



ZPD1 thru ZPD75

Zener Diodes

Zener Voltage Range: 1.0, 2.7 to 75 Volts Power Dissipation: 500mW

Features

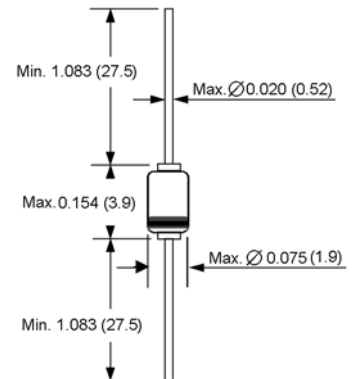
- ◆ Silicon Planar Zener Diodes.
- ◆ The Zener voltages are graded according to the international E 12 standard. Offered with either 5% or 2% tolerance. Smaller voltage tolerances and other Zener voltages are available upon request.
- ◆ These diodes are also available in MiniMELF case with the type designation ZMM1 ... ZMM75.



DO-204AH (DO-35 Glass)

Mechanical Data

- ◆ Case: DO-35 Glass Case
- ◆ Weight: approx. 0.13g



Dimensions in inches and (millimeters)

Maximum Ratings and Thermal Characteristics

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Zener current (see Table "Characteristics")			
Power dissipation at $T_{\text{amb}} = 25^\circ\text{C}$	P_{tot}	500 ⁽¹⁾	mW
Thermal resistance junction to ambient air	$R_{\theta\text{JA}}$	0.3 ⁽²⁾	$^\circ\text{C}/\text{mW}$
Junction temperature	T_j	175	$^\circ\text{C}$
Storage temperature range	T_s	-55 to +175	$^\circ\text{C}$

- Notes:**
1. Valid provided that leads at a distance of 8mm from case are kept at ambient temperature
 2. Valid provided that leads at a distance of 4mm from case are kept at ambient temperature

Electrical Characteristics

(T_A=25°C unless otherwise noted)

Type number add suffix SB14686 for ±2% tol.	Dynamic resistance		Temperature coefficient of zener voltage at I _Z =5mA α _{VZ} (10 ⁻⁴ / °C)		Reverse voltage at I _R =100nA V _R (Volts)	Admissible zener current ⁽²⁾	
	at I _Z =5mA f=1kHz r _{zj} (Ω)	at I _Z =1mA f=1kHz r _{zj} (Ω)	Min.	Max.		at T _{amb} =45°C I _Z (mA)	at T _{amb} =25°C I _Z (mA)
ZPD1 ⁽³⁾	6.5 (< 8)	< 50	-26	-23	-	280	340
ZPD2.7	75 (< 83)	< 500	-9	-4	-	135	160
ZPD3	80 (< 95)	< 500	-9	-3	-	117	140
ZPD3.3	80 (< 95)	< 500	-8	-3	-	109	130
ZPD3.6	80 (< 95)	< 500	-8	-3	-	101	120
ZPD3.9	80 (< 95)	< 500	-7	-3	-	92	110
ZPD4.3	80 (< 95)	< 500	-6	-1	-	85	100
ZPD4.7	70 (< 78)	< 500	-5	+2	-	76	90
ZPD5.1	30 (< 60)	< 480	-3	+4	> 0.8	67	80
ZPD5.6	10 (< 40)	< 400	-2	+6	> 1	59	70
ZPD6.2	4.8 (< 10)	< 200	-1	+7	> 2	54	64
ZPD6.8	4.5 (< 8)	< 150	+2	+7	> 3	49	58
ZPD7.5	4 (< 7)	< 50	+3	+7	> 5	44	53
ZPD8.2	4.5 (< 7)	< 50	+4	+7	> 6	40	47
ZPD9.1	4.8 (< 10)	< 50	+5	+8	> 7	36	43
ZPD10	5.2 (< 15)	< 70	+5	+8	> 7.5	33	40
ZPD11	6 (< 20)	< 70	+5	+9	> 8.5	30	36
ZPD12	7 (< 20)	< 90	+6	+9	> 9	28	32
ZPD13	9 (< 25)	< 110	+7	+9	> 10	25	29
ZPD15	11 (< 30)	< 110	+7	+9	> 11	23	27
ZPD16	13 (< 40)	< 170	+8	+9.5	> 12	20	24
ZPD18	18 (< 50)	< 170	+8	+9.5	> 14	18	21
ZPD20	20 (< 50)	< 220	+8	+10	> 15	17	20
ZPD22	25 (< 55)	< 220	+8	+10	> 17	16	18
ZPD24	28 (< 80)	< 220	+8	+10	> 18	13	16
ZPD27	30 (< 80)	< 250	+8	+10	> 20	12	14
ZPD30	35 (< 80)	< 250	+8	+10	> 22.5	10	13
ZPD33	40 (< 80)	< 250	+8	+10	> 25	9	12
ZPD36	40 (< 90)	< 250	+8	+10	> 27	9	11
ZPD39	50 (< 90)	< 300	+10	+12	> 29	8	10
ZPD43	60 (< 100)	< 700	+10	+12	> 32	7	9.2
ZPD47	70 (< 100)	< 750	+10	+12	> 35	6	8.5
ZPD51	70 (< 100)	< 750	+10	+12	> 38	6	7.8
ZPD56	< 135 ⁽⁴⁾	< 1000 ⁽⁵⁾	typ. +10 ⁽⁴⁾		-	-	-
ZPD62	< 150 ⁽⁴⁾	< 1000 ⁽⁵⁾	typ. +10 ⁽⁴⁾		-	-	-
ZPD68	< 200 ⁽⁴⁾	< 1000 ⁽⁵⁾	typ. +10 ⁽⁴⁾		-	-	-
ZPD75	< 250 ⁽⁴⁾	< 1500 ⁽⁵⁾	typ. +10 ⁽⁴⁾		-	-	-

- Notes:**
1. Tested with pulses t_p=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_Z=2.5 mA
 5. at I_Z=0.5 mA

Electrical Characteristics

(T_A=25°C unless otherwise noted)

Type number ±5% Tol.	Zener voltage range ⁽¹⁾ at I _Z V _Z (Volts)		Test current I _Z (mA)
	Min.	Max.	
ZPD1 ⁽³⁾	0.70	0.80	5.0
ZPD2.7	2.50	2.90	5.0
ZPD3	2.80	3.20	5.0
ZPD3.3	3.10	3.50	5.0
ZPD3.6	3.40	3.80	5.0
ZPD3.9	3.70	4.10	5.0
ZPD4.3	4.00	4.60	5.0
ZPD4.7	4.40	5.00	5.0
ZPD5.1	4.80	5.40	5.0
ZPD5.6	5.20	6.00	5.0
ZPD6.2	5.80	6.60	5.0
ZPD6.8	6.40	7.20	5.0
ZPD7.5	7.00	7.90	5.0
ZPD8.2	7.70	8.70	5.0
ZPD9.1	8.50	9.60	5.0
ZPD10	9.40	10.6	5.0
ZPD11	10.4	11.6	5.0
ZPD12	11.4	12.7	5.0
ZPD13	12.4	14.1	5.0
ZPD15	13.8	15.6	5.0
ZPD16	15.3	17.1	5.0
ZPD18	16.8	19.1	5.0
ZPD20	18.8	21.2	5.0
ZPD22	20.8	23.3	5.0
ZPD24	22.8	25.6	5.0
ZPD27	25.1	28.9	5.0
ZPD30	28.0	32.0	5.0
ZPD33	31.0	35.0	5.0
ZPD36	34.0	38.0	5.0
ZPD39	37.0	41.0	5.0
ZPD43	40.0	46.0	5.0
ZPD47	44.0	50.0	5.0
ZPD51	48.0	54.0	5.0
ZPD56	52.0	60.0	2.5
ZPD62	58.0	66.0	2.5
ZPD68	64.0	72.0	2.5
ZPD75	70.0	79.0	2.5

Type number add suffix SB14686 ±2% Tol.	Zener voltage range ⁽¹⁾ at I _Z V _Z (Volts)		Test current I _Z (mA)
	Min.	Max.	
ZPD1 ⁽³⁾	-	-	5.0
ZPD2.7	2.65	2.75	5.0
ZPD3	2.94	3.06	5.0
ZPD3.3	3.23	3.37	5.0
ZPD3.6	3.53	3.67	5.0
ZPD3.9	3.82	3.98	5.0
ZPD4.3	4.21	4.39	5.0
ZPD4.7	4.61	4.79	5.0
ZPD5.1	5.00	5.20	5.0
ZPD5.6	5.49	5.71	5.0
ZPD6.2	6.08	6.32	5.0
ZPD6.8	6.66	6.94	5.0
ZPD7.5	7.35	7.65	5.0
ZPD8.2	8.04	8.36	5.0
ZPD9.1	8.92	9.28	5.0
ZPD10	9.80	10.2	5.0
ZPD11	10.8	11.2	5.0
ZPD12	11.8	12.2	5.0
ZPD13	12.7	13.3	5.0
ZPD15	14.7	15.3	5.0
ZPD16	15.7	16.3	5.0
ZPD18	17.6	18.4	5.0
ZPD20	19.6	20.4	5.0
ZPD22	21.6	22.4	5.0
ZPD24	23.5	24.5	5.0
ZPD27	26.5	27.5	5.0
ZPD30	29.4	30.6	5.0
ZPD33	32.3	33.7	5.0
ZPD36	35.3	36.7	5.0
ZPD39	38.2	39.8	5.0
ZPD43	42.1	43.9	5.0
ZPD47	46.1	47.9	5.0
ZPD51	50.0	52.0	5.0
ZPD56	54.9	57.1	2.5
ZPD62	60.8	63.2	2.5
ZPD68	66.6	69.4	2.5
ZPD75	73.5	76.5	2.5

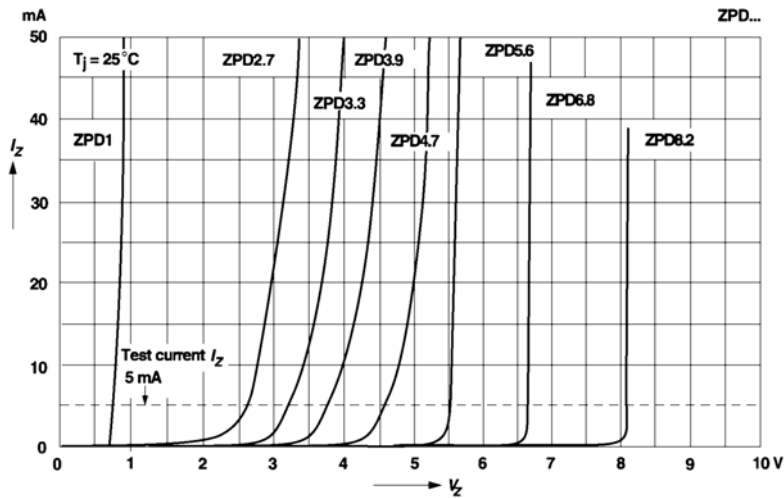
- Notes:**
1. Measured with pulses t_p=5 ms
 3. The ZPD1 is a silicon diode operated in forward direction. Hence, the subscript of all parameters should be "F" instead of "Z". Connect the cathode terminal to the negative pole

RATINGS AND CHARACTERISTIC CURVES

($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

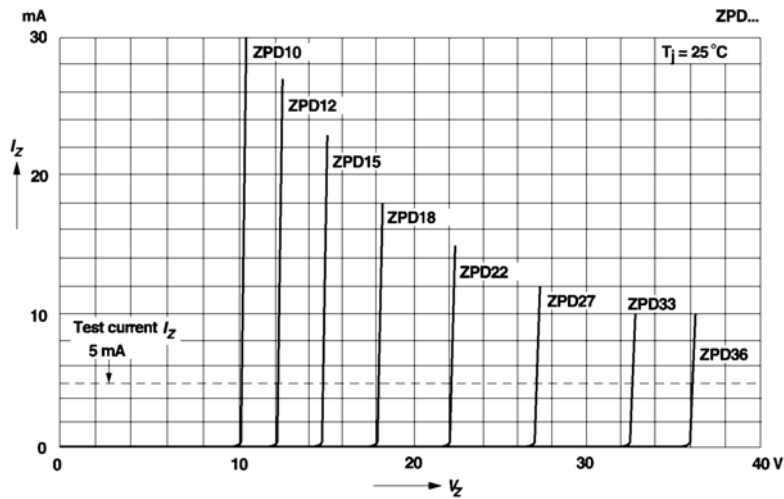
Breakdown characteristics

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



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

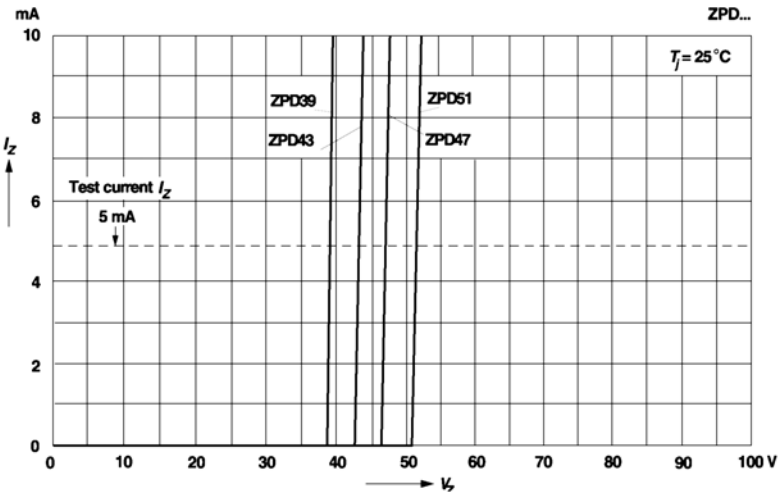


RATINGS AND CHARACTERISTIC CURVES

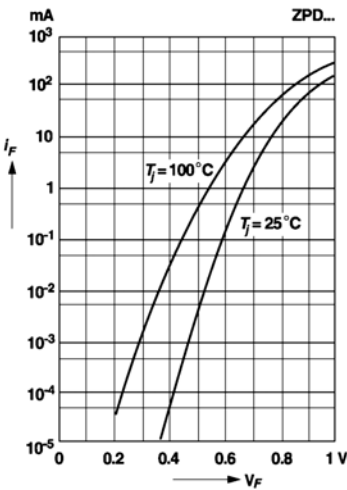
($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Breakdown characteristics

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

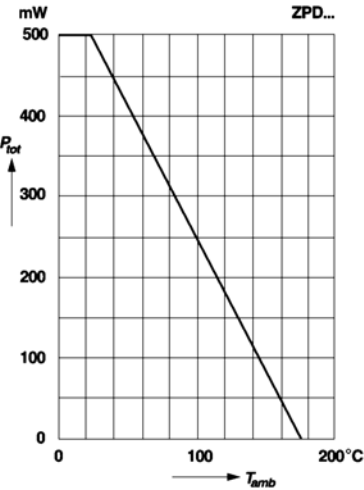


Forward characteristics



Admissible power dissipation
versus ambient temperature

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

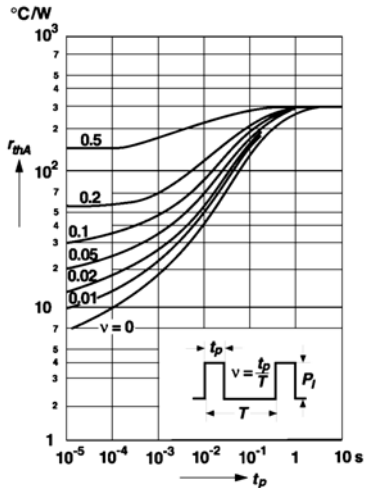


RATINGS AND CHARACTERISTIC CURVES

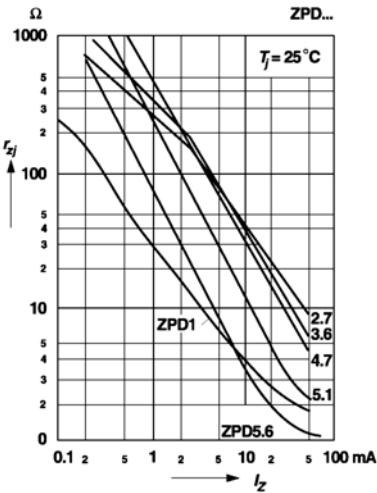
($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Pulse thermal resistance
versus pulse duration

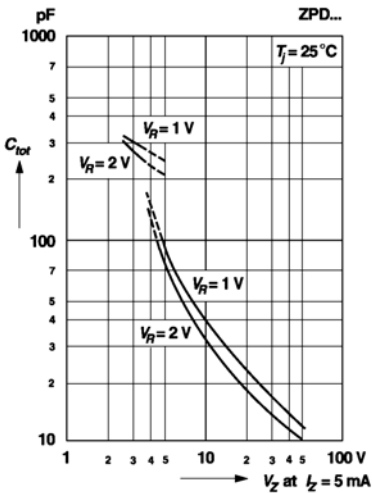
Valid provided that leads at a distance of 4 mm from case
are kept at ambient temperature



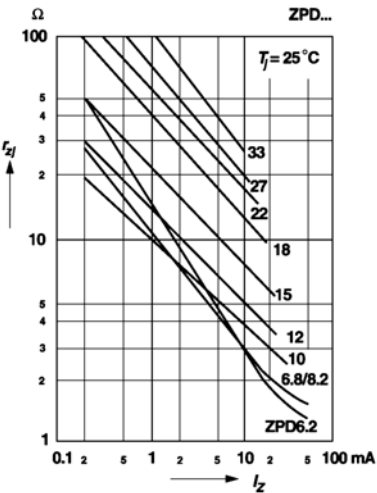
Dynamic resistance
versus Zener current



Capacitance
versus Zener voltage



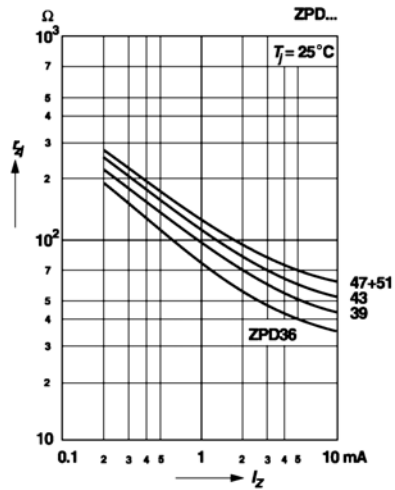
Dynamic resistance
versus Zener current



RATINGS AND CHARACTERISTIC CURVES

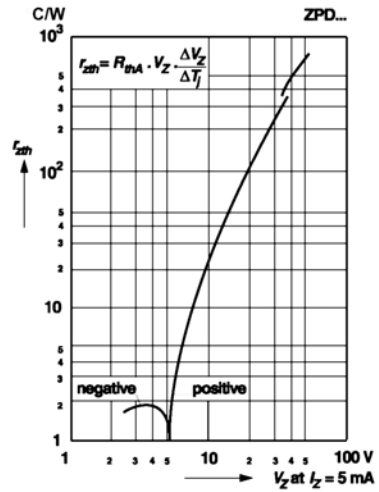
($T_A = 25^\circ\text{C}$ unless otherwise noted)

**Dynamic resistance
versus Zener current**

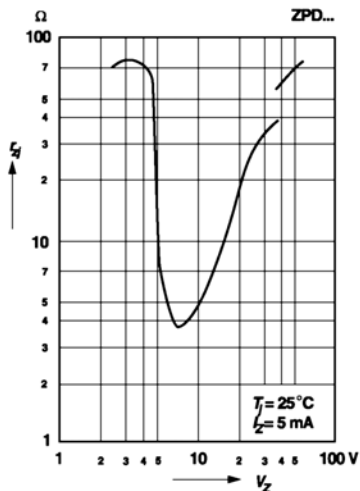


**Thermal differential resistance
versus Zener voltage**

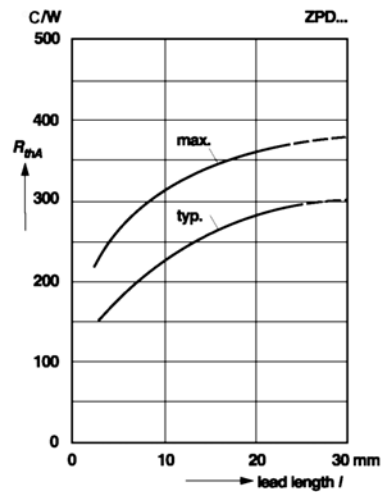
Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature



**Dynamic resistance
versus Zener voltage**



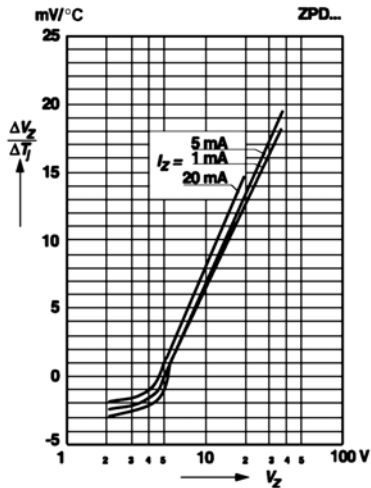
**Thermal resistance
versus lead length**



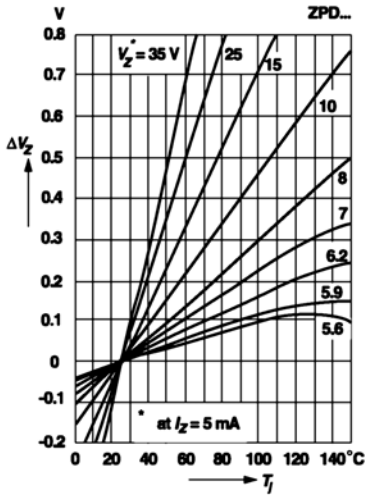
RATINGS AND CHARACTERISTIC CURVES

($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

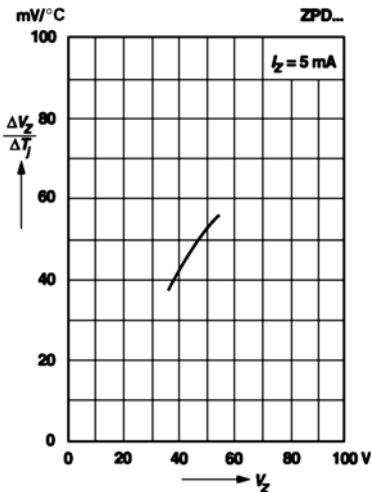
Temperature dependence of Zener voltage
versus Zener voltage



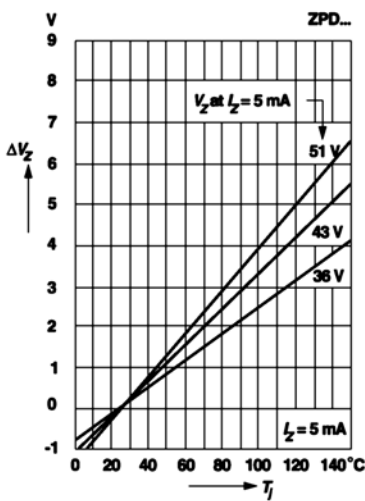
Change of Zener voltage
versus junction temperature



Temperature dependence of Zener
voltage versus Zener voltage



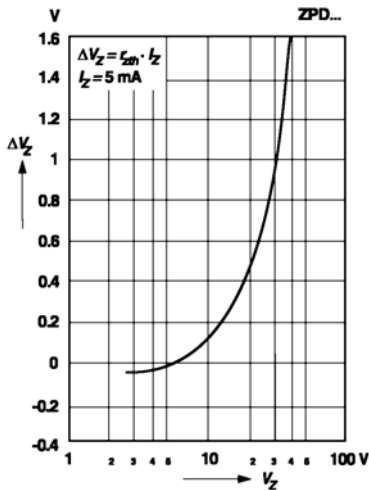
Change of Zener voltage
versus junction temperature



RATINGS AND CHARACTERISTIC CURVES

(T_A = 25°C unless otherwise noted)

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

