

## Silicone Planer Zener Diodes

## MM1ZS2V4B ~ ZS36B



SOD-123

**SOD-123 Surface Mount  
Plastic Package  
RoHS compliant**

### FEATURES:

1. Power dissipation: 365 mW
2. Zener voltage tolerance:  $\pm 2\%$
3. Low reverse current IR range.
4. This product is available in AEC-Q101 Compliant and PPAP Capable also.

**Note:** For AEC-Q101 compliant products, please use suffix -AQ in the part number while ordering.

**APPLICATIONS:** General Regulation Functions.

### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	$I_F$	200	mA
Non-Repetitive Peak Reverse Current	$I_{ZSM}$	See Characteristic Table	
Non-Repetitive Peak Power Dissipation	$P_{ZSM}$	40	W
Power Dissipation	$P_D$	365 <sup>1</sup> , 625 <sup>2</sup>	mW
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

### THERMAL RESISTANCE

Thermal Resistance Junction to Ambient Air	$R_{eJA}$	340 <sup>1</sup> , 200 <sup>2</sup>	$^\circ\text{C}/\text{W}$
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### ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Forward Voltage at $I_F = 10\text{mA}$	$V_F$	0.9	V
Forward Voltage at $I_F = 100\text{mA}$		1.1	

**Note:**

1. Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
2. Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

**ELECTRICAL CHARACTERISTICS** ( $T_A=25\text{ }^\circ\text{C}$  unless otherwise noted)

Type	Marking Code	Zener Voltage Range <sup>(1)</sup>			Dynamic Impedance				Reverse Leakage Current		Temperature coefficient Sz at $I_z=5\text{mA}$	Diode Capacitance $C_d$ <sup>(2)</sup>	Non-Repet. Peak Rev Current $I_z$ <sup>(3)</sup>
		$V_{znom}$		$I_{zT}$ for $V_{zT}$	$Z_{ZT(MAX)}$ at $I_z$		$Z_{ZK(MAX)}$ at $I_{ZK}$		$I_{R(MAX)}$ at $V_R$		Typ	Max	Max
		V	mA	V	$\Omega$	mA	$\Omega$	mA	$\mu\text{A}$	V	mV/K	pF	A
MM1ZS2V4B	B1	2.4	5	2.43..2.63	100	5	1000	0.5	50	1	-1.6	450	8
MM1ZS2V7B	B2	2.7	5	2.69..2.91	100	5	1000	0.5	20	1	-2	450	8
MM1ZS3V0B	B3	3.0	5	2.85..3.07	95	5	1000	0.5	10	1	-2.1	425	8
MM1ZS3V3B	B4	3.3	5	3.32..3.53	95	5	1000	0.5	5	1	-2.4	410	8
MM1ZS3V6B	B5	3.6	5	3.60..3.85	90	5	500	1	5	1	-2.4	390	8
MM1ZS3V9B	B6	3.9	5	3.89..4.16	90	5	500	1	3	1	-2.5	370	8
MM1ZS4V3B	B7	4.3	5	4.17..4.48	90	5	600	1	3	1	-2.5	350	8
MM1ZS4V7B	B8	4.7	5	4.55..4.75	90	5	600	1	2	1	-1.4	325	8
MM1ZS5V1B	B9	5.1	5	4.96..5.20	60	5	250	0.5	2	1.5	0.3	300	5.5
MM1ZS5V6B	BA	5.6	5	5.48..5.73	50	5	100	0.5	1	2.5	1.9	275	5.5
MM1ZS6V2B	BB	6.2	5	6.06..6.33	50	5	80	0.5	0.5	3	2.7	250	5.5
MM1ZS6V8B	BC	6.8	5	6.65..6.93	40	5	60	0.5	0.5	3.5	3.4	215	5.5
MM1ZS7V5B	BD	7.5	5	7.28..7.60	10	5	60	0.5	0.5	4	4	170	3.5
MM1ZS8V2B	BE	8.2	5	8.02..8.36	10	5	60	0.5	0.5	5	4.6	150	3.5
MM1ZS9V1B	BF	9.1	5	8.85..9.23	10	5	60	0.5	0.5	6	5.5	120	3.5
MM1ZS10B	BG	10	5	9.77..10.21	10	5	60	0.5	0.1	7	6.4	110	3.5
MM1ZS11B	BH	11	5	10.78..11.22	10	5	60	0.5	0.1	8	7.4	108	3
MM1ZS12B	BJ	12	5	11.74..12.24	10	5	60	0.5	0.1	9	8.4	105	3
MM1ZS13B	BK	13	5	12.91..13.49	10	5	80	0.5	0.1	10	9.4	103	2.5
MM1ZS15B	BL	15	5	14.34..14.98	15	5	80	0.5	0.1	11	11.4	99	2
MM1ZS16B	BM	16	5	15.85..16.51	20	5	80	0.5	0.1	12	12.4	97	1.5
MM1ZS18B	BN	18	5	17.56..18.35	20	5	80	0.5	0.1	13	14.4	93	1.5
MM1ZS20B	BP	20	5	19.52..20.39	20	5	80	0.5	0.1	15	16.4	88	1.5
MM1ZS22B	BQ	22	5	21.54..22.47	25	5	100	0.5	0.1	17	18.4	84	1.3
MM1ZS24B	BR	24	5	23.72..24.48	30	5	120	0.5	0.1	19	20.4	80	1.3
MM1ZS27B	BS	27	5	26.19..27.53	40	5	150	0.5	0.1	21	23.4	73	1
MM1ZS30B	BT	30	5	29.19..30.69	40	5	200	0.5	0.1	23	26.4	66	1
MM1ZS33B	BU	33	5	32.15..33.79	40	5	250	0.5	0.1	25	29.4	60	0.9
MM1ZS36B	BV	36	5	35.07..36.87	60	5	300	0.5	0.1	27	33	59	0.8

**Notes:**

- 1)  $V_z$  is tested with pulses (20 ms).
- 2)  $f=1\text{ MHz}; V_R=0\text{V}$ .
- 3)  $t_p=100\mu\text{s}$

## TYPICAL CHARACTERISTICS CURVES

Fig 1: Non-Repetitive Peak Reverse Power Dissipation vs. Pulse Duration

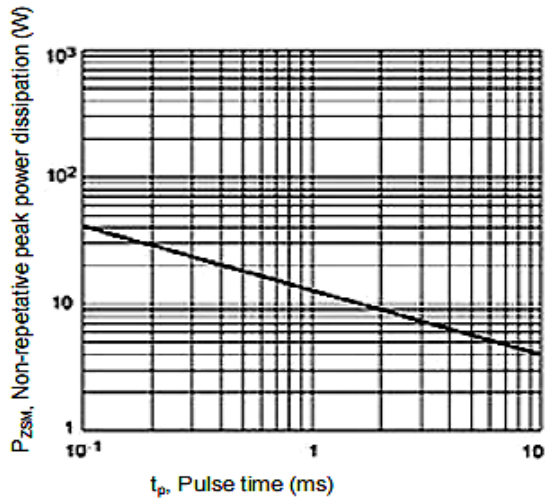


Fig 2: Typical Temperature Coefficient vs. Working Current

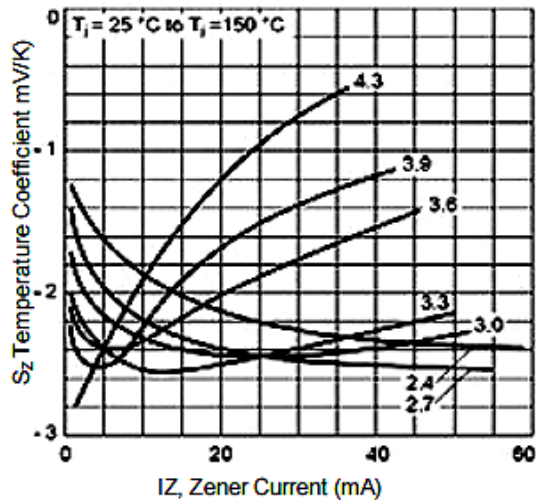


Fig 3: Typical Forward Current vs Forward Voltage.

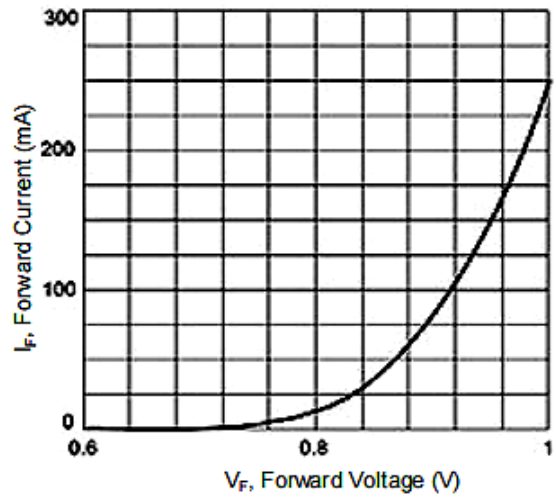
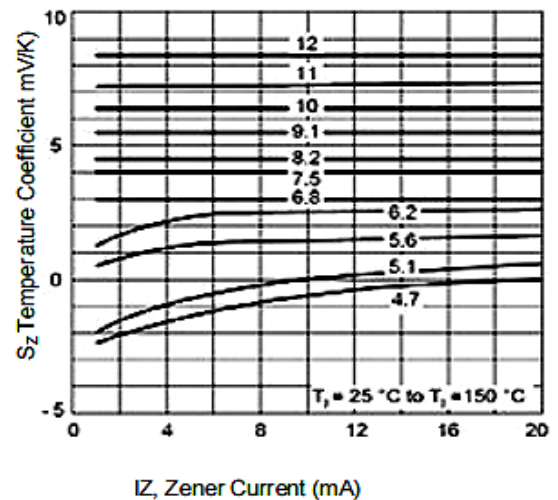


Fig 4: Typical Temperature Coefficient vs. Working Current



### TYPICAL CHARACTERISTICS CURVES

Fig 5: Typical Working Current vs Working Voltage.

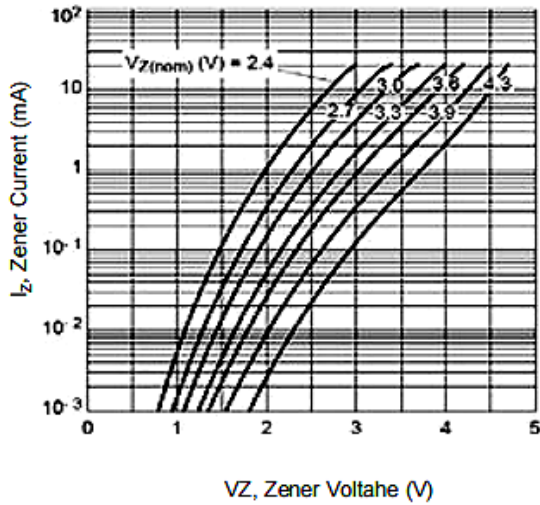


Fig 7: Typical Working Current vs Working Voltage

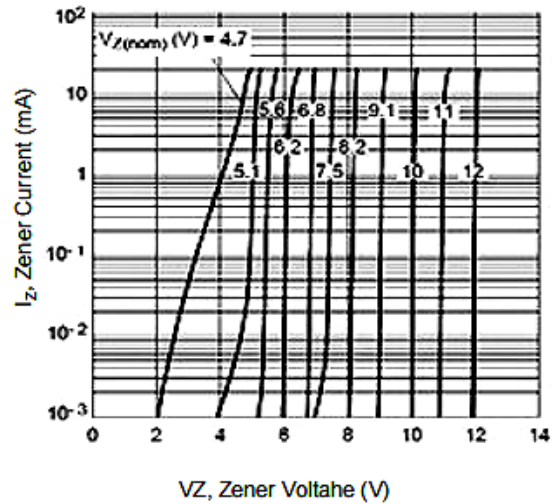
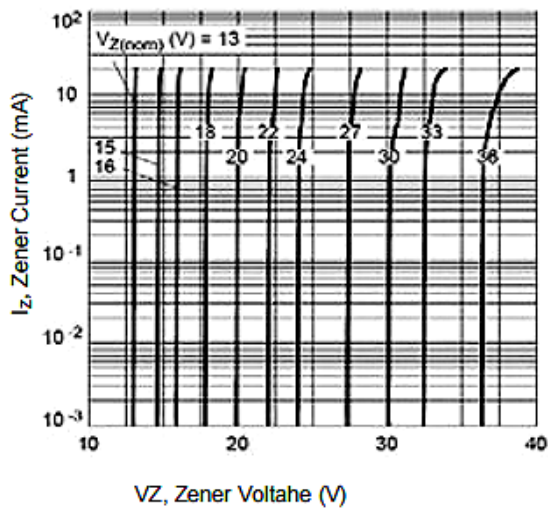
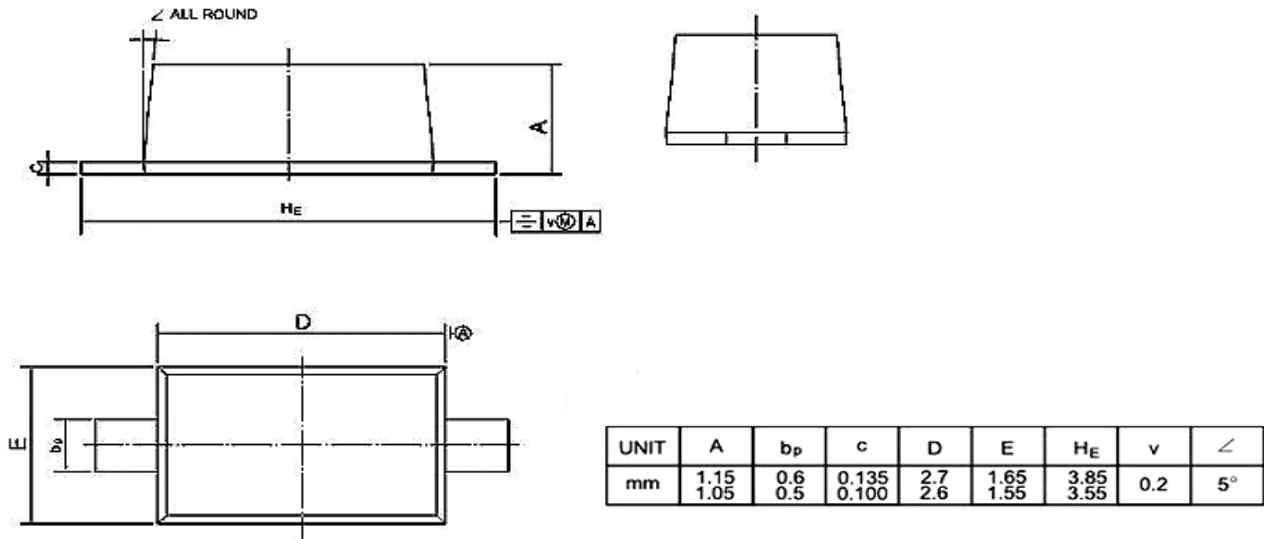


Fig 6: Typical Working Current vs Working Voltage

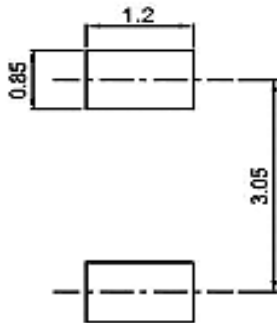


## PACKGE DETAILS

### SOD-123 Surface Mount Package



### Recommended Soldering Footprint



### Packing information

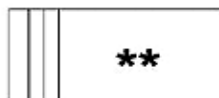
Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	(inch)	mm	(inch)	
SOD-123	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

### Marking information

" III " = Cathode line

" \*\* " = Part No.

Font type: Arial





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### **Recommended Product Storage Environment for Discrete Semiconductor Devices**

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

#### **Shelf Life of CDIL Products**

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

#### **Floor Life of CDIL Products and MSL Level**

When the products are opened from the original packing, the floor life will start.

For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	Time	Condition
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH



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## Customer Notes

### Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

### Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is commended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



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