



## DESCRIPTION

This series of Zener diodes is packaged in a SOD-523 surface mount package. They are designed to provide voltage regulation protection and are especially attractive in situations where space is at a premium. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

The M5Z2V0~M5Z75V are available in SOD-523 package.

## ORDERING INFORMATION

Package Type	Part Number	
SOD-523	M5Z2V0	M5Z13V
	M5Z2V4	M5Z15V
	M5Z2V7	M5Z16V
	M5Z3V0	M5Z18V
	M5Z3V3	M5Z20V
	M5Z3V6	M5Z22V
	M5Z3V9	M5Z24V
	M5Z4V3	M5Z27V
	M5Z4V7	M5Z30V
	M5Z5V1	M5Z33V
	M5Z5V6	M5Z36V
	M5Z6V2	M5Z39V
	M5Z6V8	M5Z43V
	M5Z7V5	M5Z47V
	M5Z8V2	M5Z51V
	M5Z9V1	M5Z56V
	M5Z10V	M5Z62V
M5Z11V	M5Z68V	
M5Z12V	M5Z75V	
Note	3,000pcs / Reel	
AiT provides all RoHS Compliant Products		

## FEATURES

- Standard Zener Breakdown Voltage Range: 2.0 V ~ 75 V
- Steady State Power Rating of 200mW
- Small Body Outline Dimensions: 0.047" x 0.032"(1.20 mm x 0.80 mm)
- Low Body Height: 0.028" (0.7 mm)
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- RoHS Compliant
- Available in SOD-523 package

## MECHANICAL CHARACTERISTICS

Case: Void-free, transfer-molded, thermosetting plastic Epoxy Meets UL 94V-0

Lead Finish: 100% Matte Sn (Tin)

Qualified Max Reflow Temperature: 260°C

Device Meets MSL 1 Requirements

Mounting Position: Any

## PIN DESCRIPTION





## ABSOLUTE MAXIMUM RATINGS

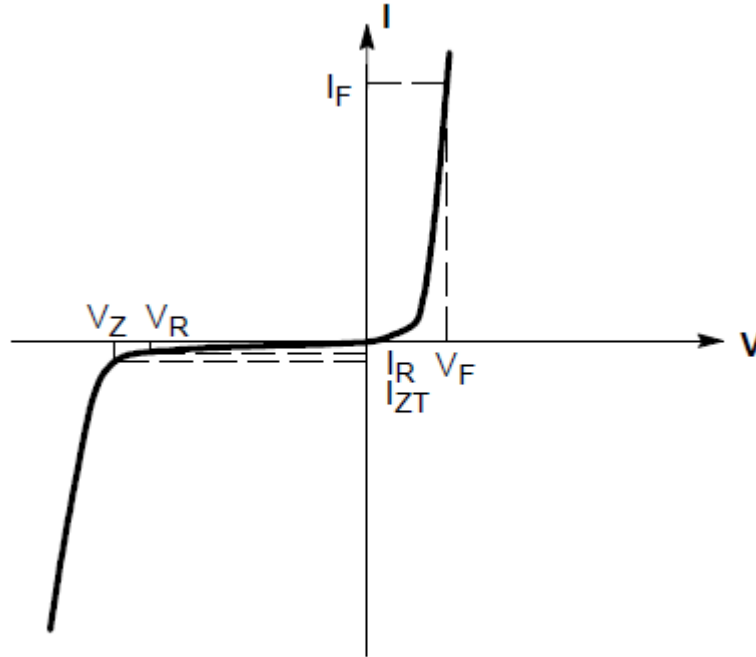
Total Device Dissipation FR-5 Board	
$P_D$ , @ $T_A = 25^\circ\text{C}$	200mW
$T_J$ , $T_{STG}$ , Junction and Storage Temperature Range	$-65^\circ\text{C} \sim +150^\circ\text{C}$

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



## ELECTRICAL PARAMETER

$T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 0.9\text{V Max.}$  @  $I_F = 10\text{mA}$  for all types



**Zener Voltage Regulator**

Symbol	Parameter
$V_Z$	Reverse Zener Voltage @ $I_{ZT}$
$I_{ZT}$	Reverse Current
$Z_{ZT}$	Maximum Zener Impedance @ $I_{ZT}$
$I_{ZK}$	Reverse Current
$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$
$I_R$	Reverse Leakage Current @ $V_R$
$V_R$	Reverse Voltage
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$
$\theta_{V_Z}$	Maximum Temperature Coefficient of $V_Z$
C	Max. Capacitance @ $V_R = 0$ and $f = 1\text{MHz}$



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C unless otherwise noted, V<sub>F</sub> = 0.9V Max. @I<sub>F</sub> = 10mA for all types.

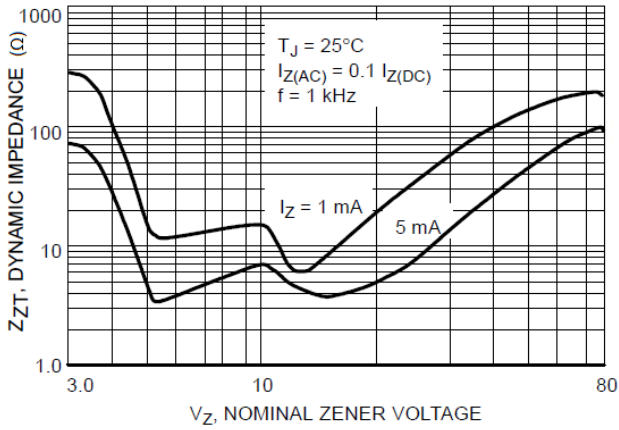
Part Number	Zener Voltage <sup>NOTE1</sup>			Zener Impedance			Leakage Current		θV <sub>Z</sub> (mV/k) @ I <sub>ZT</sub>		C @V <sub>R</sub> =0 f = 1MHz pF	
	V <sub>Z</sub> (Volts)			@I <sub>ZT</sub>	Z <sub>ZT</sub> @I <sub>ZT</sub>	Z <sub>ZK</sub> @I <sub>ZK</sub>	I <sub>R</sub> @V <sub>R</sub>					
	Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts	Min		Max
M5Z2V0	1.91	2.0	2.09	5	100	600	1.0	150	1.0	-3.5	0	450
M5Z2V4	2.2	2.4	2.6	5	100	1000	1.0	50	1.0	-3.5	0	450
M5Z2V7	2.5	2.7	2.9	5	100	1000	1.0	20	1.0	-3.5	0	450
M5Z3V0	2.8	3.0	3.2	5	100	1000	1.0	10	1.0	-3.5	0	450
M5Z3V3	3.1	3.3	3.5	5	95	1000	1.0	5	1.0	-3.5	0	450
M5Z3V6	3.4	3.6	3.8	5	90	1000	1.0	5	1.0	-3.5	0	450
M5Z3V9	3.7	3.9	4.1	5	90	1000	1.0	3	1.0	-3.5	-2.5	450
M5Z4V3	4.0	4.3	4.6	5	90	1000	1.0	3	1.0	-3.5	0	450
M5Z4V7	4.4	4.7	5.0	5	80	800	1.0	3	2.0	-3.5	0.2	260
M5Z5V1	4.8	5.1	5.4	5	60	500	1.0	2	2.0	-2.7	1.2	225
M5Z5V6	5.2	5.6	6.0	5	40	400	1.0	1	2.0	-2.0	2.5	200
M5Z6V2	5.8	6.2	6.6	5	10	100	1.0	3	4.0	0.4	3.7	185
M5Z6V8	6.4	6.8	7.2	5	15	160	1.0	2	4.0	1.2	4.5	155
M5Z7V5	7.0	7.5	7.9	5	15	160	1.0	1	5.0	2.5	5.3	140
M5Z8V2	7.7	8.2	8.7	5	15	160	1.0	0.7	5.0	3.2	6.2	135
M5Z9V1	8.5	9.1	9.6	5	15	160	1.0	0.2	7.0	3.8	7.0	130
M5Z10V	9.4	10	10.6	5	20	160	1.0	0.1	8.0	4.5	8.0	130
M5Z11V	10.4	11	11.6	5	20	160	1.0	0.1	8.0	5.4	9.0	130
M5Z12V	11.4	12	12.7	5	25	80	1.0	0.1	8.0	6.0	10	130
M5Z13V	12.4	13.25	14.1	5	30	80	1.0	0.1	8.0	7.0	11	120
M5Z15V	14.3	15	15.8	5	30	200	1.0	0.05	10.5	9.2	13	110
M5Z16V	15.3	16.2	17.1	2	40	200	1.0	0.05	11.2	10.4	14	105
M5Z18V	16.8	18	19.1	2	45	225	1.0	0.05	12.6	12.4	16	100
M5Z20V	18.8	20	21.2	2	55	225	1.0	0.05	14.0	14.4	18	85
M5Z22V	20.8	22	23.3	2	55	250	1.0	0.05	15.4	16.4	20	85
M5Z24V	22.8	24.2	25.6	2	70	120	1.0	0.05	16.8	18.4	22	80
M5Z27V	25.1	27	28.9	2	80	300	1.0	0.05	18.9	21.4	25.3	70
M5Z30V	28	30	32	2	80	300	1.0	0.05	21.0	24.4	29.4	70
M5Z33V	31	33	35	2	80	300	1.0	0.05	23.2	27.4	33.4	70
M5Z36V	34	36	38	2	90	500	1.0	0.05	25.2	30.4	37.4	70
M5Z39V	37	39	41	2	130	500	1.0	0.05	27.3	33.4	41.2	45
M5Z43V	40	43	46	1	150	500	1.0	0.05	30.1	37.6	46.6	40
M5Z47V	44	47	50	1	170	500	1.0	0.05	32.9	42.0	51.8	40
M5Z51V	48	51	54	1	180	500	1.0	0.05	35.7	46.6	57.2	40
M5Z56V	52	56	60	1	200	500	1.0	0.05	39.2	52.2	63.8	40
M5Z62V	58	62	66	1	215	500	1.0	0.05	43.4	58.8	71.6	35
M5Z68V	64	68	72	1	240	500	1.0	0.05	47.6	65.6	79.8	35
M5Z75V	70	75	79	1	255	500	1.0	0.05	52.5	73.4	88.6	35

NOTE1: Zener voltage is measured with a pulse test current I<sub>Z</sub> at an ambient temperature of 25°C.

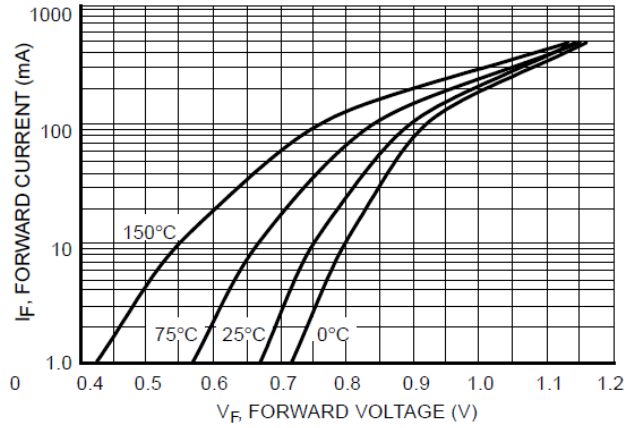


## TYPICAL PERFORMANCE CHARACTERISTICS

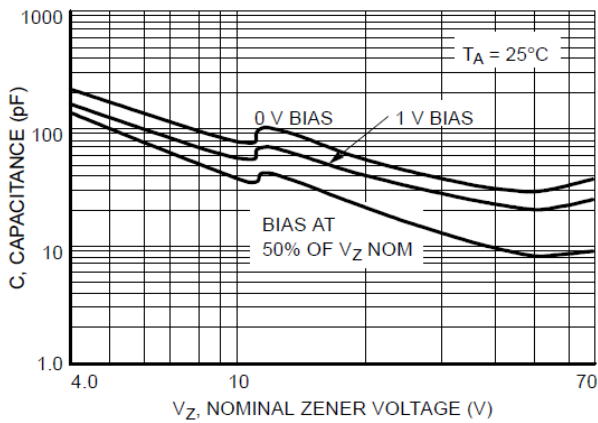
### 1. Effect of Zener Voltage on ZENER Impedance



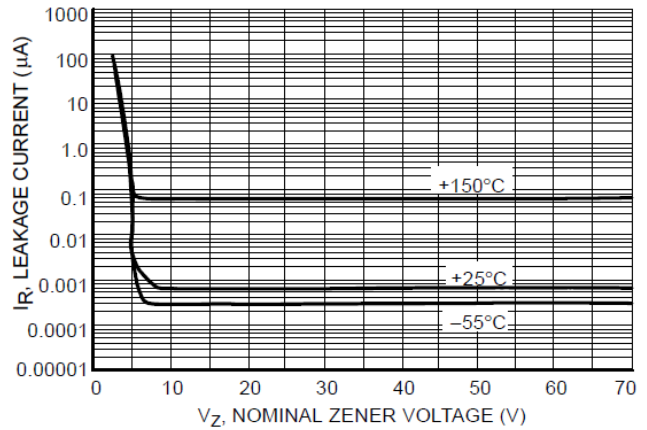
### 2. Typical Forward Voltage



### 3. Typical Capacitance

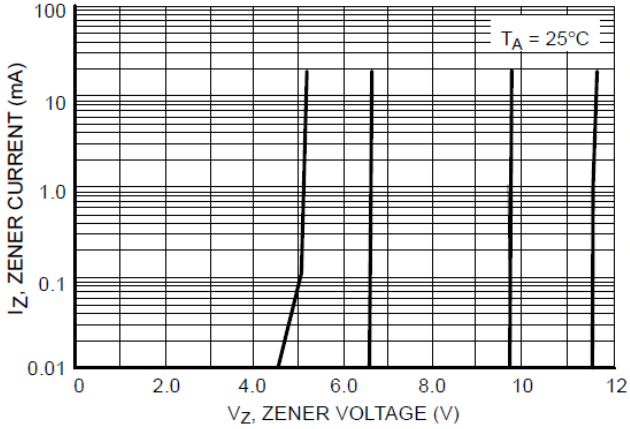


### 4. Typical Leakage Current

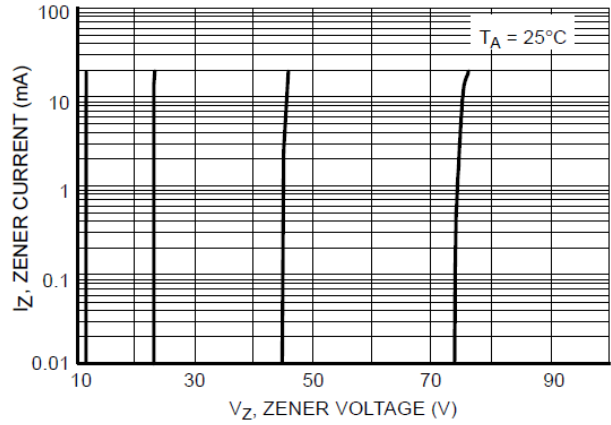




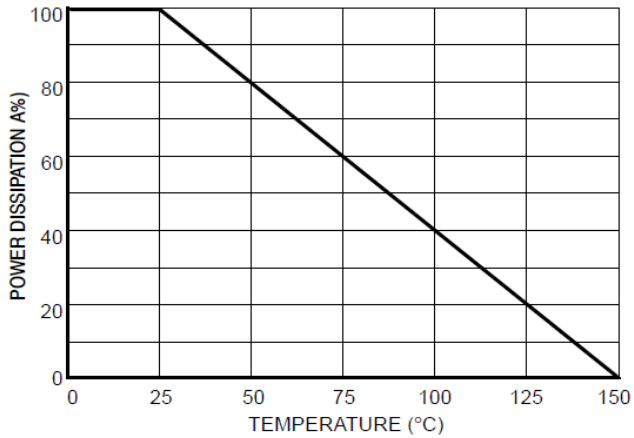
5. ZENER Voltage vs. Zener Current ( $V_Z$  Up to 12V)



6. Zener Voltage vs. Zener Current (12V to 75V)



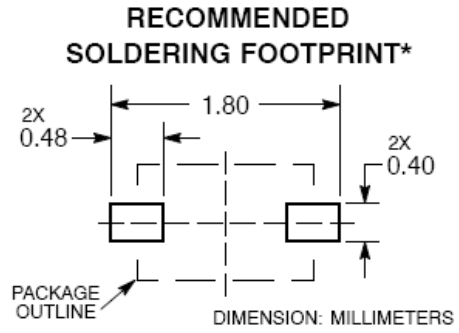
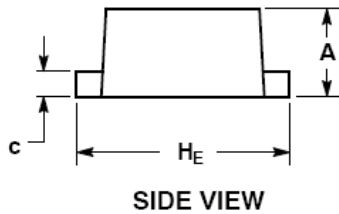
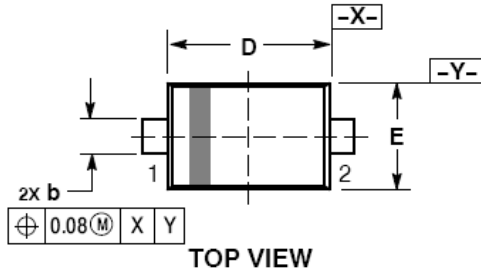
7. Steady State Power Derating





**PACKAGE INFORMATION**

Dimension in SOD-523 Package (Unit: mm)



DIM	MILLIMETERS	
	MIN	MAX
A	0.50	0.70
b	0.25	0.35
c	0.07	0.20
D	1.10	1.30
E	0.70	0.90
H <sub>E</sub>	1.50	1.70
L	0.30 REF	
L2	0.15	0.25



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