

OM SENI

MMSZ52xxxT1G Series Zener Voltage Regulators

500 mW SOD-123 Surface Mount

Three complete series of Zener diodes are offered in the convenient, surface mount plastic SOD-123 package. These devices provide a convenient alternative to the leadless 34-package style. Zener voltage in this series are specified with device junction in thermal equilibrium.

Features

- 500 mW Rating on FR-4 or FR-5 Board
- Wide Zener Reverse Voltage Range – 2.4 V to 110 V @ Thermal Equilibrium*
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- General Purpose, Medium Current
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- These are Pb-Free Devices*

Mechanical Characteristics:

CASE: Void-free, transfer-molded, thermosetting plastic case

FINISH: Corrosion resistant finish, easily solderable

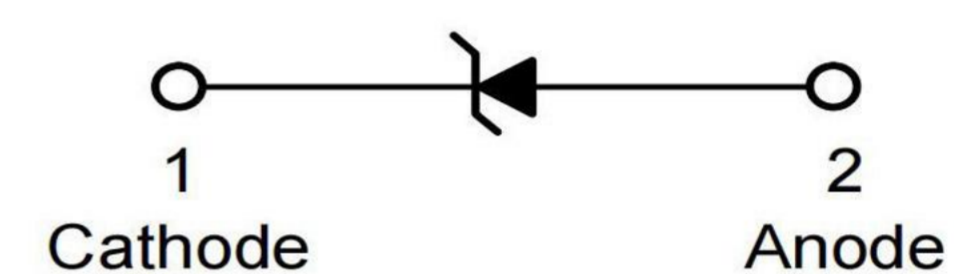
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

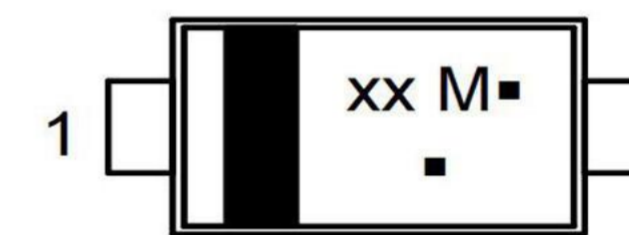
POLARITY: Cathode indicated by polarity band



SOD-123
CASE 425
STYLE 1



MARKING DIAGRAM



- xx = Device Code (Refer to page 3)
- M = Date Code
- = Pb-Free Package

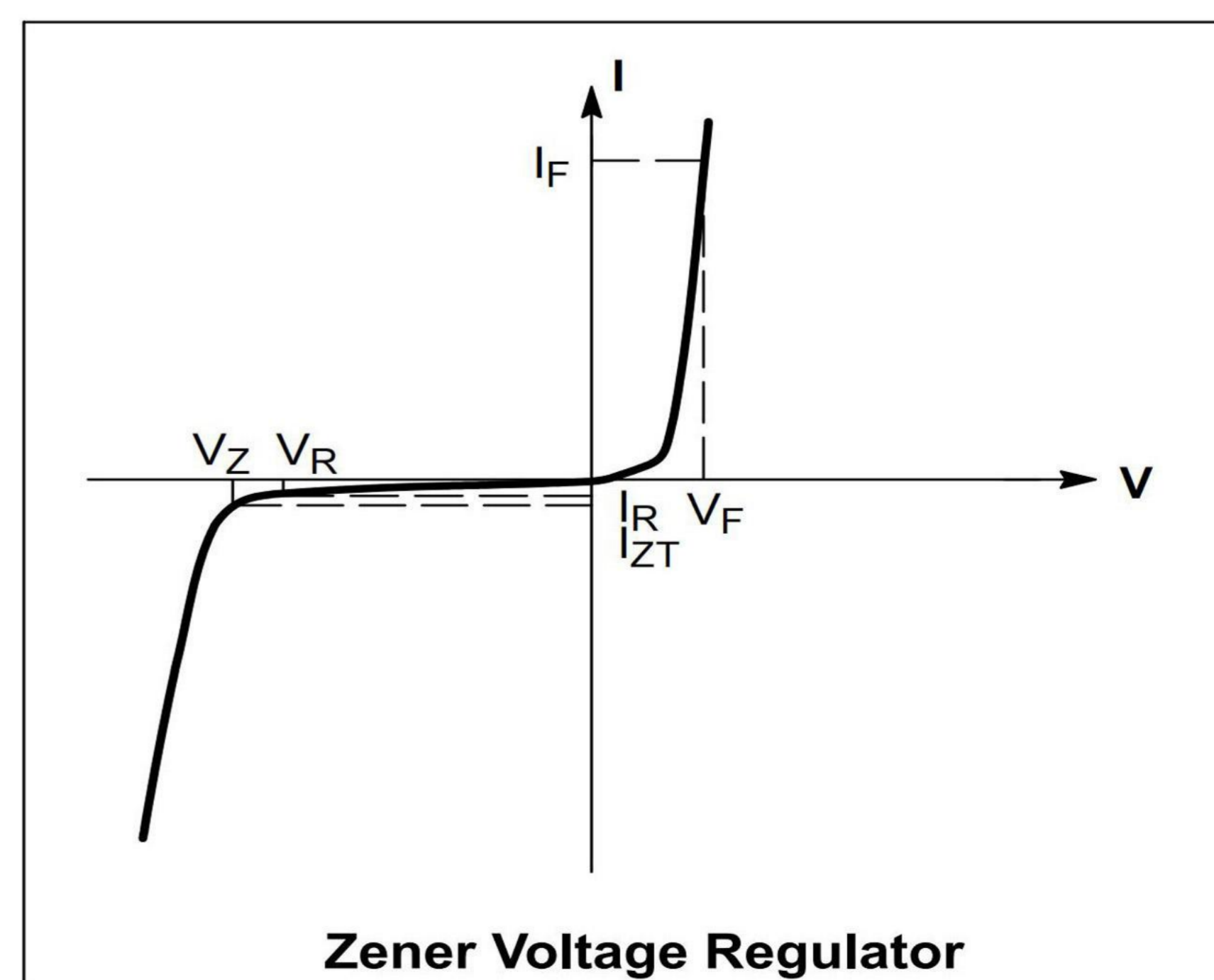
(Note: Microdot may be in either location)

MAXIMUM RATINGS

Rating	Symbol	Max	Units
Total Power Dissipation on FR-5 Board, (Note 1) @ $T_L = 75^\circ\text{C}$ Derated above 75°C	P_D	500 6.7	mW mW/°C
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	340	°C/W
Thermal Resistance, Junction-to-Lead (Note 2)	$R_{\theta JL}$	150	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.95\text{ V Max.}$ @ $I_F = 10\text{ mA}$)

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F



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5% TOLERANCE FG ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.9\text{ V Max. @ } I_F = 10\text{ mA}$)

Device*	Device Marking	Zener Voltage (Notes 3 and 4)				Zener Impedance (Note 5)			Leakage Current	
		V_Z (Volts)			@ I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}		I_R @ V_R	
		Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts
MMSZ5221BT1G	C1	2.28	2.4	2.52	20	30	1200	0.25	100	1
MMSZ5222BT1G	C2	2.38	2.5	2.63	20	30	1250	0.25	100	1
MMSZ5223BT1G	C3	2.57	2.7	2.84	20	30	1300	0.25	75	1
MMSZ5224BT1G	C4	2.66	2.8	2.94	20	30	1400	0.25	75	1
MMSZ5225BT1G	C5	2.85	3.0	3.15	20	29	1600	0.25	50	1
MMSZ5226BT1G	D1	3.14	3.3	3.47	20	28	1600	0.25	25	1
MMSZ5227BT1G	D2	3.42	3.6	3.78	20	24	1700	0.25	15	1
MMSZ5228BT1G	D3	3.71	3.9	4.10	20	23	1900	0.25	10	1
MMSZ5229BT1G	D4	4.09	4.3	4.52	20	22	2000	0.25	5	1
MMSZ5230BT1G	D5	4.47	4.7	4.94	20	19	1900	0.25	5	2
MMSZ5231BT1G	E1	4.85	5.1	5.36	20	17	1600	0.25	5	2
MMSZ5232BT1G	E2	5.32	5.6	5.88	20	11	1600	0.25	5	3
MMSZ5233BT1G	E3	5.70	6.0	6.30	20	7	1600	0.25	5	3.5
MMSZ5234BT1G	E4	5.89	6.2	6.51	20	7	1000	0.25	5	4
MMSZ5235BT1G	E5	6.46	6.8	7.14	20	5	750	0.25	3	5
MMSZ5236BT1G	F1	7.13	7.5	7.88	20	6	500	0.25	3	6
MMSZ5237BT1G	F2	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MMSZ5238BT1G	F3	8.27	8.7	9.14	20	8	600	0.25	3	6.5
MMSZ5239BT1G	F4	8.65	9.1	9.56	20	10	600	0.25	3	7
MMSZ5240BT1G	F5	9.50	10	10.50	20	17	600	0.25	3	8
MMSZ5241BT1G	H1	10.45	11	11.55	20	22	600	0.25	2	8.4
MMSZ5242BT1G	H2	11.40	12	12.60	20	30	600	0.25	1	9.1
MMSZ5243BT1G	H3	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MMSZ5244BT1G	H4	13.30	14	14.70	9.0	15	600	0.25	0.1	10
MMSZ5245BT1G	H5	14.25	15	15.75	8.5	16	600	0.25	0.1	11
MMSZ5246BT1G	J1	15.20	16	16.80	7.8	17	600	0.25	0.1	12
MMSZ5247BT1G	J2	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MMSZ5248BT1G	J3	17.10	18	18.90	7.0	21	600	0.25	0.1	14
MMSZ5249BT1G	J4	18.05	19	19.95	6.6	23	600	0.25	0.1	14
MMSZ5250BT1G	J5	19.00	20	21.00	6.2	25	600	0.25	0.1	15
MMSZ5251BT1G	K1	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MMSZ5252BT1G	K2	22.80	24	25.20	5.2	33	600	0.25	0.1	18
MMSZ5253BT1G	K3	23.75	25	26.25	5.0	35	600	0.25	0.1	19
MMSZ5254BT1G	K4	25.65	27	28.35	4.6	41	600	0.25	0.1	21
MMSZ5255BT1G	K5	26.60	28	29.40	4.5	44	600	0.25	0.1	21
MMSZ5256BT1G	M1	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MMSZ5257BT1G	M2	31.35	33	34.65	3.8	58	700	0.25	0.1	25
MMSZ5258BT1G	M3	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MMSZ5259BT1G	M4	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MMSZ5260BT1G	M5	40.85	43	45.15	3.0	93	900	0.25	0.1	33
MMSZ5261BT1G	N1	44.65	47	49.35	2.7	105	1000	0.25	0.1	36
MMSZ5262BT1G	N2	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MMSZ5263BT1G	N3	53.20	56	58.80	2.2	150	1300	0.25	0.1	43
MMSZ5264BT1G	N4	57.00	60	63.00	2.1	170	1400	0.25	0.1	46
MMSZ5265BT1G	N5	58.90	62	65.10	2.0	185	1400	0.25	0.1	47
MMSZ5266BT1G	P1	64.60	68	71.40	1.8	230	1600	0.25	0.1	52
MMSZ5267BT1G	P2	71.25	75	78.75	1.7	270	1700	0.25	0.1	56
MMSZ5268BT1G	P3	77.90	82	86.10	1.5	330	2000	0.25	0.1	62
MMSZ5269BT1G	P4	82.65	87	91.35	1.4	370	2200	0.25	0.1	68
MMSZ5270BT1G	P5	86.45	91	95.55	1.4	400	2300	0.25	0.1	69
MMSZ5272BT1G	R2	104.5	110	115.5	1.1	750	3000	0.25	0.1	84

3. "B" Suffix Type numbers shown have a standard tolerance of $\pm 5\%$ on the nominal Zener voltages.

4. Nominal Zener voltage is measured with the device junction in thermal equilibrium at $T_L = 30^\circ\text{C} \pm 1^\circ\text{C}$.

5. Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the ac current applied.

The specified limits are for $I_{Z(AC)} = 0.1 I_{Z(dc)}$ with the AC frequency = 1 kHz.

*Includes SZ-prefix devices where applicable.

TYPICAL CHARACTERISTICS

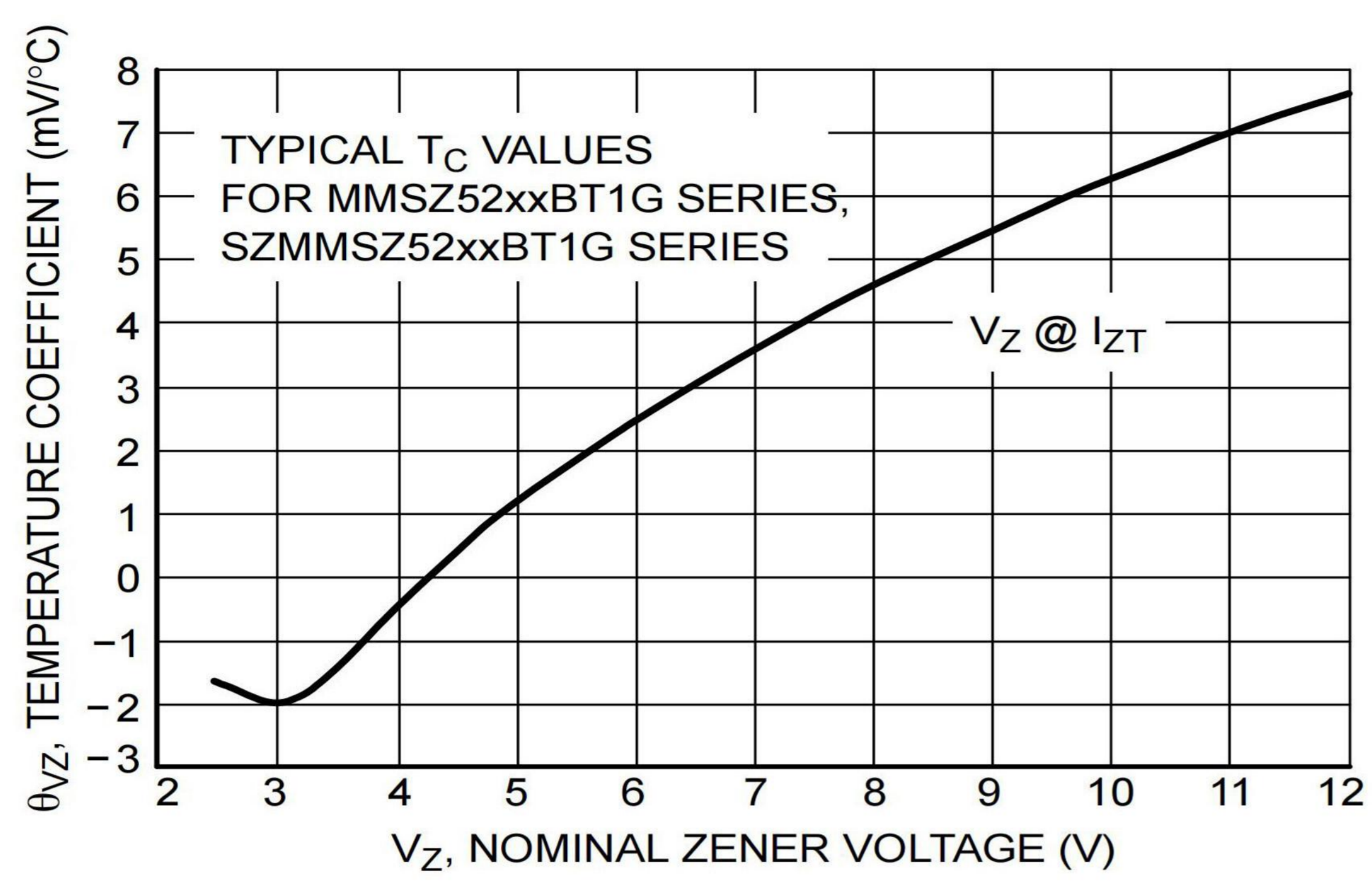


Figure 1. Temperature Coefficients
(Temperature Range -55°C to +150°C)

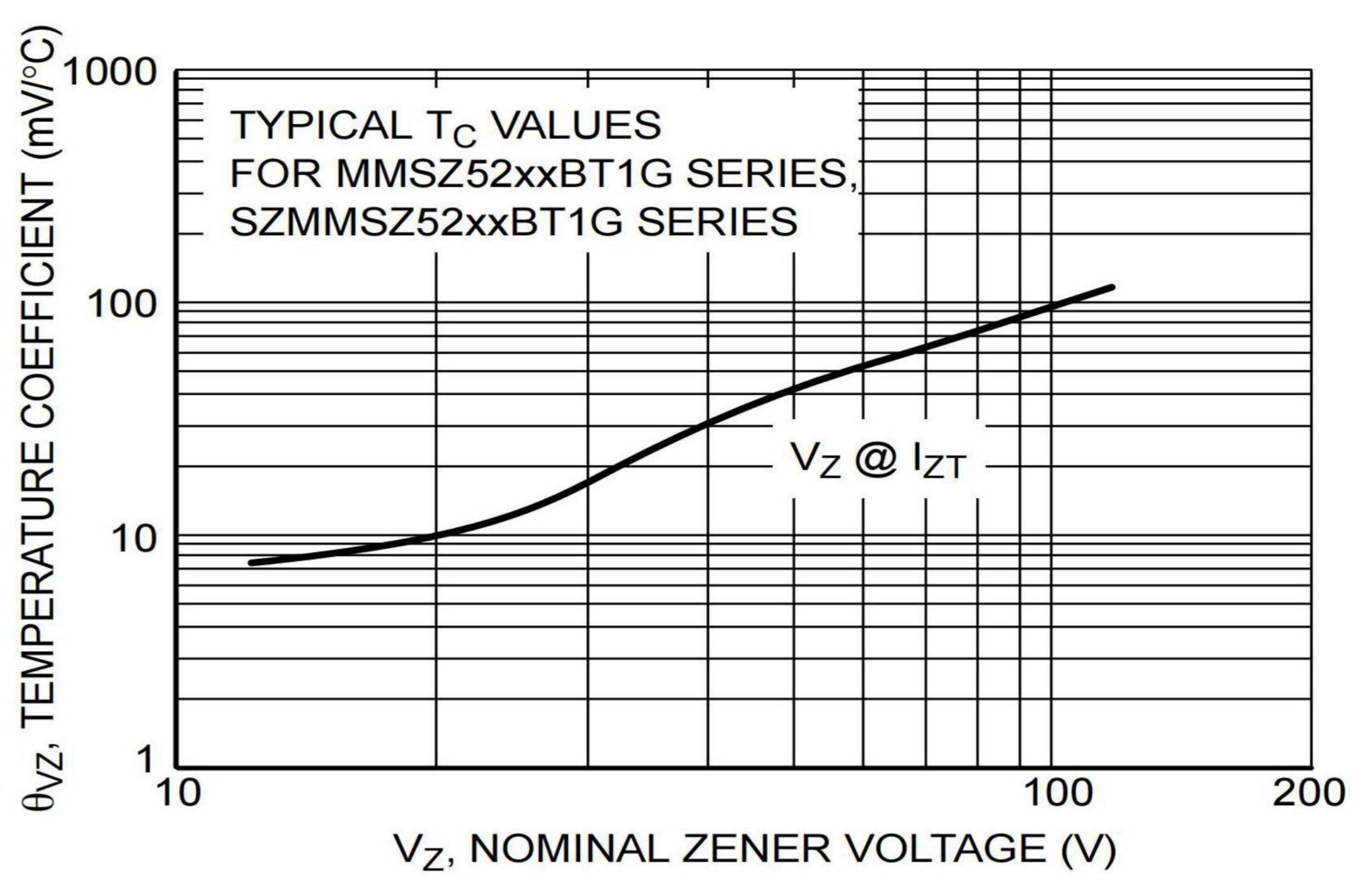


Figure 2. Temperature Coefficients
(Temperature Range -55°C to +150°C)

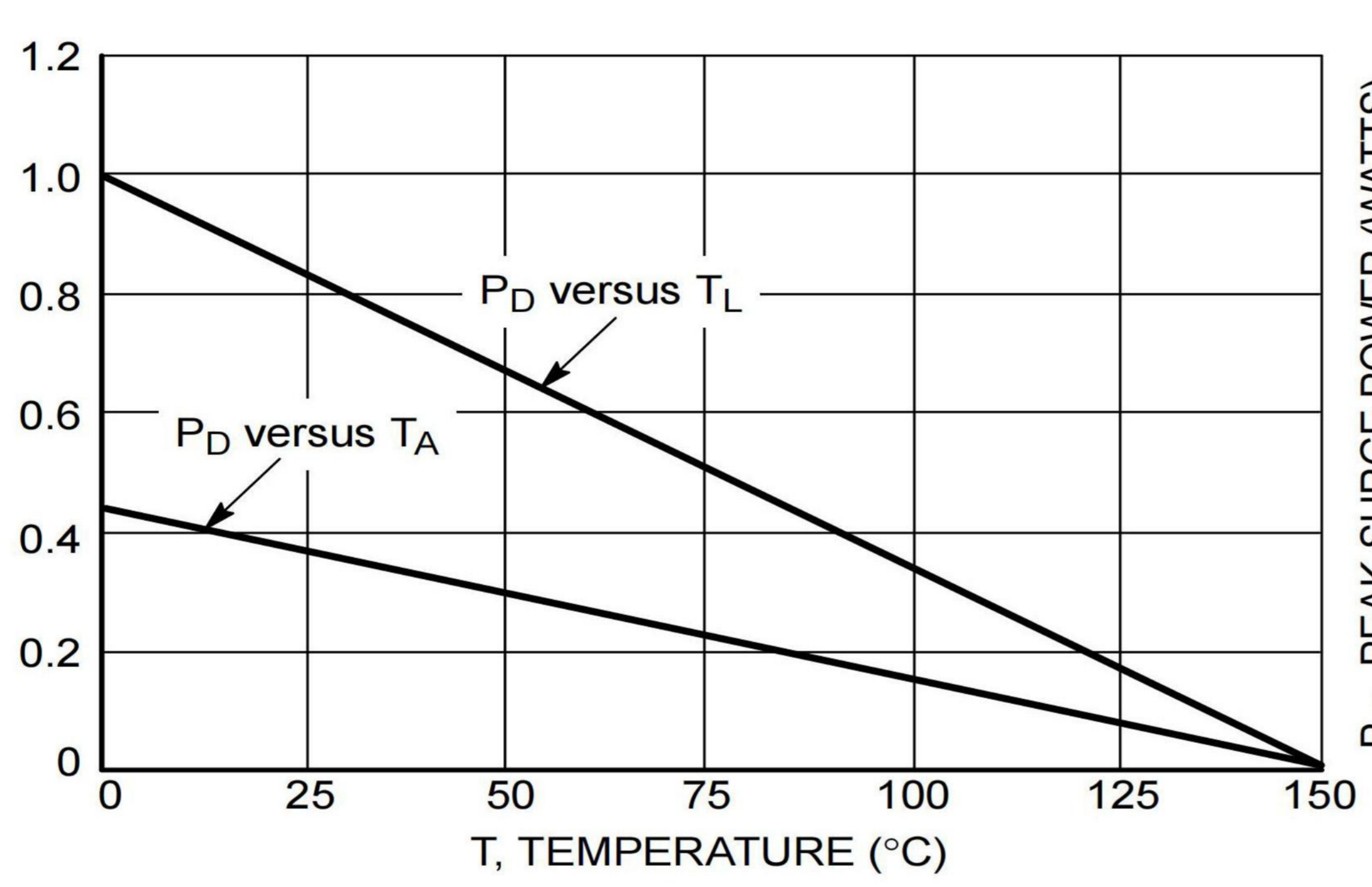


Figure 3. Steady State Power Derating

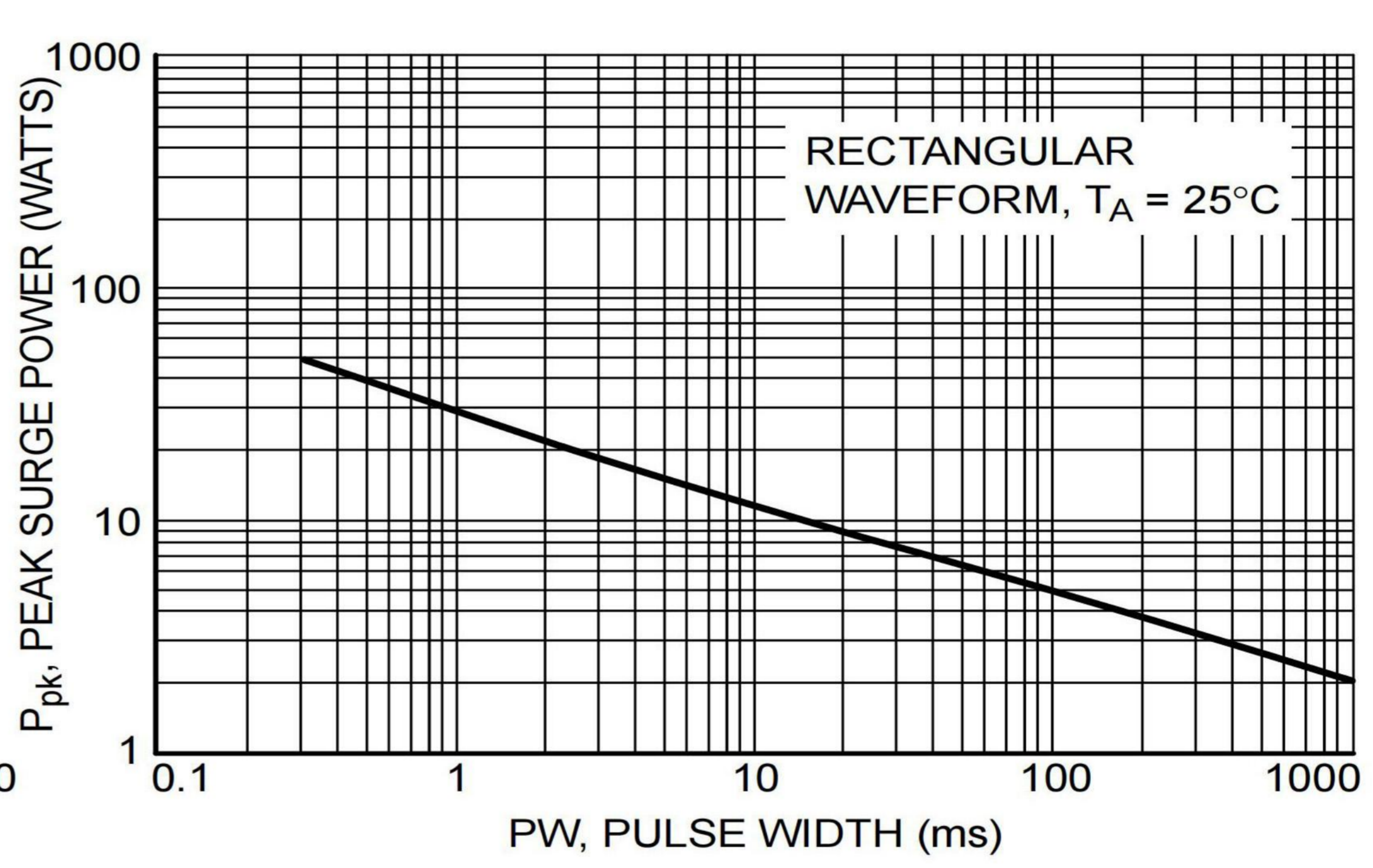


Figure 4. Maximum Nonrepetitive Surge Power

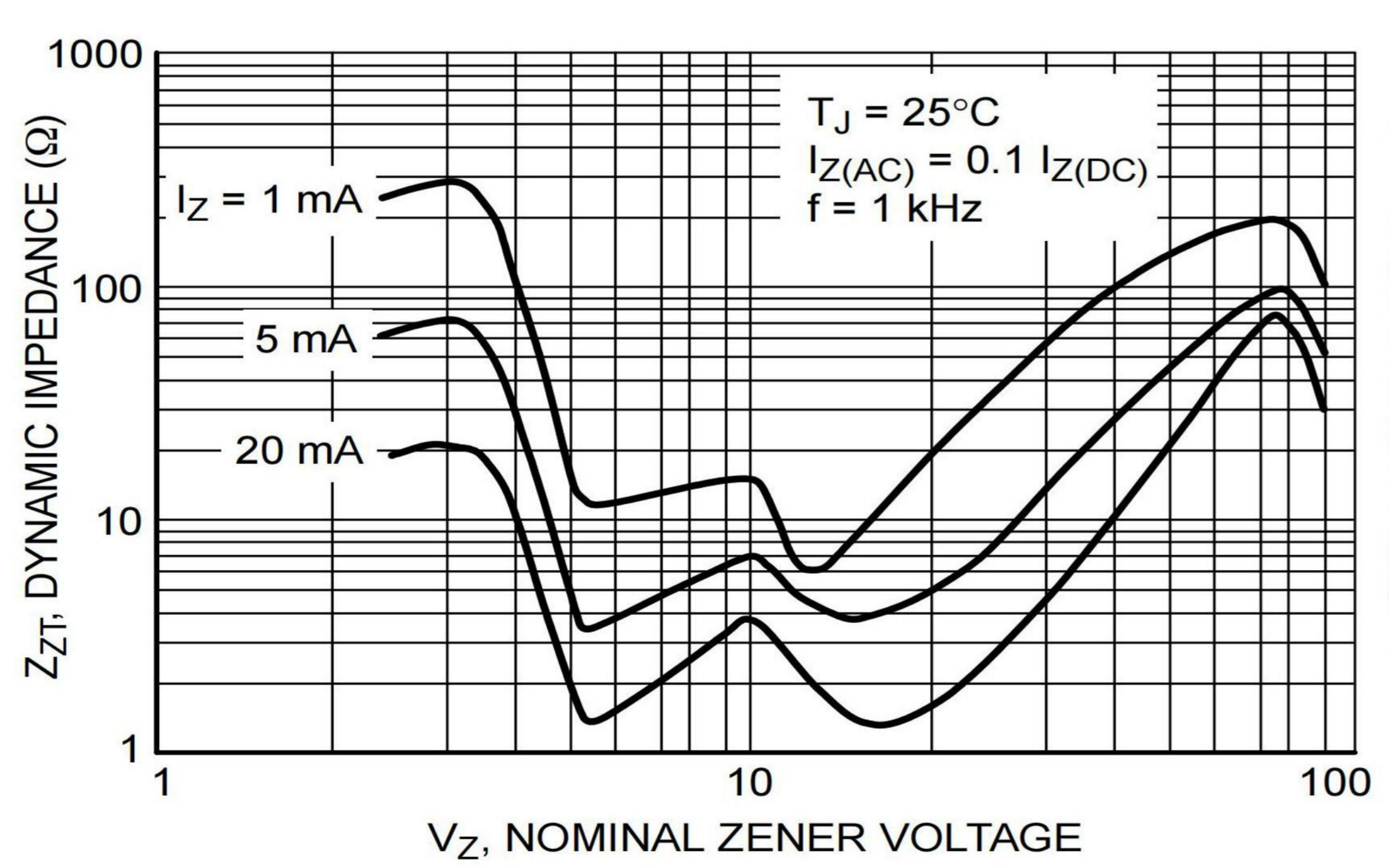


Figure 5. Effect of Zener Voltage on Zener Impedance

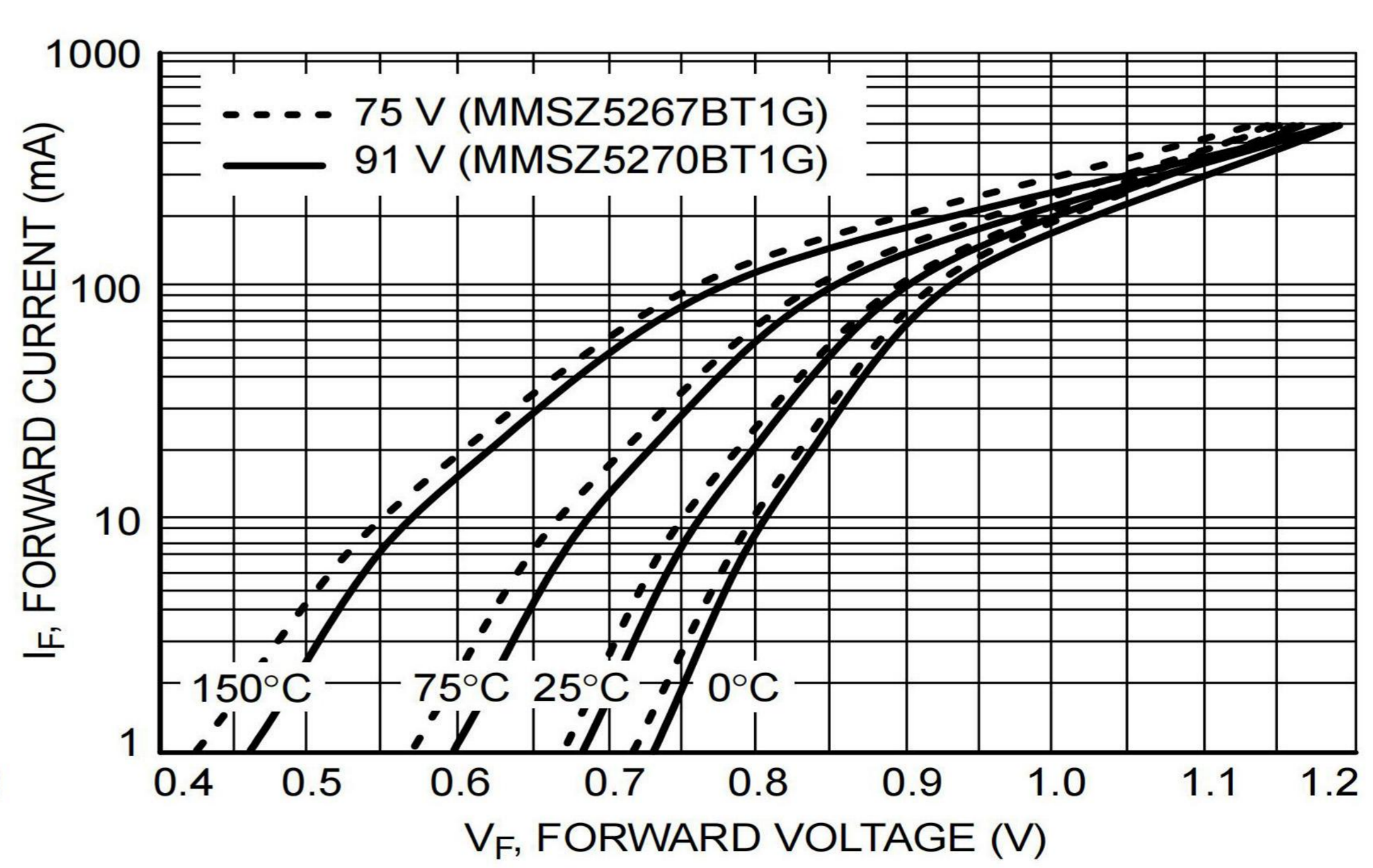


Figure 6. Typical Forward Voltage

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TYPICAL CHARACTERISTICS

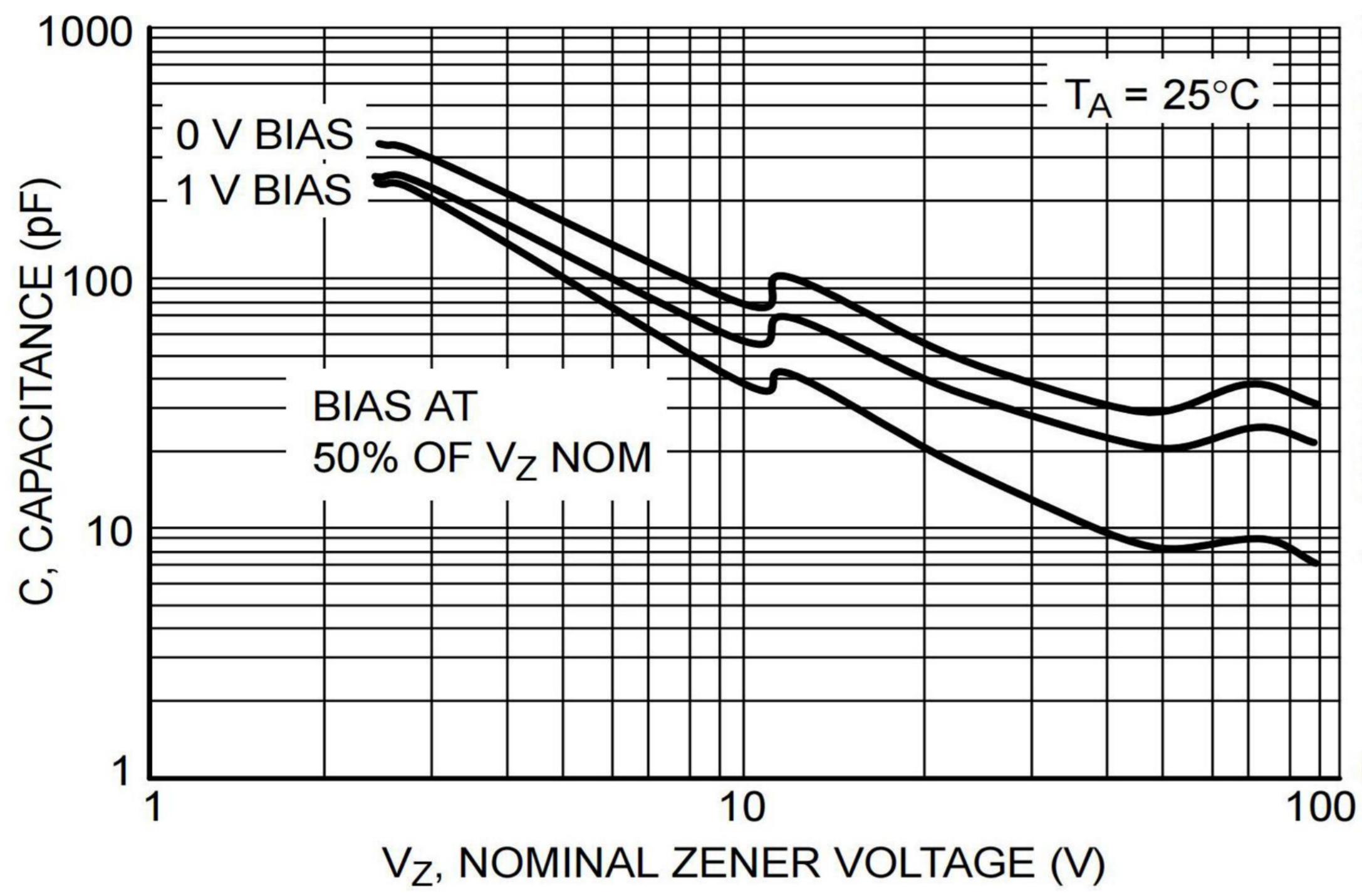


Figure 7. Typical Capacitance

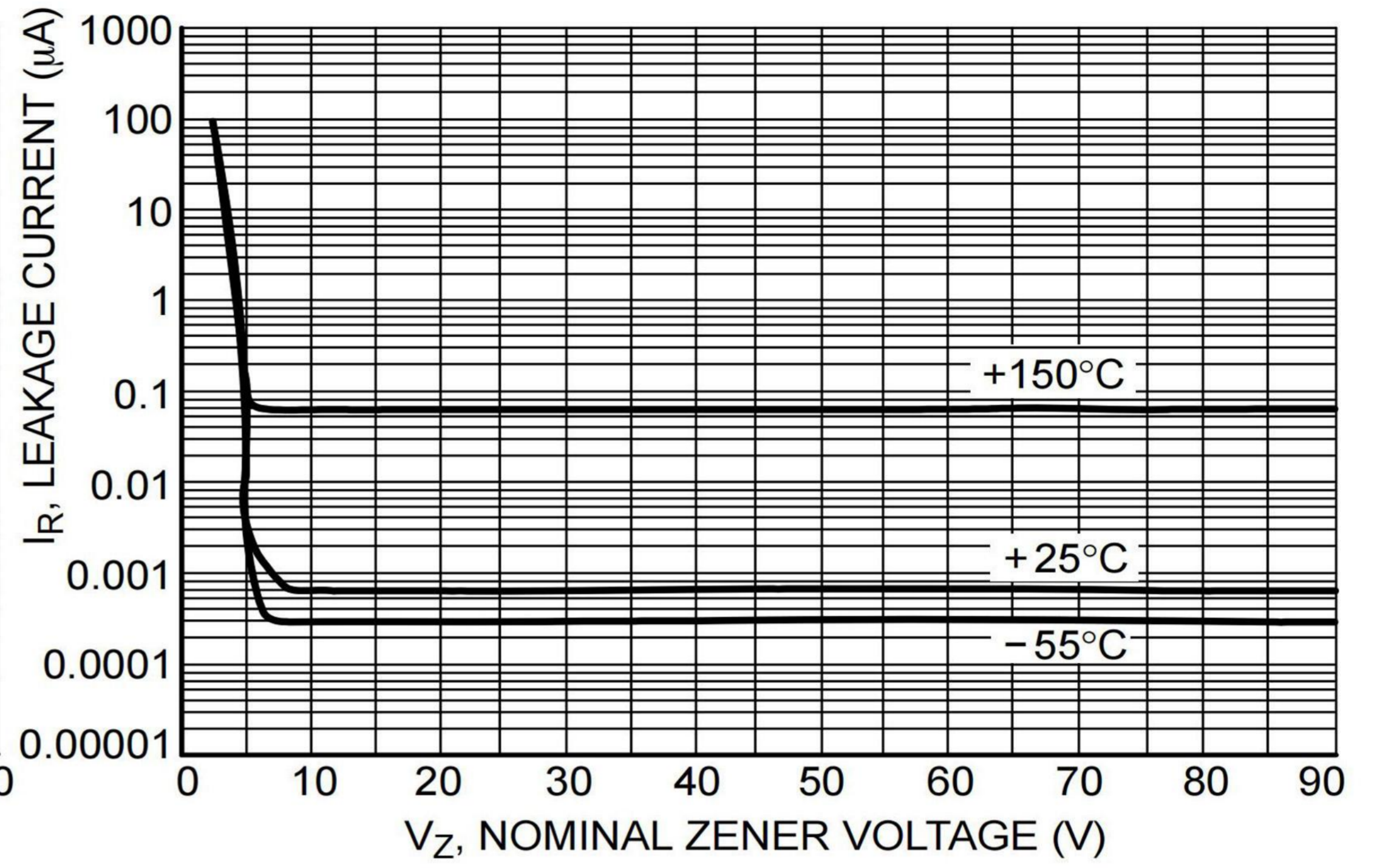


Figure 8. Typical Leakage Current

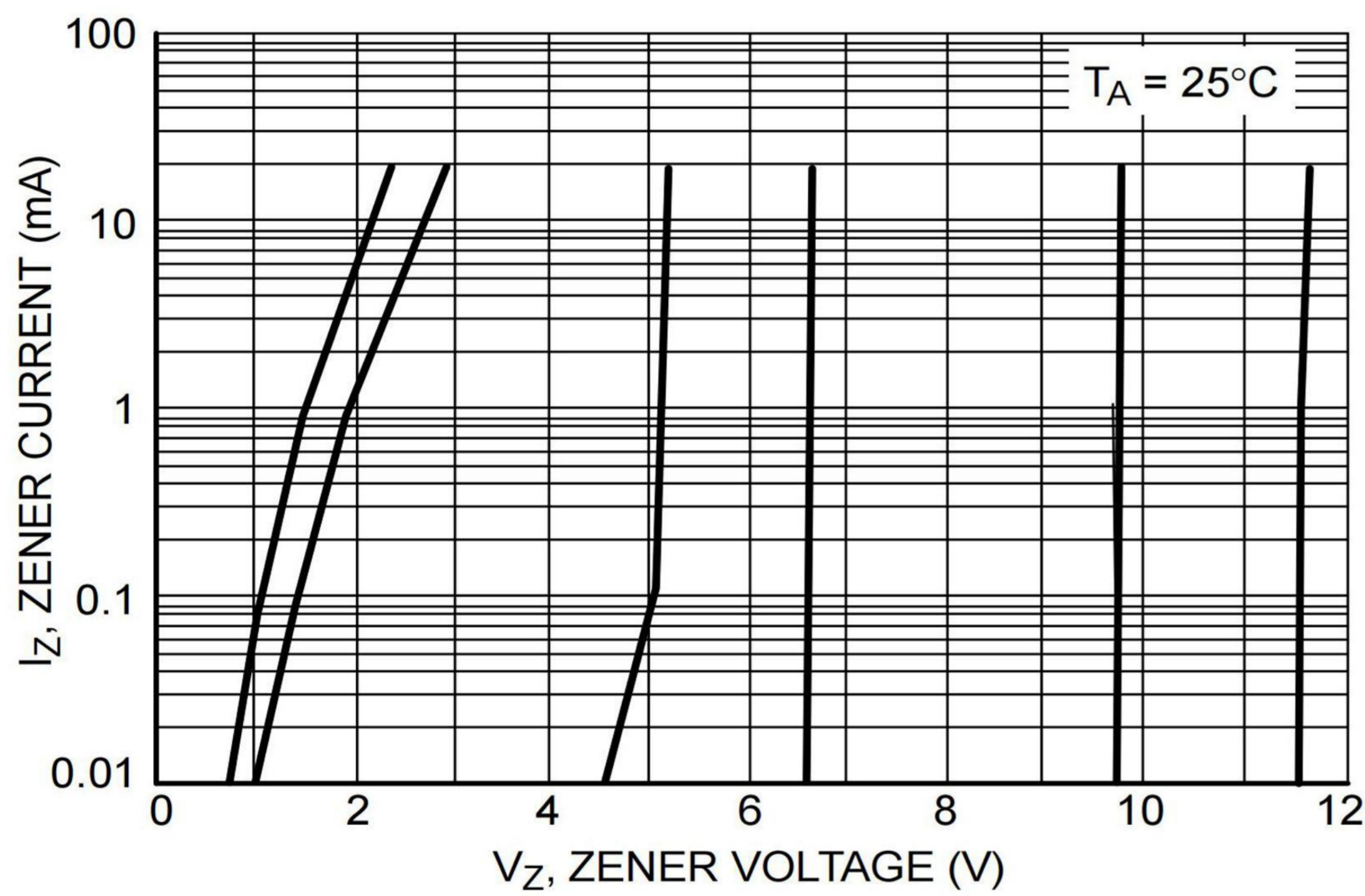


Figure 9. Zener Voltage versus Zener Current
(V_Z Up to 12 V)

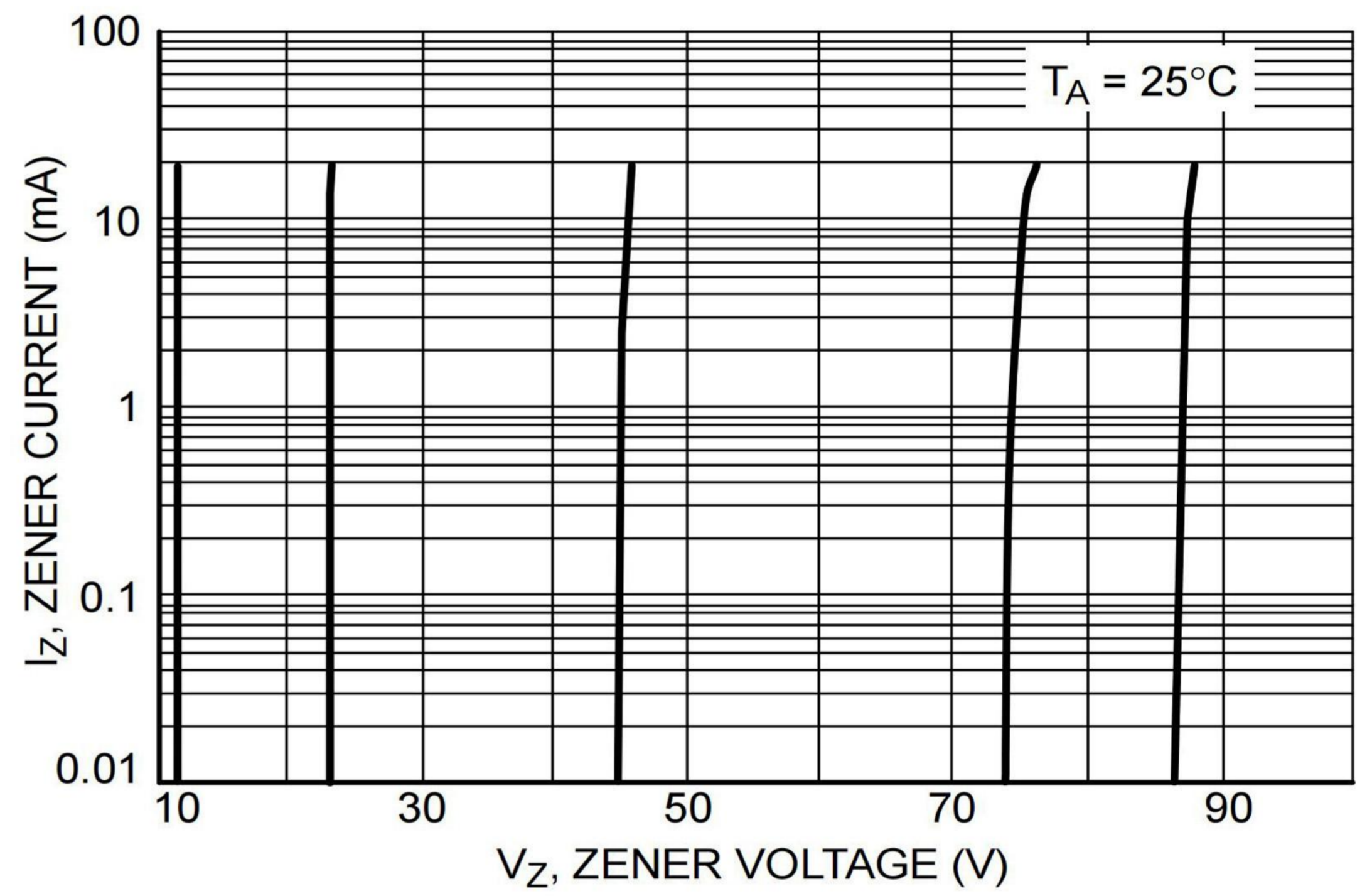


Figure 10. Zener Voltage versus Zener Current
(12 V to 91 V)

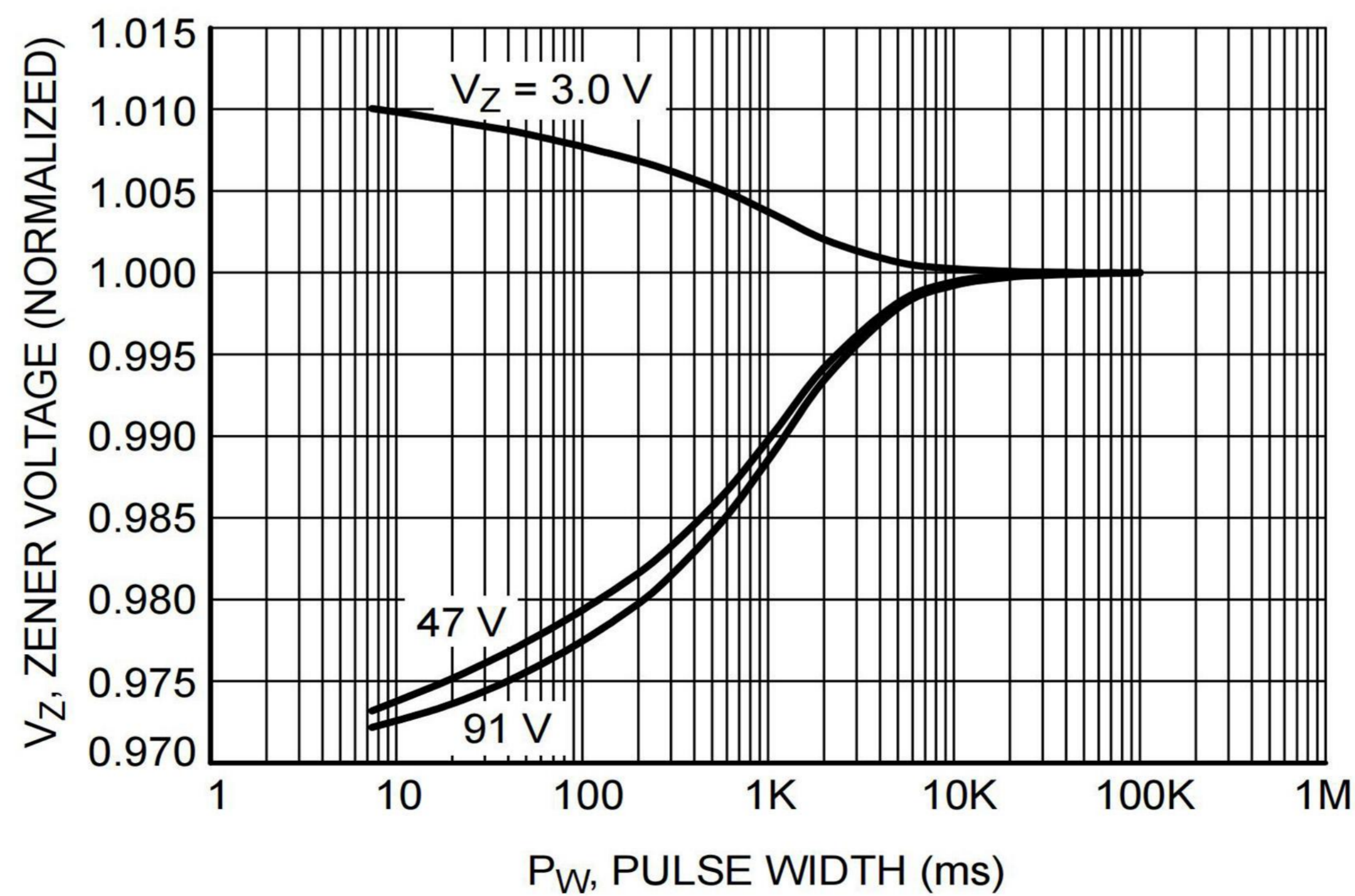


Figure 11. SOD-123 (plastic) 500 Watt Device

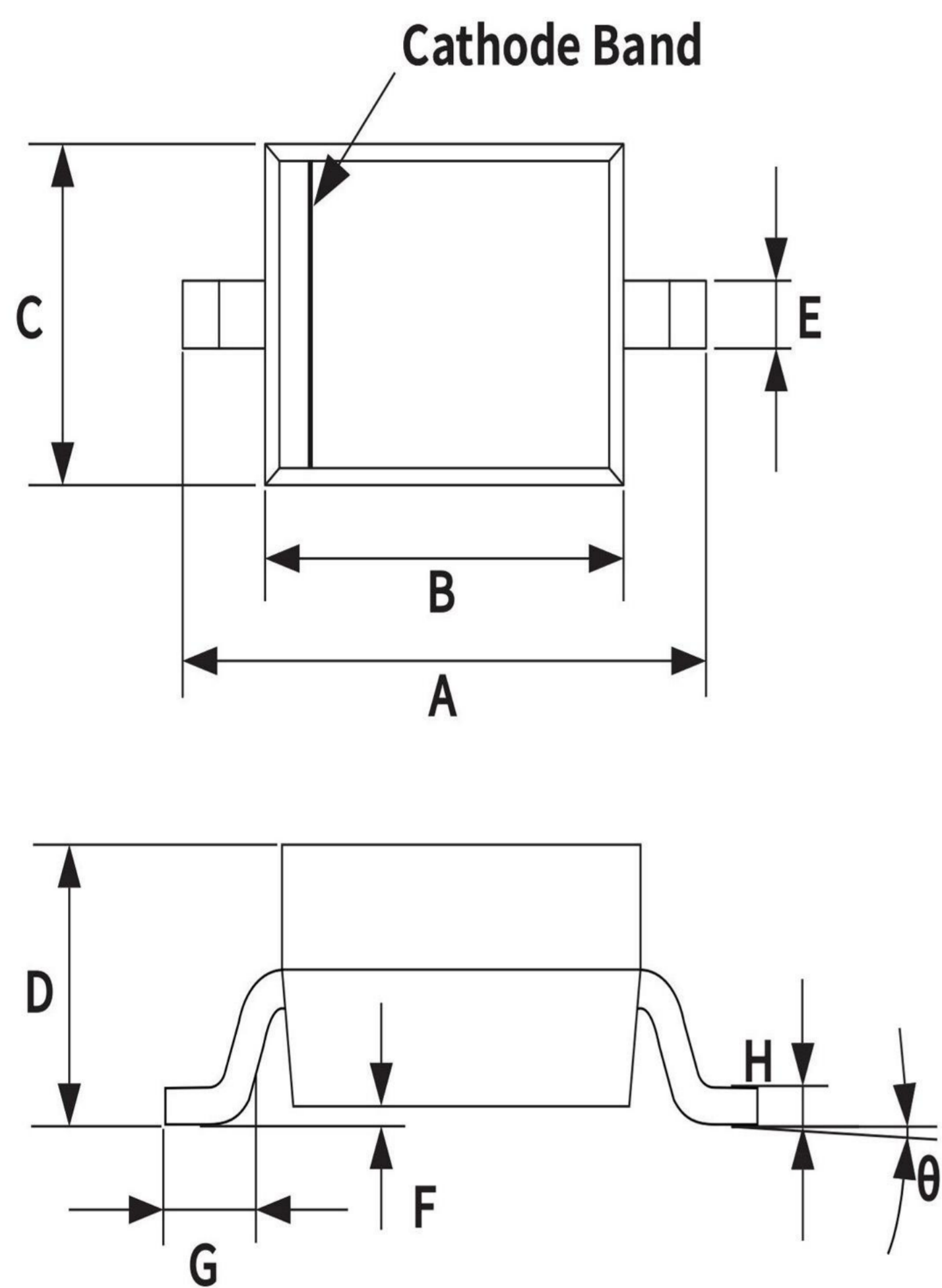
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Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOD-123	R1	0.012	3000	45000	180000	7"
SOD-123	R3	0.012	10000	20000	200000	13"

Package Outline Dimensions (SOD-123)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.55	3.85	0.140	0.152
B	2.55	2.85	0.100	0.112
C	1.40	1.80	0.055	0.071
D	0.95	1.35	0.140	0.152
E	0.51	0.71	0.037	0.053
F	-	0.15	-	0.006
G	0.15	0.45	0.006	0.008
H	0.08	0.25	0.003	0.010
θ	-	8°	-	8°



Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.91	-	0.036	-
K	-	2.36	-	0.092
M	1.22	-	0.048	-

