Zener Diodes with Surge Current Specification



SMA (DO-214AC)

FEATURES

- High reliability
- Stand-off voltage range 8.2 V to 220 V
- Excellent clamping capability
- Fast response time
- AEC-Q101 qualified available
- Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
- Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT HALOGEN FREE

APPLICATIONS

- Protection from high voltage, high energy transients

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V_Z range nom.	10 to 270	V
Test current I_{ZT}	2 to 50	mA
V_{BR}	9.4 to 251	V
V_{WM}	8.2 to 220	V
P_{PPM}	300	W
T_J max.	150	°C
V_Z specification	Pulse current	
Circuit configuration	Single	
Polarity	Uni-directional	

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZG04-M-series	BZG04xxx-M3-08	1500 per 7" reel	6000/box
BZG04-M-series	BZG04xxx-M3-18	6000 per 13" reel	6000/box
BZG04-M-series	BZG04xxx-HM3-08	1500 per 7" reel	6000/box
BZG04-M-series	BZG04xxx-HM3-18	6000 per 13" reel	6000/box

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SMA (DO-214AC)	73 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	R_{thJA} < 25 K/W, T_{amb} = 100 °C	P_{tot}	3000	mW
	R_{thJA} < 100 K/W, T_{amb} = 50 °C	P_{tot}	1250	mW
Non repetitive peak surge power dissipation	t_p = 10/1000 µs exp. pulse, T_j = 25 °C prior to surge	P_{ZSM}	300	W
Peak forward surge current	10 ms single half sine wave	I_{FSM}	50	A
Junction to lead		R_{thJL}	25	K/W
Junction to ambient air	Mounted on epoxy-glass hard tissue, fig. 1a	R_{thJA}	150	K/W
	Mounted on epoxy-glass hard tissue, fig. 1b	R_{thJA}	125	K/W
	Mounted on Al-oxide-ceramic (Al_2O_3), fig. 1b	R_{thJA}	100	K/W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Forward voltage (max.)	I_F = 0.5 A	V_F	1.2	V

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ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

PART NUMBER	ZENER VOLTAGE RANGE	TEST CURRENT	STAND OFF VOLTAGE		BREAKDOWN VOLTAGE	CLAMPING VOLTAGE (1)		TEMPERATURE COEFFICIENT		JUNCTION CAPACITANCE
	V_Z at I_{ZT1}	I_{ZT1}	V_R at I_R		$V_{(BR)}$ at I_{ZT1}	$V_{CL(R)}$ at I_{PP}	I_{PP}	TK_{VZ} at I_{ZT1}		C_j at V_R = 0 V, f = 1 MHZ
	V	mA	V	µA	V	V	A	%/K		pF
	NOM.			MAX.	MIN.	MIN.		TYP.	MAX.	TYP.
BZG04-8V2-M	10	50	8.2	20	9.4	14.8	20.3	0.05	0.09	1200
BZG04-9V1-M	11	50	9.1	5	10.4	15.7	19.1	0.05	0.1	1100
BZG04-10-M	12	50	10	5	11.4	17	17.7	0.05	0.1	1000
BZG04-11-M	13	50	11	5	12.4	18.9	15.9	0.05	0.1	850
BZG04-12-M	15	50	12	5	13.8	20.9	14.4	0.05	0.1	815
BZG04-13-M	16	25	13	5	15.3	22.9	13.1	0.06	0.11	785
BZG04-15-M	18	25	15	5	16.8	25.6	11.7	0.06	0.11	710
BZG04-16-M	20	25	16	5	18.8	28.4	10.6	0.06	0.11	655
BZG04-18-M	22	25	18	5	20.8	31	9.7	0.06	0.11	610
BZG04-20-M	24	25	20	5	22.8	33.8	8.9	0.06	0.11	570
BZG04-22-M	27	25	22	5	25.1	38.1	7.9	0.06	0.11	545
BZG04-24-M	30	25	24	5	28	42.2	7.1	0.06	0.11	505
BZG04-27-M	33	25	27	5	31	46.2	6.5	0.06	0.11	475
BZG04-30-M	36	10	30	5	34	50.1	6	0.06	0.11	450
BZG04-33-M	39	10	33	5	37	54.1	5.5	0.06	0.11	420
BZG04-36-M	43	10	36	5	40	60.7	4.9	0.07	0.12	390
BZG04-39-M	47	10	39	5	44	65.5	4.6	0.07	0.12	370
BZG04-43-M	51	10	43	5	48	70.8	4.2	0.07	0.12	350
BZG04-47-M	56	10	47	5	52	78.6	3.8	0.07	0.12	330
BZG04-51-M	62	10	51	5	58	86.5	3.5	0.08	0.13	310
BZG04-56-M	68	10	56	5	64	94.4	3.2	0.08	0.13	291
BZG04-62-M	75	10	62	5	70	103.5	2.9	0.08	0.13	280
BZG04-68-M	82	10	68	5	77	114	2.6	0.08	0.13	275
BZG04-75-M	91	5	75	5	85	126	2.4	0.09	0.13	260
BZG04-82-M	100	5	82	5	94	139	2.2	0.09	0.13	250
BZG04-91-M	110	5	91	5	104	152	2	0.09	0.13	243
BZG04-100-M	120	5	100	5	114	167	1.8	0.09	0.13	170
BZG04-110-M	130	5	110	5	124	185	1.6	0.09	0.13	153
BZG04-120-M	150	5	120	5	138	204	1.5	0.09	0.13	150
BZG04-130-M	160	5	130	5	153	224	1.3	0.09	0.13	145
BZG04-150-M	180	5	150	5	168	249	1.2	0.09	0.13	140
BZG04-160-M	200	5	160	5	188	276	1.1	0.09	0.13	135
BZG04-180-M	220	2	180	5	208	305	1	0.09	0.13	131
BZG04-200-M	240	2	200	5	228	336	0.9	0.09	0.13	122
BZG04-220-M	270	2	220	5	251	380	0.8	0.09	0.13	120

Note

(1) 10/1000 µs pulse

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BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

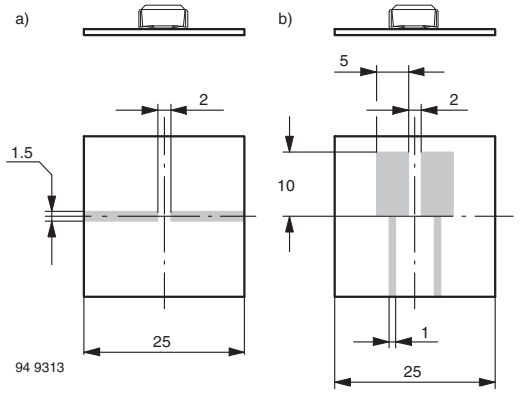


Fig. 1 - Boards for R_{thJA} Definition (Copper Overlay 35 µ)

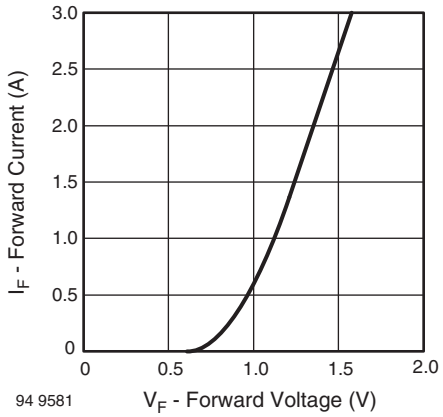


Fig. 3 - Forward Current vs. Forward Voltage

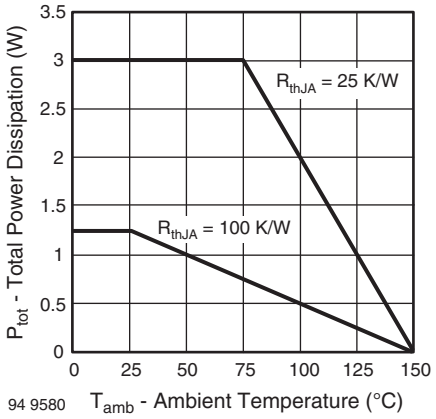


Fig. 2 - Typ. Total Power Dissipation vs. Ambient Temperature

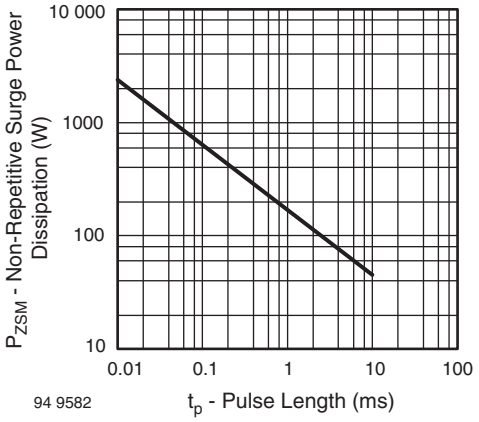


Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

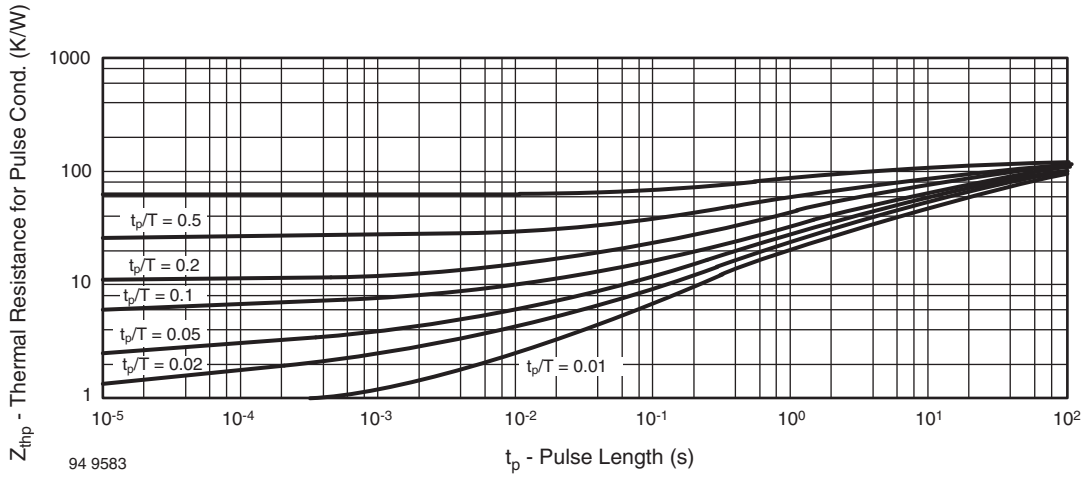
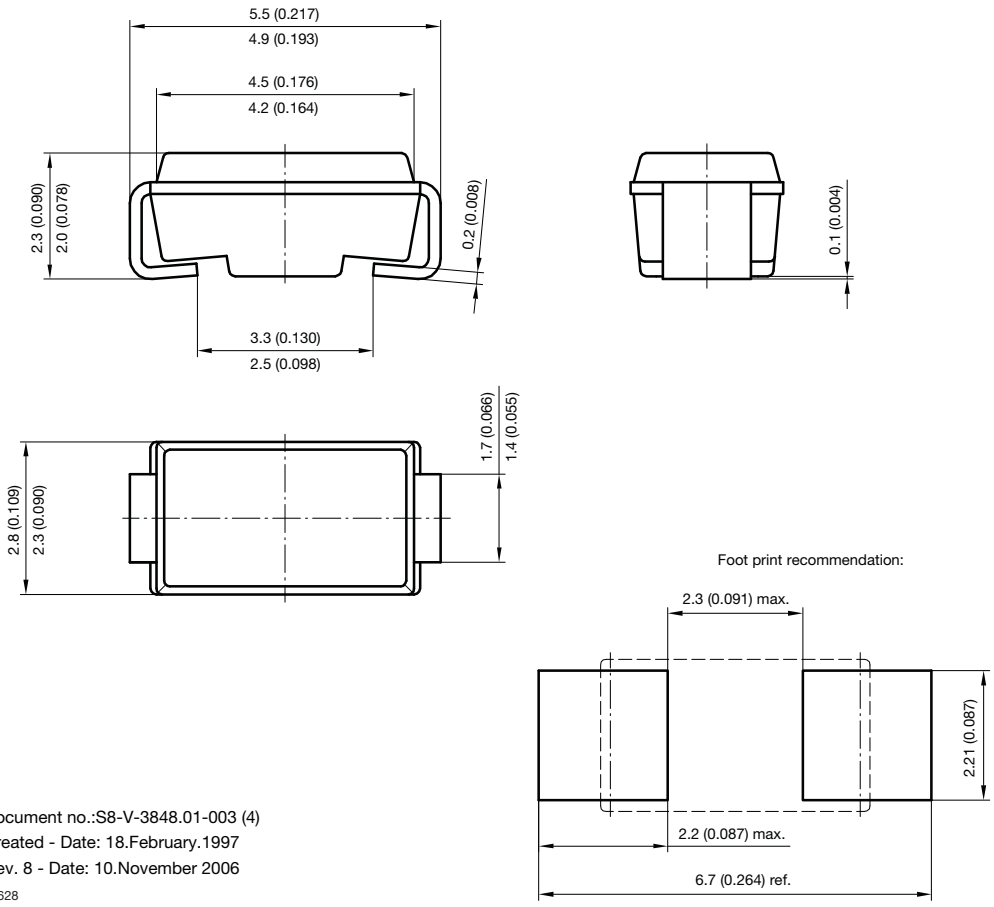


Fig. 5 - Thermal Response

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PACKAGE DIMENSIONS in millimeters (inches): **SMA (DO-214AC)**



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