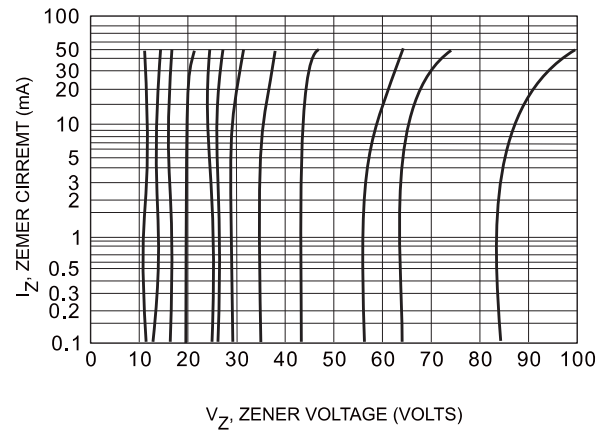


FIG. 8 Typical Thermal Resistance

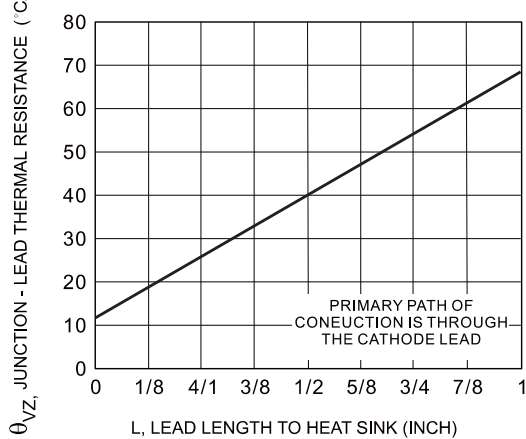
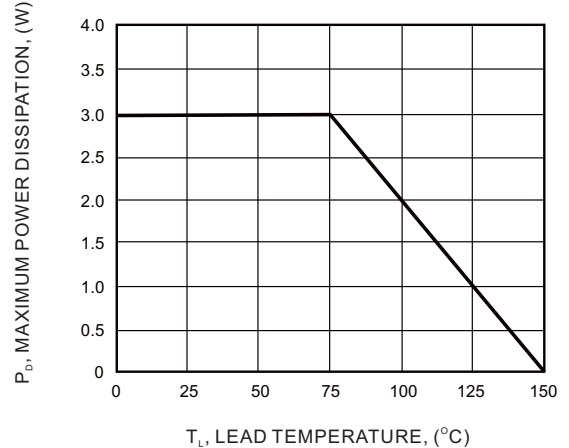
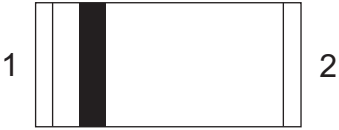


FIG.9 STEADY STATE POWER DERATING

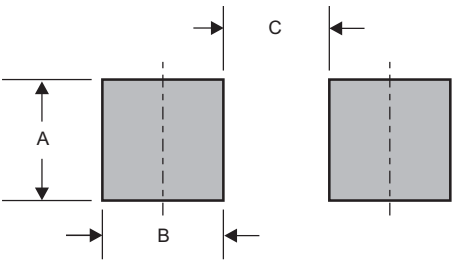


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Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

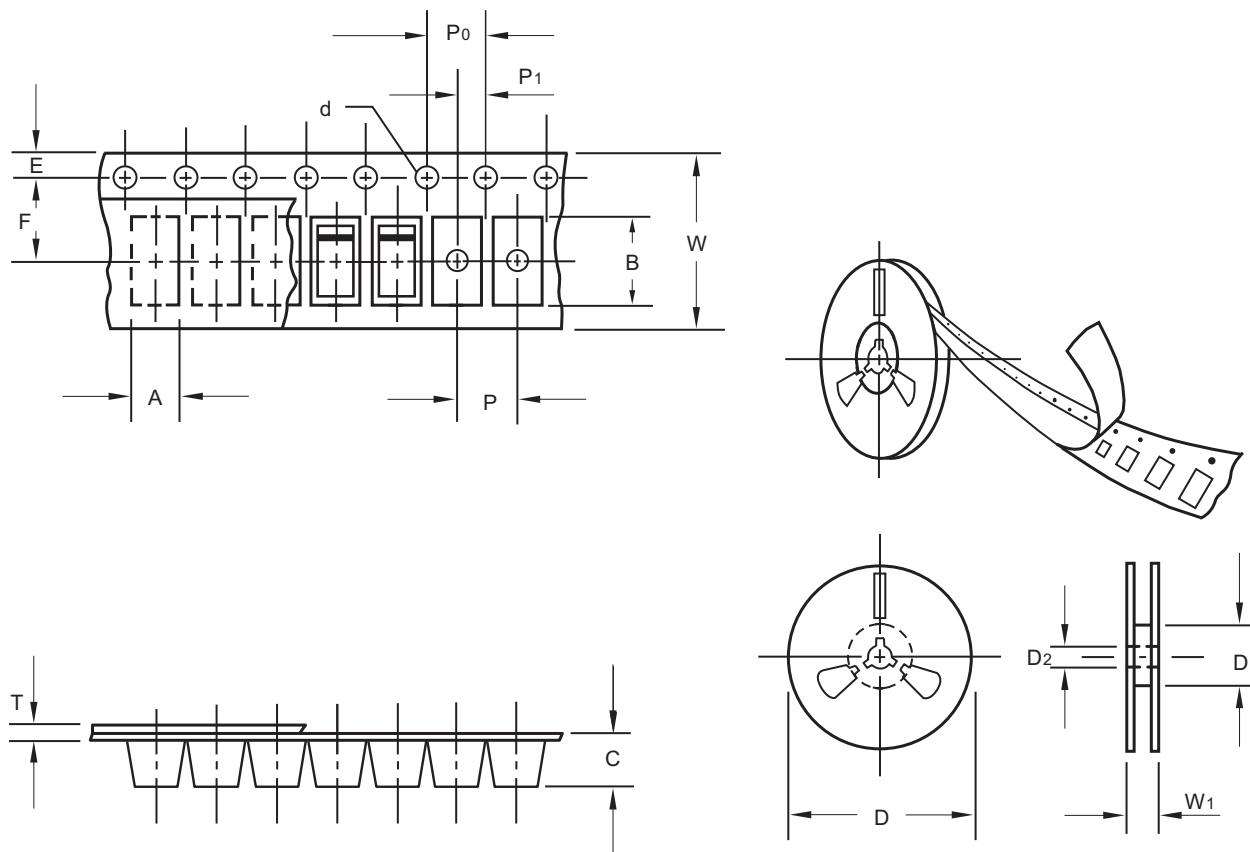


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMB	0.142 (3.60)	0.059 (1.50)	0.118 (3.00)

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Packing information



unit:mm

Item	Symbol	Tolerance	SMB
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.

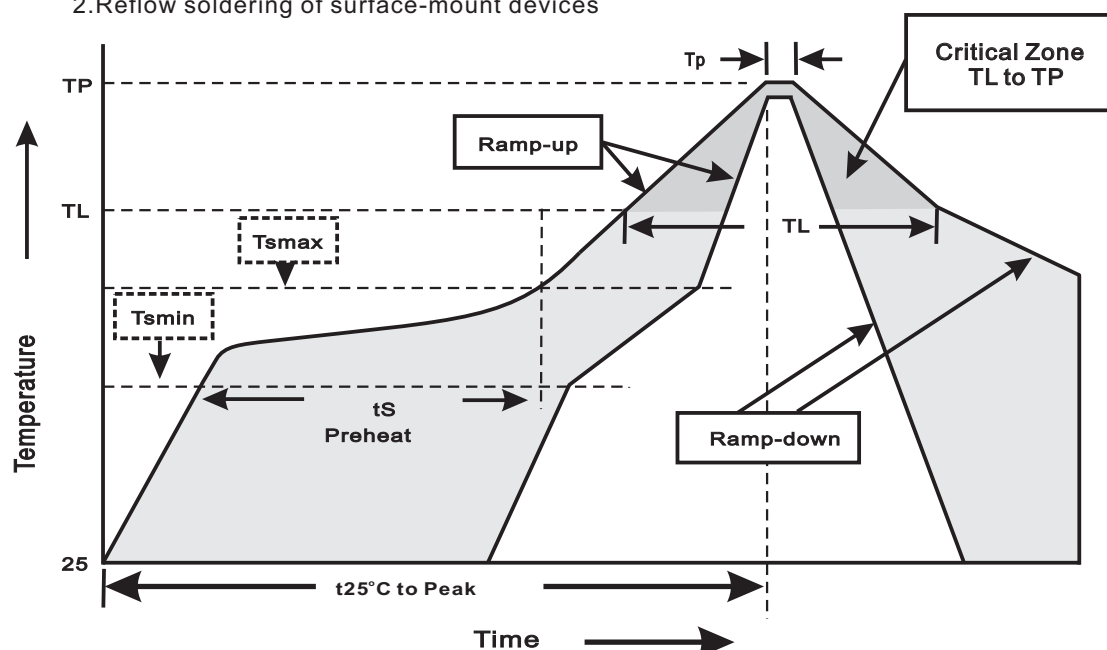
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Reel packing

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)
SMB	13"	4,000	8.0	8,000	335*335*38	330	350*330*360	64,000	14.0

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(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	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