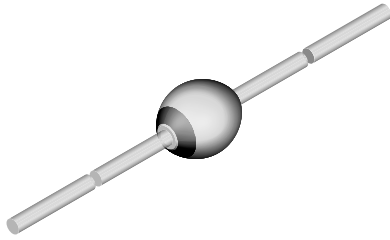




# Zener Diodes with Surge Current Specification



949539

## FEATURES

- Glass passivated junction
- Hermetically sealed package
- Clamping time in picoseconds
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## APPLICATIONS

- Medium power voltage regulators and medium power transient suppression circuits

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V <sub>Z</sub> range nom.	6.2 to 300	V
Test current I <sub>ZT</sub>	2 to 100	mA
V <sub>Z</sub> specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION (Example)			
DEVICE NAME	ORDERING CODE	TAPED UNITS	MINIMUM ORDER QUANTITY
BZT03C6V2	BZT03C6V2-TR	5000 per 10" tape and reel	25 000
BZT03C6V2	BZT03C6V2-TAP	5000 per ammpack	25 000

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOD-57	369 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	I = 10 mm, T <sub>L</sub> = 25 °C	P <sub>tot</sub>	3250	mW
	T <sub>amb</sub> = 25 °C	P <sub>tot</sub>	1300	
Repetitive peak reverse power dissipation		P <sub>ZRM</sub>	10	W
Non repetitive peak surge power dissipation	t <sub>p</sub> = 100 μs, T <sub>j</sub> = 25 °C	P <sub>ZSM</sub>	600	W
Junction to ambient air	I = 10 mm, T <sub>L</sub> = constant	R <sub>thJA</sub>	46	K/W
	On PC board with spacing 25 mm	R <sub>thJA</sub>	100	
Junction temperature		T <sub>j</sub>	175	°C
Storage temperature range		T <sub>S</sub>	- 65 to + 175	°C
Forward voltage (max.)	I <sub>F</sub> = 0.5 A	V <sub>F</sub>	1.2	V



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)														
PART NUMBER	ZENER VOLTAGE RANGE			TEST CURRENT	REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT		CLAMPING <sup>(1)</sup>		STAND OFF <sup>(2)</sup>	
	$V_Z$ at $I_{ZT1}$			$I_{ZT1}$	$I_R$ at $V_R$		$Z_Z$ at $I_{ZT1}$		$TC_{VZ}$ at $I_{ZT1}$		$V_{(CL)R}$ at $I_{RMS}$		$I_R$ at $V_R$	
	V			mA	$\mu\text{A}$	V	$\Omega$		%K		V	A	$\mu\text{A}$	V
	MIN.	NOM.	MAX.		MAX.		TYP.	MAX.	MIN.	MAX.	MAX.		MAX.	
BZT03C6V2	5.8	6.2	6.6	100	1500	4.7	1	2	0	0.07	9.3	34	3000	5.1
BZT03C6V8	6.4	6.8	7.2	100	1000	5.1	1	2	0	0.07	10.2	31	2000	5.6
BZT03C7V5	7	7.5	7.9	100	750	5.6	1	2	0	0.07	11.3	26.5	1500	6.2
BZT03C8V2	7.7	8.2	8.7	100	600	6.2	1	2	0.03	0.08	12.3	24.4	1200	6.8
BZT03C9V1	8.5	9.1	9.6	50	20	6.8	2	4	0.03	0.08	13.3	22.7	50	7.5
BZT03C10	9.4	10	10.6	50	10	7.5	2	4	0.05	0.09	14.8	20.3	20	8.2
BZT03C11	10.4	11	11.6	50	4	8.2	4	7	0.05	0.1	15.7	19.1	5	9.1
BZT03C12	11.4	12	12.7	50	3	9.1	4	7	0.05	0.1	17	17.7	5	10
BZT03C13	12.4	13	14.1	50	2	10	5	10	0.05	0.1	18.9	15.9	5	11
BZT03C15	13.8	15	15.6	50	1	11	5	10	0.05	0.1	20.9	14.4	5	12
BZT03C16	15.3	16	17.1	25	1	12	6	15	0.06	0.11	22.9	13.1	5	13
BZT03C18	16.8	18	19.1	25	1	13	6	15	0.06	0.11	25.6	11.7	5	15
BZT03C20	18.8	20	21.2	25	1	15	6	15	0.06	0.11	28.4	10.6	5	16
BZT03C22	20.8	22	23.3	25	1	16	6	15	0.06	0.11	31	9.7	5	18
BZT03C24	22.8	24	25.6	25	1	18	7	15	0.06	0.11	33.8	8.9	5	20
BZT03C27	25.1	27	28.9	25	1	20	7	15	0.06	0.11	38.1	7.9	5	22
BZT03C30	28	30	32	25	1	22	8	15	0.06	0.11	42.2	7.1	5	24
BZT03C33	31	33	35	25	1	24	8	15	0.06	0.11	46.2	6.5	5	27
BZT03C36	34	36	38	10	1	27	21	40	0.06	0.11	50.1	6	5	30
BZT03C39	37	39	41	10	1	30	21	40	0.06	0.11	54.1	5.5	5	33
BZT03C43	40	43	46	10	1	33	24	45	0.07	0.12	60.7	4.9	5	36
BZT03C47	44	47	50	10	1	36	24	45	0.07	0.12	65.5	4.6	5	39
BZT03C51	48	51	54	10	1	39	25	60	0.07	0.12	70.8	4.2	5	43
BZT03C56	52	56	60	10	1	43	25	60	0.07	0.12	78.6	3.8	5	47
BZT03C62	58	62	66	10	1	47	25	80	0.08	0.13	86.5	3.5	5	51
BZT03C68	64	68	72	10	1	51	25	80	0.08	0.13	94.4	3.2	5	56
BZT03C75	70	75	79	10	1	56	30	100	0.08	0.13	103.5	2.9	5	62
BZT03C82	77	82	87	10	1	62	30	100	0.08	0.13	114	2.6	5	68
BZT03C91	85	91	96	5	1	68	60	200	0.09	0.13	126	2.4	5	75
BZT03C100	94	100	106	5	1	75	60	200	0.09	0.13	139	2.2	5	82
BZT03C110	104	110	116	5	1	82	80	250	0.09	0.13	152	2	5	91
BZT03C120	114	120	127	5	1	91	80	250	0.09	0.13	167	1.8	5	100
BZT03C130	124	130	141	5	1	100	110	300	0.09	0.13	185	1.6	5	110
BZT03C150	138	150	156	5	1	110	130	300	0.09	0.13	204	1.5	5	120
BZT03C160	153	160	171	5	1	120	150	350	0.09	0.13	224	1.3	5	130
BZT03C180	168	180	191	5	1	130	180	400	0.09	0.13	249	1.2	5	150
BZT03C200	188	200	212	5	1	150	200	500	0.09	0.13	276	1.1	5	160
BZT03C220	208	220	233	2	1	160	350	750	0.09	0.13	305	1	5	180
BZT03C240	228	240	256	2	1	180	400	850	0.09	0.13	336	0.9	5	200
BZT03C270	251	270	289	2	1	200	450	1000	0.09	0.13	380	0.8	5	220
BZT03C300	280	300	320	2	1	220	450	1000	0.09	0.13	419	0.72	5	240

**Notes**

- (1) 10/1000 exp. falling pulse  $t_p = 1000\text{ }\mu\text{s}$  down to 50 %
- (2) Stand-off voltage = recommended supply voltage



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)														
PART NUMBER	ZENER VOLTAGE RANGE			TEST CURRENT	REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT		CLAMPING <sup>(1)</sup>		STAND OFF <sup>(2)</sup>	
	$V_Z$ at $I_{ZT1}$			$I_{ZT1}$	$I_R$ at $V_R$		$Z_Z$ at $I_{ZT1}$		$TC_{VZ}$ at $I_{ZT1}$		$V_{(CL)R}$ at $I_{RMS}$		$I_R$ at $V_R$	
	V			mA	$\mu\text{A}$	V	$\Omega$		%/K		V	A	$\mu\text{A}$	V
	MIN.	NOM.	MAX.		MAX.		TYP.	MAX.	MIN.	MAX.	MAX.		MAX.	
BZT03D6V2	5.6	6.2	6.8	100	1500	4.4	1	2	0	0.07	9.5	34	3000	4.8
BZT03D6V8	6.1	6.8	7.5	100	1000	4.8	1	2	0	0.07	10.5	31	2000	5.3
BZT03D7V5	6.75	7.5	8.25	100	750	5.3	1	2	0	0.07	11.6	26.5	1500	5.9
BZT03D8V2	7.4	8.2	9	100	600	5.9	1	2	0.03	0.08	12.6	24.4	1200	6.5
BZT03D9V1	8.2	9.1	10	50	20	6.5	2	4	0.03	0.08	13.7	22.7	50	7.1
BZT03D10	9	10	11	50	10	7.1	2	4	0.05	0.09	15.2	20.3	20	7.9
BZT03D11	9.9	11	12.1	50	4	7.9	4	7	0.05	0.1	16.2	19.1	5	8.6
BZT03D12	10.8	12	13.2	50	3	8.6	4	7	0.05	0.1	17.5	17.7	5	9.3
BZT03D13	11.7	13	14.3	50	2	9.3	5	10	0.05	0.1	19.1	15.9	5	10.6
BZT03D15	13.5	15	16.5	50	1	10.6	5	10	0.05	0.1	21.8	14.4	5	11.6
BZT03D16	14.4	16	17.6	25	1	11.6	6	15	0.06	0.11	23.4	13.1	5	12.6
BZT03D18	16.2	18	19.8	25	1	12.6	6	15	0.06	0.11	26.3	11.7	5	14.4
BZT03D20	18	20	22	25	1	14.4	6	15	0.06	0.11	29.2	10.6	5	15.8
BZT03D22	29.8	22	24.2	25	1	15.8	6	15	0.06	0.11	31.9	9.7	5	17.2
BZT03D24	21.6	24	26.4	25	1	17.2	7	15	0.06	0.11	34.6	8.9	5	19.4
BZT03D27	24.3	27	29.7	25	1	19.4	7	15	0.06	0.11	39	7.9	5	21.5
BZT03D30	27	30	33	25	1	21.5	8	15	0.06	0.11	43.5	7.1	5	23.5
BZT03D33	29.7	33	36.3	25	1	23.5	8	15	0.06	0.11	47.5	6.5	5	25.8
BZT03D36	32.4	36	39.6	10	1	25.8	21	40	0.06	0.11	51.5	6	5	28
BZT03D39	35.1	39	42.9	10	1	28	21	40	0.06	0.11	56	5.5	5	31
BZT03D43	38.7	43	47.3	10	1	31	24	45	0.07	0.12	62	4.9	5	33.5
BZT03D47	42.3	47	51.7	10	1	33.5	24	45	0.07	0.12	67.5	4.6	5	36.5
BZT03D51	45.9	51	56.1	10	1	36.5	25	60	0.07	0.12	73	4.2	5	40
BZT03D56	50.4	56	61.6	10	1	40	25	60	0.07	0.12	81	3.8	5	44.5
BZT03D62	55.8	62	68.2	10	1	44.5	25	80	0.08	0.13	89	3.5	5	49
BZT03D68	61.2	68	74.8	10	1	49	25	80	0.08	0.13	97	3.2	5	54
BZT03D75	67.5	75	82.5	10	1	54	30	100	0.08	0.13	107	2.9	5	59
BZT03D82	73.8	82	90.2	10	1	59	30	100	0.08	0.13	117	2.6	5	65
BZT03D91	81.9	91	100	5	1	65	60	200	0.09	0.13	130	2.4	5	71
BZT03D100	90	100	110	5	1	71	60	200	0.09	0.13	143	2.2	5	79
BZT03D110	99	110	121	5	1	79	80	250	0.09	0.13	157	2	5	86
BZT03D120	108	120	132	5	1	86	80	250	0.09	0.13	172	1.8	5	93
BZT03D130	117	130	143	5	1	93	110	300	0.09	0.13	187	1.6	5	106
BZT03D150	135	150	165	5	1	106	130	300	0.09	0.13	213	1.5	5	116
BZT03D160	144	160	176	5	1	116	150	350	0.09	0.13	229	1.3	5	126
BZT03D180	162	180	198	5	1	126	180	400	0.09	0.13	256	1.2	5	144
BZT03D200	180	200	220	5	1	144	200	500	0.09	0.13	284	1.1	5	158
BZT03D220	198	220	242	2	1	158	350	750	0.09	0.13	314	1	5	172
BZT03D240	216	240	264	2	1	172	400	850	0.09	0.13	364	0.9	5	194
BZT03D270	243	270	297	2	1	194	450	1000	0.09	0.13	388	0.8	5	215

**Notes**

- (1) 10/1000 exp. falling pulse  $t_p = 1000\text{ }\mu\text{s}$  down to 50 %
- (2) Stand-off voltage = recommended supply voltage

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

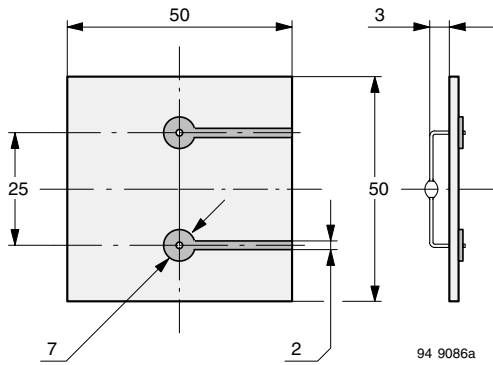


Fig. 1 - Epoxy Glass Hard Tissue, Board Thickness 1.5 mm,  $R_{thJA} \leq 100\text{ K/W}$

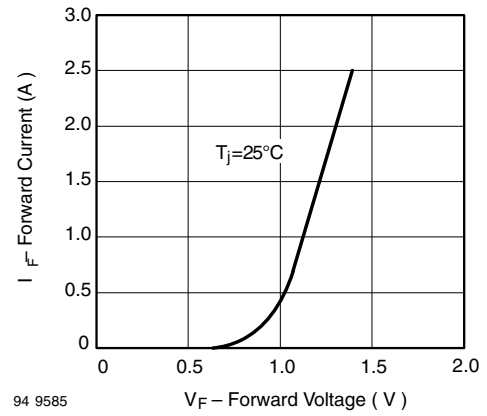


Fig. 3 - Forward Current vs. Forward Voltage

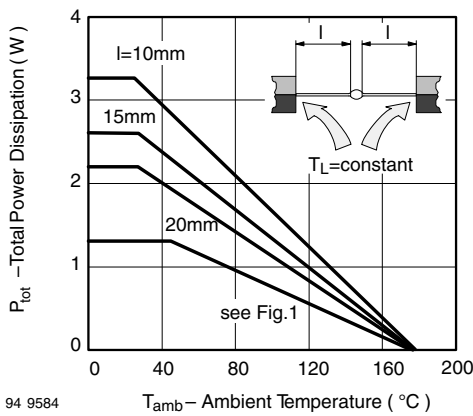


Fig. 2 - Total Power Dissipation vs. Ambient Temperature

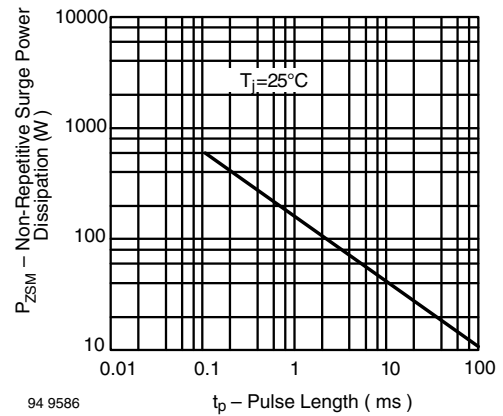
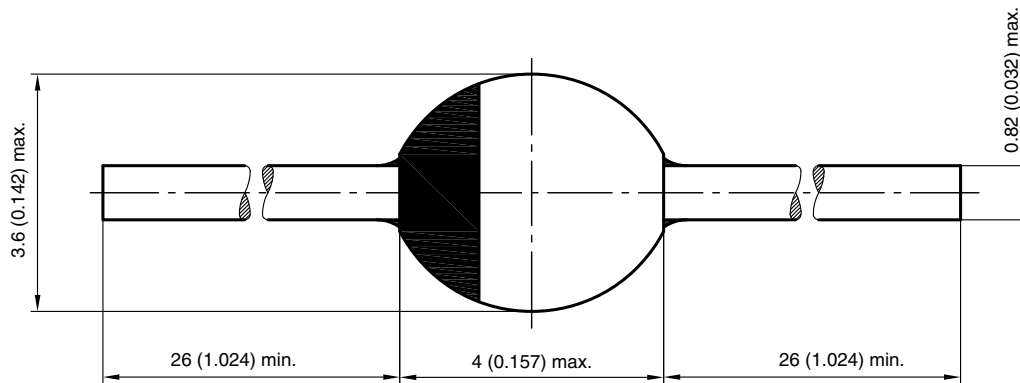


Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

**PACKAGE DIMENSIONS** in millimeters (inches): **SOD-57**



20543  
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