

ZGFM205V6B THRU ZGFM20200B**List**

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ZGFM205V6B THRU ZGFM20200B

2.0W Surface Mount Zener
Diodes 5.6V-200V

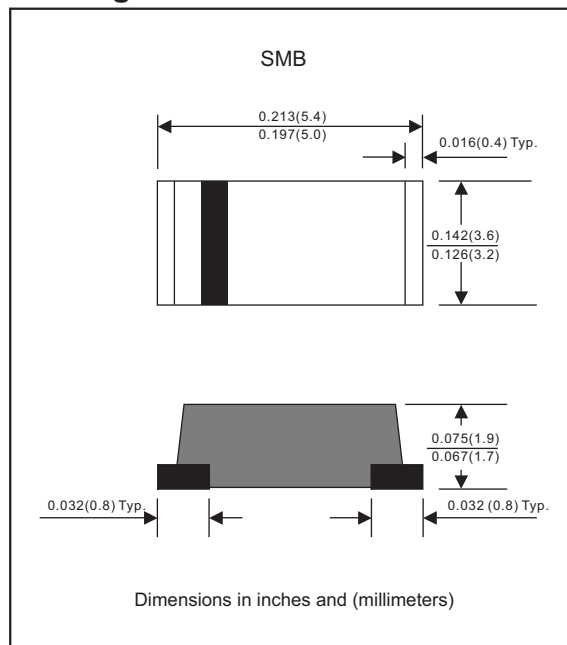
Features

- 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. ZGFM205V6B-H

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AA / 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			2.0	W
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
ZGFM205V6B	2Z5V6	5.32	5.6	5.88	89.5	2.5	500	1.00	5.0	2.0
ZGFM206V2B	2Z6V2	5.89	6.2	6.51	80.5	1.5	700	1.00	5.0	3.0
ZGFM206V8B	2Z6V8	6.46	6.8	7.14	73.5	2.0	700	1.00	5.0	4.0
ZGFM207V5B	2Z7V5	7.13	7.5	7.88	66.5	2.0	700	0.50	5.0	5.0
ZGFM208V2B	2Z8V2	7.79	8.2	8.61	61	2.0	700	0.50	5.0	6.0
ZGFM208V7B	2Z8V7	8.27	8.7	9.14	58	2.0	700	0.50	4.0	6.6
ZGFM209V1B	2Z9V1	8.65	9.1	9.56	55	3.0	700	0.50	3.0	7.0
ZGFM2010B	2Z10	9.50	10	10.50	50	4.0	700	0.50	3.0	7.6
ZGFM2011B	2Z11	10.45	11	11.55	45.5	4.0	700	0.25	1.0	8.4
ZGFM2012B	2Z12	11.40	12	12.60	41.5	4.5	700	0.25	1.0	9.1
ZGFM2013B	2Z13	12.35	13	13.65	38.5	5.0	700	0.25	0.5	9.9
ZGFM2015B	2Z15	14.25	15	15.75	33.4	7.0	700	0.25	0.5	11.4
ZGFM2016B	2Z16	15.20	16	16.80	31.2	8.0	700	0.25	0.5	12.2
ZGFM2018B	2Z18	17.10	18	18.90	27.8	10.0	750	0.25	0.5	13.7
ZGFM2020B	2Z20	19.00	20	21.00	25.0	11.0	750	0.25	0.5	15.2
ZGFM2022B	2Z22	20.90	22	23.10	22.8	12.0	750	0.25	0.5	16.7
ZGFM2024B	2Z24	22.80	24	25.20	20.8	13.0	750	0.25	0.5	18.2
ZGFM2027B	2Z27	25.65	27	28.35	18.5	18.0	750	0.25	0.5	20.6
ZGFM2030B	2Z30	28.50	30	31.50	16.6	20.0	1000	0.25	0.5	22.8
ZGFM2033B	2Z33	31.35	33	34.65	15.1	23.0	1000	0.25	0.5	25.4
ZGFM2036B	2Z36	34.20	36	37.80	13.9	25.0	1000	0.25	0.5	27.4
ZGFM2039B	2Z39	37.05	39	40.95	12.8	30.0	1500	0.25	0.5	29.7
ZGFM2043B	2Z43	40.85	43	45.15	11.6	35.0	1500	0.25	0.5	32.7
ZGFM2047B	2Z47	44.65	47	49.35	10.6	40.0	1500	0.25	0.5	35.8
ZGFM2051B	2Z51	48.45	51	53.55	9.8	48.0	1500	0.25	0.5	38.8
ZGFM2056B	2Z56	53.20	56	58.80	9.0	55.0	2000	0.25	0.5	42.6
ZGFM2062B	2Z62	58.90	62	65.10	8.1	60.0	2000	0.25	0.5	47.1
ZGFM2068B	2Z68	64.60	68	71.40	7.4	75.0	2000	0.25	0.5	51.7
ZGFM2075B	2Z75	71.25	75	78.75	6.7	90.0	2000	0.25	0.5	56.0
ZGFM2082B	2Z82	77.90	82	86.10	6.1	100	3000	0.25	0.5	62.2
ZGFM2091B	2Z91	86.45	91	95.55	5.5	125	3000	0.25	0.5	69.2
ZGFM20100B	2Z100	95.00	100	105.0	5.0	175	3000	0.25	0.5	76.0
ZGFM20110B	2Z110	104.50	110	115.5	4.5	250	4000	0.25	0.5	83.6
ZGFM20120B	2Z120	114.00	120	126.0	4.2	325	4500	0.25	0.5	91.2
ZGFM20130B	2Z130	123.50	130	136.5	3.8	400	5000	0.25	0.5	98.8
ZGFM20150B	2Z150	142.50	150	157.5	3.3	575	6000	0.25	0.5	114.0
ZGFM20160B	2Z160	152.00	160	168.0	3.1	650	6500	0.25	0.5	121.6
ZGFM20180B	2Z180	171.00	180	189.0	2.8	725	7000	0.25	0.5	136.8
ZGFM20200B	2Z200	190.00	200	210.0	2.5	900	8000	0.25	0.5	152.0

Note : 5% tolerance of Zener voltage for suffix "B" ex: ZGFM205V6B is 5.6V 5%

Rating and characteristic curves (ZGFM205V6B THRU ZGFM20200B)

FIG.1 Typical Thermal Response L

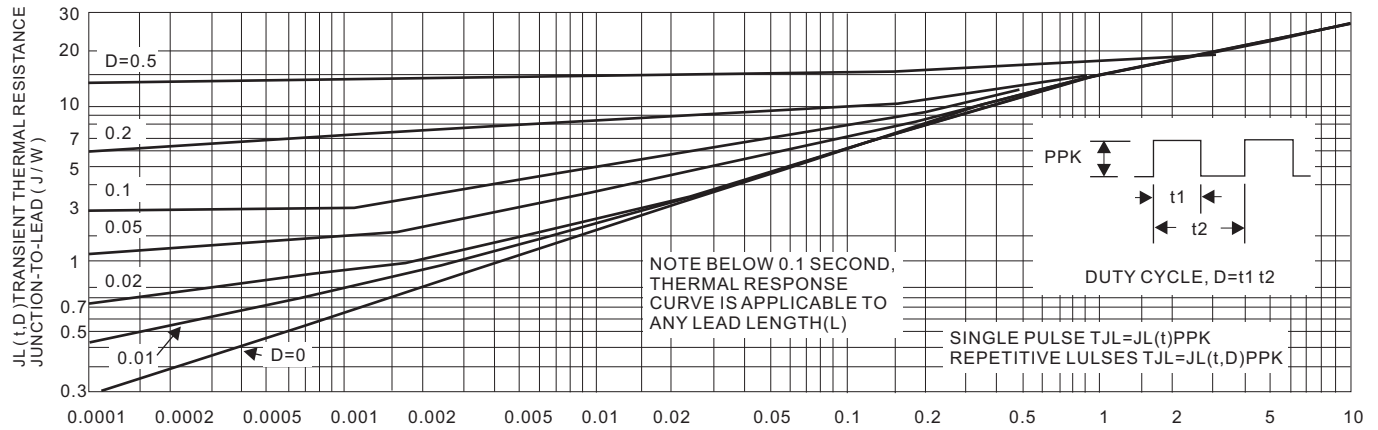


Fig. 2 Maximum Surge Power

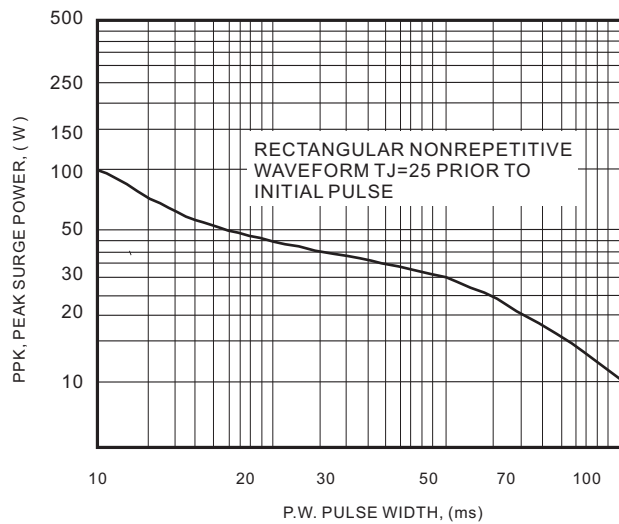


Fig. 3 Maximum Surge Power

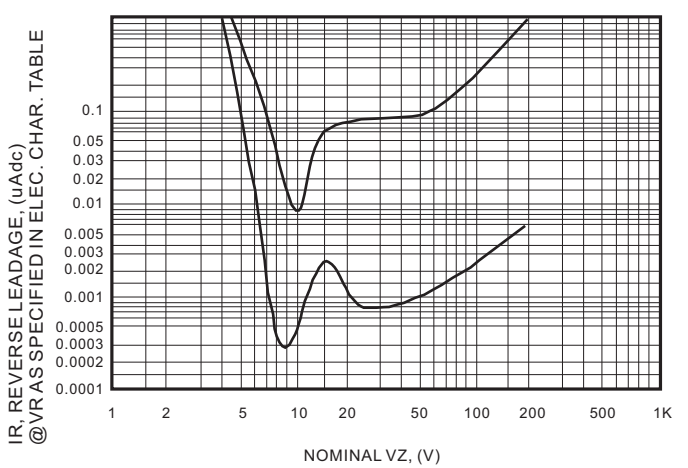


FIG.4 Units To 200 Volts

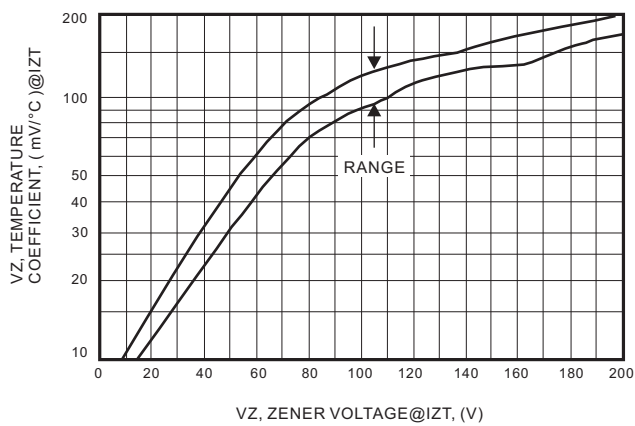
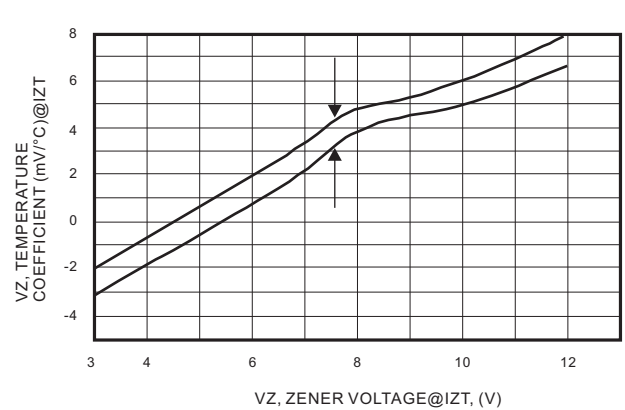


Fig 5. Units To 12 Volts



Rating and characteristic curves (ZGFM205V6B THRU ZGFM20200B)

FIG.6 VZ = 3.9 Thru 10 Volts

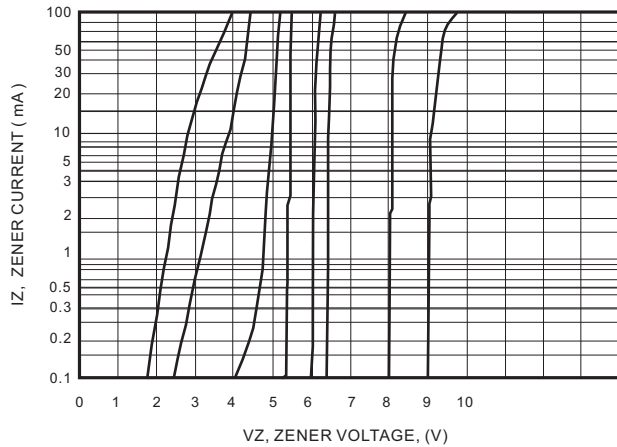


FIG.7 VZ = 12 Thru 82 Volts

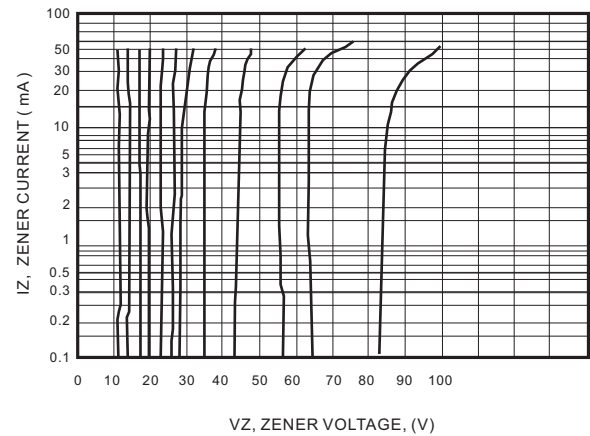


Fig. 8 VZ = 100 Thru 200 Volts

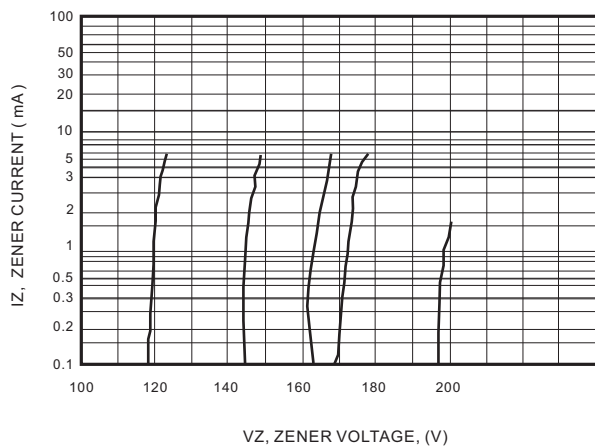
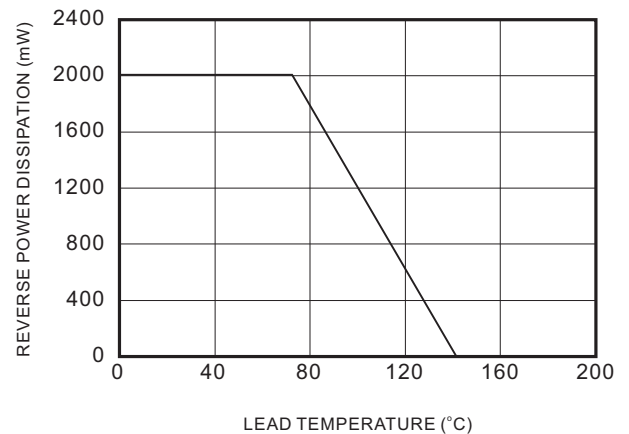
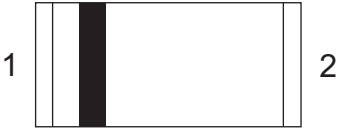


Fig.9-TOTAL POWER DISSIPATION VS. LEAD TEMPERATURE

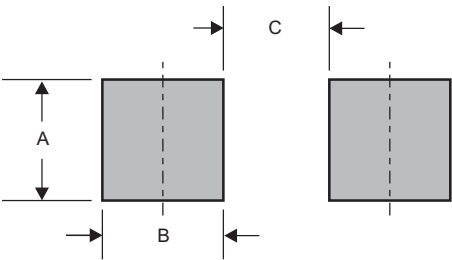


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Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

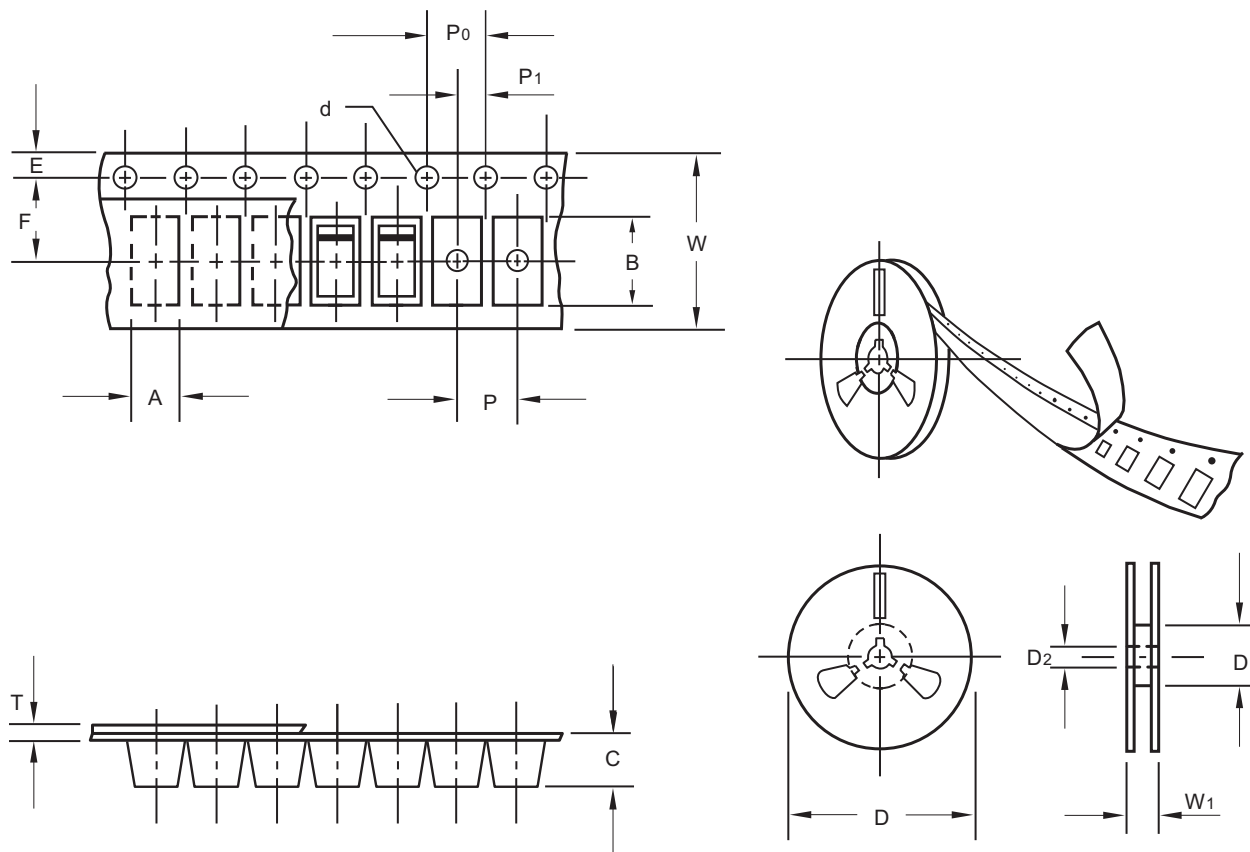


Dimensions in inches and (millimeters)

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.

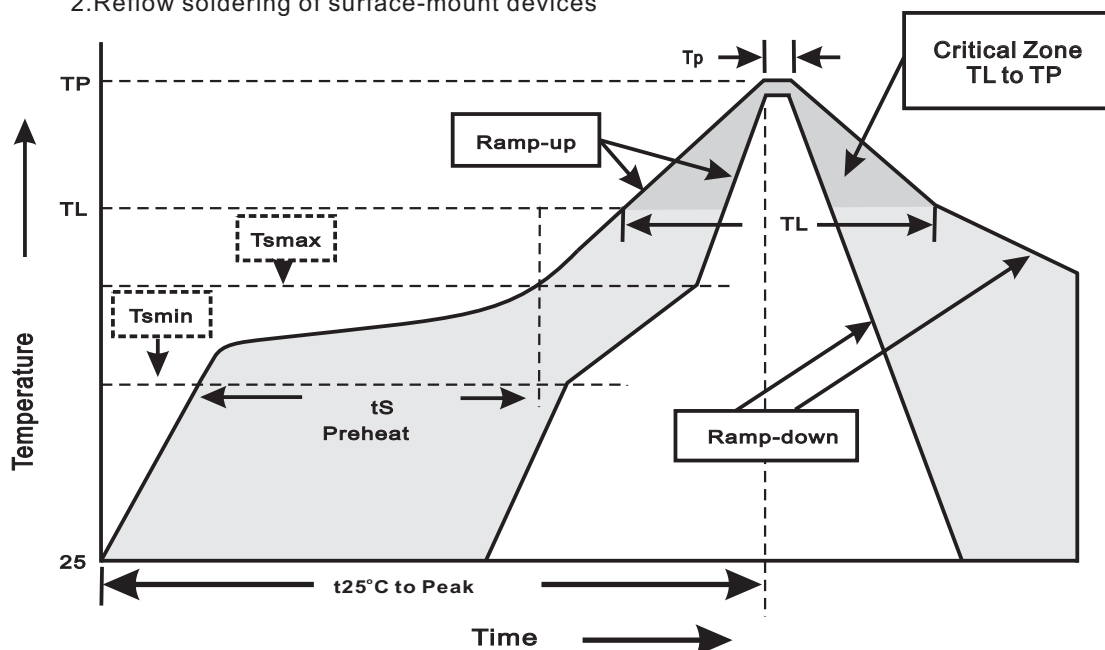
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Reel packing

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(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