

Description

1SMA59 Series Zener Diodes are excellent voltage stabilization devices.

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



SMA (DO-214AC)

Features

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

Mechanical Characteristics

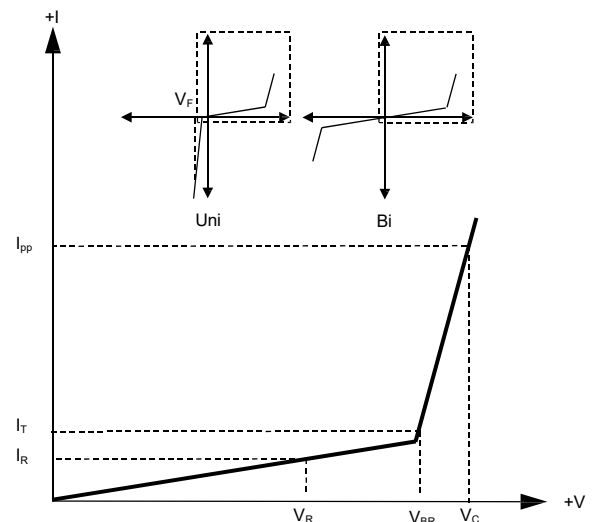
- Package: SMA (DO-214AC) plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

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 though 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	1.5	W	
Maximum Forward Voltage @ $I_F=200\text{mA}$	V_F	1.5	V	
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	100	$^\circ\text{C/W}$	
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
1SMA5913A	913A	3.3	3.14	3.47	113.6	10.0	500	1.00	100.0	1.0	455.0
1SMA5914A	914A	3.6	3.42	3.78	104.2	9.0	500	1.00	100.0	1.0	417.0
1SMA5915A	915A	3.9	3.71	4.10	96.1	7.5	500	1.00	50.0	1.0	385.0
1SMA5916A	916A	4.3	4.09	4.52	87.2	6.0	500	1.00	10.0	1.0	349.0
1SMA5917A	917A	4.7	4.47	4.94	79.8	5.0	500	1.00	10.0	1.5	319.0
1SMA5918A	918A	5.1	4.85	5.36	73.5	4.0	350	1.00	10.0	2.0	294.0
1SMA5919A	919A	5.6	5.32	5.88	66.9	2.0	250	1.00	10.0	3.0	268.0
1SMA5920A	920A	6.2	5.89	6.51	60.5	2.0	200	1.00	10.0	4.0	242.0
1SMA5921A	921A	6.8	6.46	7.14	55.1	2.5	200	1.00	10.0	5.2	221.0
1SMA5922A	922A	7.5	7.13	7.88	50.0	3.0	400	0.50	10.0	6.0	200.0
1SMA5923A	923A	8.2	7.79	8.61	45.7	3.5	400	0.50	10.0	6.5	183.0
1SMA5924A	924A	9.1	8.65	9.56	41.2	4.0	500	0.50	10.0	7.0	165.0
1SMA5925A	925A	10.0	9.50	10.50	37.5	4.5	500	0.25	10.0	8.0	150.0
1SMA5926A	926A	11.0	10.45	11.55	34.1	5.5	550	0.25	0.5	8.4	136.0
1SMA5927A	927A	12.0	11.40	12.60	31.2	6.5	550	0.25	0.5	9.1	125.0
1SMA5928A	928A	13.0	12.35	13.65	28.8	7.0	550	0.25	0.5	9.9	115.0
1SMA5929A	929A	15.0	14.25	15.75	25.0	9.0	600	0.25	0.5	11.4	100.0
1SMA5930A	930A	16.0	15.20	16.80	23.4	10.0	600	0.25	0.5	12.2	94.0
1SMA5931A	931A	18.0	17.10	18.90	20.8	12.0	650	0.25	0.5	13.7	83.0
1SMA5932A	932A	20.0	19.00	21.00	18.7	14.0	650	0.25	0.5	15.2	75.0
1SMA5933A	933A	22.0	20.90	23.10	17.0	17.5	650	0.25	0.5	16.7	68.0
1SMA5934A	934A	24.0	22.80	25.20	15.6	19.0	700	0.25	0.5	18.2	63.0
1SMA5935A	935A	27.0	25.65	28.35	13.9	23.0	700	0.25	0.5	20.6	56.0
1SMA5936A	936A	30.0	28.50	31.50	12.5	26.0	750	0.25	0.5	22.8	50.0
1SMA5937A	937A	33.0	31.35	34.65	11.4	33.0	800	0.25	0.5	25.1	45.0
1SMA5938A	938A	36.0	34.20	37.80	10.4	38.0	850	0.25	0.5	27.4	42.0
1SMA5939A	939A	39.0	37.05	40.95	9.6	45.0	900	0.25	0.5	29.7	38.0
1SMA5940A	940A	43.0	40.85	45.15	8.7	53.0	950	0.25	0.5	32.7	35.0
1SMA5941A	941A	47.0	44.65	49.35	8.0	67.0	1000	0.25	0.5	35.8	32.0
1SMA5942A	942A	51.0	48.45	53.55	7.3	70.0	1100	0.25	0.5	38.8	29.0
1SMA5943A	943A	56.0	53.20	58.80	6.7	86.0	1300	0.25	0.5	42.6	27.0
1SMA5944A	944A	62.0	58.90	65.10	6.0	100.0	1500	0.25	0.5	47.1	24.0

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}			I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}		I _R @ V _R		I _{ZM}
		Nom (V)	Min (V)	Max (V)	mA	Ω	Ω	mA	μA	V	mA
1SMA5945A	945A	68.0	64.60	71.40	5.5	120.0	1700	0.25	0.5	51.7	22.0
1SMA5946A	946A	75.0	71.25	78.75	5.0	140.0	2000	0.25	0.5	56.0	20.0
1SMA5947A	947A	82.0	77.90	86.10	4.6	160.0	2500	0.25	0.5	62.2	18.0
1SMA5948A	948A	91.0	86.45	95.55	4.1	200.0	3000	0.25	0.5	69.2	16.0
1SMA5949A	949A	100.0	95.00	105.00	3.7	250.0	3100	0.25	0.5	76.0	15.0
1SMA5950A	950A	110.0	104.50	115.50	3.4	300.0	4000	0.25	0.5	83.6	14.0
1SMA5951A	951A	120.0	114.00	126.00	3.1	380.0	4500	0.25	0.5	91.2	13.0
1SMA5952A	952A	130.0	123.50	136.50	2.9	450.0	5000	0.25	0.5	98.8	12.0
1SMA5953A	953A	150.0	142.50	157.50	2.5	600.0	6000	0.25	0.5	114.0	10.0
1SMA5954A	954A	160.0	152.00	168.00	2.3	700.0	6500	0.25	0.5	121.6	9.4
1SMA5955A	955A	180.0	171.00	189.00	2.1	900.0	7000	0.25	0.5	136.8	8.3
1SMA5956A	956A	200.0	190.00	210.00	1.9	1200.0	8000	0.25	0.5	152.0	7.5

The accuracy of voltage regulator is 5%

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

FIG 1: Power Temperature Derating Curve

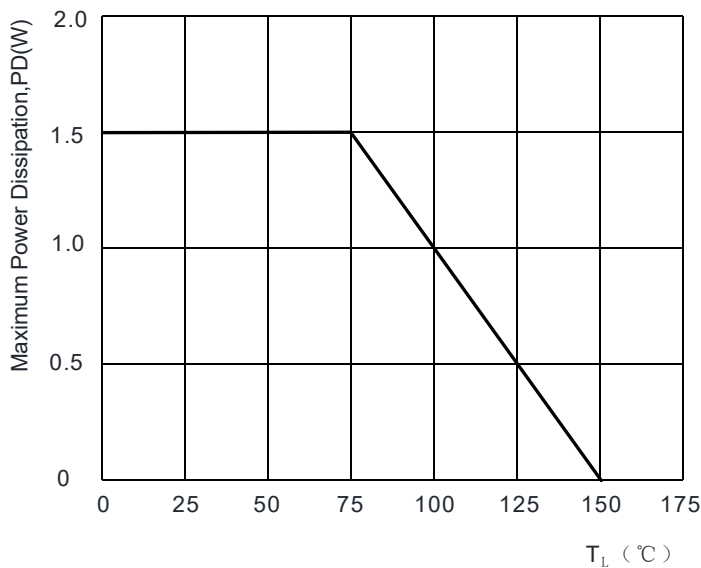


FIG2: Temperature Coefficients v.s. Zener Voltage

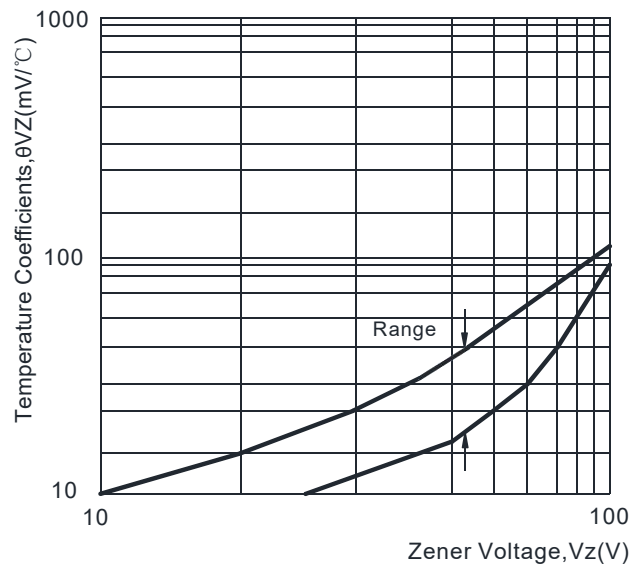


FIG3: Typical Thermal Resistance v.s. Lead Length

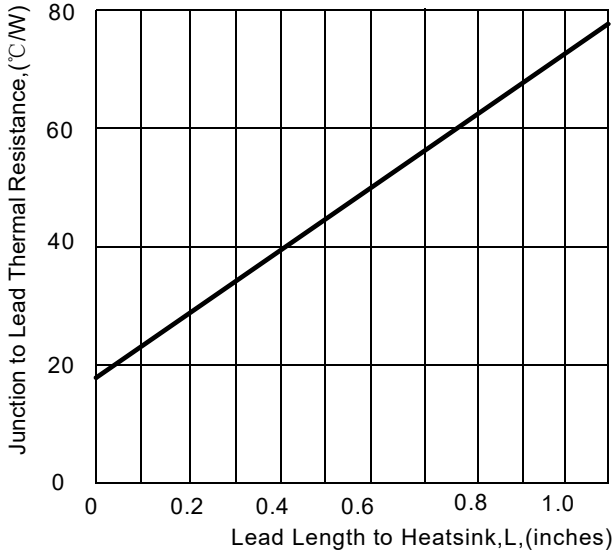
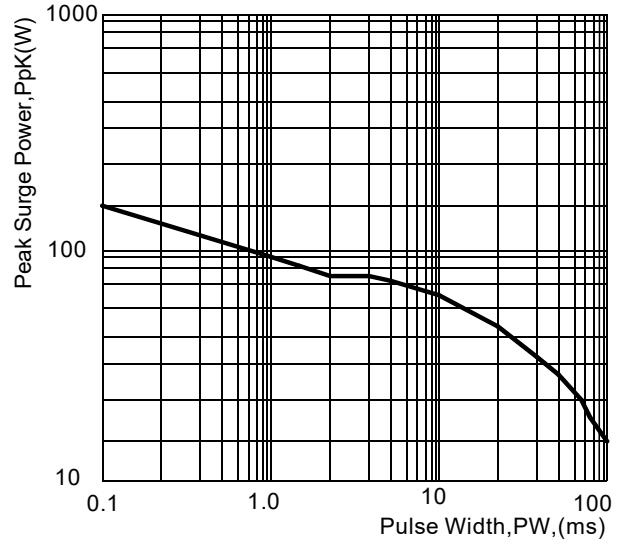
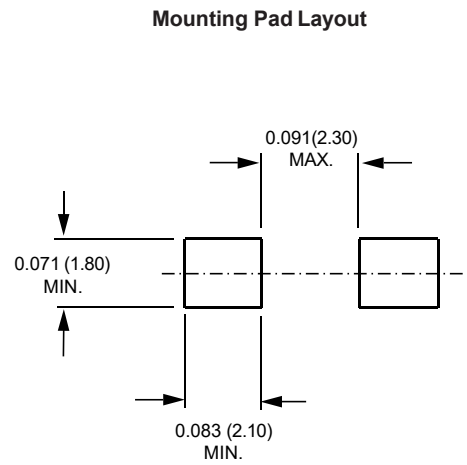
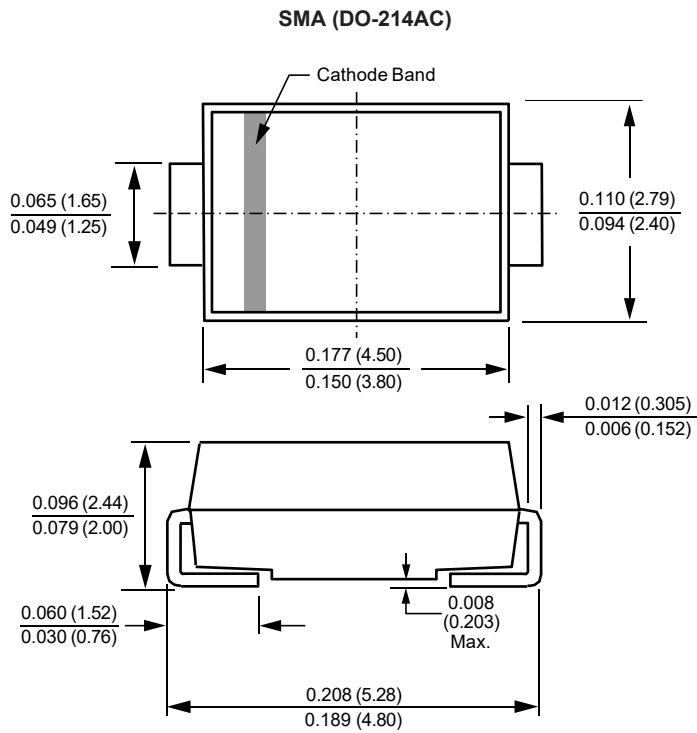


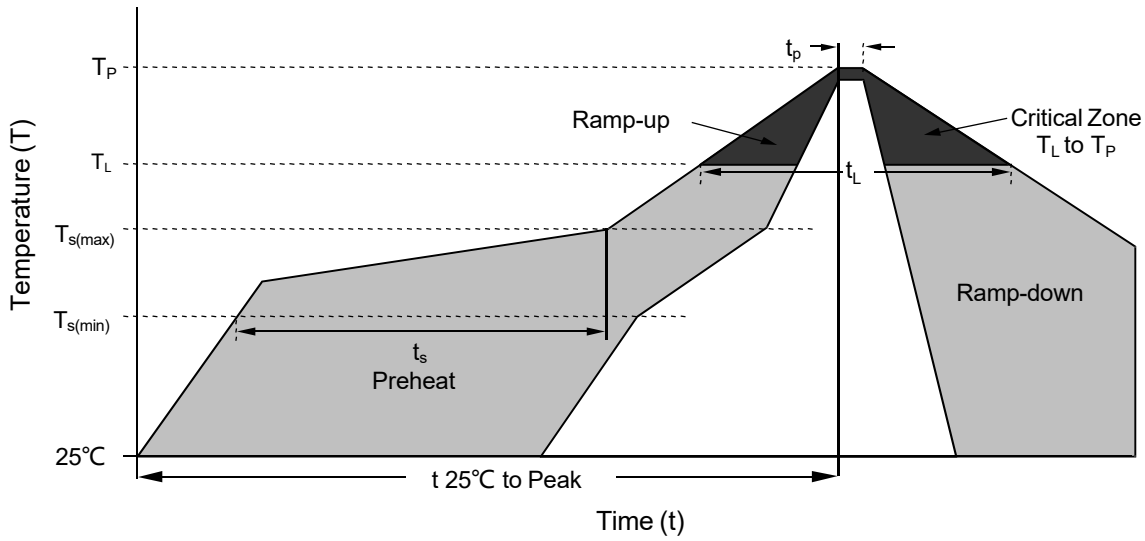
FIG4: Maximum Surge Power



Package Outline Dimensions in inches (millimeters)

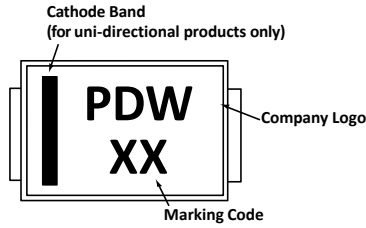


Soldering Parameters



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
SMA	Tape/Reel, 7" reel	1800
	Tape/Reel, 13" reel	7500

Tape and Reel Specification

