Formosa MS

ZMM55B2V0 THRU ZMM55B75
ZMM55C2V0 THRU ZMM55C100

List

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ZMM55B2V0 THRU ZMM55B75
ZMM55C2V0 THRU ZMM55C100

500mW Surface Mount Zener Diodes - 2.0V-100V

Features

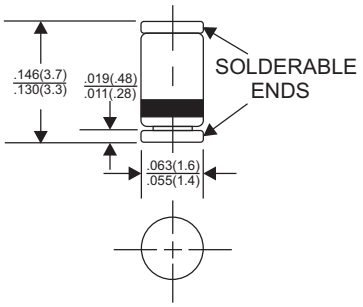
- Silicon epitaxial planar chip structure.
- Zener Breakdown Voltage Range, 2.0V to 75V ex.ZMM55B2V0
- Zener Breakdown Voltage Range, 2.0V to 100V ex.ZMM55C2V0
- Small package size for high density applications.
- Glass hermetically sealed package.
- Ideally suited for automated assembly processes.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228

Mechanical data

- Case : Glass Mini-MELF / SOD-80
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.03 gram

Package outline

SOD-80



Dimensions in inches and (millimeters)

Maximum ratings (at T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 200 mA DC	V_F			1.50	V
Power Dissipation	Fig.1	P_D			500	mW
Thermal resistance junction to ambient		$R_{\theta JA}$		300		°C/W
Operating junction temperature range		T_J	-55		+175	°C
Storage temperature range		T_{STG}	-65		+175	°C

ZMM55C2V0 THRU ZMM55C100

Electrical characteristics (at T_A=25°C unless otherwise noted)

Part No.	Zener voltage			Test current	Zener impedance			Leakage current	
	V_Z @ I_{ZT}			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	(uA)Max	Volts
ZMM55C2V0	1.9	2.0	2.1	5.0	100	600	1.0	150	1.0
ZMM55C2V2	2.1	2.2	2.3	5.0	100	600	1.0	150	1.0
ZMM55C2V4	2.2	2.4	2.6	5.0	85	600	1.0	50	1.0
ZMM55C2V7	2.5	2.7	2.9	5.0	85	600	1.0	10	1.0
ZMM55C3V0	2.8	3.0	3.2	5.0	85	600	1.0	4.0	1.0
ZMM55C3V3	3.1	3.3	3.5	5.0	85	600	1.0	2.0	1.0
ZMM55C3V6	3.4	3.6	3.8	5.0	85	600	1.0	2.0	1.0
ZMM55C3V9	3.7	3.9	4.1	5.0	85	600	1.0	2.0	1.0
ZMM55C4V3	4.0	4.3	4.6	5.0	75	600	1.0	1.0	1.0
ZMM55C4V7	4.4	4.7	5.0	5.0	60	600	1.0	0.5	1.0
ZMM55C5V1	4.8	5.1	5.4	5.0	35	550	1.0	0.1	1.0
ZMM55C5V6	5.2	5.6	6.0	5.0	25	450	1.0	0.1	1.0
ZMM55C6V2	5.8	6.2	6.6	5.0	10	200	1.0	0.1	2.0
ZMM55C6V8	6.4	6.8	7.2	5.0	8	150	1.0	0.1	3.0
ZMM55C7V5	7.0	7.5	7.9	5.0	7	50	1.0	0.1	5.0
ZMM55C8V2	7.7	8.2	8.7	5.0	7	50	1.0	0.1	6.2
ZMM55C9V1	8.5	9.1	9.6	5.0	10	50	1.0	0.1	6.8
ZMM55C10	9.4	10	10.6	5.0	15	70	1.0	0.1	7.5
ZMM55C11	10.4	11	11.6	5.0	20	70	1.0	0.1	8.2
ZMM55C12	11.4	12	12.7	5.0	20	90	1.0	0.1	9.1
ZMM55C13	12.4	13	14.1	5.0	26	110	1.0	0.1	10
ZMM55C15	13.8	15	15.6	5.0	30	110	1.0	0.1	11
ZMM55C16	15.3	16	17.1	5.0	40	170	1.0	0.1	12
ZMM55C18	16.8	18	19.1	5.0	50	170	1.0	0.1	13
ZMM55C20	18.8	20	21.2	5.0	55	220	1.0	0.1	15
ZMM55C22	20.8	22	23.3	5.0	55	220	1.0	0.1	16
ZMM55C24	22.8	24	25.6	5.0	80	220	1.0	0.1	18
ZMM55C27	25.1	27	28.9	5.0	80	220	1.0	0.1	20
ZMM55C30	28	30	32	5.0	80	220	1.0	0.1	22
ZMM55C33	31	33	35	5.0	80	220	1.0	0.1	24
ZMM55C36	34	36	38	5.0	80	220	1.0	0.1	27
ZMM55C39	37	39	41	2.5	90	500	1.0	0.1	30
ZMM55C43	40	43	46	2.5	90	600	0.5	0.1	33
ZMM55C47	44	47	50	2.5	110	700	0.5	0.1	36
ZMM55C51	48	51	54	2.5	125	700	0.5	0.1	39
ZMM55C56	52	56	60	2.5	135	1000	0.5	0.1	43
ZMM55C62	58	62	66	2.5	150	1000	0.5	0.1	47
ZMM55C68	64	68	72	2.5	200	1000	0.5	0.1	51
ZMM55C75	70	75	79	2.5	250	1500	0.5	0.1	56
ZMM55C82	78	82	86	2.5	300	2000	0.5	0.1	62
ZMM55C91	86	91	96	1.0	450	5000	0.1	0.1	68
ZMM55C100	95	100	105	1.0	450	5000	0.1	0.1	75

ZMM55B2V0 THRU ZMM55B75

Electrical characteristics (at T_A=25°C unless otherwise noted)

Part No.	Zener voltage			Test current	Zener impedance			Leakage current	
	V_Z @ I_{ZT}			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	(uA)Max	Volts
ZMM55B2V0	1.96	2.0	2.04	5.0	100	600	1.0	150	1.0
ZMM55B2V2	2.12	2.2	2.24	5.0	100	600	1.0	150	1.0
ZMM55B2V4	2.35	2.4	2.45	5.0	85	600	1.0	50	1.0
ZMM55B2V7	2.65	2.7	2.75	5.0	85	600	1.0	10	1.0
ZMM55B3V0	2.94	3.0	3.06	5.0	85	600	1.0	4.0	1.0
ZMM55B3V3	3.23	3.3	3.37	5.0	85	600	1.0	2.0	1.0
ZMM55B3V6	3.53	3.6	3.67	5.0	85	600	1.0	2.0	1.0
ZMM55B3V9	3.82	3.9	3.98	5.0	85	600	1.0	2.0	1.0
ZMM55B4V3	4.21	4.3	4.39	5.0	75	600	1.0	1.0	1.0
ZMM55B4V7	4.61	4.7	4.79	5.0	60	600	1.0	0.5	1.0
ZMM55B5V1	5.00	5.1	5.20	5.0	35	550	1.0	0.1	1.0
ZMM55B5V6	5.49	5.6	5.71	5.0	25	450	1.0	0.1	1.0
ZMM55B6V2	6.08	6.2	6.32	5.0	10	200	1.0	0.1	2.0
ZMM55B6V8	6.66	6.8	6.94	5.0	8	150	1.0	0.1	3.0
ZMM55B7V5	7.35	7.5	7.65	5.0	7	50	1.0	0.1	5.0
ZMM55B8V2	8.04	8.2	8.36	5.0	7	50	1.0	0.1	6.2
ZMM55B9V1	8.92	9.1	9.28	5.0	10	50	1.0	0.1	6.8
ZMM55B10	9.8	10	10.2	5.0	15	70	1.0	0.1	7.5
ZMM55B11	10.8	11	11.2	5.0	20	70	1.0	0.1	8.2
ZMM55B12	11.8	12	12.2	5.0	20	90	1.0	0.1	9.1
ZMM55B13	12.7	13	13.3	5.0	26	110	1.0	0.1	10
ZMM55B15	14.7	15	15.3	5.0	30	110	1.0	0.1	11
ZMM55B16	15.7	16	16.3	5.0	40	170	1.0	0.1	12
ZMM55B18	17.6	18	18.4	5.0	50	170	1.0	0.1	13
ZMM55B20	19.6	20	20.4	5.0	55	220	1.0	0.1	15
ZMM55B22	21.6	22	22.4	5.0	55	220	1.0	0.1	16
ZMM55B24	23.5	24	24.5	5.0	80	220	1.0	0.1	18
ZMM55B27	26.5	27	27.5	5.0	80	220	1.0	0.1	20
ZMM55B30	29.4	30	30.6	5.0	80	220	1.0	0.1	22
ZMM55B33	32.3	33	33.7	5.0	80	220	1.0	0.1	24
ZMM55B36	35.3	36	36.7	5.0	80	220	1.0	0.1	27
ZMM55B39	38.2	39	39.8	2.5	90	500	1.0	0.1	30
ZMM55B43	42.1	43	43.9	2.5	90	600	0.5	0.1	33
ZMM55B47	46.1	47	47.9	2.5	110	700	0.5	0.1	36
ZMM55B51	50.0	51	52.0	2.5	125	700	0.5	0.1	39
ZMM55B56	54.9	56	57.1	2.5	135	1000	0.5	0.1	43
ZMM55B62	60.8	62	63.2	2.5	150	1000	0.5	0.1	47
ZMM55B68	66.6	68	69.4	2.5	200	1000	0.5	0.1	51
ZMM55B75	73.5	75	76.5	2.5	250	1500	0.5	0.1	56

Rating and characteristic curves

FIG.1-TOTAL POWER DISSIPATION VS. AMBIENT TEMPERATURE

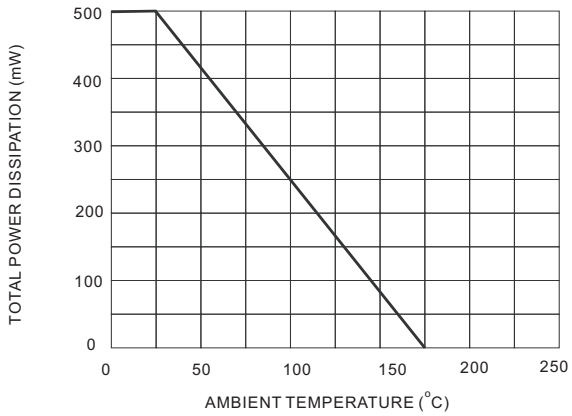


FIG. 2-TYPICAL CHANGE OF WORKING VOLTAGE UNDER OPERATING CONDITIONS AT T_A =25°C

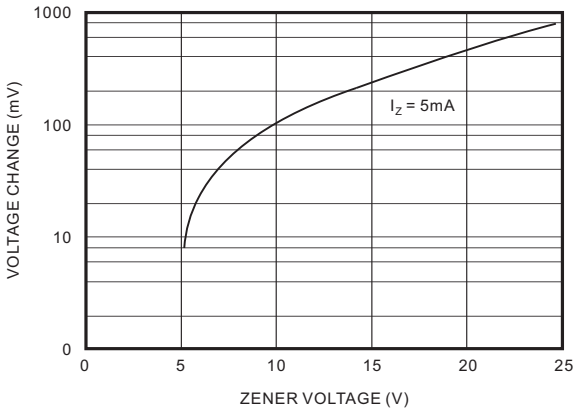


FIG. 3-TYPICAL CHANGE OF WORKING VOLTAGE VS. JUNCTION TEMPERATURE

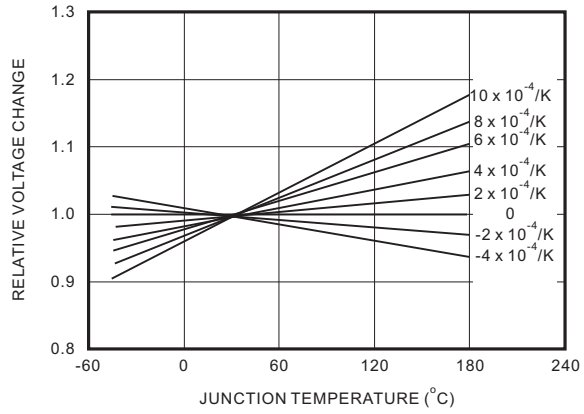


FIG. 4-TEMPERATURE COEFFICIENT OF VZ VS. Z-VOLTAGE

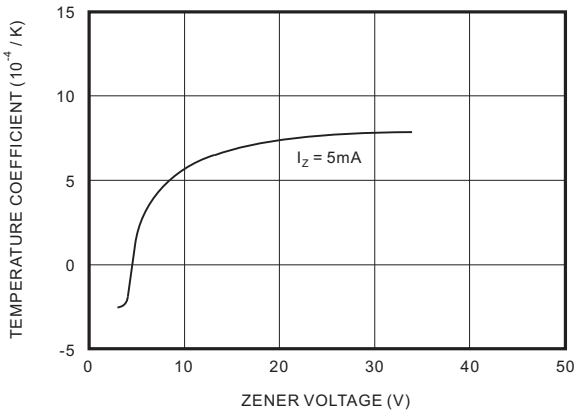
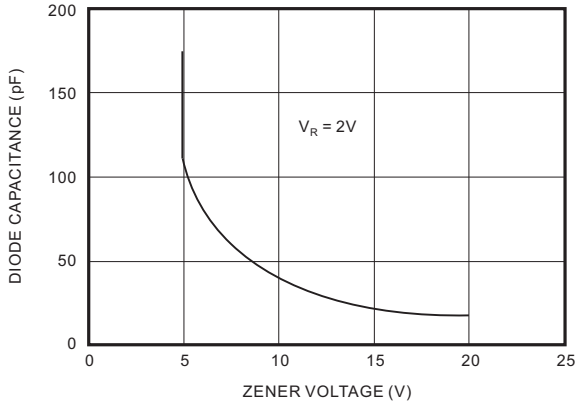


FIG. 5-DIODE CAPACITANCE VS. Z-VOLTAGE



Rating and characteristic curves

FIG. 6-FORWARD CURRENT VS. FORWARD VOLTAGE

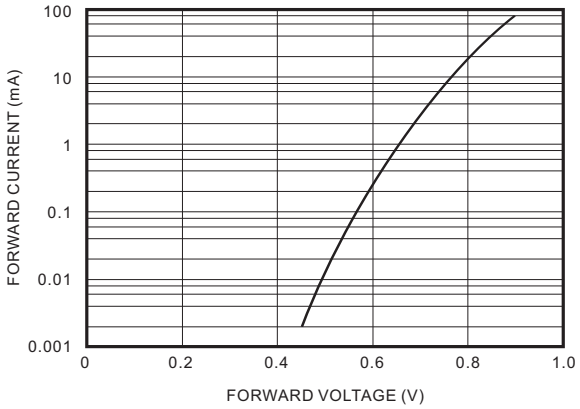


FIG. 7-Z-CURRENT VS. Z-VOLTAGE

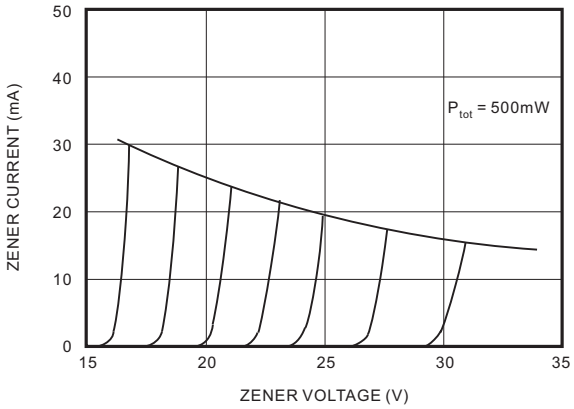


FIG. 8-Z-CURRENT VS. Z-VOLTAGE

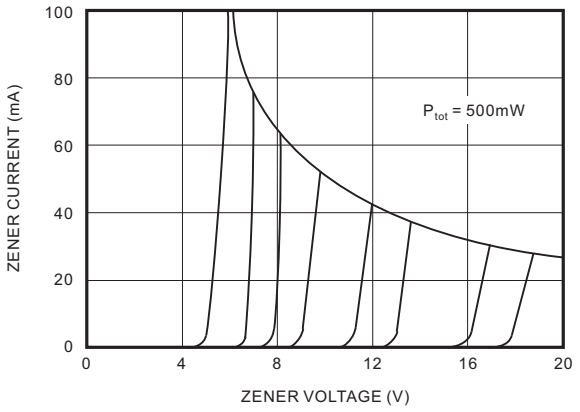


FIG. 9-DIFFERENTIAL Z-RESISTANCE VS. Z-VOLTAGE

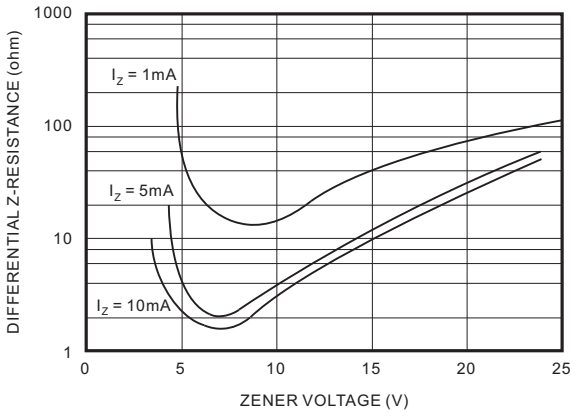
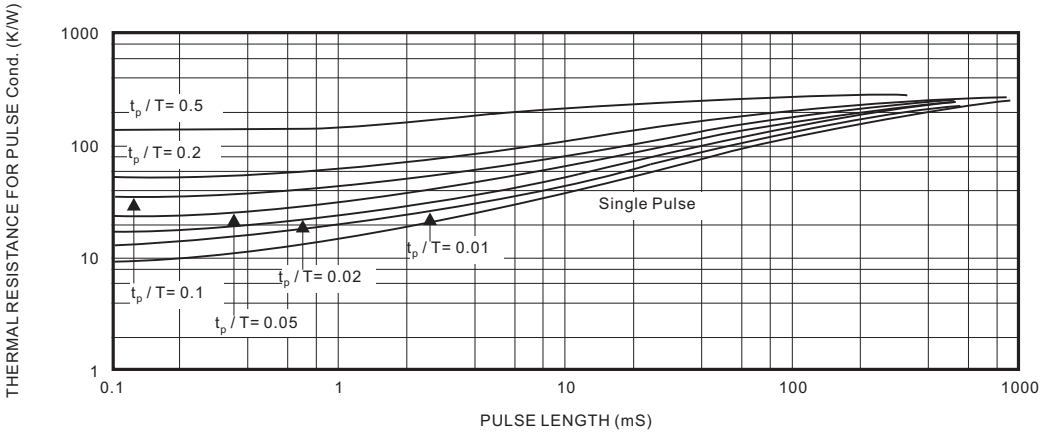


FIG. 10-THERMAL RESPONSE

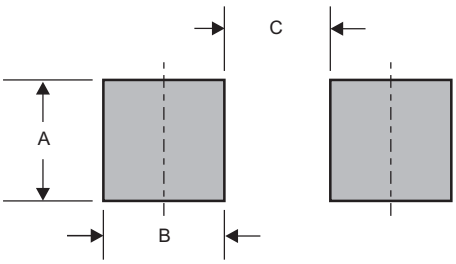


ZMM55B2V0 THRU ZMM55B75
ZMM55C2V0 THRU ZMM55C100

Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

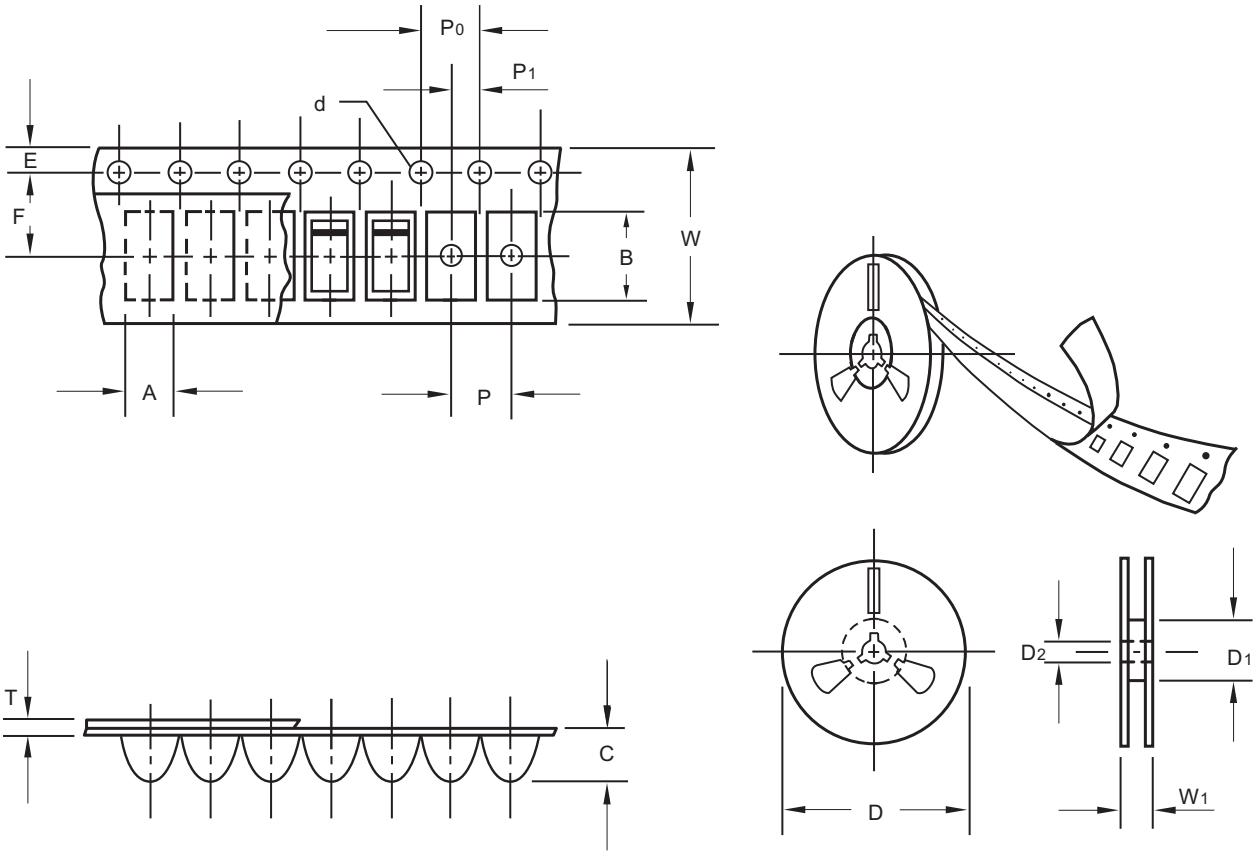


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-80	0.071 (1.80)	0.035 (0.90)	0.102 (2.60)

ZMM55B2V0 THRU ZMM55B75
ZMM55C2V0 THRU ZMM55C100

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-80
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.70
Carrier depth	C	0.1	1.80
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	50.00
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

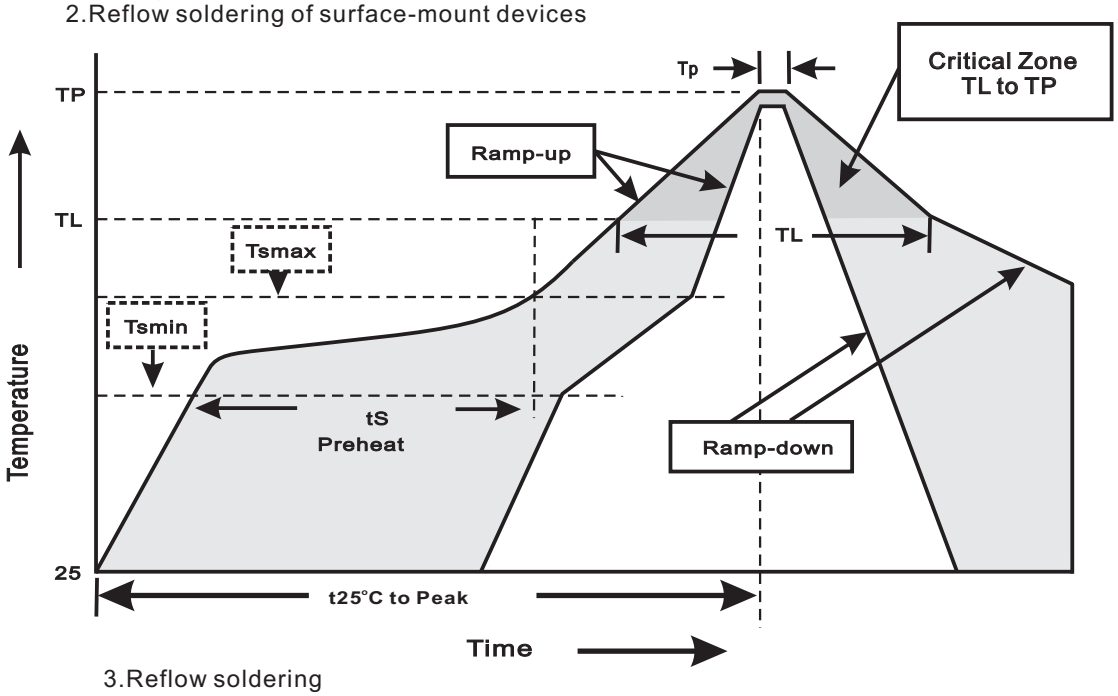
ZMM55B2V0 THRU ZMM55B75
ZMM55C2V0 THRU ZMM55C100

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)
SOD-80	7"	2500	4.0	25,000	183*183*123	178	382*262*387	200,000	9.6

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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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

ZMM55B2V0 THRU ZMM55B75
ZMM55C2V0 THRU ZMM55C100

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec. immerse body into solder 1/16"±1/32"	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_R=80% rate at T_J=175°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P_{SIG} at T_A=121°C for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at T_A=85°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