

Description

1SMB59 Series Zener Diodes are excellent voltage stabilization devices.

The Series is designed specifically for Voltage stabilization, Voltage regulation, and so on.



SMB (DO-214AA)

Features

- For surface mounted applications
- Low Zener impedance
- Low regulation factor
- Epoxy resin package
- RoHS Compliant

Mechanical Characteristics

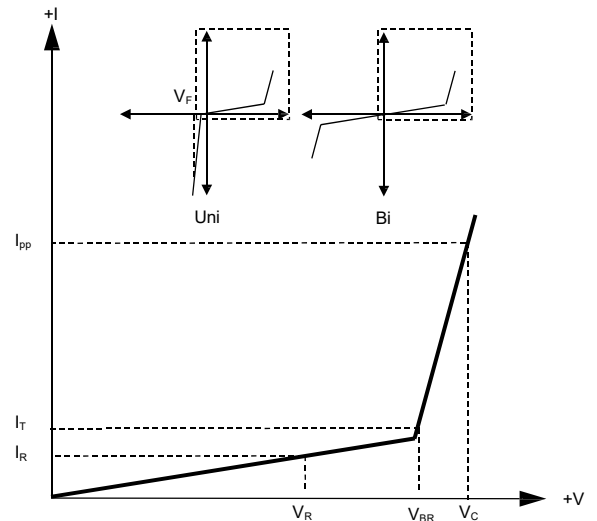
- Package: SMB (DO-214AA) plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Voltage stabilization
- Voltage regulation

Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current)
V_{BR}	Breakdown Voltage - Maximum voltage that flows through the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Units	Remarks
Power Dissipation @ $T_L=75^\circ\text{C}$	P_D	3	W	
Maximum Forward Voltage @ $I_F=200\text{mA}$	V_F	1.5	V	
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	20	$^\circ\text{C/W}$	
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	220	$^\circ\text{C/W}$	
Operating Temperature Range	T_J	-55 to 150	$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$	

Electrical Characteristics (TA=25°C unless otherwise)

Part Number	Marking Code	Zener Voltage			Test Current	Maximum Zener Impedance			Maximum Reverse Current		Maximum Zener Current
		$V_Z @ I_{ZT}$				$Z_{ZT} @ I_{ZT}$	$Z_{ZK} @ I_{ZK}$		$I_R @ V_R$		
		Nom (V)	Min (V)	Max (V)	mA	Ω	Ω	mA	μA	V	mA
1SMB5913B	913B	3.3	3.13	3.47	113.6	10	500	1	100	1	454
1SMB5914B	914B	3.6	3.42	3.78	104.2	9	500	1	75	1	416
1SMB5915B	915B	3.9	3.70	4.10	96.1	7.5	500	1	25	1	384
1SMB5916B	916B	4.3	4.08	4.52	87.2	6	500	1	5	1	348
1SMB5917B	917B	4.7	4.46	4.94	79.8	5	500	1	5	1.5	319
1SMB5918B	918B	5.1	4.84	5.36	73.5	4	350	1	5	2	294
1SMB5919B	919B	5.6	5.32	5.88	66.9	2	250	1	5	3	267
1SMB5920B	920B	6.2	5.89	6.51	60.5	2	200	1	5	4	241
1SMB5921B	921B	6.8	6.46	7.14	55.1	2.5	200	1	5	5.2	220
1SMB5922B	922B	7.5	7.12	7.88	50	3	400	0.5	5	6	200
1SMB5923B	923B	8.2	7.79	8.61	45.7	3.5	400	0.5	5	6.5	182
1SMB5924B	924B	9.1	8.64	9.56	41.2	4	500	0.5	5	7	164
1SMB5925B	925B	10	9.5	10.5	37.5	4.5	500	0.25	5	8	150
1SMB5926B	926B	11	10.45	11.55	34.1	5.5	550	0.25	1	8.4	136
1SMB5927B	927B	12	11.4	12.6	31.2	6.5	550	0.25	1	9.1	125
1SMB5928B	928B	13	12.35	13.65	28.8	7	550	0.25	1	9.9	115
1SMB5929B	929B	15	14.25	15.75	25	9	600	0.25	1	11.4	100
1SMB5930B	930B	16	15.2	16.8	23.4	10	600	0.25	1	12.2	93
1SMB5931B	931B	18	17.1	18.9	20.8	12	650	0.25	1	13.7	83
1SMB5932B	932B	20	19	21	18.7	14	650	0.25	1	15.2	75
1SMB5933B	933B	22	20.9	23.1	17	17.5	650	0.25	1	16.7	68
1SMB5934B	934B	24	22.8	25.2	15.6	19	700	0.25	1	18.2	62
1SMB5935B	935B	27	25.65	28.35	13.9	23	700	0.25	1	20.6	55
1SMB5936B	936B	30	28.5	31.5	12.5	28	750	0.25	1	22.8	50
1SMB5937B	937B	33	31.35	34.65	11.4	33	800	0.25	1	25.1	45
1SMB5938B	938B	36	34.2	37.8	10.4	38	850	0.25	1	27.4	41
1SMB5939B	939B	39	37.05	40.95	9.6	45	900	0.25	1	29.7	38
1SMB5940B	940B	43	40.85	45.15	8.7	53	950	0.25	1	32.7	34
1SMB5941B	941B	47	44.65	49.35	8	67	1000	0.25	1	35.8	31
1SMB5942B	942B	51	48.45	53.55	7.3	70	1100	0.25	1	38.8	29
1SMB5943B	943B	56	53.2	58.8	6.7	86	1300	0.25	1	42.6	26
1SMB5944B	944B	62	58.9	65.1	6	100	1500	0.25	1	47.1	24

The accuracy of voltage regulator is 5%

Electrical Characteristics (TA=25°C unless otherwise)

Part Number	Marking Code	Zener Voltage			Test Current	Maximum Zener Impedance			Maximum Reverse Current		Maximum Zener Current
		V _Z @ I _{ZT}				Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}		I _R @ V _R		
		Nom (V)	Min (V)	Max (V)	mA	Ω	Ω	mA	μA	V	mA
1SMB5945B	945B	68	64.6	71.4	5.5	120	1700	0.25	1	51.7	22
1SMB5946B	946B	75	71.25	78.75	5	140	2000	0.25	1	56	20
1SMB5947B	947B	82	77.9	86.1	4.6	160	2500	0.25	1	62.2	18
1SMB5948B	948B	91	86.45	95.55	4.1	200	3000	0.25	1	69.2	16
1SMB5949B	949B	100	95	105	3.7	250	3100	0.25	1	76	15
1SMB5951B	951B	120	114	126	3.1	380	4500	0.25	1	91.2	12
1SMB5952B	952B	130	123.5	136.5	2.9	450	5000	0.25	1	98.8	11
1SMB5953B	953B	150	142.5	157.5	2.5	600	6000	0.25	1	114	10
1SMB5954B	954B	160	152	168	2.3	700	6500	0.25	1	121.6	9
1SMB5955B	955B	180	171	189	2.1	900	7000	0.25	1	136.8	8
1SMB5956B	956B	200	190	210	1.9	1200	8000	0.25	1	152	7

The accuracy of voltage regulator is 5%

Rating And Characteristic Curves (TA=25°C unless otherwise noted)

FIG 1: Power Temperature Derating Curve

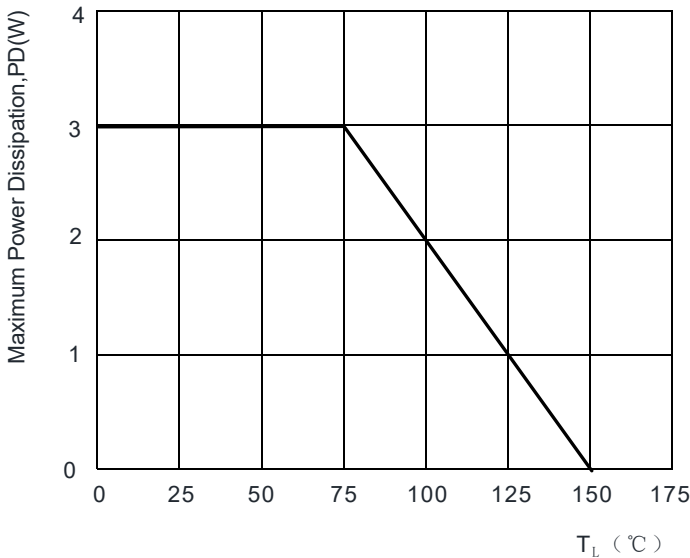


FIG2: Temperature Coefficients v.s. Zener Voltage

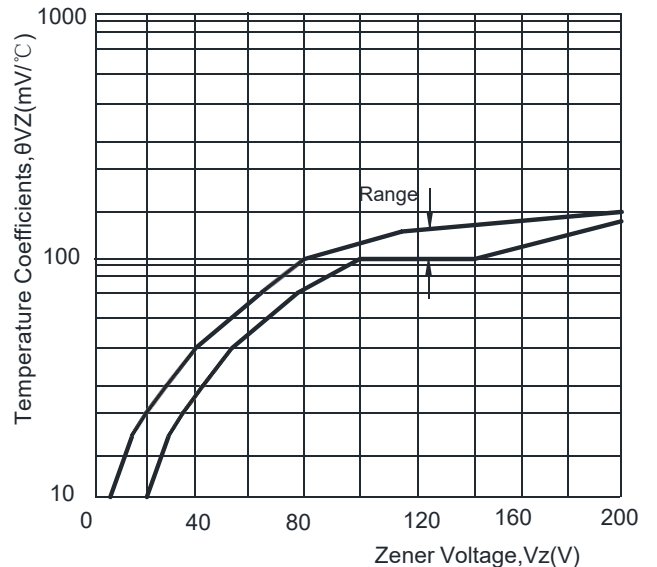


FIG3: Pulse Waveform

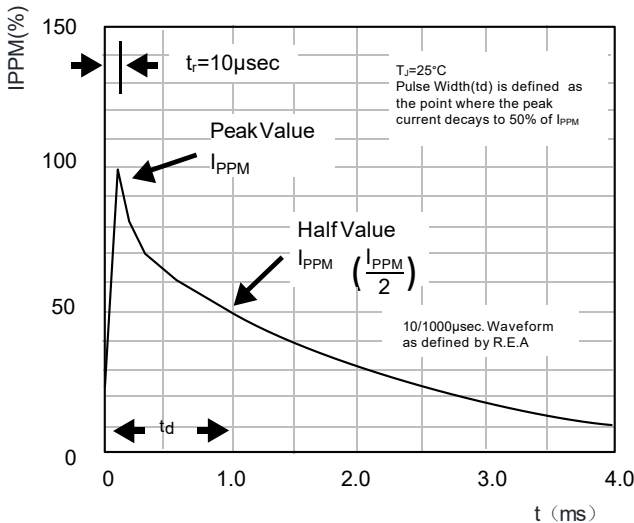
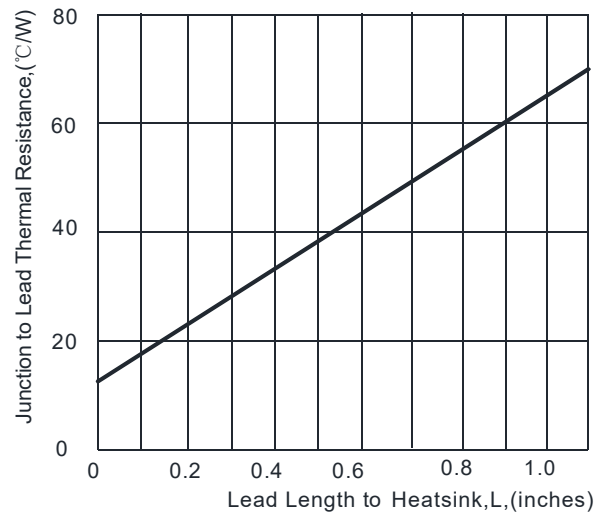
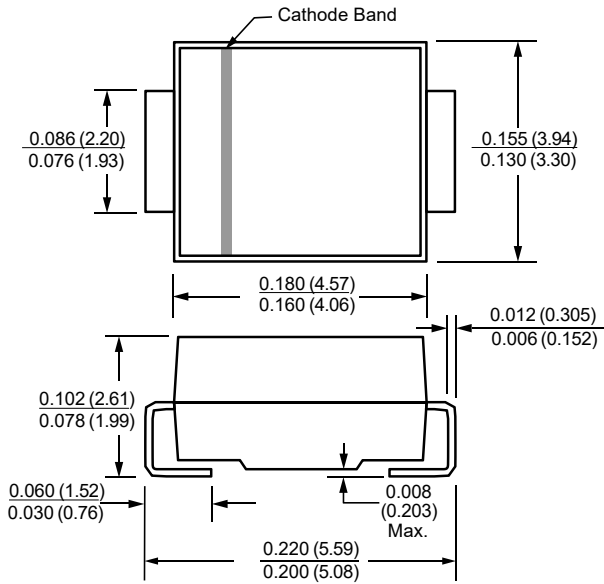


FIG 4: Typical Thermal Resistance v.s. Lead Length

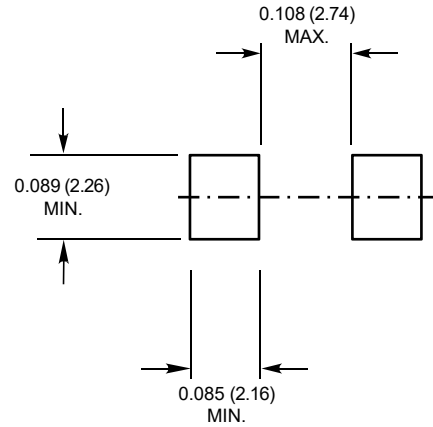


Package Outline Dimensions in inches (millimeters)

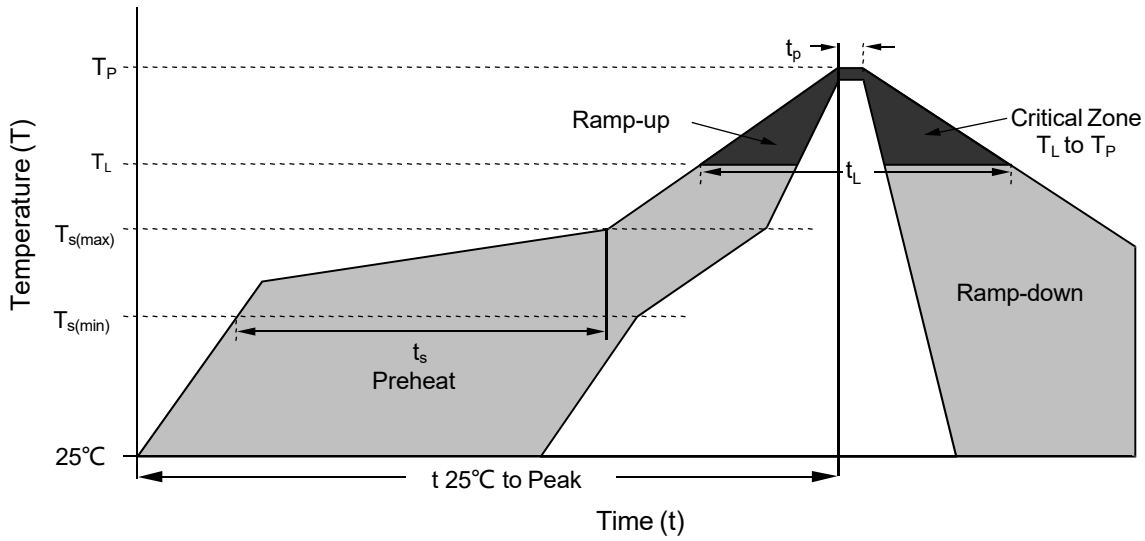
SMB (DO-214AA)



Mounting Pad Layout

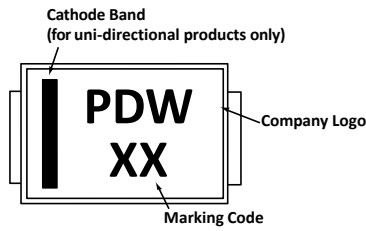


Soldering Parameters



Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 – 150 secs
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C

Part Marking System



Summary of Packing Options

Package	Packing Description	Packing Quantity
SMB	Tape/Reel, 13" reel	3000

Tape and Reel Specification

