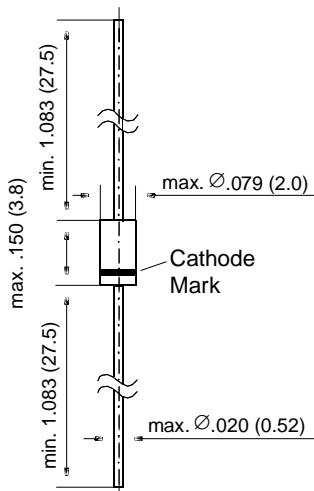


# ZPD1 THRU ZPD75

## ZENER DIODES

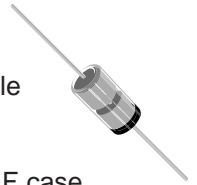
### DO-35



Dimensions are in inches and (millimeters)

### FEATURES

- ◆ Silicon Planar Zener Diodes
- ◆ The Zener voltages are graded according to the international E 12 standard. Smaller voltage tolerances and other Zener voltages are available upon request.
- ◆ These diodes are also available in the Mini-MELF case with the type designation ZMM1 ... ZMM75.



### MECHANICAL DATA

**Case:** DO-35 Glass Case

**Weight:** approx. 0.13 g

### MAXIMUM RATINGS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNIT
Zener Current (see Table "Characteristics")			
Power Dissipation at $T_{amb} = 25^{\circ}\text{C}$	$P_{tot}$	500 <sup>(1)</sup>	mW
Junction Temperature	$T_j$	175	°C
Storage Temperature Range	$T_s$	- 55 to +175	°C

#### NOTES:

(1) Valid provided that leads at a distance of 8 mm from case are kept at ambient temperature.

	SYMBOL	MIN.	TYP.	MAX.	UNIT
Thermal Resistance Junction to Ambient Air	$R_{thJA}$	-	-	0.3 <sup>(1)</sup>	°C/W

#### NOTES:

(1) Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature.

# ZPD1 THRU ZPD75

## ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Type	Zener Voltage <sup>(1)</sup> at I <sub>Z</sub> = 5 mA V <sub>Z</sub> (V)	Dynamic Resistance		Temp. Coeff. of Zener Voltage at I <sub>Z</sub> = 5 mA α <sub>VZ</sub> (10 <sup>-4</sup> /K)	Reverse Voltage at I <sub>R</sub> = 100 nA V <sub>R</sub> (V)	Admissible Zener current <sup>(2)</sup>	
		at I <sub>Z</sub> = 5 mA f = 1 kHz r <sub>Zj</sub> (Ω)	at I <sub>Z</sub> = 1 mA f = 1 kHz r <sub>Zj</sub> (Ω)			at T <sub>amb</sub> = 45°C I <sub>Z</sub> (mA)	at T <sub>amb</sub> = 25°C I <sub>Z</sub> (mA)
ZPD1 <sup>(3)</sup>	0.7 ... 0.8	6.5 (< 8)	< 50	-26 ... -23	-	280	340
ZPD2.7	2.5 ... 2.9	75 (< 83)	< 500	-9 ... -4	-	135	160
ZPD3	2.8 ... 3.2	80 (< 95)	< 500	-9 ... -3	-	117	140
ZPD3.3	3.1 ... 3.5	80 (< 95)	< 500	-8 ... -3	-	109	130
ZPD3.6	3.4 ... 3.8	80 (< 95)	< 500	-8 ... -3	-	101	120
ZPD3.9	3.7 ... 4.1	80 (< 95)	< 500	-7 ... -3	-	92	110
ZPD4.3	4.0 ... 4.6	80 (< 95)	< 500	-6 ... -1	-	85	100
ZPD4.7	4.4 ... 5.0	70 (< 78)	< 500	-5 ... +2	-	76	90
ZPD5.1	4.8 ... 5.4	30 (< 60)	< 480	-3 ... +4	> 0.8	67	80
ZPD5.6	5.2 ... 6.0	10 (< 40)	< 400	-2 ... +6	> 1	59	70
ZPD6.2	5.8 ... 6.6	4.8 (< 10)	< 200	-1 ... +7	> 2	54	64
ZPD6.8	6.4 ... 7.2	4.5 (< 8)	< 150	+2 ... +7	> 3	49	58
ZPD7.5	7.0 ... 7.9	4 (< 7)	< 50	+3 ... +7	> 5	44	53
ZPD8.2	7.7 ... 8.7	4.5 (< 7)	< 50	+4 ... +7	> 6	40	47
ZPD9.1	8.5 ... 9.6	4.8 (< 10)	< 50	+5 ... +8	> 7	36	43
ZPD10	9.4 ... 10.6	5.2 (< 15)	< 70	+5 ... +8	> 7.5	33	40
ZPD11	10.4 ... 11.6	6 (< 20)	< 70	+5 ... +9	> 8.5	30	36
ZPD12	11.4 ... 12.7	7 (< 20)	< 90	+6 ... +9	> 9	28	32
ZPD13	12.4 ... 14.1	9 (< 25)	< 110	+7 ... +9	> 10	25	29
ZPD15	13.8 ... 15.6	11 (< 30)	< 110	+7 ... +9	> 11	23	27
ZPD16	15.3 ... 17.1	13 (< 40)	< 170	+8 ... +9.5	> 12	20	24
ZPD18	16.8 ... 19.1	18 (< 50)	< 170	+8 ... +9.5	> 14	18	21
ZPD20	18.8 ... 21.2	20 (< 50)	< 220	+8 ... +10	> 15	17	20
ZPD22	20.8 ... 23.3	25 (< 55)	< 220	+8 ... +10	> 17	16	18
ZPD24	22.8 ... 25.6	28 (< 80)	< 220	+8 ... +10	> 18	13	16
ZPD27	25.1 ... 28.9	30 (< 80)	< 250	+8 ... +10	> 20	12	14
ZPD30	28 ... 32	35 (< 80)	< 250	+8 ... +10	> 22.5	10	13
ZPD33	31 ... 35	40 (< 80)	< 250	+8 ... +10	> 25	9	12
ZPD36	34 ... 38	40 (< 90)	< 250	+8 ... +10	> 27	9	11
ZPD39	37 ... 41	50 (< 90)	< 300	+10 ... +12	> 29	8	10
ZPD43	40 ... 46	60 (< 100)	< 700	+10 ... +12	> 32	7	9.2
ZPD47	44 ... 50	70 (< 100)	< 750	+10 ... +12	> 35	6	8.5
ZPD51	48 ... 54	70 (< 100)	< 750	+10 ... +12	> 38	6	7.8
ZPD56	52.0 ... 60.0 <sup>(4)</sup>	< 135 <sup>(4)</sup>	< 1000 <sup>(5)</sup>	typ. +10 <sup>(4)</sup>	-	-	-
ZPD62	58.0 ... 66.0 <sup>(4)</sup>	< 150 <sup>(4)</sup>	< 1000 <sup>(5)</sup>	typ. +10 <sup>(4)</sup>	-	-	-
ZPD68	64.0 ... 72.0 <sup>(4)</sup>	< 200 <sup>(4)</sup>	< 1000 <sup>(5)</sup>	typ. +10 <sup>(4)</sup>	-	-	-
ZPD75	70.0 ... 79.0 <sup>(4)</sup>	< 250 <sup>(4)</sup>	< 1500 <sup>(5)</sup>	typ. +10 <sup>(4)</sup>	-	-	-

### NOTES:

(1) Tested with pulses t<sub>p</sub> = 5 ms

(2) Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature

(3) The ZPD1 is a silicon diode operated in forward direction. Hence, the subscript of all parameters should be "F" instead of "Z".

Connect the cathode terminal to the negative pole

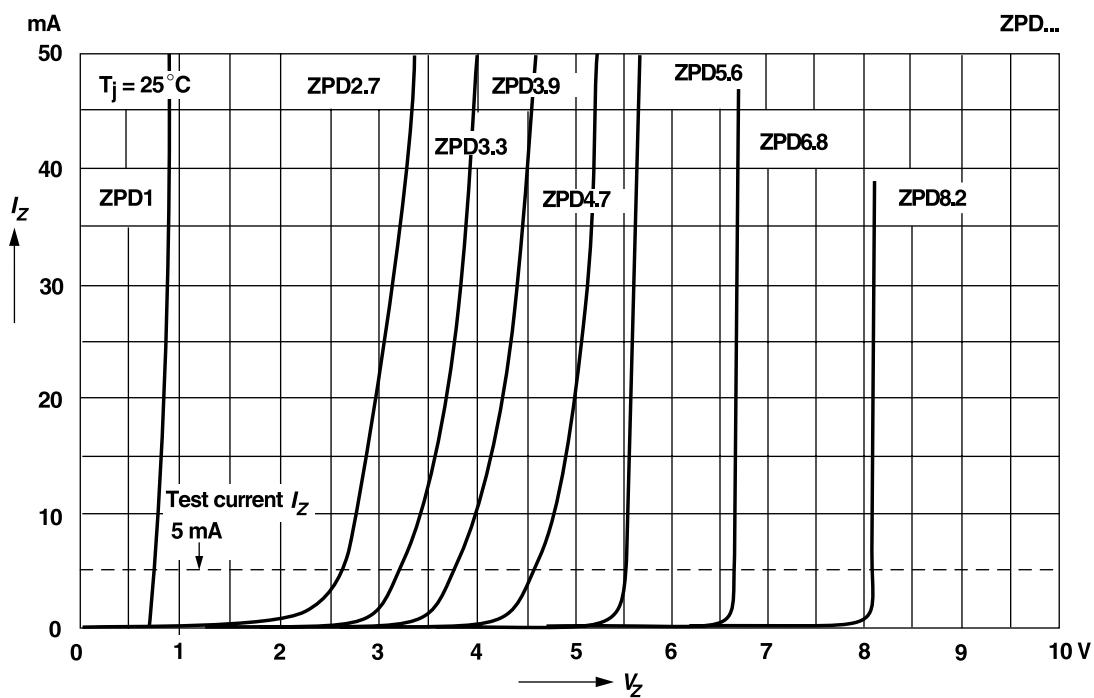
(4) at I<sub>Z</sub> = 2.5 mA

(5) at I<sub>Z</sub> = 0.5 mA

# RATINGS AND CHARACTERISTIC CURVES ZPD1 THRU ZPD75

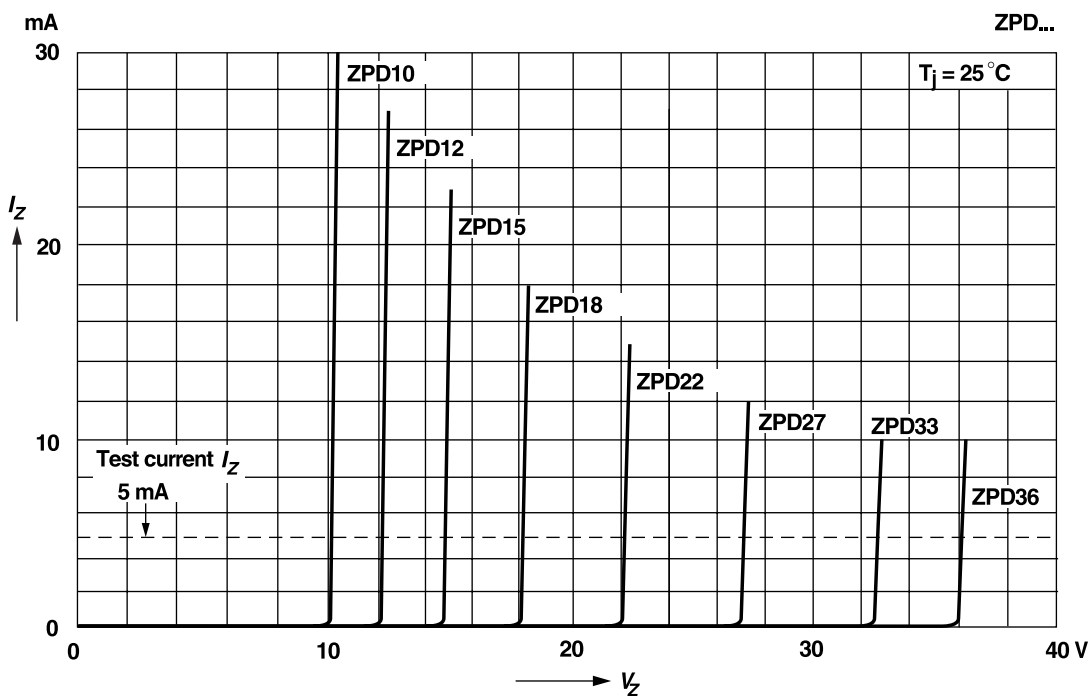
## Breakdown characteristics

$T_j = \text{constant (pulsed)}$



## Breakdown characteristics

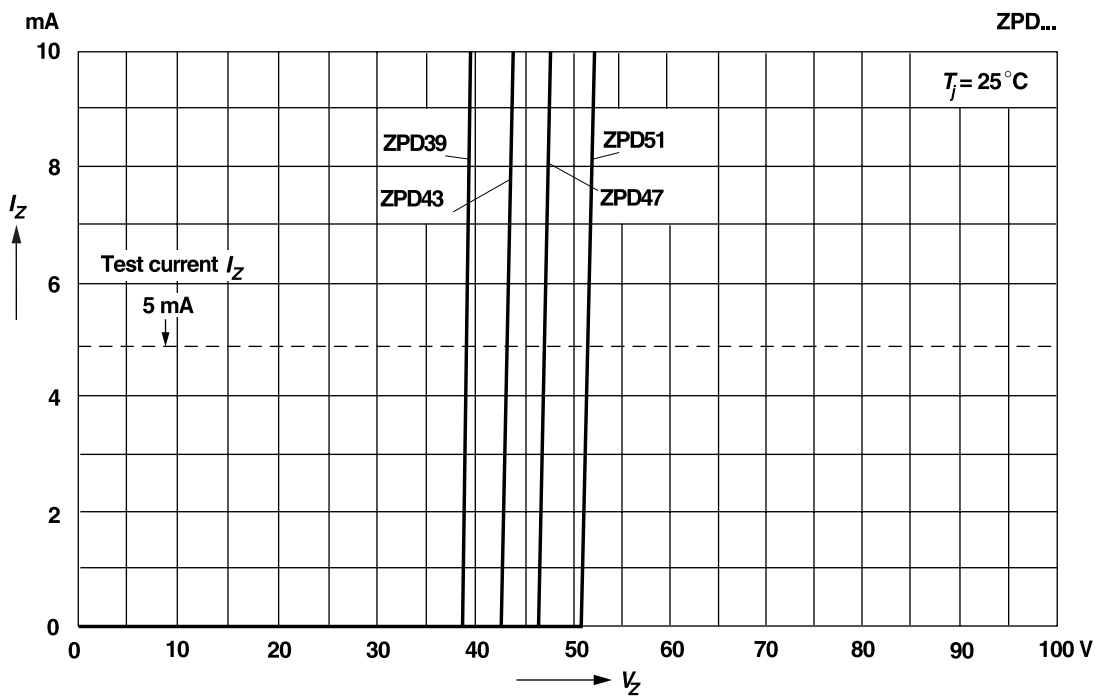
$T_j = \text{constant (pulsed)}$



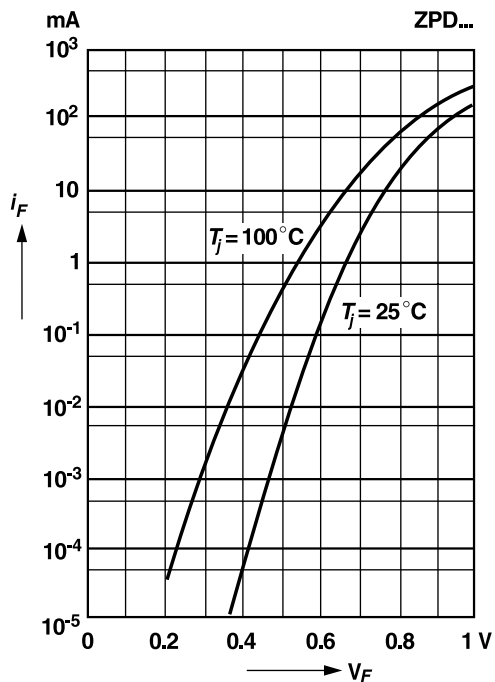
# RATINGS AND CHARACTERISTIC CURVES ZPD1 THRU ZPD75

## Breakdown characteristics

$T_j = \text{constant (pulsed)}$

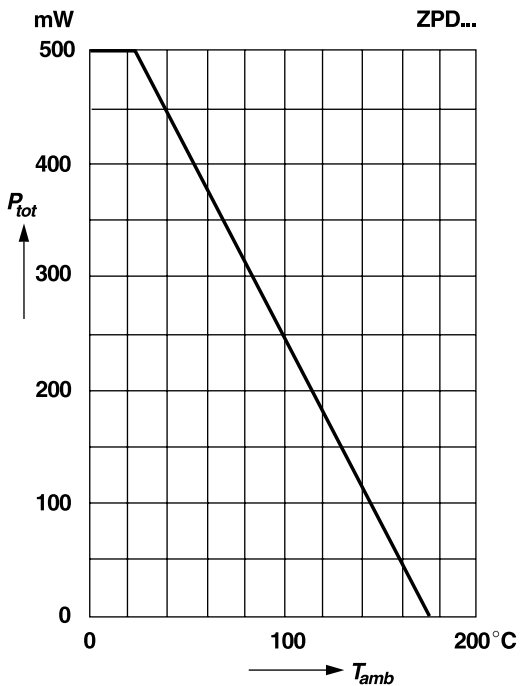


## Forward characteristics



## Admissible power dissipation versus ambient temperature

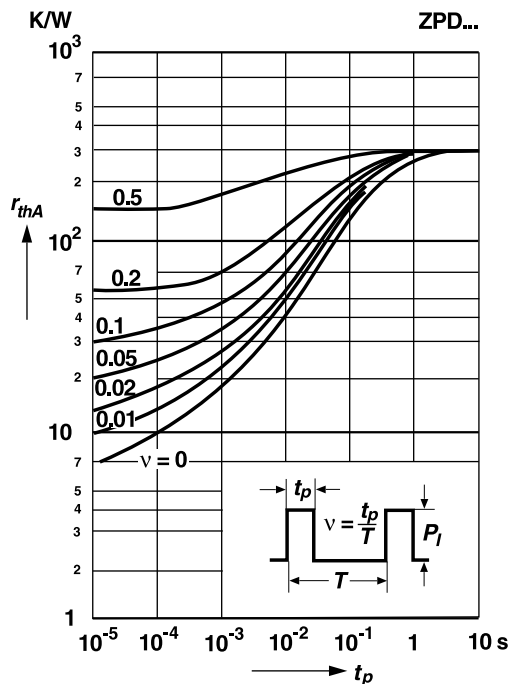
Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature



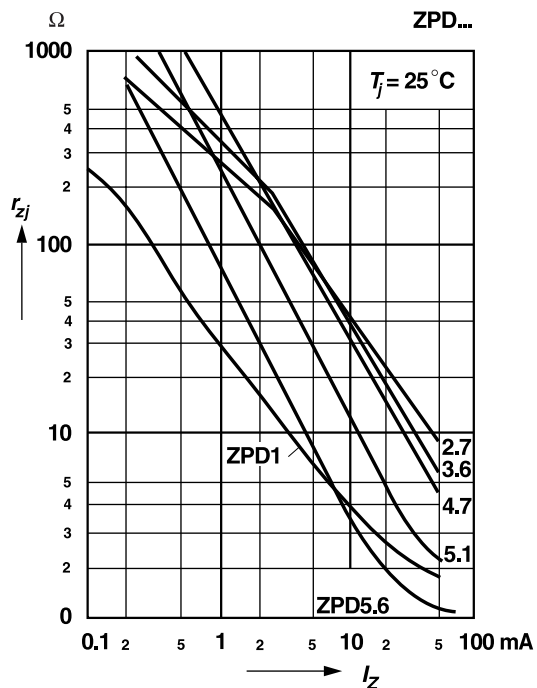
# RATINGS AND CHARACTERISTIC CURVES ZPD1 THRU ZPD75

## Pulse thermal resistance versus pulse duration

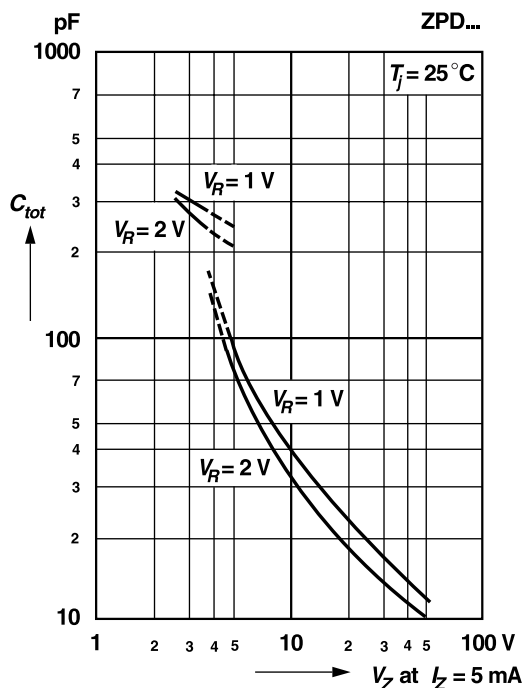
Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature



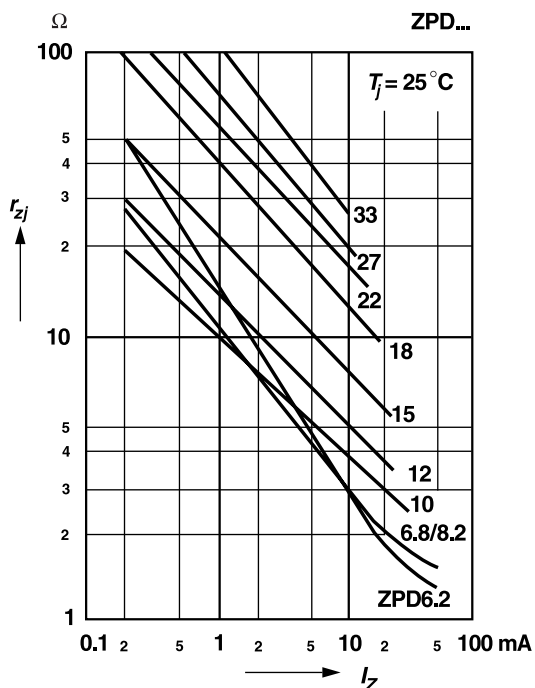
## Dynamic resistance versus Zener current



## Capacitance versus Zener voltage

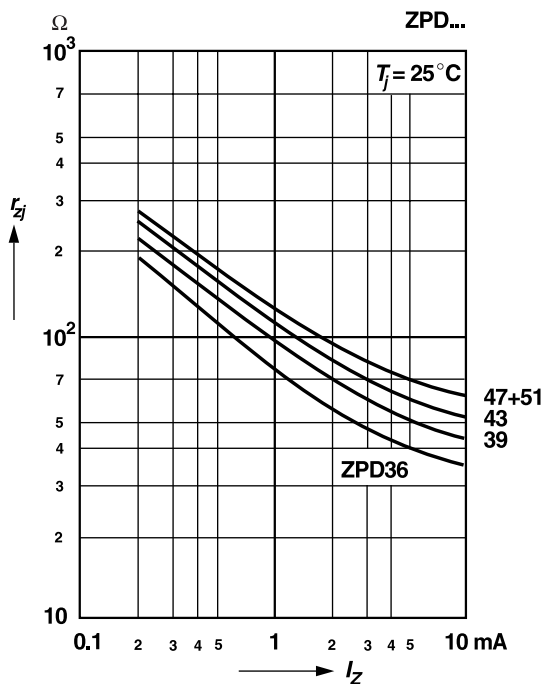


## Dynamic resistance versus Zener current



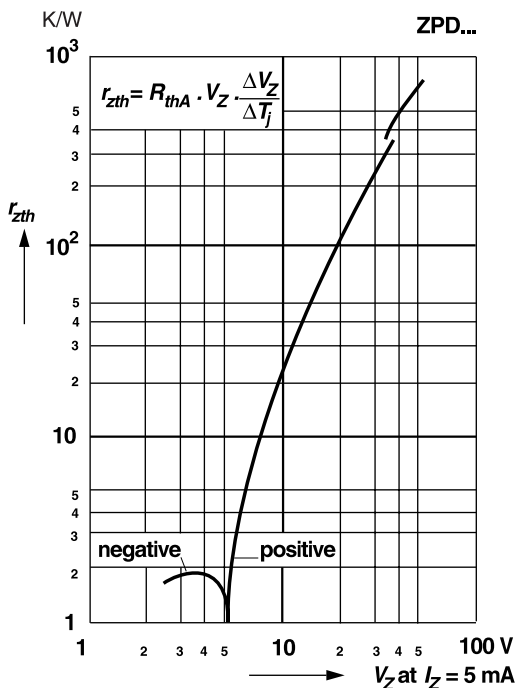
# RATINGS AND CHARACTERISTIC CURVES ZPD1 THRU ZPD75

**Dynamic resistance versus Zener current**

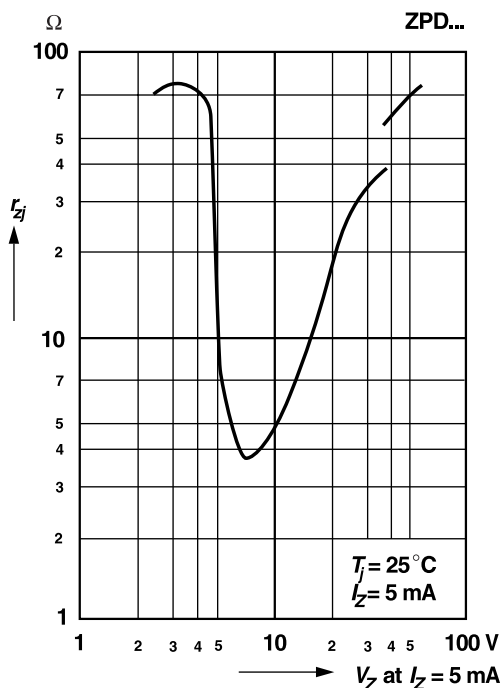


**Thermal differential resistance versus Zener voltage**

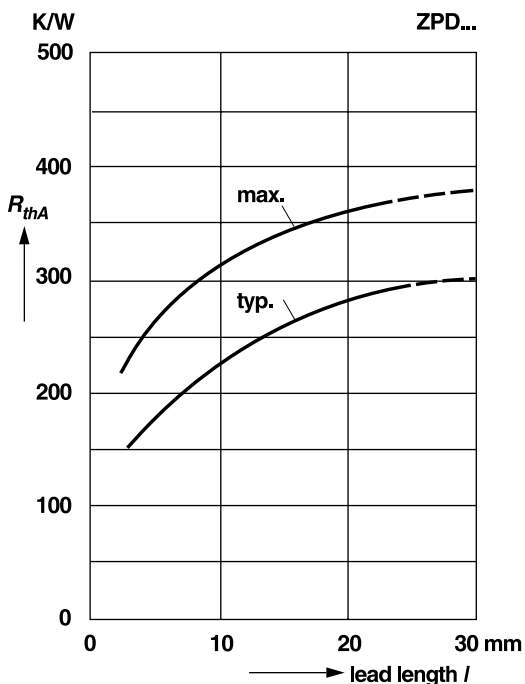
Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature



**Dynamic resistance versus Zener voltage**

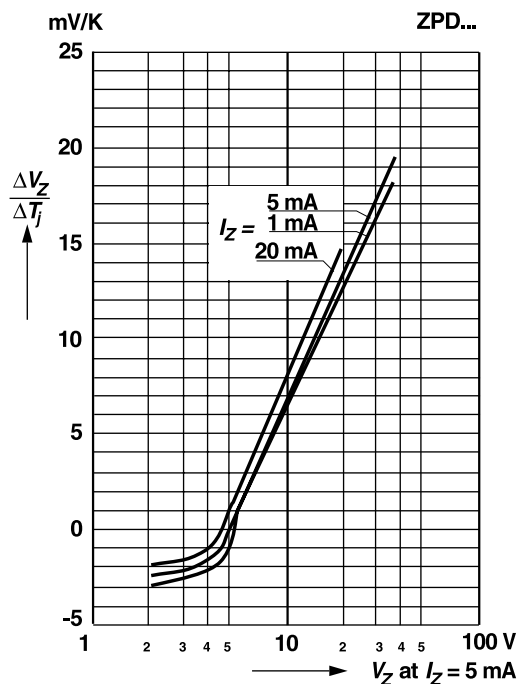


**Thermal resistance versus lead length**

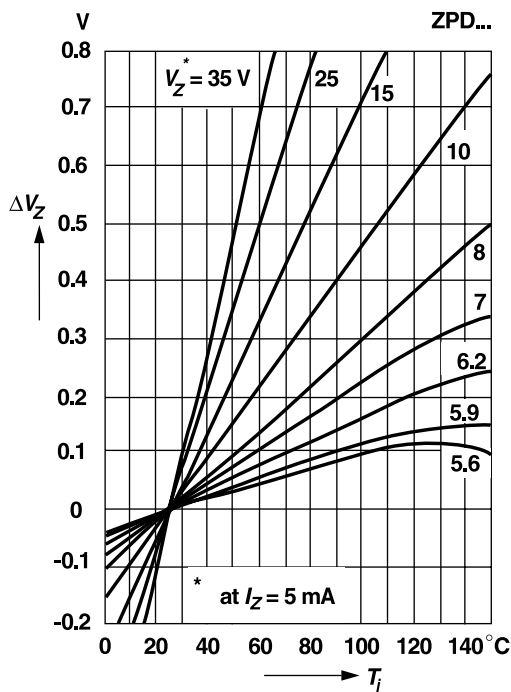


# RATINGS AND CHARACTERISTIC CURVES ZPD1 THRU ZPD75

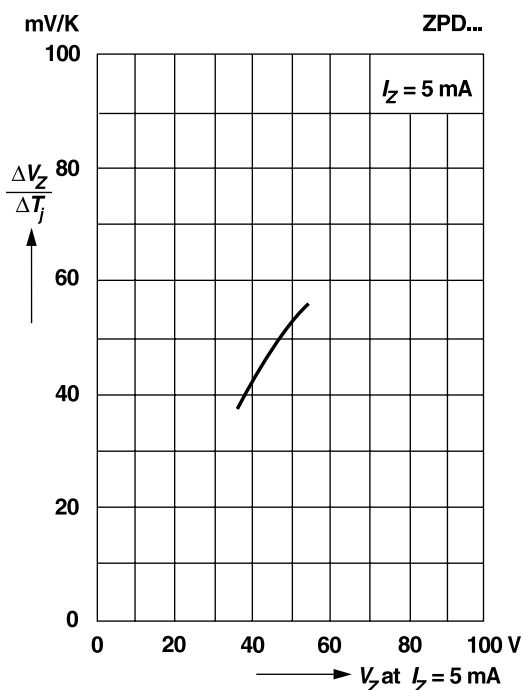
Temperature dependence of Zener voltage versus Zener voltage



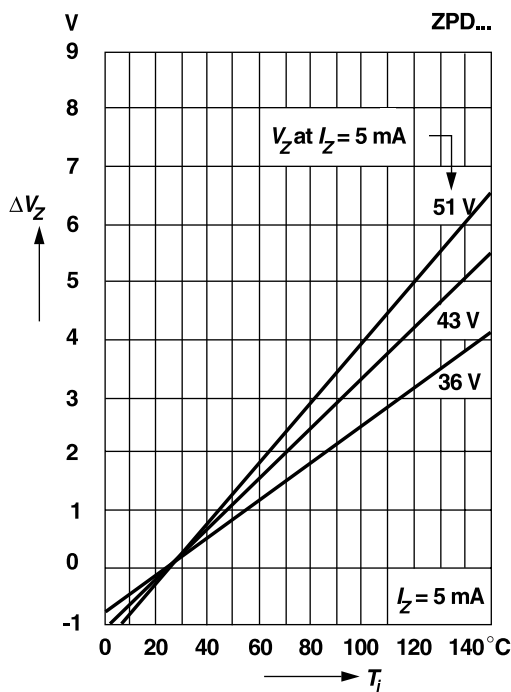
Change of Zener voltage versus junction temperature



Temperature dependence of Zener voltage versus Zener voltage

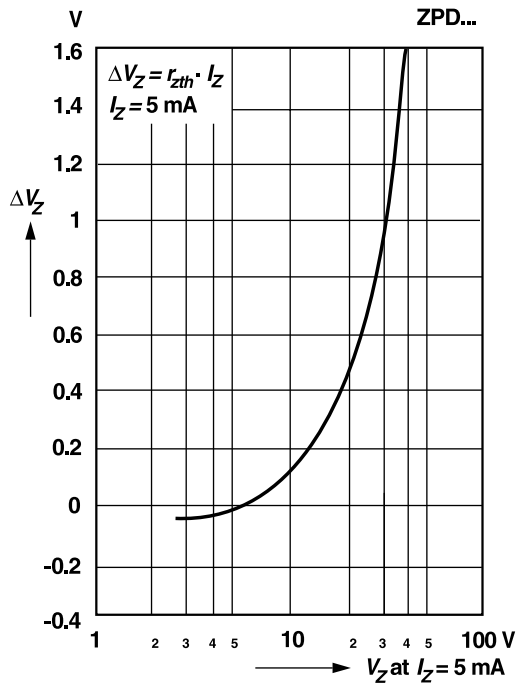


Change of Zener voltage versus junction temperature



# RATINGS AND CHARACTERISTIC CURVES ZPD1 THRU ZPD75

Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage



Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage

