

MMSZ4678S Thru MMSZ4717S**List**

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MMSZ4678S Thru MMSZ4717S

300mW Zener Diodes : 1.8V ~ 43V

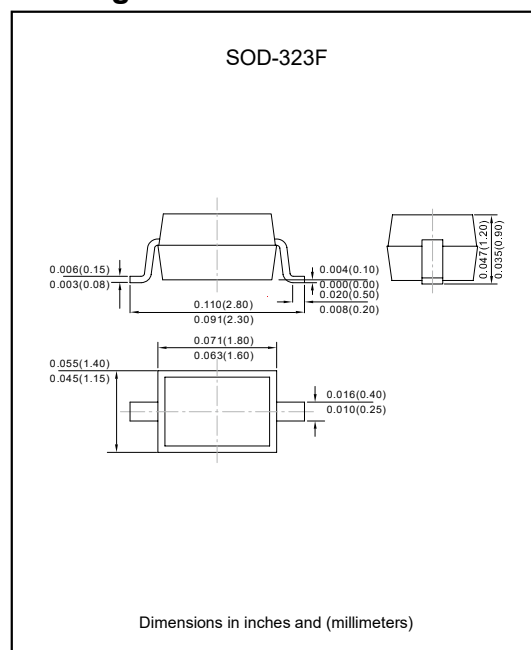
Features

- Zener voltage 1.8V-43V.
- Low zener impedance.
- High stability and high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. MMSZ4678S-H.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, SOD-323F.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.

Package Outline



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

Parameter	Symbol	Value	Unit
Forward voltage @ $I_F=10\text{mA}$ (Note2)	V_F	0.9	V
Power dissipation (Note1)	P_D	300	mW
Operating temperature range	T_J	+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-65 to +150	$^{\circ}\text{C}$

Note 1. Device mounted on ceramic PCB: With pad areas 35mm^2 .
 2. Short duration test pulse used to minimize self-heating effect.
 3. $f=1\text{KHz}$.

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

Device	Device marking	Zener voltage (Note 1)				Leakage current	
		V_Z (Volts)			$@I_Z$	$I_R (@V_R)$	
		Min.	Nom.	Max.	μA	μA	Volts
MMSZ4678S	CC	1.71	1.8	1.89	50	7.5	1
MMSZ4679S	CD	1.90	2.0	2.10	50	5	1
MMSZ4680S	CE	2.09	2.2	2.31	50	4	1
MMSZ4681S	CF	2.28	2.4	2.52	50	2	1
MMSZ4682S	CH	2.565	2.7	2.835	50	1	1
MMSZ4683S	CJ	2.85	3.0	3.15	50	0.8	1
MMSZ4684S	CK	3.13	3.3	3.47	50	7.5	1.5
MMSZ4685S	CM	3.42	3.6	3.78	50	7.5	2
MMSZ4686S	CN	3.70	3.9	4.10	50	5	2
MMSZ4687S	CP	4.09	4.3	4.52	50	4	2
MMSZ4688S	CT	4.47	4.7	4.94	50	10	3
MMSZ4689S	CU	4.85	5.1	5.36	50	10	3
MMSZ4690S	CV	5.32	5.6	5.88	50	10	4
MMSZ4691S	CA	5.89	6.2	6.51	50	10	5
MMSZ4692S	CX	6.46	6.8	7.14	50	10	5.1
MMSZ4693S	CY	7.13	7.5	7.88	50	10	5.7
MMSZ4694S	CZ	7.79	8.2	8.61	50	1	6.2
MMSZ4695S	DC	8.27	8.7	9.14	50	1	6.6
MMSZ4696S	DD	8.65	9.1	9.56	50	1	6.9
MMSZ4697S	DE	9.50	10	10.50	50	1	7.6
MMSZ4698S	DF	10.45	11	11.55	50	0.05	8.4
MMSZ4699S	DH	11.40	12	12.60	50	0.05	9.1
MMSZ4700S	DJ	12.35	13	13.65	50	0.05	9.8
MMSZ4701S	DK	13.30	14	14.70	50	0.05	10.6
MMSZ4702S	DM	14.25	15	15.75	50	0.05	11.4
MMSZ4703S	DN	15.20	16	16.80	50	0.05	12.1
MMSZ4704S	DP	16.15	17	17.85	50	0.05	12.9
MMSZ4705S	DT	17.10	18	18.90	50	0.05	13.6
MMSZ4706S	DU	18.05	19	19.95	50	0.05	14.4
MMSZ4707S	DV	19.00	20	21.00	50	0.01	15.2
MMSZ4708S	DA	20.90	22	23.10	50	0.01	16.7
MMSZ4709S	DX	22.80	24	25.20	50	0.01	18.2
MMSZ4710S	DY	23.75	25	26.25	50	0.01	19.0
MMSZ4711S	EA	25.65	27	28.35	50	0.01	20.4
MMSZ4712S	EC	26.60	28	29.40	50	0.01	21.2
MMSZ4713S	ED	28.50	30	31.50	50	0.01	22.8
MMSZ4714S	EE	31.35	33	34.65	50	0.01	25.0
MMSZ4715S	EF	34.20	36	37.80	50	0.01	27.3
MMSZ4716S	EH	37.05	39	40.95	50	0.01	29.6
MMSZ4717S	EJ	40.85	43	45.15	50	0.01	32.6

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Rating and characteristic curves

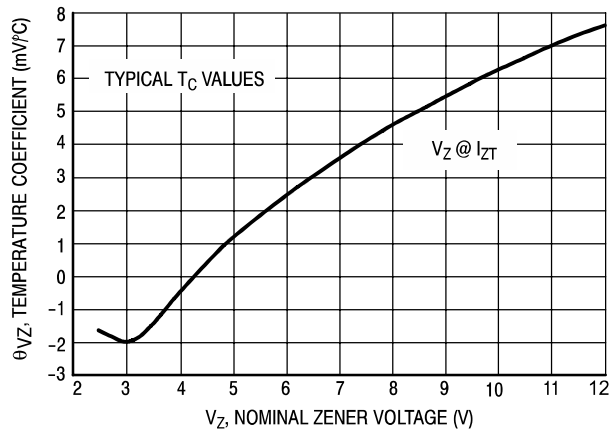


Figure 1. Temperature Coefficients
(Temperature Range -55 °C to +150°C)

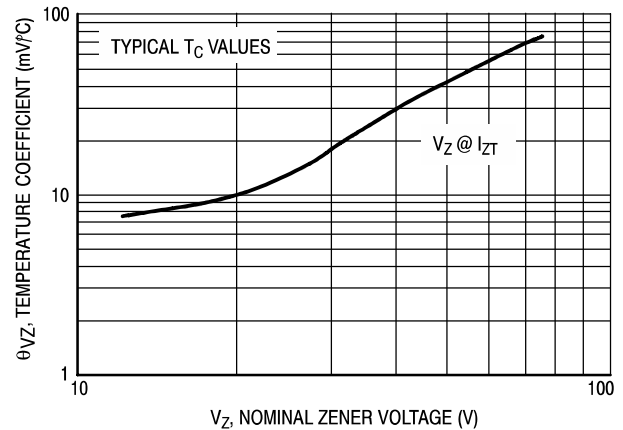


Figure 2. Temperature Coefficients
(Temperature Range -55 °C to +150°C)

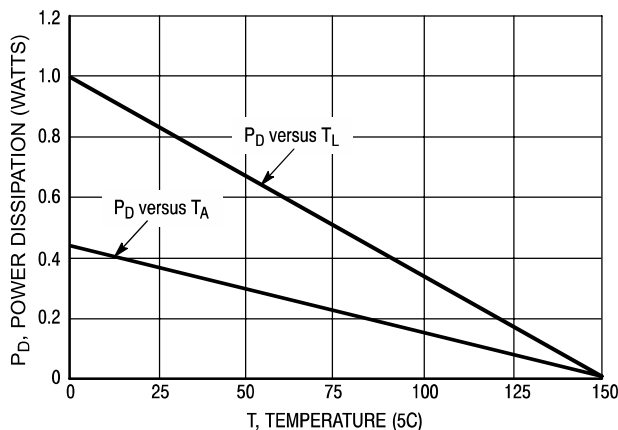


Figure 3. Steady State Power Derating

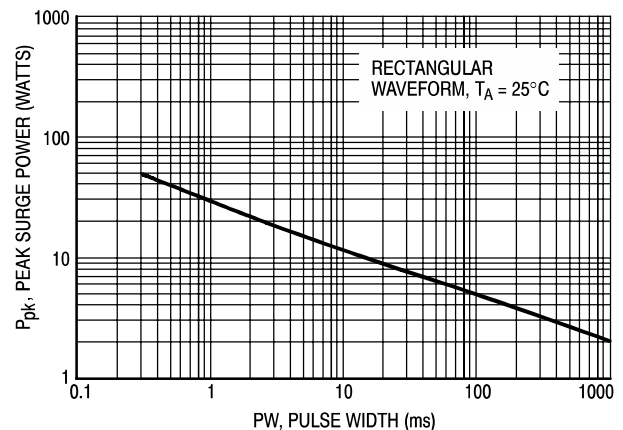


Figure 4. Maximum Nonrepetitive Surge Power

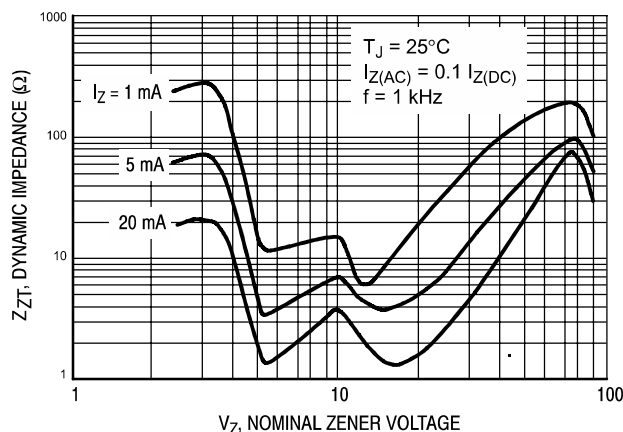


Figure 5. Effect of Zener V oltagne on
Zener Impedance

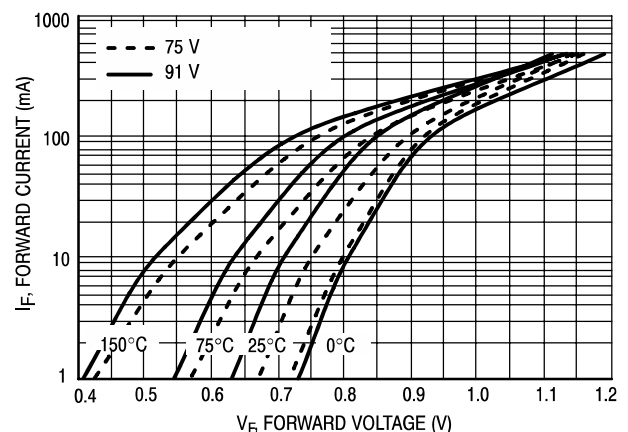


Figure 6. Typical Forward Voltage

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Rating and characteristic curves

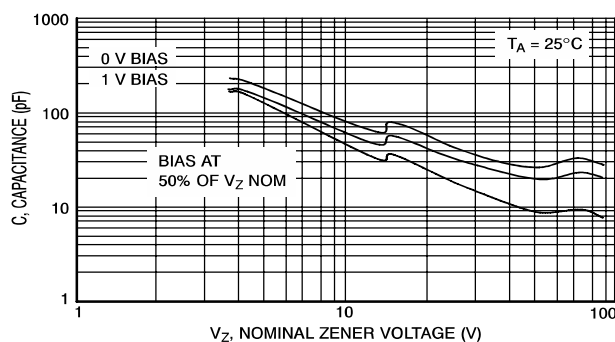


Figure 7. Typical Capacitance

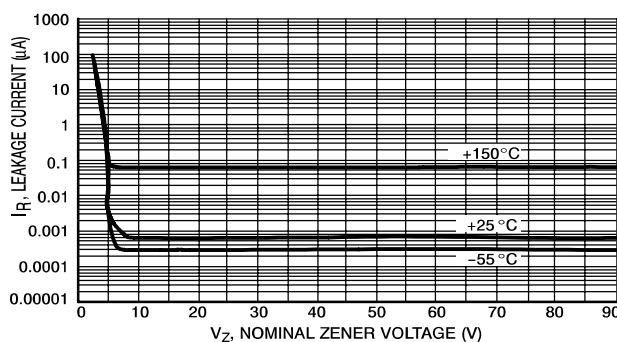
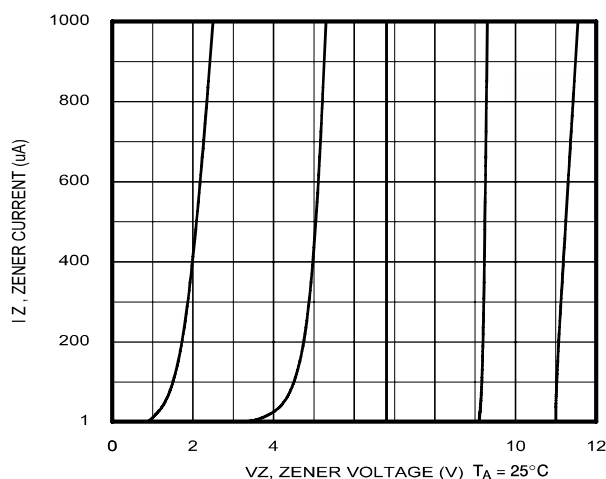
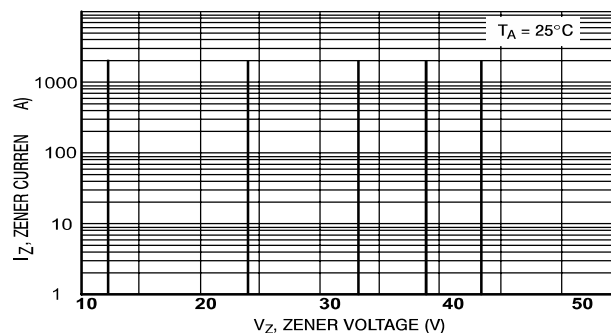


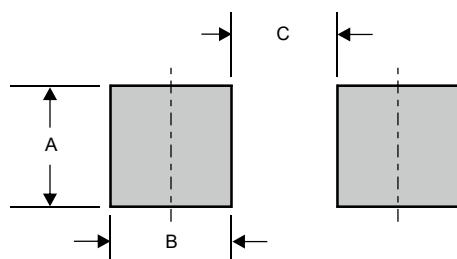
Figure 8. Typical Leakage Current

Figure 9. Zener Voltage versus Zener Current
(VZ Up to 12 V)Figure 10. Zener Voltage versus Zener Current
(12 V to 43 V)

Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Suggested solder pad layout

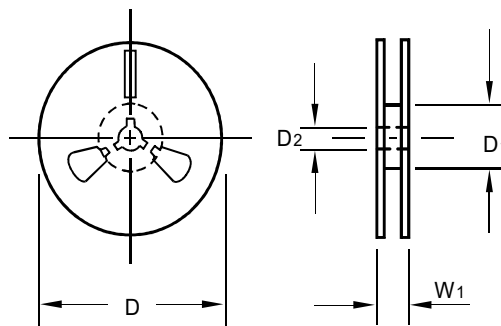
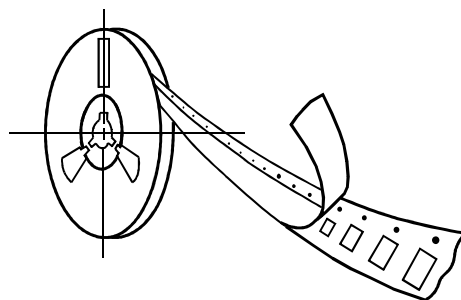
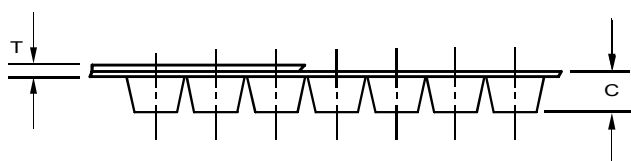
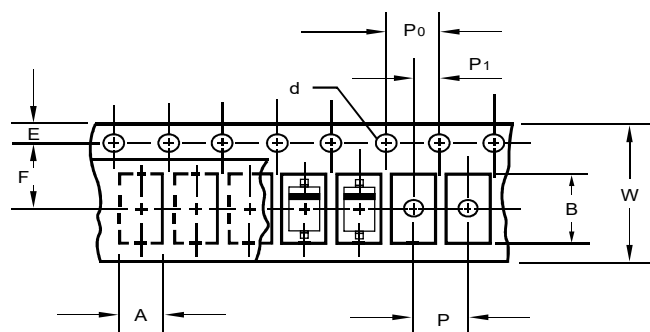


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323F	0.033 (0.83)	0.025 (0.63)	0.063 (1.60)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOD-323F
Carrier width	A	0.1	1.46
Carrier length	B	0.1	2.90
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	D2	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	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	9.50

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

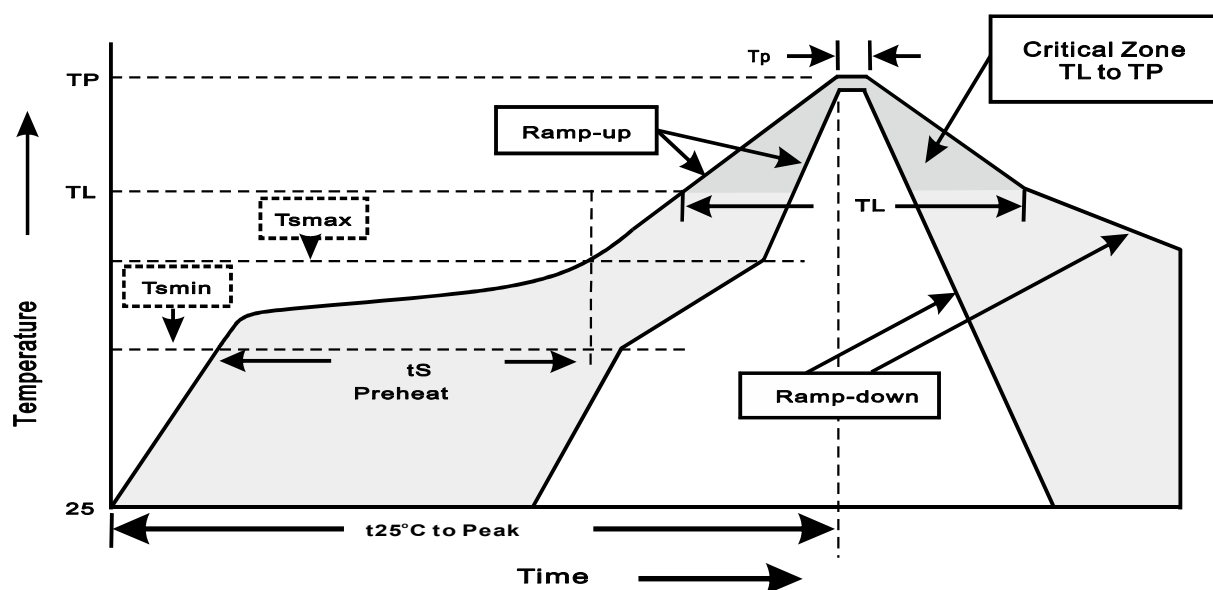
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Reel packing

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)
SOD-323F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	8.0

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)	$<3^{\circ}\text{C}/\text{sec}$
Preheat - Temperature Min($T_{\text{smín}}$) - Temperature Max($T_{\text{smáx}}$) - Time(min to max)(t_s)	150°C 200°C 60~120sec
$T_{\text{smáx}}$ to T_L - Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
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	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$