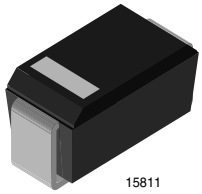
THE DATASHEET OF

BZG04-51TR3

Zener Diodes with Surge Current Specification

Features

- Glass passivated junction
- High reliability
- Stand-off Voltage range 8.2 V to 220 V
- Excellent clamping cabability
- Fast response time (typ. ≤ 1 ps from 0 to V_{Zmin})
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



Applications

Protection from high voltage, high energy transients

Mechanical Data

Case: DO-214AC
Weight: approx. 77 mg
Packaging Codes/Options:
TR / 1.5 k 7 " reel
TR3 / 6 k 13 " reel 6 k/box

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_{diss}	3	W
	R_{thJA} < 100 K/W, T_{amb} = 50 °C	P_{diss}	1.25	W
Non repetitive peak surge power dissipation	t_p = 10/1000 µs sq.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 temperature		T_j	150	°C
Storage temperature range		T_{stg}	- 65 to + 150	°C

Thermal Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Junction lead		R_{thJL}	25	K/W
Junction ambient	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-oxid-ceramic (Al_2O_3), Fig. 1b	R_{thJA}	100	K/W

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	I_F = 0.5 A	V_F			1.2	V

Electrical Characteristics

Partnumber	Standoff Voltage		Breakdown Voltage		TK_{VZ} @ I_R		Clamping Voltage		Junction Capacitance
	V_R	I_R	$V_{(BR)}$ @ I_R				$V_{CL(R)}$ @ I_{PP}	@ I_{ZT}	C_j @ V_R = 0 V, f = 1 MHz
	V	µA	V	mA	%/K		V *)	A *)	pF
		max	min		typ	max	max		typ
BZG04-8V2	8.2	20	9.4	50	0.05	0.09	14.8	20.3	1200
BZG04-9V1	9.1	5	10.4	50	0.05	0.1	15.7	19.1	1100
BZG04-10	10	5	11.4	50	0.05	0.1	17	17.7	1000
BZG04-11	11	5	12.4	50	0.05	0.1	18.9	15.9	850
BZG04-12	12	5	13.8	50	0.05	0.1	20.9	14.4	815
BZG04-13	13	5	15.3	25	0.06	0.11	22.9	13.1	785
BZG04-15	15	5	16.8	25	0.06	0.11	25.6	11.7	710
BZG04-16	16	5	18.8	25	0.06	0.11	28.4	10.6	655
BZG04-18	18	5	20.8	25	0.06	0.11	31	9.7	610
BZG04-20	20	5	22.8	25	0.06	0.11	33.8	8.9	570
BZG04-22	22	5	25.1	25	0.06	0.11	38.1	7.9	545
BZG04-24	24	5	28	25	0.06	0.11	42.2	7.1	505
BZG04-27	27	5	31	25	0.06	0.11	46.2	6.5	475
BZG04-30	30	5	34	10	0.06	0.11	50.1	6.0	450
BZG04-33	33	5	37	10	0.06	0.11	54.1	5.5	420
BZG04-36	36	5	40	10	0.07	0.12	60.7	4.9	390
BZG04-39	39	5	44	10	0.07	0.12	65.5	4.6	370
BZG04-43	43	5	48	10	0.07	0.12	70.8	4.2	350
BZG04-47	47	5	52	10	0.07	0.12	78.6	3.8	330
BZG04-51	51	5	58	10	0.08	0.13	86.5	3.5	310
BZG04-56	56	5	64	10	0.08	0.13	94.4	3.2	291
BZG04-62	62	5	70	10	0.08	0.13	103.5	2.9	280
BZG04-68	68	5	77	10	0.08	0.13	114	2.6	275
BZG04-75	75	5	85	5	0.09	0.13	126	2.4	260
BZG04-82	82	5	94	5	0.09	0.13	139	2.2	250
BZG04-91	91	5	104	5	0.09	0.13	152	2.0	243
BZG04-100	100	5	114	5	0.09	0.13	167	1.8	170
BZG04-110	110	5	124	5	0.09	0.13	185	1.6	153
BZG04-120	120	5	138	5	0.09	0.13	204	1.5	150
BZG04-130	130	5	153	5	0.09	0.13	224	1.3	145
BZG04-150	150	5	168	5	0.09	0.13	249	1.2	140
BZG04-160	160	5	188	5	0.09	0.13	276	1.1	135
BZG04-180	180	5	208	2	0.09	0.13	305	1.0	131
BZG04-200	200	5	228	2	0.09	0.13	336	0.9	122
BZG04-220	220	5	251	2	0.09	0.13	380	0.8	120

*) 10/1000 µs pulse

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

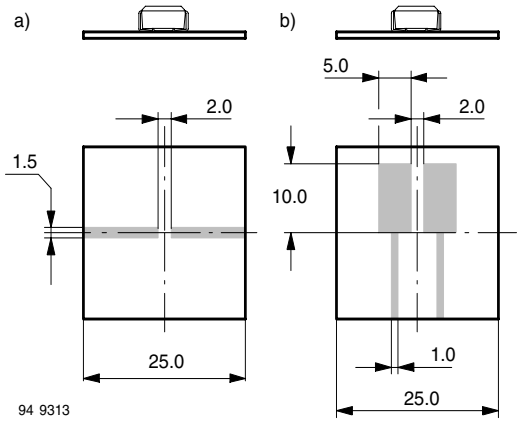


Figure 1. Boards for R_{thJA} definition (copper overlay 35µ)

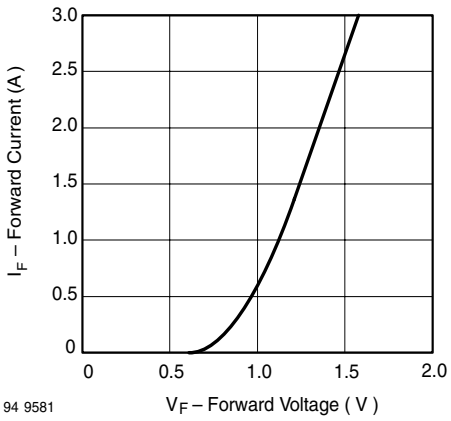


Figure 3. Forward Current vs. Forward Voltage

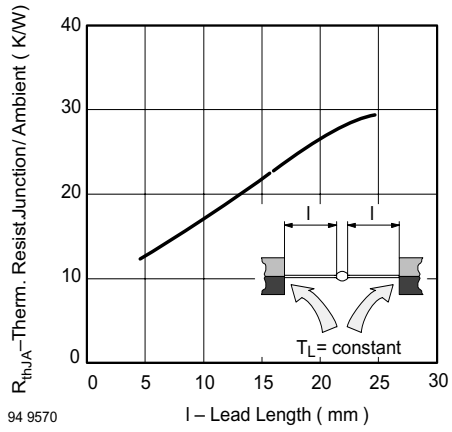


Figure 2. Typ. Thermal Resistance vs. Lead Length

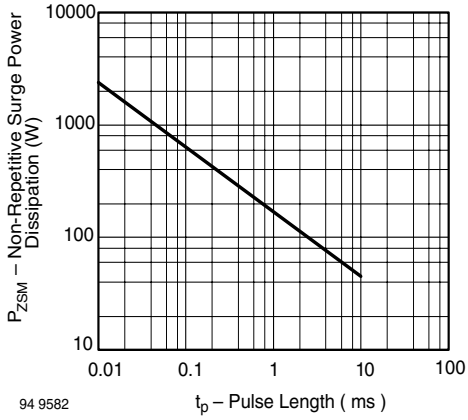


Figure 4. Non Repetitive Surge Power Dissipation vs. Pulse Length

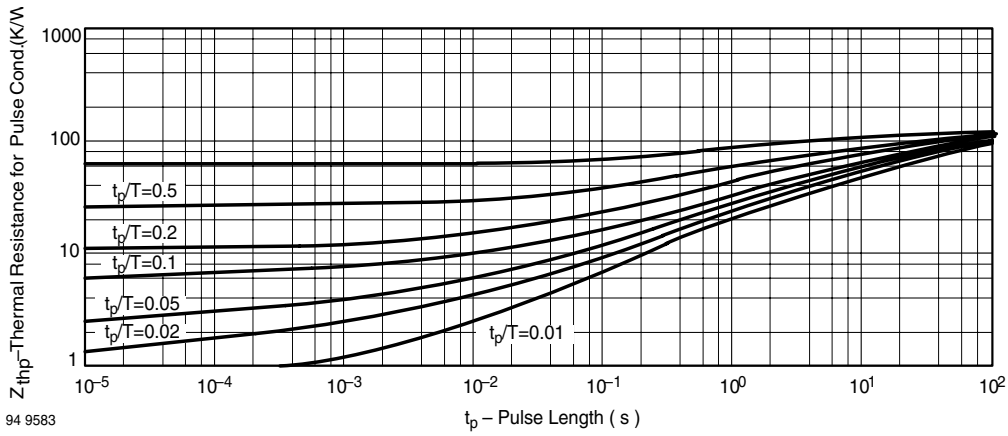
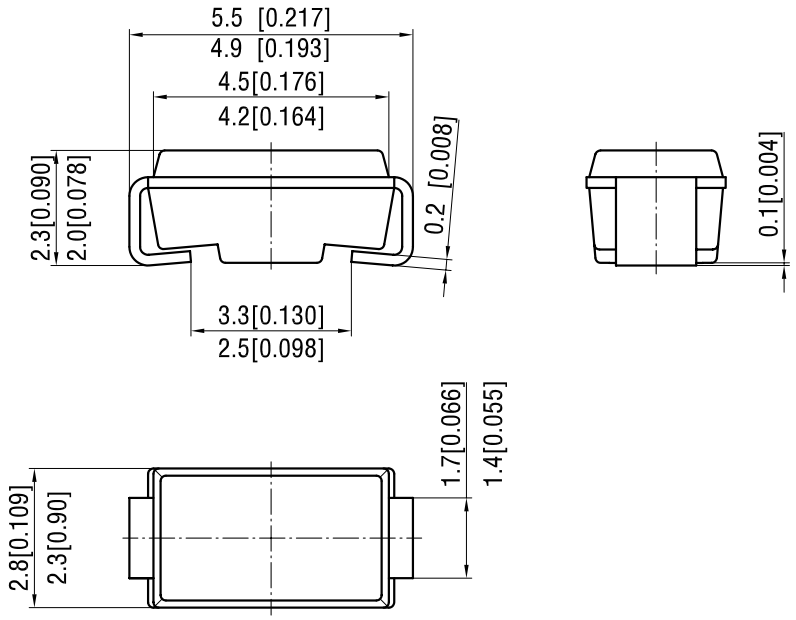
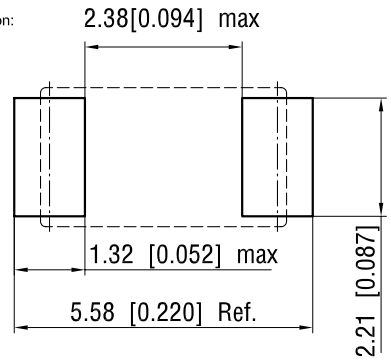


Figure 5. Thermal Response

Package Dimensions in mm (Inches)



foot print recommendation:



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Document no.:S8-V-3848.01-003 (4) Rev. g - Date: 14.February.2005

Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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