THE DATASHEET OF

DDZ9686-7

SURFACE MOUNT LOW CURRENT ZENER DIODE

Features

- 500mW Power Dissipation on FR-4 PCB at T_L = +75°C
- Specified at a Low Test Current (50µA), Ideal For Low Bias and Portable Battery-Powered Applications
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

- Case: SOD123
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.01 grams (Approximate)

SOD123

Top View

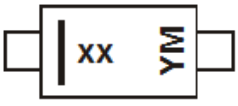
Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
(Type Number)-7*	Standard	SOD123	3,000/Tape & Reel
(Type Number)Q-7*	Automotive	SOD123	3,000/Tape & Reel
(Type Number)Q-13*	Automotive	SOD123	10,000/Tape & Reel

* Refer to the Electrical Characteristics Table for Type Number

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



xx = Product Type Marking Code -
(See Electrical Characteristics Table)
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Code	V	W	X	Y	Z	A	B	C	D	E	F	G	H

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Forward Voltage @ I_F = 10mA	V_F	0.9	V

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	500	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	340	°C/W
Thermal Resistance, Junction to Lead (Note 6)	$R_{\theta JL}$	150	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Type Number	Type Code	Zener Voltage Range (Note 7)				Maximum Reverse Leakage Current (Note 8)	
		V_Z @ I_{ZT}			I_{ZT}	I_R @ V_R	
		Nom (V)	Min (V)	Max (V)	µA	µA	V
DDZ9678	D1	1.8	1.71	1.89	50	7.5	1
DDZ9681	H9	2.4	2.28	2.52	50	2	1
DDZ9682	HA	2.7	2.565	2.835	50	1	1
DDZ9683	HB	3.0	2.85	3.15	50	0.8	1
DDZ9684	HC	3.3	3.13	3.47	50	7.5	1.5
DDZ9685	HD	3.6	3.42	3.78	50	7.5	2
DDZ9686	HE	3.9	3.70	4.10	50	5	2
DDZ9687	HF	4.3	4.09	4.52	50	4	2
DDZ9688	HG	4.7	4.47	4.94	50	5	3
DDZ9689	HH	5.1	4.85	5.36	50	5	3
DDZ9690	HJ	5.6	5.32	5.88	50	2	4
DDZ9691	HK	6.2	5.89	6.51	50	1	5
DDZ9692	HL	6.8	6.46	7.14	50	0.1	5.1
DDZ9693	HM	7.5	7.13	7.88	50	0.1	5.7
DDZ9694	HN	8.2	7.79	8.61	50	0.1	6.2
DDZ9696	HP	9.1	8.65	9.56	50	0.1	6.9
DDZ9697	HQ	10	9.50	10.50	50	0.1	7.6
DDZ9698	HR	11	10.45	11.55	50	0.05	8.4
DDZ9699	HS	12	11.40	12.60	50	0.05	9.1
DDZ9700	HT	13	12.35	13.65	50	0.05	9.8
DDZ9701	HU	14	13.30	14.70	50	0.05	10.6
DDZ9702	HV	15	14.25	15.75	50	0.05	11.4
DDZ9703	HW	16	15.20	16.80	50	0.05	12.1
DDZ9704	H8	17	16.15	17.85	50	0.05	12.9
DDZ9705	HY	18	17.10	18.90	50	0.05	13.6
DDZ9707	MD	20	19.00	21.00	50	0.05	15.2
DDZ9708	ME	22	20.90	23.10	50	0.05	16.7
DDZ9709	MF	24	22.80	25.20	50	0.05	18.2
DDZ9711	MH	27	25.65	28.35	50	0.05	20.4
DDZ9712	MJ	28	26.60	29.40	50	0.05	21.2
DDZ9713	MK	30	28.50	31.50	50	0.05	22.8
DDZ9714	ML	33	31.35	34.65	50	0.05	25.0
DDZ9715	MM	36	34.20	37.80	50	0.05	27.3
DDZ9716	MN	39	37.05	40.95	50	0.05	29.6
DDZ9717	MO	43	40.85	45.15	50	0.05	32.6

Notes:
6. Device mounted on FR-4 PCB with minimum recommended pad layout, as shown in Diodes Incorporated's Suggested Pad Layout document, which can be found on our website at http://www.diodes.com, at T_L = +75°C.
7. Nominal zener voltage is measured with the device junction in thermal equilibrium at T_T = +30°C ±1°C.
8. Short duration pulse test used to minimize self-heating effect.

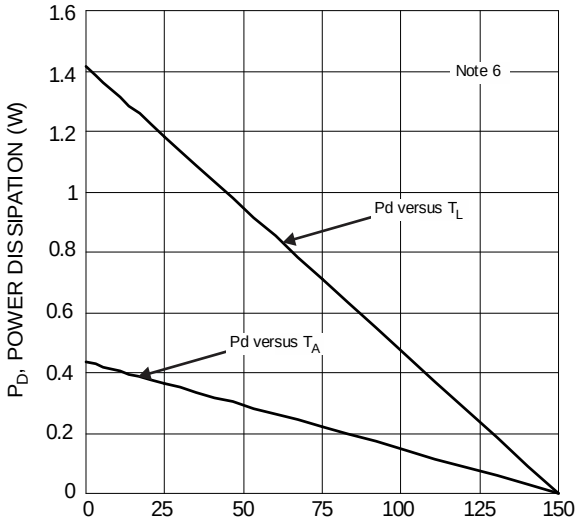


Fig. 1 Power Derating Curve

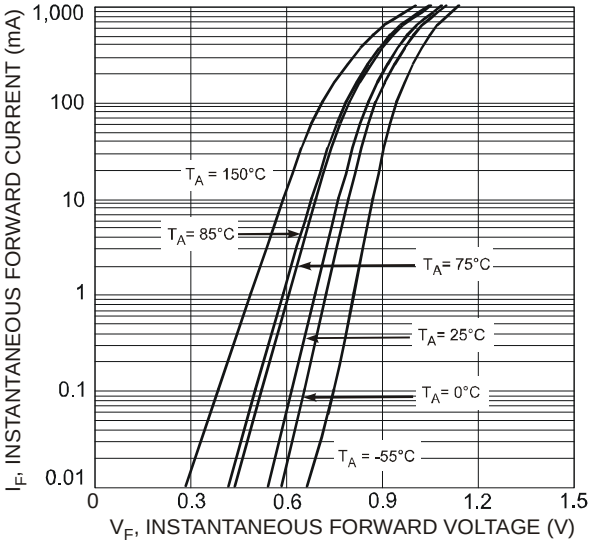


Fig. 2 Typical Forward Characteristics

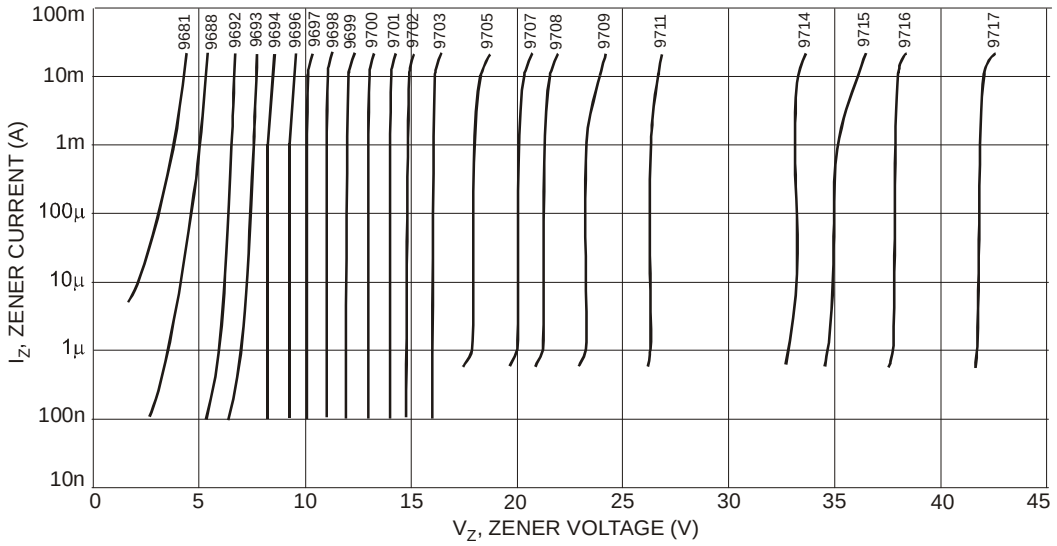


Fig. 3 Typical Zener Breakdown Characteristics

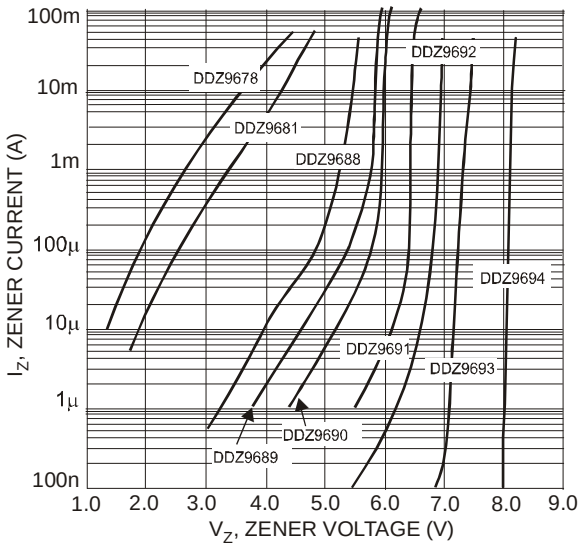


Fig. 4 Typical Zener Breakdown Characteristics, DDZ9678 - DDZ9694

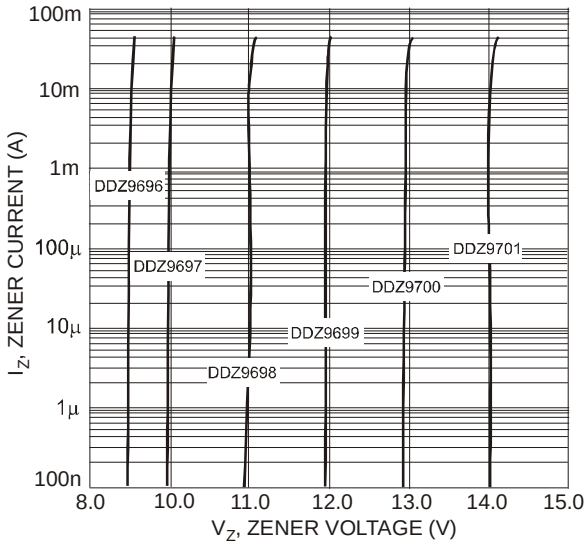


Fig. 5 Typical Zener Breakdown Characteristics, DDZ9696 - DDZ9701

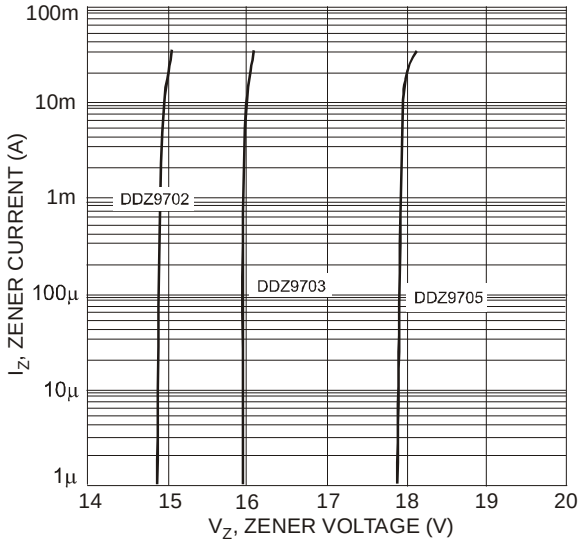


Fig. 6 Typical Zener Breakdown Characteristics, DDZ9702 - DDZ9705

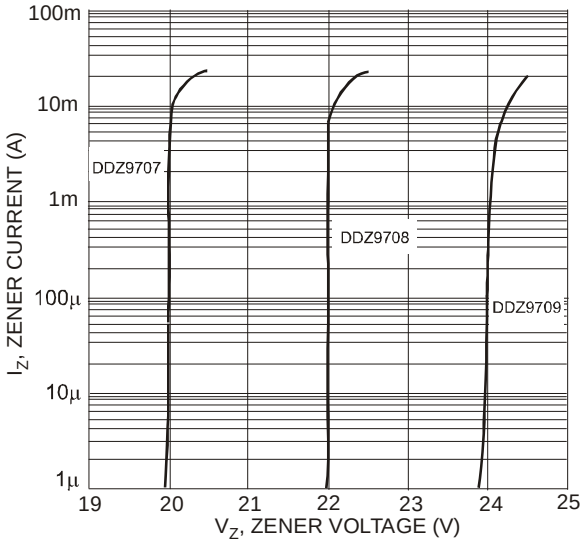


Fig. 7 Typical Zener Breakdown Characteristics, DDZ9707 - DDZ9709

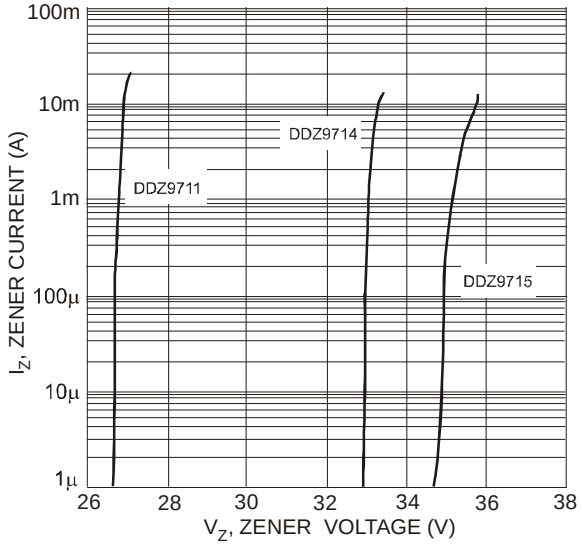


Fig. 8 Typical Zener Breakdown Characteristics, DDZ9711 - DDZ9715

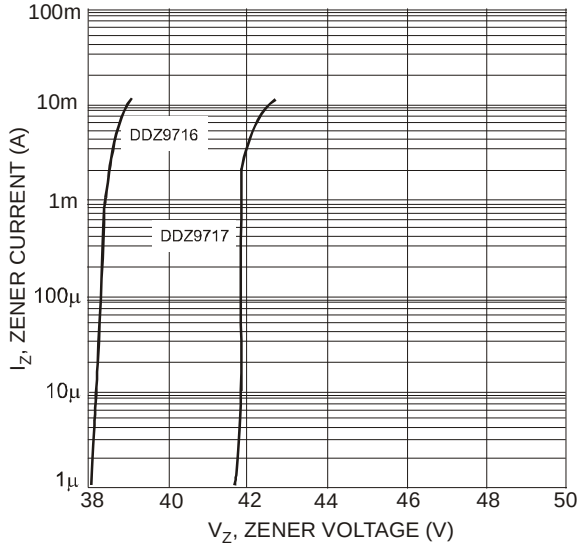


Fig. 9 Typical Zener Breakdown Characteristics, DDZ9716 - DDZ9717

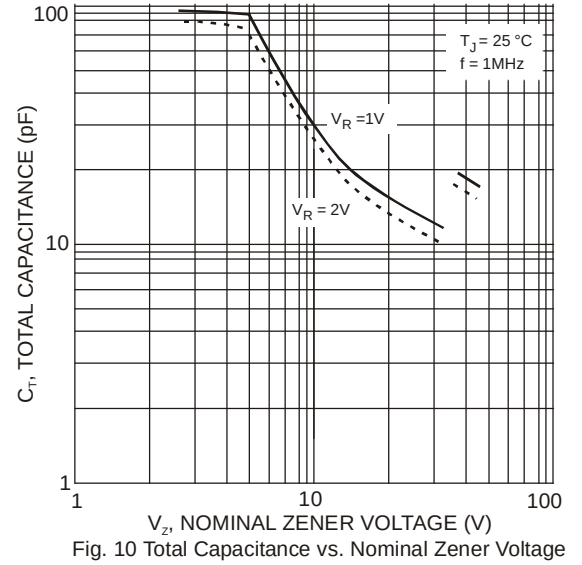


Fig. 10 Total Capacitance vs. Nominal Zener Voltage

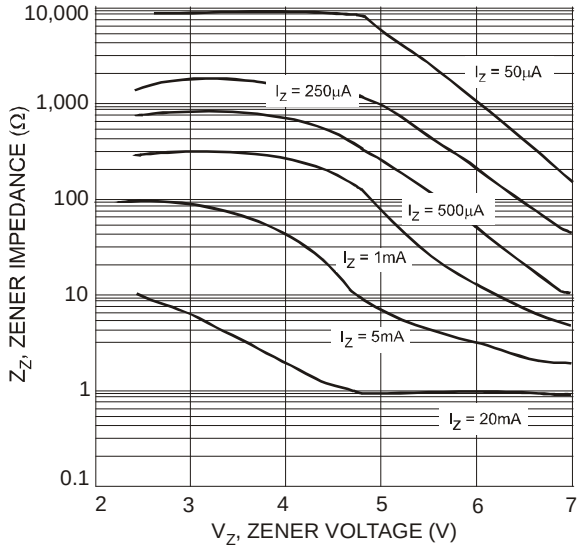


Fig. 11 Typical Zener Impedance Characteristics, DDZ9681 - DDZ9692

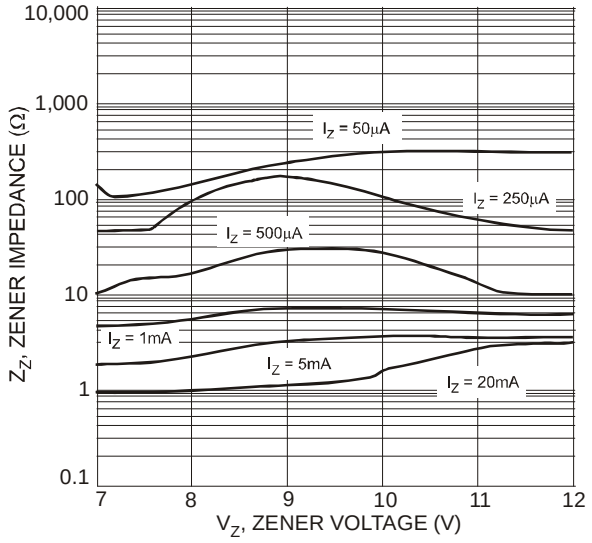


Fig. 12 Typical Zener Impedance Characteristics, DDZ9693 - DDZ9699

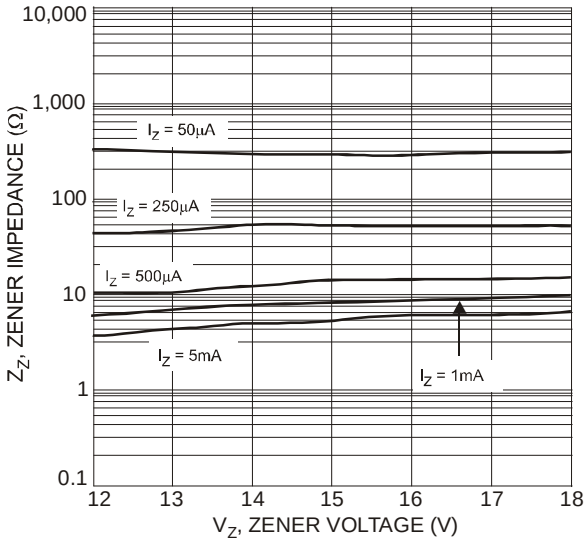


Fig. 13 Typical Zener Impedance Characteristics, DDZ9699 - DDZ9705

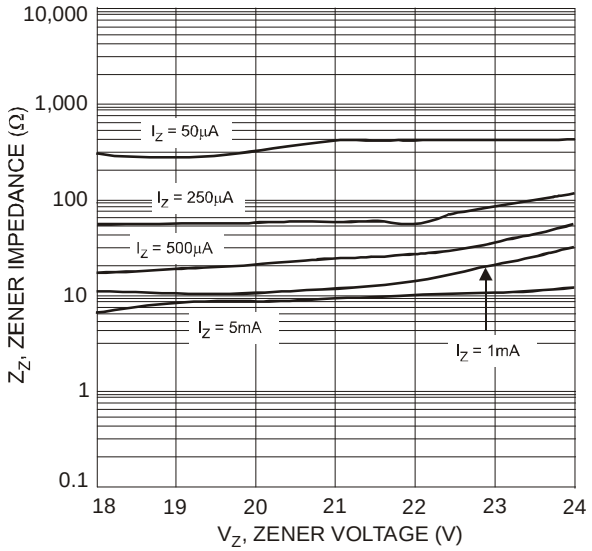


Fig. 14 Typical Zener Impedance Characteristics, DDZ9705 - DDZ9709

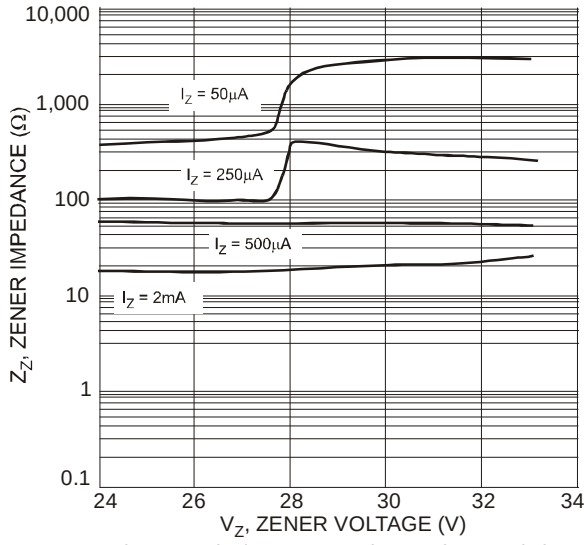


Fig. 15 Typical Zener Impedance Characteristics, DDZ9709 - DDZ9714

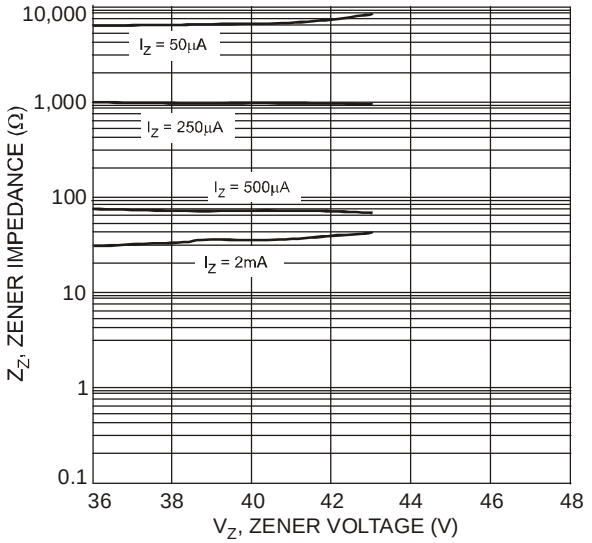


Fig. 16 Typical Zener Impedance Characteristics, DDZ9715 - DDZ9717

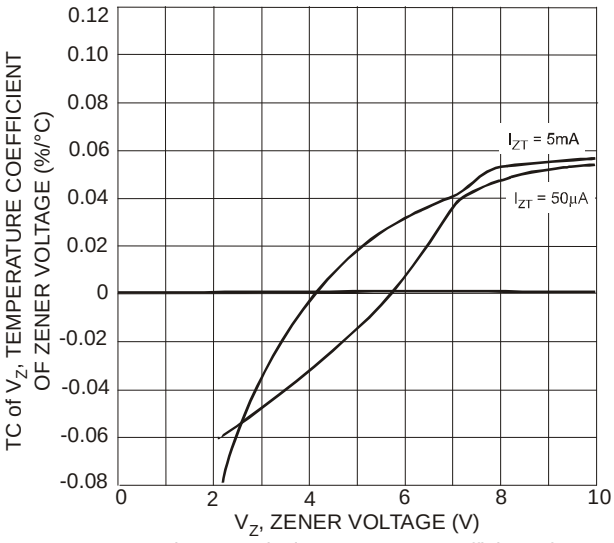


Fig. 17 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9681 - DDZ9697

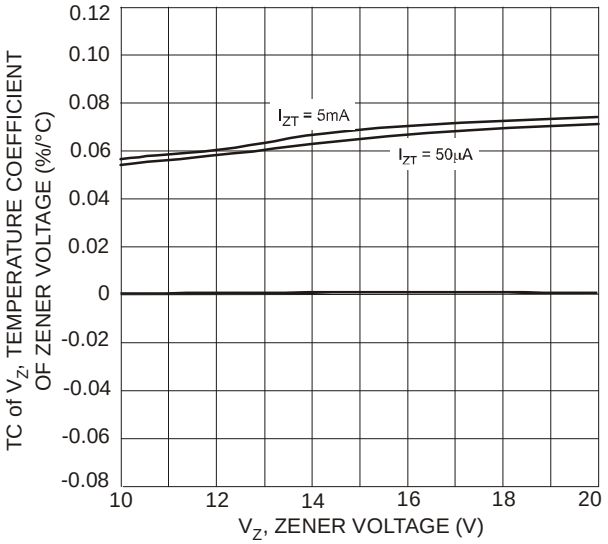


Fig. 18 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9697 - DDZ9707

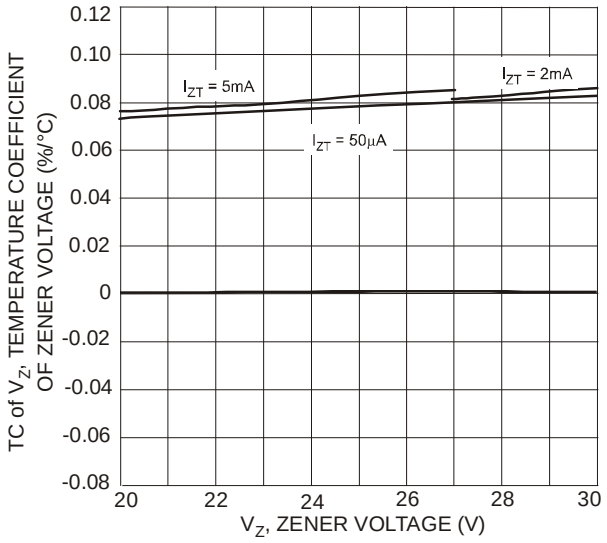


Fig. 19 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9707 - DDZ9713

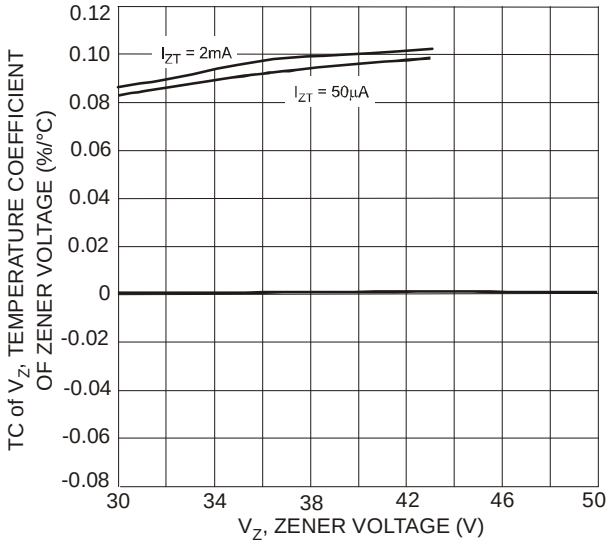


Fig. 20 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9713 - DDZ9717

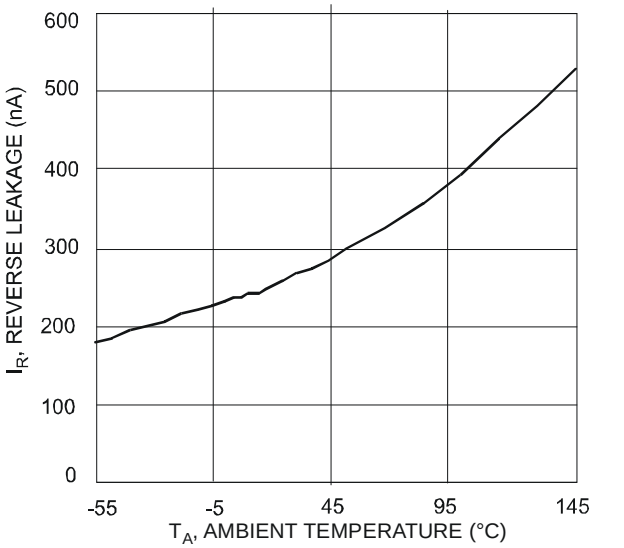
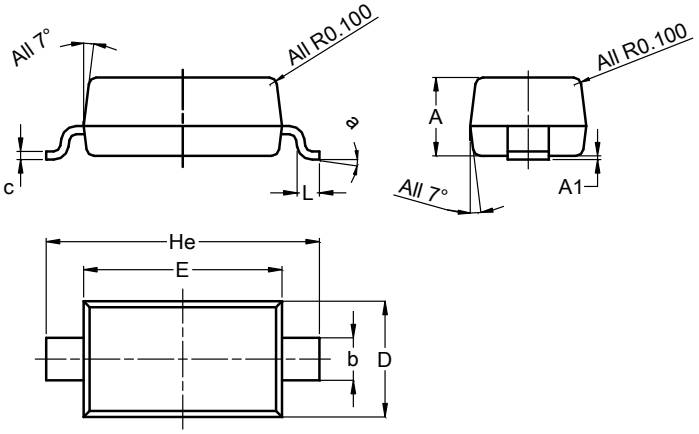


Fig. 21 Typical Leakage vs. Ambient Temperature, DDZ9681

Package Outline Dimensions

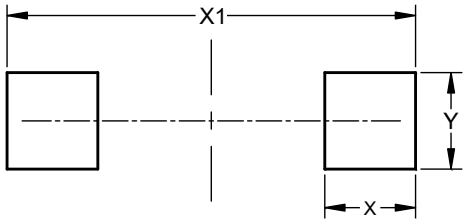
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOD123			
Dim	**Min**	**Max**	**Typ**
A	1.00	1.35	1.05
A1	0.00	0.10	0.05
b	0.52	0.62	0.57
c	0.10	0.15	0.11
D	1.40	1.70	1.55
E	2.55	2.85	2.65
He	3.55	3.85	3.65
L	0.25	0.40	0.30
a	0º	8º	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
X	0.900
X1	4.050
Y	0.950

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