VOLTAGE REGULATOR DIODES

Silicon planar diodes in DO-35 envelopes intended for use as low voltage stabilizers or voltage references. They are available in four series; each series having a different tolerance rating, one series is to the international standardized E24 (± 5%) range, the other three have tolerances of 1%, 2% and 3% on working voltage. Each series consists of 37 types with nominal working voltages ranging from 2,4 V to 75 V.

QUICK REFERENCE DATA

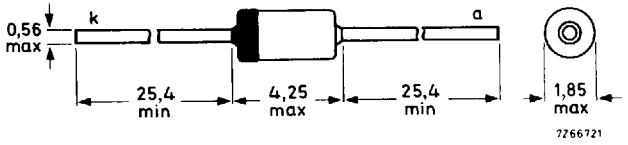
Working voltage range	V_Z	nom.	2,4 to 75	V
Total power dissipation	P_{tot}	max.	500	mW *
Non-repetitive peak reverse power dissipation	P_{ZSM}	max.	30	W
Junction temperature	T_j	max.	200	°C
Thermal resistance from junction to tie-point	$R_{th\ j\text{-}tp}$	=	0,30	K/mW *

* If leads are kept at T_{tp} = 50 °C at 8 mm from body.

MECHANICAL DATA

Dimensions in mm

Fig.1 DO-35 (SOD27).



Cathode indicated by coloured band.
The diodes are type-branded.

Products approved to CECC 50 005-005.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Average forward current (averaged over any 20 ms period)	$I_{F(AV)}$	max.	250	mA
Repetitive peak forward current	I_{FRM}	max.	250	mA
Total power dissipation	P_{tot}	max.	500	mW *
		max.	400	mW **
Non-repetitive peak reverse power dissipation $t = 100\ \mu s$; $T_j = 150\ ^oC$	P_{ZSM}	max.	30	W
Storage temperature	T_{stg}	−65 to +	200	°C
Junction temperature	T_j	max.	200	°C

THERMAL RESISTANCE

From junction to tie-point	$R_{th\ j\text{-}tp}$	=	0,30	K/mW*
From junction to ambient	$R_{th\ j\text{-}a}$	=	0,38	K/mW**

CHARACTERISTICS

$T_j = 25\ ^oC$

Forward voltage $I_F = 10$ mA		V_F	<	0,9	V
Reverse current					
BZX79-.2V4	$V_R = 1$ V	I_R	<	50	μA
.2V7	$V_R = 1$ V	I_R	<	20	μA
.3V0	$V_R = 1$ V	I_R	<	10	μA
.3V3	$V_R = 1$ V	I_R	<	5	μA
.3V6	$V_R = 1$ V	I_R	<	5	μA
.3V9	$V_R = 1$ V	I_R	<	3	μA
.4V3	$V_R = 1$ V	I_R	<	3	μA
.4V7	$V_R = 2$ V	I_R	<	3	μA
.5V1	$V_R = 2$ V	I_R	<	2	μA
.5V6	$V_R = 2$ V	I_R	<	1	μA
.6V2	$V_R = 4$ V	I_R	<	3	μA
.6V8	$V_R = 4$ V	I_R	<	2	μA
.7V5	$V_R = 5$ V	I_R	<	1	μA
.8V2	$V_R = 5$ V	I_R	<	700	nA
.9V1	$V_R = 6$ V	I_R	<	500	nA
.10	$V_R = 7$ V	I_R	<	200	nA
.11 to .13	$V_R = 8$ V	I_R	<	100	nA
.15 to .75	$V_R = 0{,}7\ V_{Znom}$	I_R	<	50	nA

. = A for 1% tolerance range
. = B for 2% tolerance range
. = F for 3% tolerance range
. = C for E24 (± 5%) tolerance range

* If leads are kept at $T_{tp} = 50\ ^oC$ at 8 mm from body.
** In still air at maximum lead length up to $T_{amb} = 50\ ^oC$.

T_j = 25 °C
± 1% tolerance range

BZX79A	working voltage V_Z (V) at I_{Ztest} = 5 mA		differential resistance r_{diff} (Ω) at I_{Ztest} = 5 mA		temperature coefficient S_Z (mV/K) at I_{Ztest} = 5 mA			differential resistance r_{diff} (Ω) at I_Z = 1 mA	
	min.	max.	typ.	max.	min.	typ.	max.	typ.	max.
A2V4	2,37	2,43	70	100	−3,5	−1,6	0	275	600
A2V7	2,67	2,73	75	100	−3,5	−2,0	0	300	600
A3V0	2,97	3,03	80	95	−3,5	−2,1	0	325	600
A3V3	3,26	3,34	85	95	−3,5	−2,4	0	350	600
A3V6	3,56	3,64	85	90	−3,5	−2,4	0	375	600
A3V9	3,86	3,94	85	90	−3,5	−2,5	0	400	600
A4V3	4,25	4,35	80	90	−3,5	−2,5	0	410	600
A4V7	4,65	4,75	50	80	−3,5	−1,4	0,2	425	500
A5V1	5,04	5,16	40	60	−2,7	−0,8	1,2	400	480
A5V6	5,54	5,66	15	40	−2,0	1,2	2,5	80	400
A6V2	6,13	6,27	6	10	0,4	2,3	3,7	40	150
A6V8	6,73	6,87	6	15	1,2	3,0	4,5	30	80
A7V5	7,42	7,58	6	15	2,5	4,0	5,3	30	80
A8V2	8,11	8,29	6	15	3,2	4,6	6,2	40	80
A9V1	9,00	9,20	6	15	3,8	5,5	7,0	40	100
A10	9,90	10,10	8	20	4,5	6,4	8,0	50	150
A11	10,89	11,11	10	20	5,4	7,4	9,0	50	150
A12	11,88	12,12	10	25	6,0	8,4	10,0	50	150
A13	12,87	13,13	10	30	7,0	9,4	11,0	50	170
A15	14,85	15,15	10	30	9,2	11,4	13,0	50	200
A16	15,84	16,16	10	40	10,4	12,4	14,0	50	200
A18	17,82	18,18	10	45	12,4	14,4	16,0	50	225
A20	19,80	20,20	15	55	14,4	16,4	18,0	60	225
A22	21,78	22,22	20	55	16,4	18,4	20,0	60	250
A24	23,76	24,24	25	70	18,4	20,4	22,0	60	250
	at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA			at I_Z = 0,5 mA	
A27	26,73	27,27	25	80	21,4	23,4	25,3	65	300
A30	29,70	30,30	30	80	24,4	26,6	29,4	70	300
A33	32,67	33,33	35	80	27,4	29,7	33,4	75	325
A36	35,64	36,36	35	90	30,4	33,0	37,4	80	350
A39	38,61	39,39	40	130	33,4	36,4	41,2	80	350
A43	42,57	43,43	45	150	37,6	41,2	46,6	85	375
A47	46,53	47,47	50	170	42,0	46,1	51,8	85	375
A51	50,49	51,51	60	180	46,6	51,0	57,2	90	400
A56	55,44	56,56	70	200	52,2	57,0	63,8	100	425
A62	61,38	62,62	80	215	58,8	64,4	71,6	120	450
A68	67,32	68,68	90	240	65,6	71,7	79,8	150	475
A75	74,25	75,75	95	255	73,4	80,2	88,6	170	500

T_j = 25 °C

± 2% tolerance range.

BZX79-...	working voltage V_Z (V) at I_{Ztest} = 5 mA		differential resistance r_{diff} (Ω) at I_{Ztest} = 5 mA		temperature coefficient S_Z (mV/K) at I_{Ztest} = 5 mA			differential resistance r_{diff} (Ω) at I_Z = 1 mA	
	min.*	max.*	typ.	max.	min.	typ.	max.	typ.	max.
B2V4	2,35	2,45	70	100	−3,5	−1,6	0	275	600
B2V7	2,65	2,75	75	100	−3,5	−2,0	0	300	600
B3V0	2,94	3,06	80	95	−3,5	−2,1	0	325	600
B3V3	3,23	3,37	85	95	−3,5	−2,4	0	350	600
B3V6	3,53	3,67	85	90	−3,5	−2,4	0	375	600
B3V9	3,82	3,98	85	90	−3,5	−2,5	0	400	600
B4V3	4,21	4,39	80	90	−3,5	−2,5	0	410	600
B4V7	4,61	4,79	50	80	−3,5	−1,4	0,2	425	500
B5V1	5,00	5,20	40	60	−2,7	−0,8	1,2	400	480
B5V6	5,49	5,71	15	40	−2,0	1,2	2,5	80	400
B6V2	6,08	6,32	6	10	0,4	2,3	3,7	40	150
B6V8	6,66	6,94	6	15	1,2	3,0	4,5	30	80
B7V5	7,35	7,65	6	15	2,5	4,0	5,3	30	80
B8V2	8,04	8,36	6	15	3,2	4,6	6,2	40	80
B9V1	8,92	9,28	6	15	3,8	5,5	7,0	40	100
B10	9,80	10,20	8	20	4,5	6,4	8,0	50	150
B11	10,80	11,20	10	20	5,4	7,4	9,0	50	150
B12	11,80	12,20	10	25	6,0	8,4	10,0	50	150
B13	12,70	13,30	10	30	7,0	9,4	11,0	50	170
B15	14,70	15,30	10	30	9,2	11,4	13,0	50	200
B16	15,70	16,30	10	40	10,4	12,4	14,0	50	200
B18	17,60	18,40	10	45	12,4	14,4	16,0	50	225
B20	19,60	20,40	15	55	14,4	16,4	18,0	60	225
B22	21,60	22,40	20	55	16,4	18,4	20,0	60	250
B24	23,50	24,50	25	70	18,4	20,4	22,0	60	250
	at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA			at I_Z = 0,5 mA	
B27	26,50	27,50	25	80	21,4	23,4	25,3	65	300
B30	29,40	30,60	30	80	24,4	26,6	29,4	70	300
B33	32,30	33,70	35	80	27,4	29,7	33,4	75	325
B36	35,30	36,70	35	90	30,4	33,0	37,4	80	350
B39	38,20	39,80	40	130	33,4	36,4	41,2	80	350
B43	42,10	43,90	45	150	37,6	41,2	46,6	85	375
B47	46,10	47,90	50	170	42,0	46,1	51,8	85	375
B51	50,00	52,00	60	180	46,6	51,0	57,2	90	400
B56	54,90	57,10	70	200	52,2	57,0	63,8	100	425
B62	60,80	63,20	80	215	58,8	64,4	71,6	120	450
B68	66,60	69,40	90	240	65,6	71,7	79,8	150	475
B75	73,50	76,50	95	255	73,4	80,2	88,6	170	500

*When the real value is beyond this limit it is regulated as acceptable when it is within the 2% tolerance range

T_j = 25 °C
± 3% tolerance range

BZX79	working voltage V_Z (V) at I_{Ztest} = 5 mA		differential resistance r_{diff} (Ω) at I_{Ztest} = 5 mA		temperature coefficient S_Z (mV/K) at I_{Ztest} = 5 mA	leakage current I_R at V_R	
	min.	max.	typ.	max.	typ.	μA	V
F2V4	2,33	2,47	70	100	−1,6	50	1
F2V7	2,62	2,78	75	100	−2,0	20	1
F3V0	2,91	3,09	80	100	−2,1	10	1
F3V3	3,20	3,40	85	100	−2,4	5	1
F3V6	3,49	3,71	85	100	−2,4	5	1
F3V9	3,78	4,02	85	100	−2,5	3	1
F4V3	4,17	4,43	80	100	−2,5	3	1
F4V7	4,56	4,84	50	100	−1,4	3	2
F5V1	4,95	5,25	40	80	−0,8	2	2
F5V6	5,43	5,77	15	40	1,2	1	2
F6V2	6,01	6,39	6	30	2,3	3	4
F6V8	6,60	7,00	6	20	3,0	2	4
F7V5	7,28	7,72	6	20	4,0	1	5
F8V2	7,95	8,45	6	20	4,6	0,7	5
F9V1	8,83	9,37	6	20	5,5	0,5	6
F10	9,70	10,30	8	25	6,4	0,2	7
F11	10,67	11,33	10	25	7,4	0,1	8
F12	11,64	12,36	10	25	8,4	0,1	8
F13	12,61	13,39	10	35	9,4	0,1	8
F15	14,55	15,45	10	40	11,4	0,05	10
F16	15,50	16,50	10	45	12,4	0,05	
F18	17,50	18,50	10	50	14,4	0,05	
F20	19,40	20,60	15	60	16,4	0,05	
F22	21,30	22,70	20	70	18,4	0,05	
F24	23,30	24,70	25	80	20,4	0,05	
	at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA	at I_Z = 0,5 mA	
F27	26,20	27,80	25	80	23,4	0,05	0,7
F30	29,10	30,90	30	100	26,6	0,05	0,7
F33	32,00	34,00	35	120	29,7	0,05	0,7
F36	34,90	37,10	35	140	33,0	0,05	0,7
F39	37,80	40,20	40	150	36,4	0,05	0,7
F43	41,70	44,30	45	160	41,2	0,05	0,7
F47	45,60	48,40	50	170	46,1	0,05	0,7
F51	49,50	52,50	60	180	51,0	0,05	0,7
F56	54,30	57,70	70	200	57,0	0,05	0,7
F62	60,10	63,90	80	220	64,4	0,05	0,7
F68	66,00	70,00	90	240	71,7	0,05	0,7
F75	72,80	77,20	95	255	80,2	0,05	0,7

T_j = 25 °C

E24 (± 5%) logarithmic range

BZX79-...	working voltage V_Z (V) at I_{Ztest} = 5 mA		differential resistance r_{diff} (Ω) at I_{Ztest} = 5 mA		temperature coefficient S_Z (mV/K) at I_{Ztest} = 5 mA			differential resistance r_{diff} (Ω) at I_Z = 1 mA	
	min.	max.	typ.	max.	min.	typ.	max.	typ.	max.
C2V4	2,2	2,6	70	100	−3,5	−1,6	0	275	600
C2V7	2,5	2,9	75	100	−3,5	−2,0	0	300	600
C3V0	2,8	3,2	80	95	−3,5	−2,1	0	325	600
C3V3	3,1	3,5	85	95	−3,5	−2,4	0	350	600
C3V6	3,4	3,8	85	90	−3,5	−2,4	0	375	600
C3V9	3,7	4,1	85	90	−3,5	−2,5	0	400	600
C4V3	4,0	4,6	80	90	−3,5	−2,5	0	410	600
C4V7	4,4	5,0	50	80	−3,5	−1,4	0,2	425	500
C5V1	4,8	5,4	40	60	−2,7	−0,8	1,2	400	480
C5V6	5,2	6,0	15	40	−2,0	1,2	2,5	80	400
C6V2	5,8	6,6	6	10	0,4	2,3	3,7	40	150
C6V8	6,4	7,2	6	15	1,2	3,0	4,5	30	80
C7V5	7,0	7,9	6	15	2,5	4,0	5,3	30	80
C8V2	7,7	8,7	6	15	3,2	4,6	6,2	40	80
C9V1	8,5	9,6	6	15	3,8	5,5	7,0	40	100
C10	9,4	10,6	8	20	4,5	6,4	8,0	50	150
C11	10,4	11,6	10	20	5,4	7,4	9,0	50	150
C12	11,4	12,7	10	25	6,0	8,4	10,0	50	150
C13	12,4	14,1	10	30	7,0	9,4	11,0	50	170
C15	13,8	15,6	10	30	9,2	11,4	13,0	50	200
C16	15,3	17,1	10	40	10,4	12,4	14,0	50	200
C18	16,8	19,1	10	45	12,4	14,4	16,0	50	225
C20	18,8	21,2	15	55	14,4	16,4	18,0	60	225
C22	20,8	23,3	20	55	16,4	18,4	20,0	60	250
C24	22,8	25,6	25	70	18,4	20,4	22,0	60	250
	at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA		at I_{Ztest} = 2 mA			at I_Z = 0,5 mA	
C27	25,1	28,9	25	80	21,4	23,4	25,3	65	300
C30	28,0	32,0	30	80	24,4	26,6	29,4	70	300
C33	31,0	35,0	35	80	27,4	29,7	33,4	75	325
C36	34,0	38,0	35	90	30,4	33,0	37,4	80	350
C39	37,0	41,0	40	130	33,4	36,4	41,2	80	350
C43	40,0	46,0	45	150	37,6	41,2	46,6	85	375
C47	44,0	50,0	50	170	42,0	46,1	51,8	85	375
C51	48,0	54,0	60	180	46,6	51,0	57,2	90	400
C56	52,0	60,0	70	200	52,2	57,0	63,8	100	425
C62	58,0	66,0	80	215	58,8	64,4	71,6	120	450
C68	64,0	72,0	90	240	65,6	71,7	79,8	150	475
C75	70,0	79,0	95	255	73,4	80,2	88,6	170	500

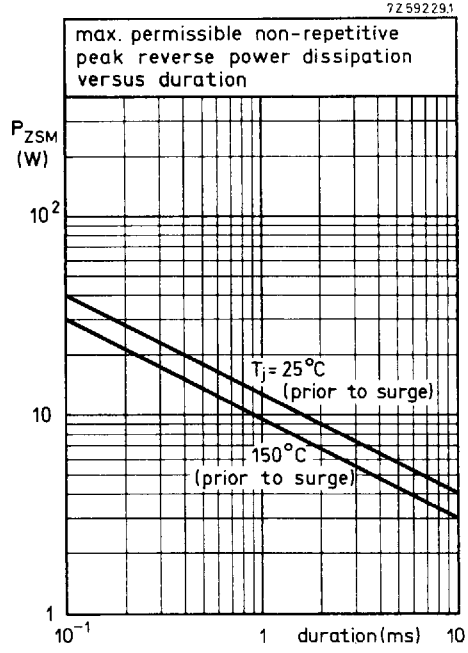

7Z59229.1
max. permissible non-repetitive peak reverse power dissipation versus duration
P_{ZSM} (W)
10^2
10
1
10^{-1}
1
10
duration (ms)
T_j = 25°C (prior to surge)
150°C (prior to surge)

Fig. 2.

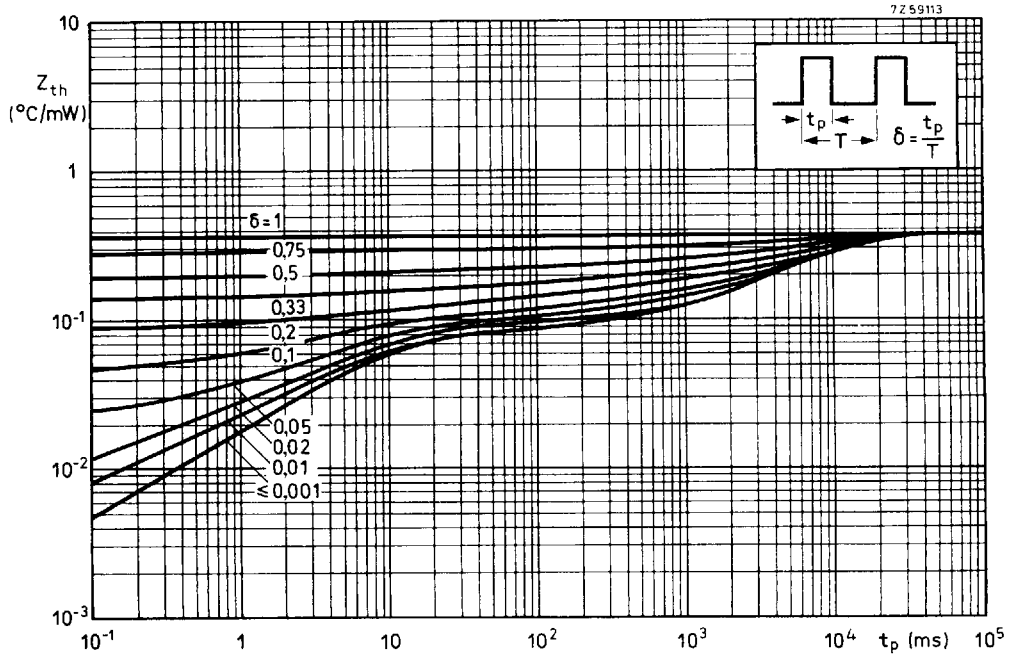

7Z59113
Z_{th} (°C/mW)
10
1
10^{-1}
10^{-2}
10^{-3}
10^{-1}
1
10
10^2
10^3
10^4
10^5
t_p (ms)
t_p
T
$\delta = \frac{t_p}{T}$
δ = 1
0,75
0,5
0,33
0,2
0,1
0,05
0,02
0,01
≤ 0,001

Fig. 3.

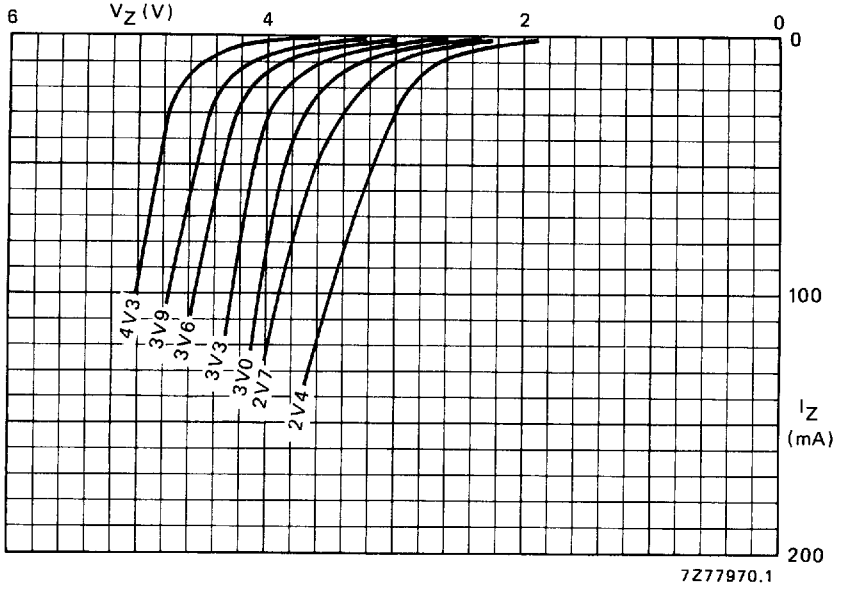


Fig. 4 Static characteristics; typical values; T_{amb} = 25 °C.

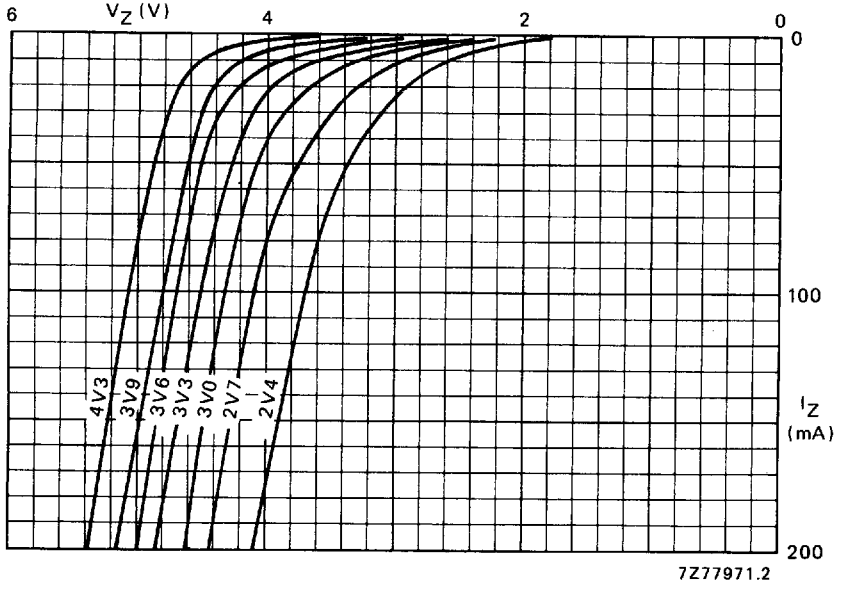


Fig. 5 Dynamic characteristics; typical values; T_j = 25 °C.

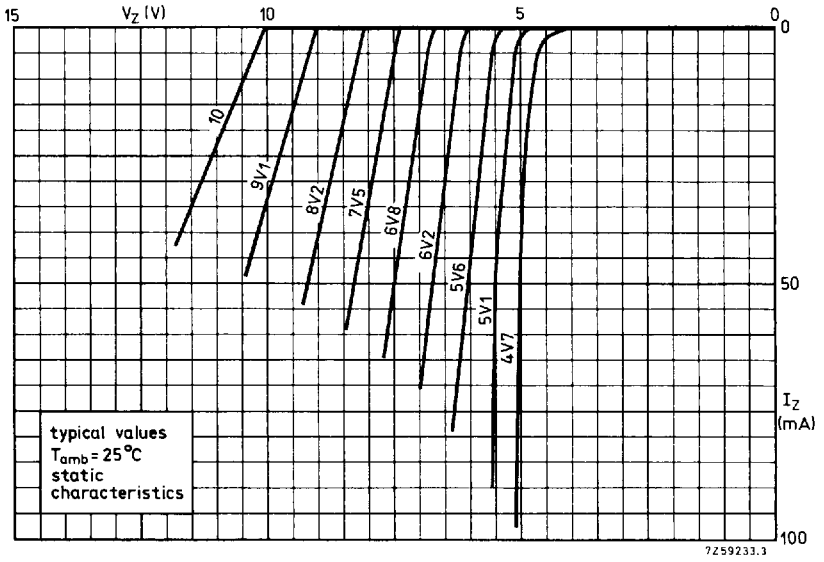

15
V_Z (V)
10
5
0
0
50
100
I_Z (mA)
10
9V1
8V2
7V5
6V8
6V2
5V6
5V1
4V7
typical values
T_{amb} = 25 °C
static characteristics
7Z59233.3

Fig. 6.

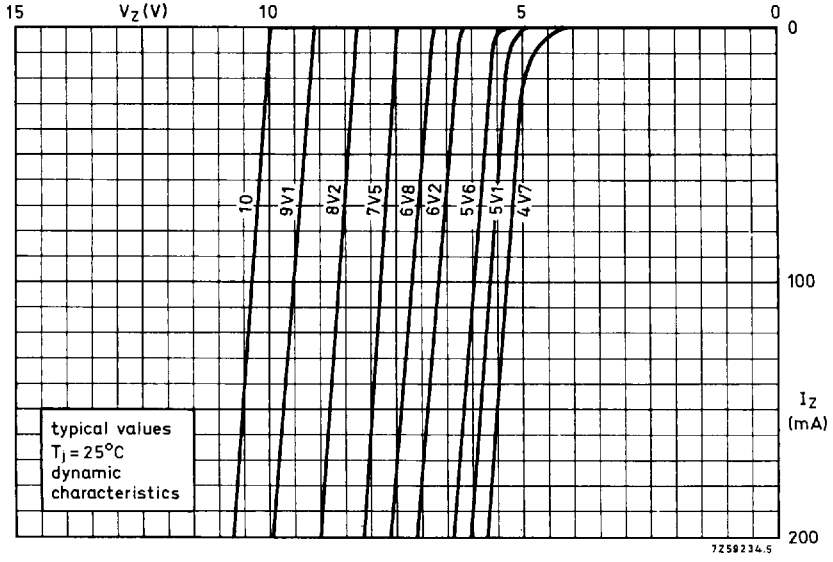

15
V_Z (V)
10
5
0
0
100
200
I_Z (mA)
10
9V1
8V2
7V5
6V8
6V2
5V6
5V1
4V7
typical values
T_j = 25 °C
dynamic characteristics
7Z59234.5

Fig. 7.

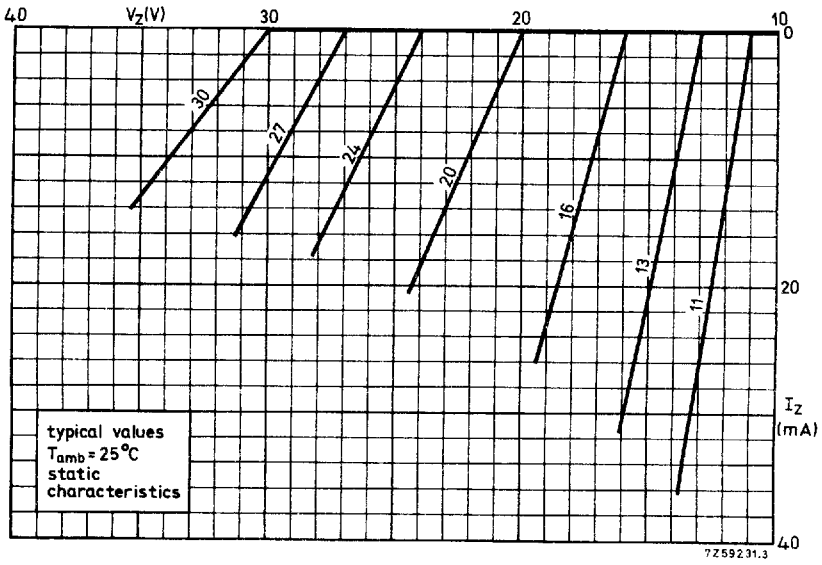

40
V_Z(V)
30
20
10
0
30
27
24
20
16
13
11
20
I_Z
(mA)
typical values
T_{amb} = 25°C
static
characteristics
40
7Z59231.3

Fig. 8.

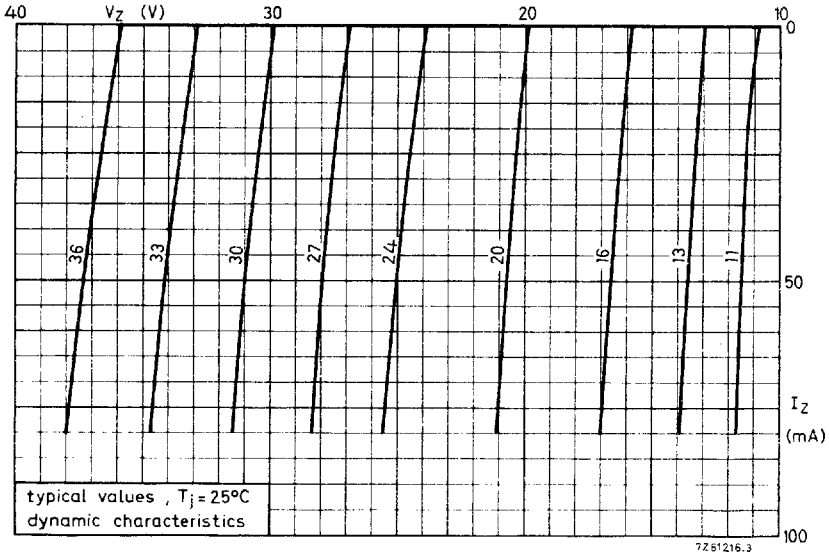

40
V_Z (V)
30
20
10
0
36
33
30
27
24
20
16
13
11
50
I_Z
(mA)
typical values , T_j = 25°C
dynamic characteristics
100
7Z61216.3

Fig. 9.

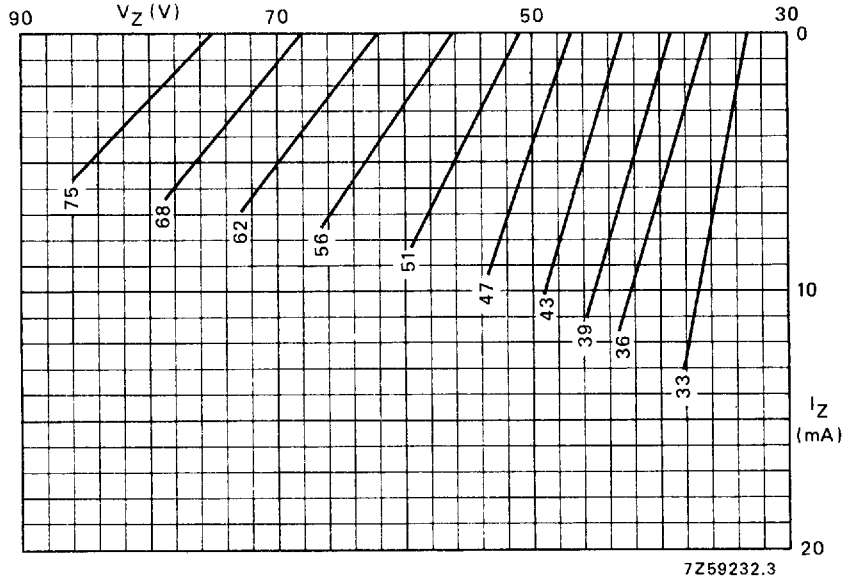


Fig. 10 Static characteristics; typical values; T_{amb} = 25 °C.

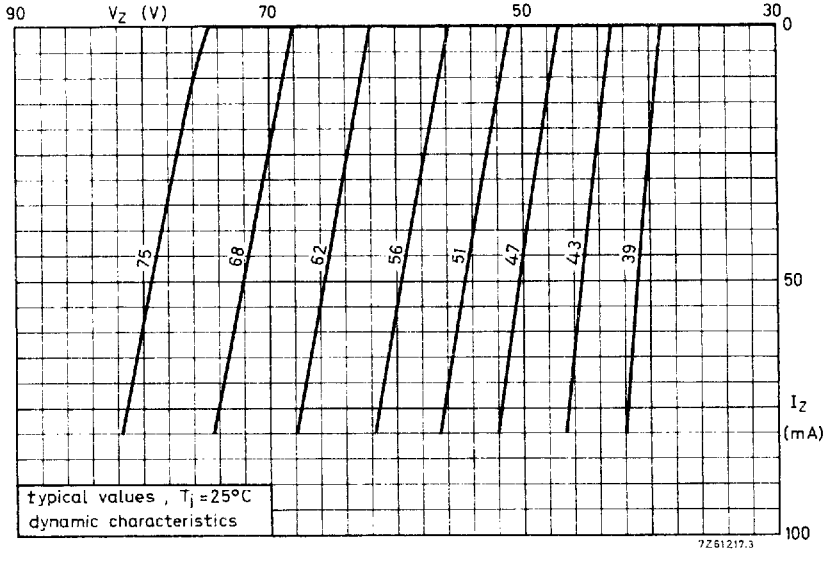


Fig. 11.

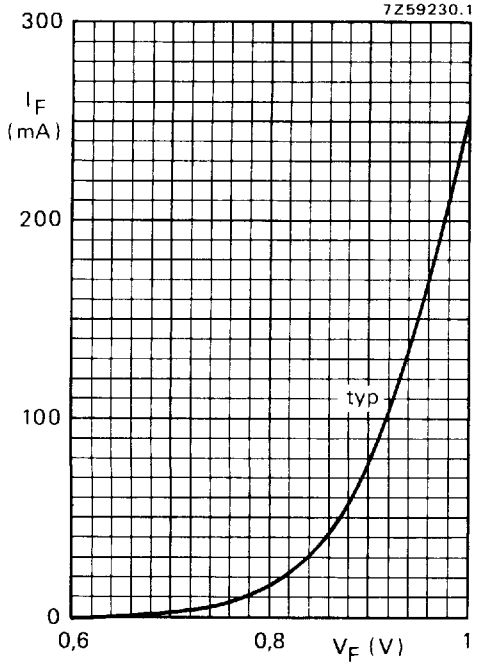


Fig. 12 T_j = 25 °C.

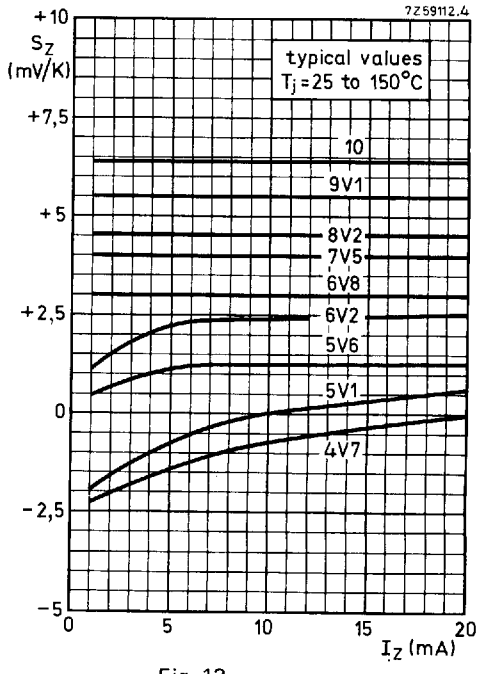


Fig. 13.

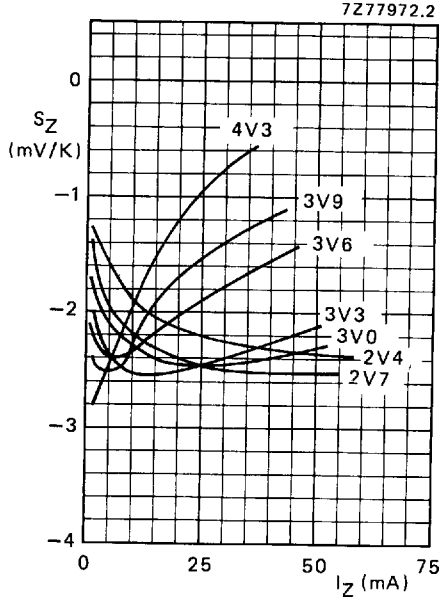


Fig. 14 Typical values; T_j = 25 to 150 °C.

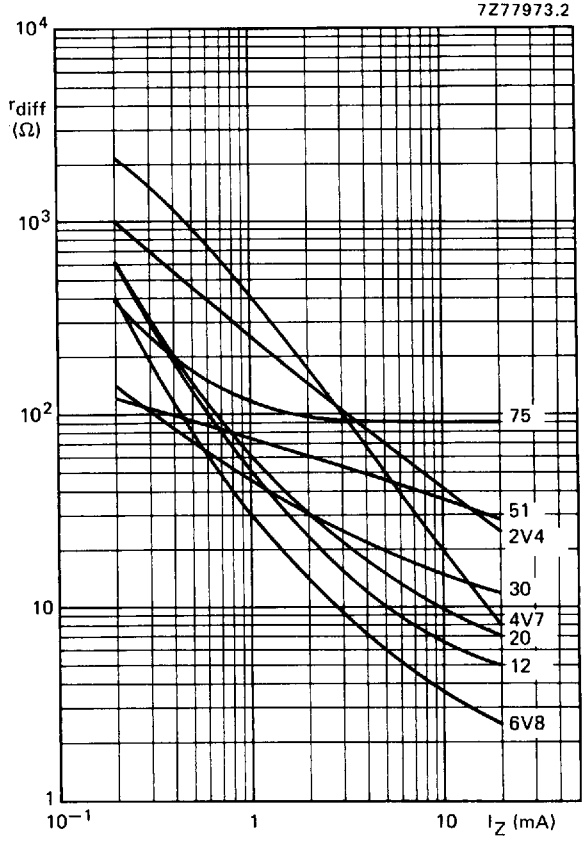


Fig. 15 Typical values; T_j = 25 °C; f = 1 kHz.

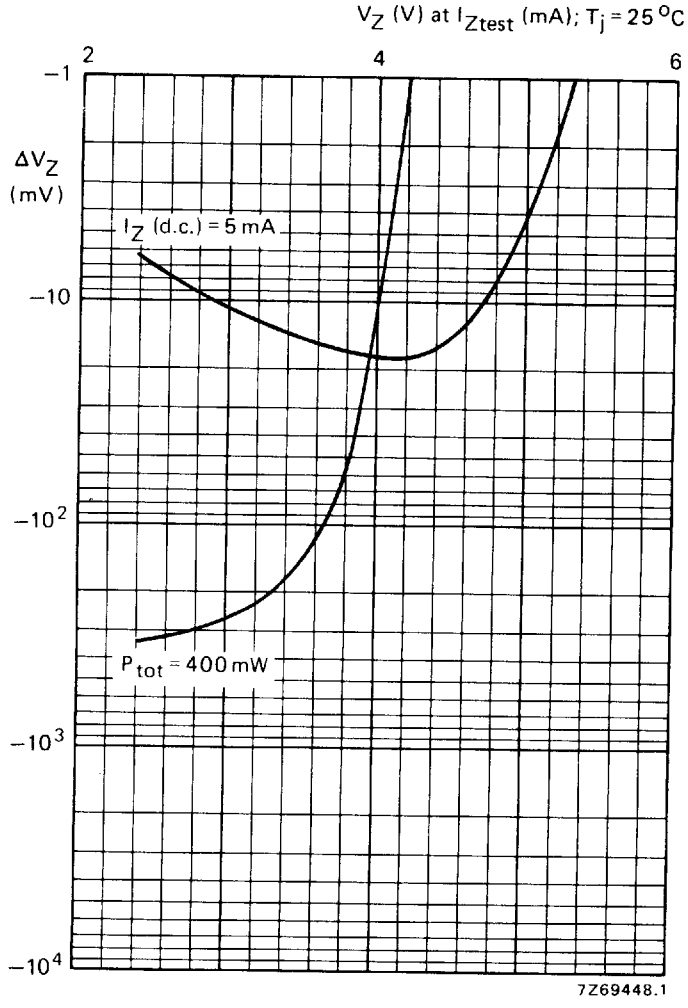


Fig. 16 Typical change of working voltage under operating conditions at T_{amb} = 25 °C.

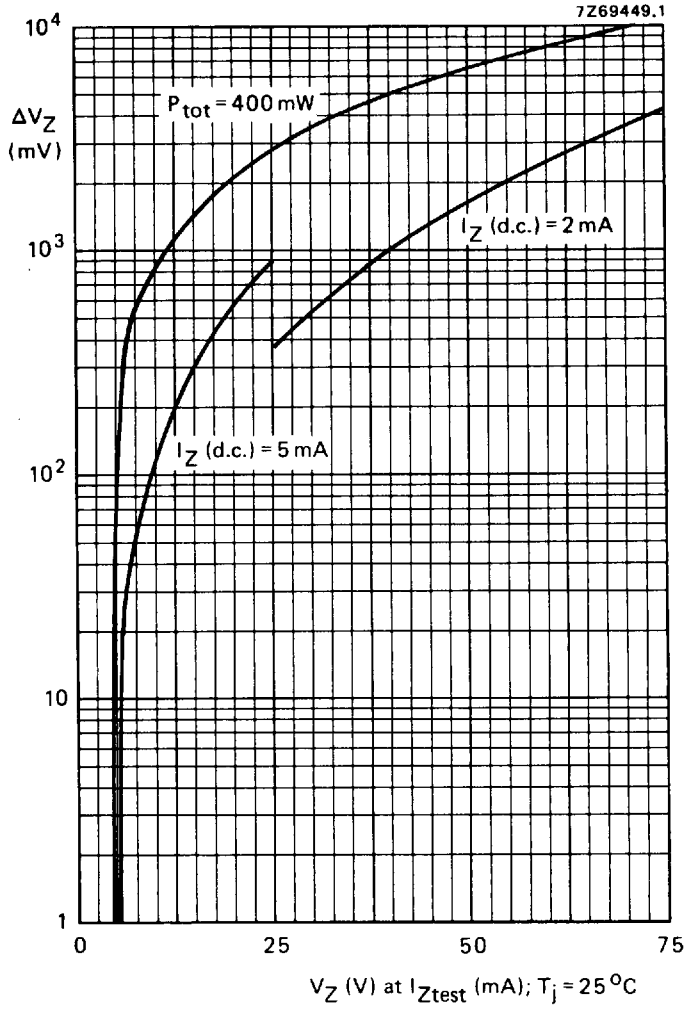


Fig. 17 Typical change of working voltage under operating conditions at T_{amb} = 25 °C.