

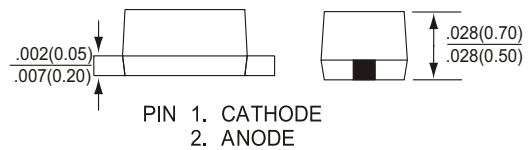
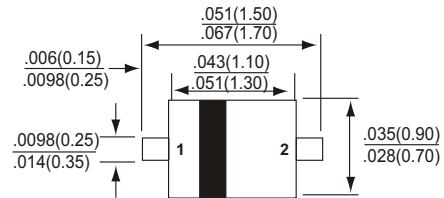
MM5Z2V4 thru MM5Z75V

SURFACE MOUNT ZENER DIODES

150mW Surface Mount Zener Diodes - 2.4V-75V



SOD-523FL



Dimensions in inches and (millimeters)

FEATURES

- Silicon epitaxial planar chip structure.
- Wide zener reverse voltage range 2.40V to 75V.
- Tiny package size for high density applications.
- Ideally suited for automated assembly processes.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free parts, ex. MM5Z2V4-H.

MECHANICAL DATA

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-523FL
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.002 gram

MAXIMUM RATINGS (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 10 \text{ mA DC}$	V_F			0.9	V
Power Dissipation	Diode on FR-5 Board	P_{TOT}			150	mW
Thermal Resistance	Junction to the ambient	$R_{\theta JA}$			625	$^{\circ}\text{C/W}$
Operating temperature		T_J	-55		+150	$^{\circ}\text{C}$
Storage temperature		T_{STG}	-65		+150	$^{\circ}\text{C}$

MM5Z2V4 thru MM5Z75V

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Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Part No.	Device code		Zener voltage			Test current	Zener impedance			Leakage current		V _z (mV/k) @ I _{ZT}		C @ V _R =0 f=1MHz
	Device date code see page 6 Note 1		V _z @ I _{ZT}			I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R	V _R	Min.	Max.	pF
			Min.(V)	Nom.(V)	Max.(V)	mA	OHMs	OHMs	mA	μA	Volts			
MM5Z2V4	00	50	2.2	2.4	2.6	5	100	1000	1.0	50	1.0	-3.5	0	450
MM5Z2V7	01	51	2.5	2.7	2.9	5	100	1000	1.0	20	1.0	-3.5	0	450
MM5Z3V0	02	52	2.8	3.0	3.2	5	100	1000	1.0	10	1.0	-3.5	0	450
MM5Z3V3	05	53	3.1	3.3	3.5	5	95	1000	1.0	5	1.0	-3.5	0	450
MM5Z3V6	06	54	3.4	3.6	3.8	5	90	1000	1.0	5	1.0	-3.5	0	450
MM5Z3V9	07	55	3.7	3.9	4.1	5	90	1000	1.0	3	1.0	-3.5	-2.5	450
MM5Z4V3	08	56	4.0	4.3	4.6	5	90	1000	1.0	3	1.0	-3.5	0	450
MM5Z4V7	09	57	4.4	4.7	5.0	5	80	800	1.0	3	2.0	-3.5	0.2	260
MM5Z5V1	0A	58	4.8	5.1	5.4	5	60	500	1.0	2	2.0	-2.7	1.2	225
MM5Z5V6	0C	59	5.2	5.6	6.0	5	40	200	1.0	1	2.0	-2.0	2.5	200
MM5Z6V2	0E	5A	5.8	6.2	6.6	5	10	100	1.0	3	4.0	0.4	3.7	185
MM5Z6V8	0F	5B	6.4	6.8	7.2	5	15	160	1.0	2	4.0	1.2	4.5	155
MM5Z7V5	0G	5C	7.0	7.5	7.9	5	15	160	1.0	1	5.0	2.5	5.3	140
MM5Z8V2	0H	5D	7.7	8.2	8.7	5	15	160	1.0	0.7	5.0	3.2	6.2	135
MM5Z9V1	0K	5E	8.5	9.1	9.6	5	15	160	1.0	0.2	7.0	3.8	7.0	130
MM5Z10V	0L	5F	9.4	10	10.6	5	20	160	1.0	0.1	8.0	4.5	8.0	130
MM5Z11V	0M	5G	10.4	11	11.6	5	20	160	1.0	0.1	8.0	5.4	9.0	130
MM5Z12V	0N	5H	11.4	12	12.7	5	25	80	1.0	0.1	8.0	6.0	10	130
MM5Z13V	0P	5J	12.4	13	14.1	5	30	80	1.0	0.1	8.0	7.0	11	120
MM5Z15V	0T	5K	14.3	15	15.8	5	30	80	1.0	0.05	10.5	9.2	13	110
MM5Z16V	0U	5L	15.3	16	17.1	5	40	80	1.0	0.05	11.2	10.4	14	105
MM5Z18V	0W	5M	16.8	18	19.1	5	45	80	1.0	0.05	12.6	12.4	16	100
MM5Z20V	0Z	5N	18.8	20	21.2	5	55	100	1.0	0.05	14.0	14.4	18	85
MM5Z22V	10	5P	20.8	22	23.3	5	55	100	1.0	0.05	15.4	16.4	20	85
MM5Z24V	11	5R	22.8	24	25.6	5	70	120	1.0	0.05	16.8	18.4	22	80
MM5Z27V	12	5S	25.1	27	28.9	5	80	300	1.0	0.05	18.9	21.4	25.3	70
MM5Z30V	14	5T	28.0	30	32.0	5	80	300	1.0	0.05	21.0	24.4	29.4	70
MM5Z33V	18	5U	31.0	33	35.0	5	80	300	1.0	0.05	23.2	27.4	33.4	70
MM5Z36V	19	5V	34.0	36	38.0	5	90	500	1.0	0.05	25.2	30.4	37.4	70
MM5Z39V	20	5X	37.0	39	41.0	5	130	500	1.0	0.05	27.3	33.4	41.2	45
MM5Z43V	21	5Y	40.0	43	46.0	5	150	500	1.0	0.05	30.1	37.6	46.6	40
MM5Z47V	1A	5Z	44.0	47	50.0	5	170	500	1.0	0.05	32.9	42.0	51.8	40
MM5Z51V	1C	5-	48.0	51	54.0	5	180	500	1.0	0.05	35.7	46.6	57.2	40
MM5Z56V	1D	5=	52.0	56	60.0	5	200	500	1.0	0.05	39.2	52.2	63.8	40
MM5Z62V	1E	5≡	58.0	62	66.0	5	215	500	1.0	0.05	43.4	58.8	71.6	35
MM5Z68V	1F	5>	64.0	68	72.0	5	240	500	1.0	0.05	47.6	65.6	79.8	35
MM5Z75V	1G	5<	70.0	75	79.0	5	255	500	1.0	0.05	52.5	73.4	88.6	35

MM5Z2V4 thru MM5Z75V

SURFACE MOUNT ZENER DIODES

Rating and characteristic curves (MM5Z2V4 thru MM5Z75V)

FIG. 1-TOTAL POWER DISSIPATION VS. AMBIENT TEMPERATURE

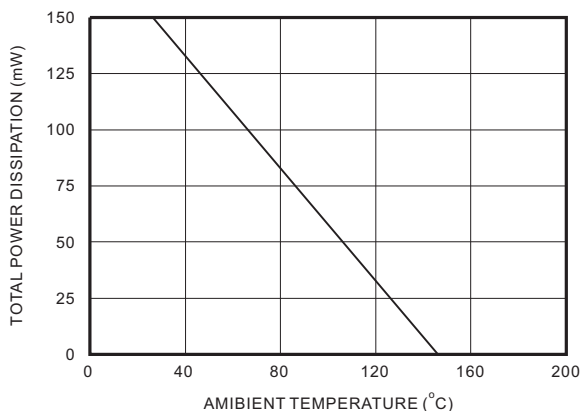


FIG. 2-TYPICAL CHANGE OF WORKING VOLTAGE UNDER OPERATING CONDITIONS AT $T_A = 25^\circ\text{C}$

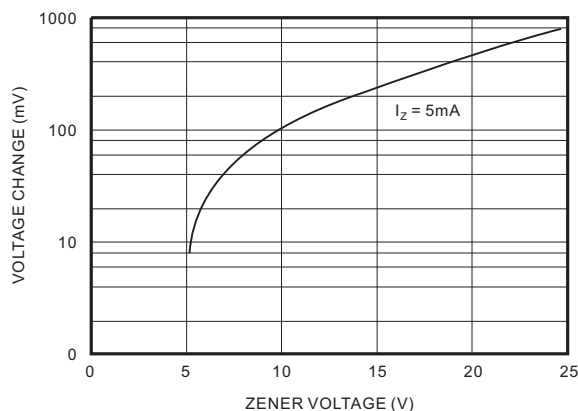


FIG. 3-TYPICAL CHANGE OF WORKING VOLTAGE VS. JUNCTION TEMPERATURE

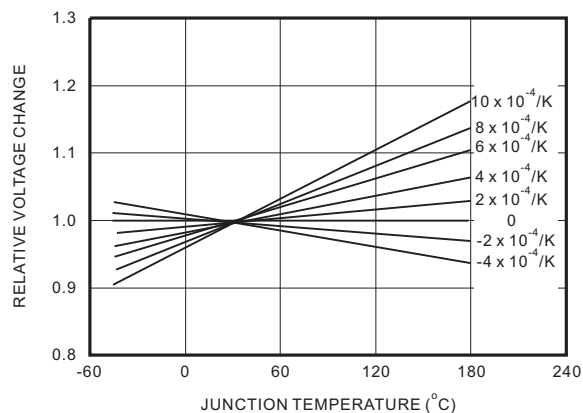


FIG. 4-TEMPERATURE COEFFICIENT OF V_Z VS. Z-VOLTAGE

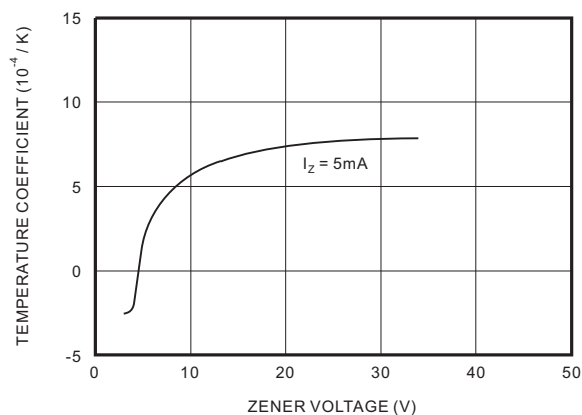
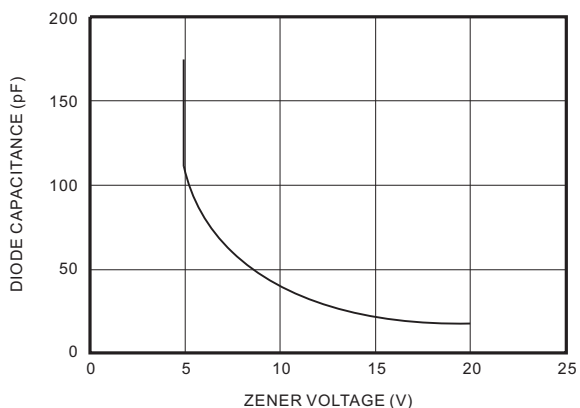


FIG. 5-DIODE CAPACITANCE VS. Z-VOLTAGE



MM5Z2V4 thru MM5Z75V

SURFACE MOUNT ZENER DIODES

Rating and characteristic curves (MM5Z2V4 thru MM5Z75V)

FIG. 6-FORWARD CURRENT VS. FORWARD VOLTAGE

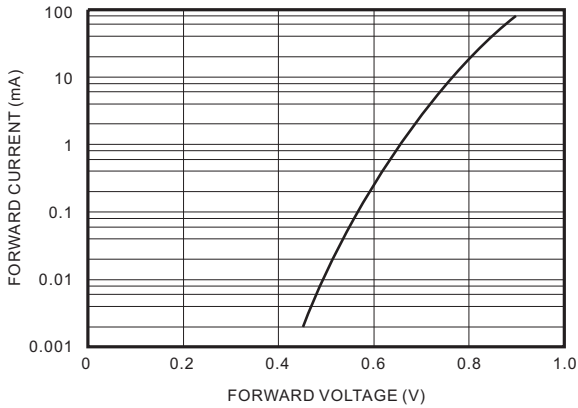


FIG. 7-Z-CURRENT VS. Z-VOLTAGE

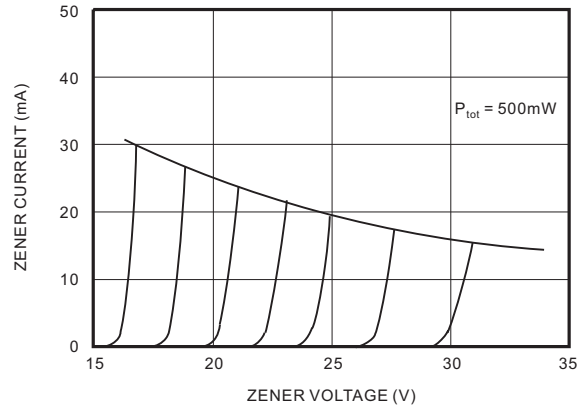


FIG. 8-Z-CURRENT VS. Z-VOLTAGE

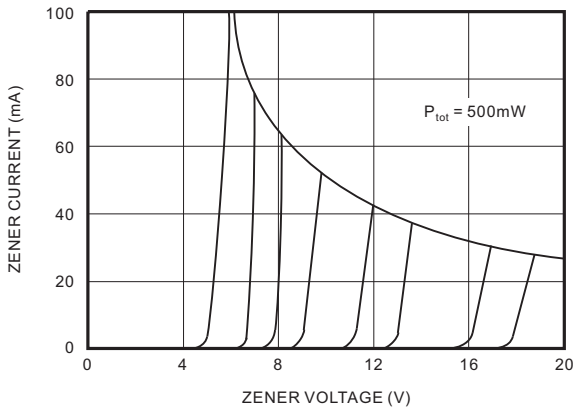


FIG. 9-DIFFERENTIAL Z-RESISTANCE VS. Z-VOLTAGE

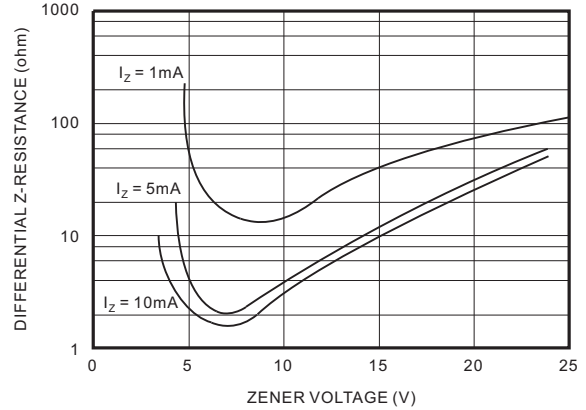
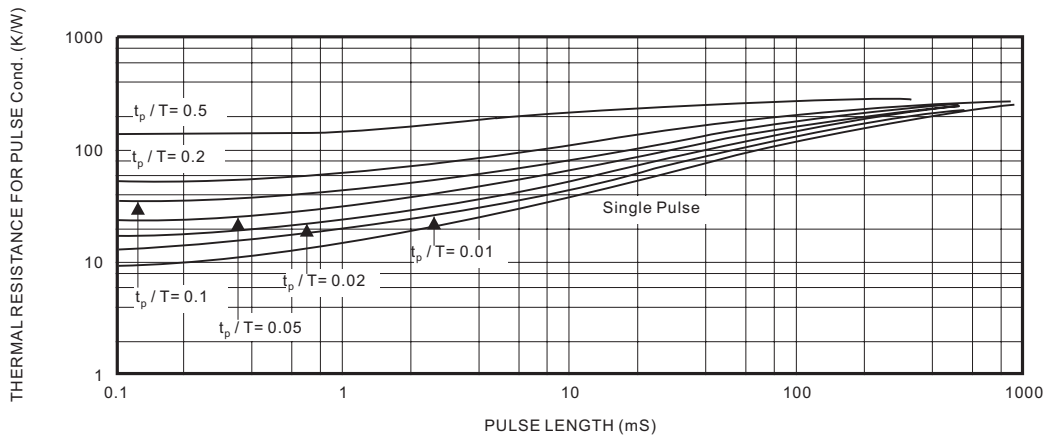




FIG. 10-THERMAL RESPONSE



MM5Z2V4 thru MM5Z75V

SURFACE MOUNT ZENER DIODES

Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

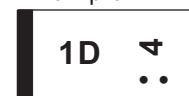
Note 1

Type number	Marking
MM5Z Series	DEV+ Σ

DEV = Device code (see page 3), Σ = Datecode

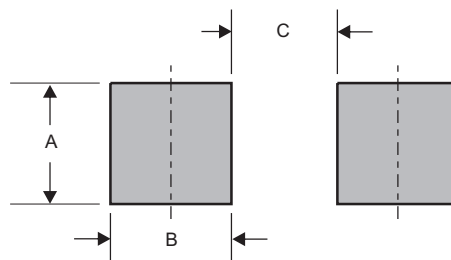


Example:



Year \ Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Odd	1	2	3	4	5	6	7	8	9	T	V	C
Even	E	F	H	J	K	L	N	P	U	X	Y	Z

Suggested solder pad layout



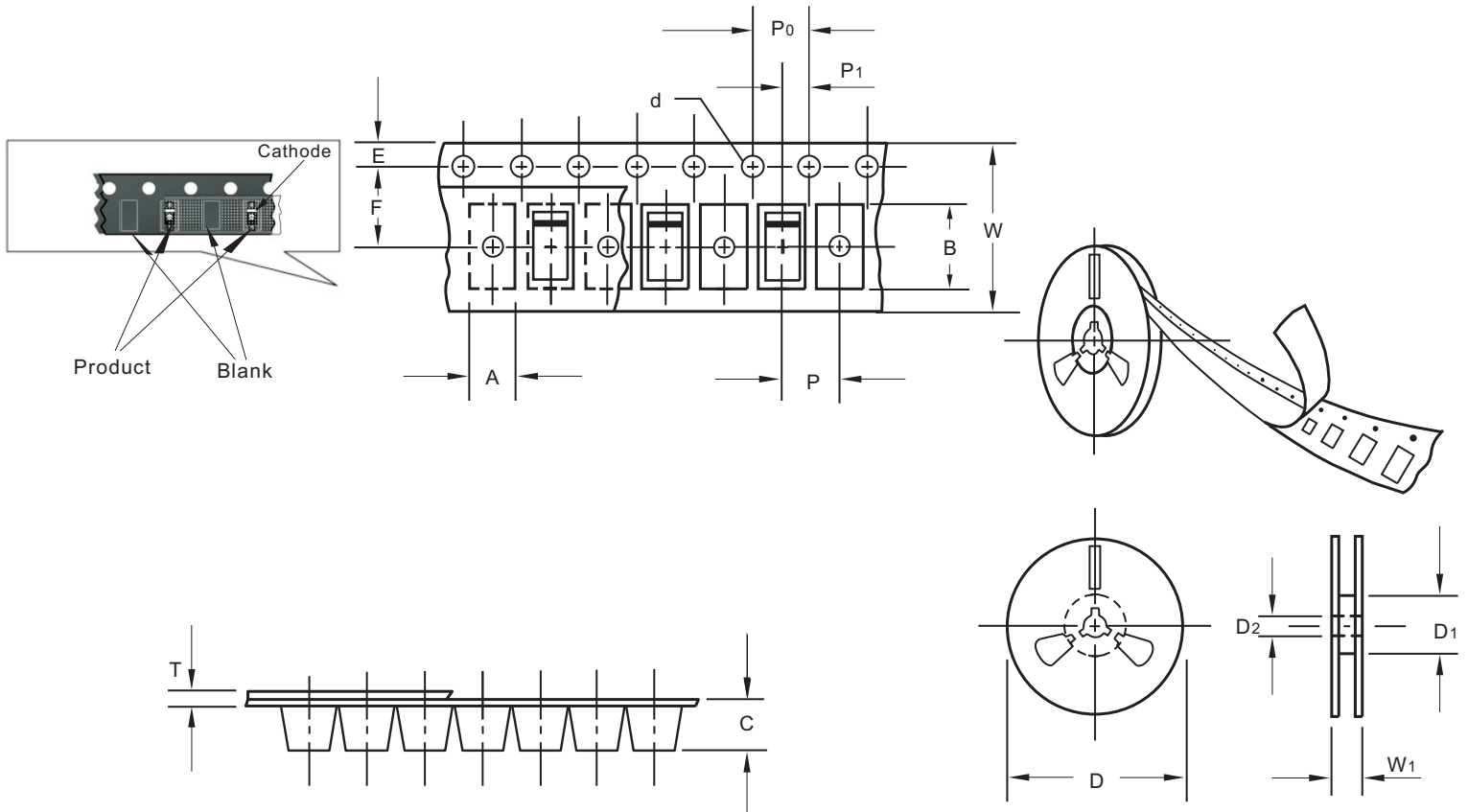
Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-523FL	0.016 (0.40)	0.016 (0.40)	0.048 (1.20)

MM5Z2V4 thru MM5Z75V

SURFACE MOUNT ZENER DIODES

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-523FL
Carrier width	A	0.1	0.90
Carrier length	B	0.1	1.40
Carrier depth	C	0.1	0.76
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	50.00
Feed hole diameter	D2	0.5	8.40~9.90
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	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	8.00
Reel width	W1	1.0	10.90

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

MM5Z2V4 thru MM5Z75V

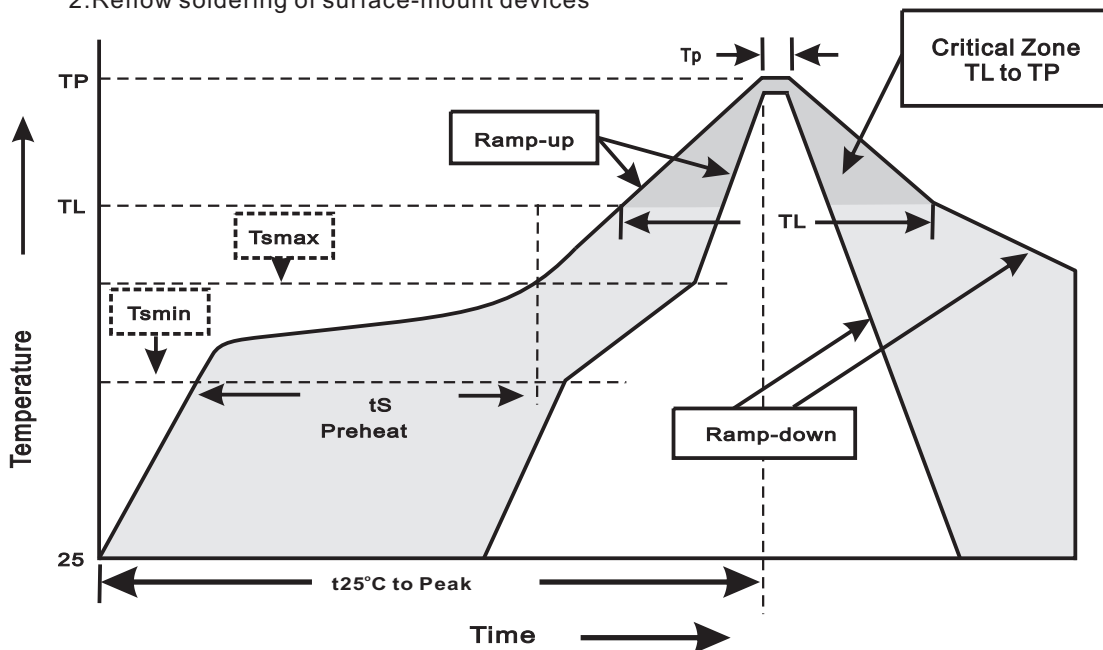
SURFACE MOUNT ZENER DIODES

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-523FL	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.5

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature= $5^{\circ}\text{C}\sim 40^{\circ}\text{C}$ Humidity= $55\%\pm 25\%$
- 2.Reflow soldering of surface-mount devices



- 3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{smax} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_p)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$