

Zener Diodes with Surge Current Specification



FEATURES

- Silicon planar Zener diodes
- Low profile surface-mount package
- Zener and surge current specification
- Low leakage current
- Excellent stability
- High temperature soldering: 260 °C/10 s at terminals
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

PARAMETER	VALUE	UNIT
V _Z range nom.	3.6 to 200	V
Test current I _{ZT}	5 to 100	mA
V _Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZD27C3V6P-M to BZD27C200P-M	BZD27C3V6P-M to BZD27C200P-M-series-08	3000 per 7" reel (8mm tape)	15 000/box
BZD27C3V6P-M to BZD27C200P-M	BZD27C3V6P-M to BZD27C200P-M-series-18	10 000 per 13" reel (8 mm tape)	10 000/box

PACKAGE

PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
DO-219AB (SMF)	15 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	T _L = 80 °C	P _{tot}	2300	mW
	T _A = 25 °C ⁽¹⁾	P _{tot}	800	mW
Non repetitive peak surge power dissipation ⁽²⁾	100 µs square pulse	P _{ZSM}	300	W
	10/1000 µs waveform (BZD27-C7V5P-M to BZD27-C100P-M)	P _{RSM}	150	W
	10/1000 µs waveform (BZD27-C110P-M to BZD27-C200P-M)	P _{RSM}	100	W
Junction to lead		R _{thJL}	30	K/W
Junction to ambient air	Mounted on epoxy-glass PCB with 3 mm x 3 mm Cu pads (≥ 40 µm thick)	R _{thJA}	180	K/W
Junction temperature		T _j	150	°C
Storage temperature range		T _{stg}	- 55 to + 150	°C

Notes

⁽¹⁾ Mounted on epoxy-glass PCB with 3 mm x 3 mm Cu pads (≥ 40 µm thick)

⁽²⁾ T_j = 25 °C prior to surge

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

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE ⁽¹⁾			TEST CURRENT	REVERSE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT	
		V_Z at I_{ZT1}			I_{ZT1}	I_R at V_R		Z_Z at I_{ZT1}		α_{VZ} at I_{ZT1}	
		V			mA	μA	V	Ω		%/ $^{\circ}\text{C}$	
		MIN.	NOM.	MAX.		MAX.		TYP.	MAX.	MIN.	MAX.
BZD27C3V6P-M	N0	3.4	3.6	3.8	100	100	1	4	8	- 0.14	- 0.04
BZD27C3V9P-M	N1	3.7	3.9	4.1	100	50	1	4	8	- 0.14	- 0.04
BZD27C4V3P-M	N2	4	4.3	4.6	100	25	1	4	7	- 0.12	- 0.02
BZD27C4V7P-M	N3	4.4	4.7	5	100	10	1	3	7	- 0.1	0
BZD27C5V1P-M	N4	4.8	5.1	5.4	100	5	1	3	6	- 0.08	0.02
BZD27C5V6P-M	N5	5.2	5.6	6	100	10	2	2	4	- 0.04	0.04
BZD27C6V2P-M	N6	5.8	6.2	6.6	100	5	2	2	3	- 0.01	0.06
BZD27C6V8P-M	N7	6.4	6.8	7.2	100	10	3	1	3	0	0.07
BZD27C7V5P-M	N8	7	7.5	7.9	100	50	3	1	2	0	0.07
BZD27C8V2P-M	N9	7.7	8.2	8.7	100	10	3	1	2	0.03	0.08
BZD27C9V1P-M	O0	8.5	9.1	9.6	50	10	5	2	4	0.03	0.08
BZD27C10P-M	O1	9.4	10	10.6	50	7	7.5	2	4	0.05	0.09
BZD27C11P-M	O2	10.4	11	11.6	50	4	8.2	4	7	0.05	0.1
BZD27C12P-M	O3	11.4	12	12.7	50	3	9.1	4	7	0.05	0.1
BZD27C13P-M	O4	12.4	13	14.1	50	2	10	5	10	0.05	0.1
BZD27C15P-M	O5	13.8	15	15.6	50	1	11	5	10	0.05	0.1
BZD27C16P-M	O6	15.3	16	17.1	25	1	12	6	15	0.06	0.11
BZD27C18P-M	O7	16.8	18	19.1	25	1	13	6	15	0.06	0.11
BZD27C20P-M	O8	18.8	20	21.2	25	1	15	6	15	0.06	0.11
BZD27C22P-M	O9	20.8	22	23.3	25	1	16	6	15	0.06	0.11
BZD27C24P-M	P0	22.8	24	25.6	25	1	18	7	15	0.06	0.11
BZD27C27P-M	P1	25.1	27	28.9	25	1	20	7	15	0.06	0.11
BZD27C30P-M	P2	28	30	32	25	1	22	8	15	0.06	0.11
BZD27C33P-M	P3	31	33	35	25	1	24	8	15	0.06	0.11
BZD27C36P-M	P4	34	36	38	10	1	27	21	40	0.06	0.11
BZD27C39P-M	P5	37	39	41	10	1	30	21	40	0.06	0.11
BZD27C43P-M	P6	40	43	46	10	1	33	24	45	0.07	0.12
BZD27C47P-M	P7	44	47	50	10	1	36	24	45	0.07	0.12
BZD27C51P-M	P8	48	51	54	10	1	39	25	60	0.07	0.12
BZD27C56P-M	P9	52	56	60	10	1	43	25	60	0.07	0.12
BZD27C62P-M	Q0	58	62	66	10	1	47	25	80	0.08	0.13
BZD27C68P-M	Q1	64	68	72	10	1	51	25	80	0.08	0.13
BZD27C75P-M	Q2	70	75	79	10	1	56	30	100	0.08	0.13
BZD27C82P-M	Q3	77	82	87	10	1	62	30	100	0.08	0.13
BZD27C91P-M	Q4	85	91	96	5	1	68	60	200	0.08	0.13
BZD27C100P-M	Q5	94	100	106	5	1	75	60	200	0.09	0.13
BZD27C110P-M	Q6	104	110	116	5	1	82	80	250	0.09	0.13
BZD27C120P-M	Q7	114	120	127	5	1	91	80	250	0.09	0.13
BZD27C130P-M	Q8	124	130	141	5	1	100	110	300	0.09	0.13
BZD27C150P-M	Q9	138	150	156	5	1	110	130	300	0.09	0.13
BZD27C160P-M	R0	153	160	171	5	1	120	150	350	0.09	0.13
BZD27C180P-M	R1	168	180	191	5	1	130	180	400	0.09	0.13
BZD27C200P-M	R2	188	200	212	5	1	150	200	500	0.09	0.13

Notes

- Electrical characteristics when used as regulator diodes
- Maximum $V_F = 1.2\text{ V}$, at $I_F = 0.2\text{ A}$
- ⁽¹⁾ Pulse test: $t_p \leq 5\text{ ms}$

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

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT	REVERSE CURRENT		CLAMPING VOLTAGE		TEMPERATURE COEFFICIENT	
		V_Z at I_{ZT1}			I_{ZT1}	I_R at V_R		V_C at $I_{RSM}^{(1)}$		α_{VZ} at I_{ZT1}	
		V			mA	μA	V	V	A	% / $^{\circ}\text{C}$	
		MIN.	NOM.	MAX.		MAX.		MAX.		MIN.	MAX.
BZD27C7V5P-M	N8	7	7.5	7.9	100	1500	6.2	11.3	13.3	0	0.07
BZD27C8V2P-M	N9	7.7	8.2	8.7	100	1200	6.8	12.3	12.2	0.03	0.08
BZD27C9V1P-M	O0	8.5	9.1	9.6	50	100	7.5	13.3	11.3	0.03	0.08
BZD27C10P-M	O1	9.4	10	10.6	50	20	8.2	14.8	10.1	0.05	0.09
BZD27C11P-M	O2	10.4	11	11.6	50	5	9.1	15.7	9.6	0.05	0.1
BZD27C12P-M	O3	11.4	12	12.7	50	5	10	17	8.8	0.05	0.1
BZD27C13P-M	O4	12.4	13	14.1	50	5	11	18.9	7.9	0.05	0.1
BZD27C15P-M	O5	13.8	15	15.6	50	5	12	20.9	7.2	0.05	0.1
BZD27C16P-M	O6	15.3	16	17.1	25	5	13	22.9	6.6	0.06	0.11
BZD27C18P-M	O7	16.8	18	19.1	25	5	15	25.6	5.9	0.06	0.11
BZD27C20P-M	O8	18.8	20	21.2	25	5	16	28.4	5.3	0.06	0.11
BZD27C22P-M	O9	20.8	22	23.3	25	5	18	31	4.8	0.06	0.11
BZD27C24P-M	P0	22.8	24	25.6	25	5	20	33.8	4.4	0.06	0.11
BZD27C27P-M	P1	25.1	27	28.9	25	5	22	38.1	3.9	0.06	0.11
BZD27C30P-M	P2	28	30	32	25	5	24	42.2	3.6	0.06	0.11
BZD27C33P-M	P3	31	33	35	25	5	27	46.2	3.2	0.06	0.11
BZD27C36P-M	P4	34	36	38	10	5	30	50.1	3	0.06	0.11
BZD27C39P-M	P5	37	39	41	10	5	33	54.1	2.8	0.06	0.11
BZD27C43P-M	P6	40	43	46	10	5	36	60.7	2.5	0.07	0.12
BZD27C47P-M	P7	44	47	50	10	5	39	65.5	2.3	0.07	0.12
BZD27C51P-M	P8	48	51	54	10	5	43	70.8	2.1	0.07	0.12
BZD27C56P-M	P9	52	56	60	10	5	47	78.6	1.9	0.07	0.12
BZD27C62P-M	Q0	58	62	66	10	5	51	86.5	1.7	0.08	0.13
BZD27C68P-M	Q1	64	68	72	10	5	56	94.4	1.6	0.08	0.13
BZD27C75P-M	Q2	70	75	79	10	5	62	103.5	1.5	0.08	0.13
BZD27C82P-M	Q3	77	82	87	10	5	68	114	1.3	0.08	0.13
BZD27C91P-M	Q4	85	91	96	5	5	75	126	1.2	0.09	0.13
BZD27C100P-M	Q5	94	100	106	5	5	82	139	1.1	0.09	0.13
BZD27C110P-M	Q6	104	110	116	5	5	91	139	0.72	0.09	0.13
BZD27C120P-M	Q7	114	120	127	5	5	100	152	0.65	0.09	0.13
BZD27C130P-M	Q8	124	130	141	5	5	110	169	0.59	0.09	0.13
BZD27C150P-M	Q9	138	150	156	5	5	120	187	0.53	0.09	0.13
BZD27C160P-M	R0	153	160	171	5	5	130	205	0.48	0.09	0.13
BZD27C180P-M	R1	168	180	191	5	5	150	229	0.43	0.09	0.13
BZD27C200P-M	R2	188	200	212	5	5	160	254	0.39	0.09	0.13

Notes

- Electrical characteristics when used as protection diodes

(1) Non-repetitive peak reverse current in accordance with "IEC 60-1, section 8" (10/1000 μs pulse); see fig. 5.



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

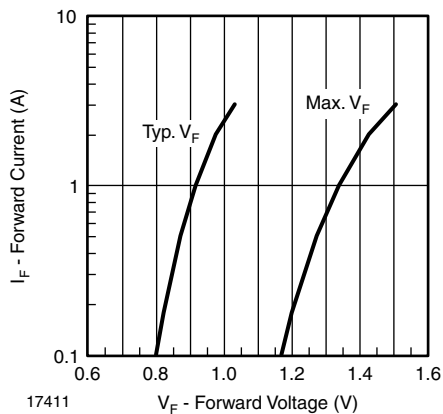


Fig. 1 - Forward Current vs. Forward Voltage

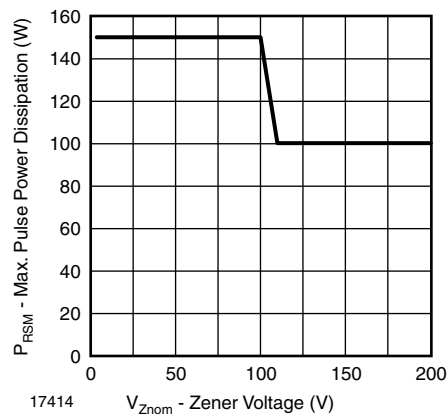


Fig. 4 - Maximum Pulse Power Dissipation vs. Zener Voltage

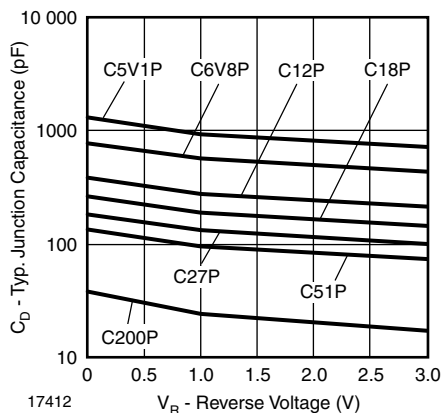


Fig. 2 - Typ. Diode Capacitance vs. Reverse Voltage

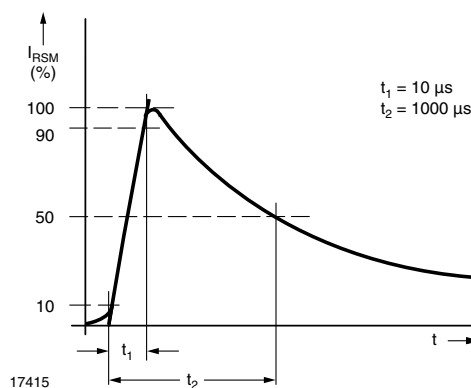


Fig. 5 - Non-Repetitive Peak Reverse Current Pulse Definition

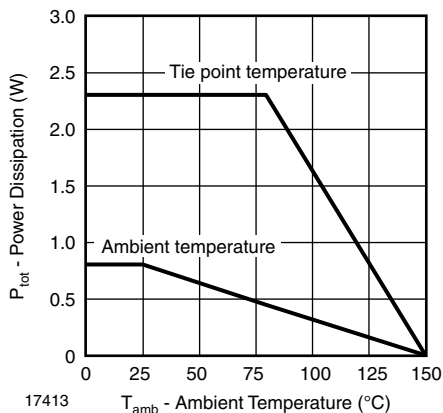
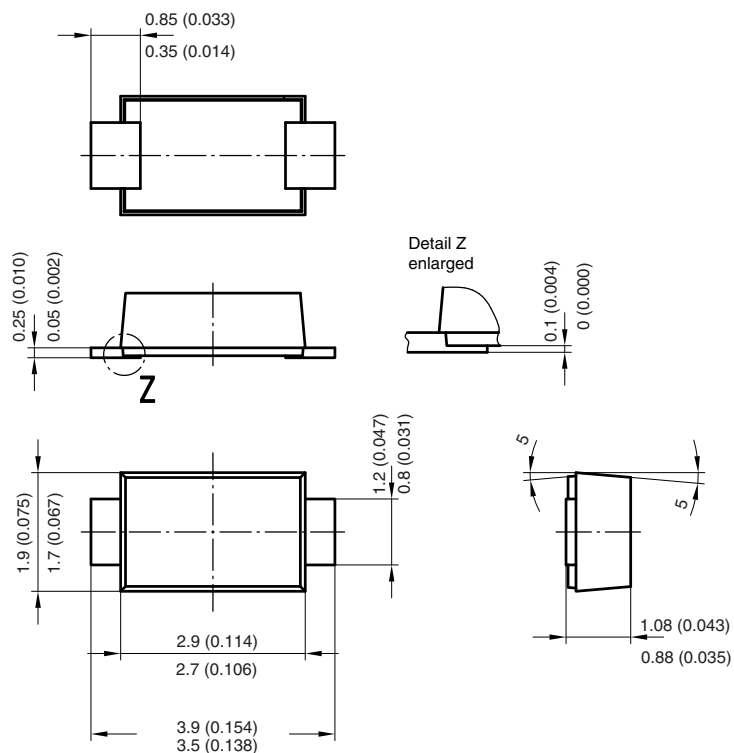


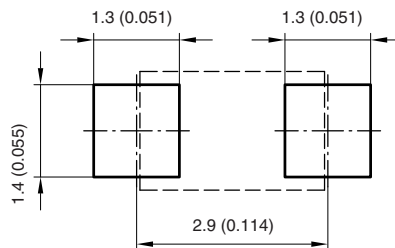
Fig. 3 - Power Dissipation vs. Ambient Temperature



PACKAGE DIMENSIONS in millimeters (inches): **DO219-AB (SMF)**



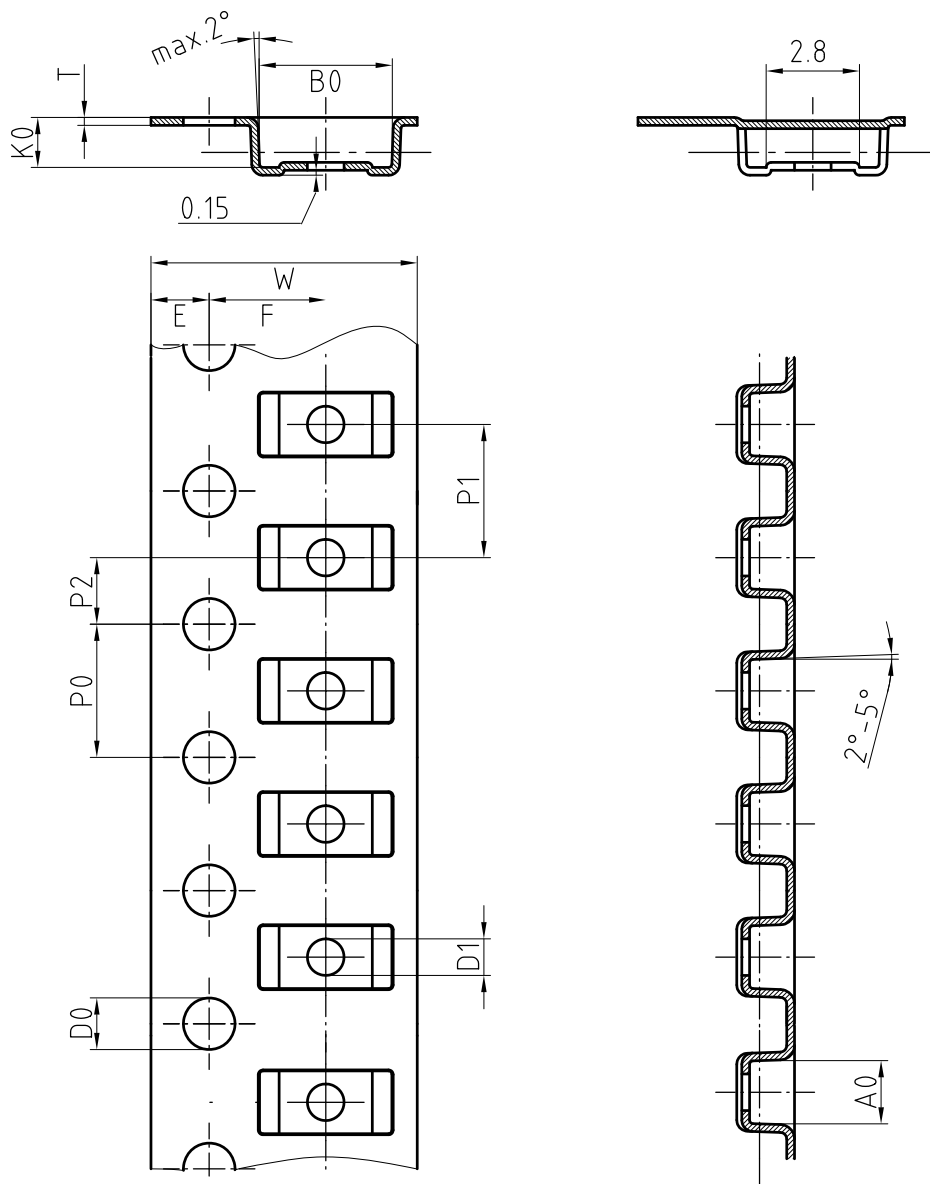
Foot print recommendation:



Created - Date: 15. February 2005
Rev. 3 - Date: 13. March 2007
Document no.:S8-V-3915.01-001 (4)
17247



Blister Tape Dimensions for SMF in millimeters



Mat:	A0	B0	K0	W	T	P0	P2	P1	D0	D1	E	F
PS	1.9	4.0	1.5	8.0	0.235	4.0	2.0	4.0	1.5	1	1.75	3.5

Document-No.: S8-V-3717.02-001 (3)

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