SURFACE MOUNT LOW CURRENT ZENER DIODE

Features

- 500mW Power Dissipation on Ceramic PCB
- 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)**

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

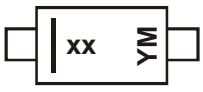
Ordering Information (Notes 4 & 5)

Part Number	Compliance	Case	Packaging
(Type Number)-7*	Standard	SOD123	3000/Tape & Reel
(Type Number)Q-7* (Note 6)	Automotive	SOD123	3000/Tape & Reel

*Example: The part number for the commercial grade 4.7 Volt device would be DDZ9688-7 and the part number for the automotive grade 4.7 Volt device would be DDZ9688Q-7.

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. Product manufactured with Date Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb_2O_3 Fire Retardants.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.
6. Only products denoted Note 10 in the "Electrical Characteristics" table are currently available as automotive grade devices.

Marking Information



xx = Product Type Marking Code -
(See Electrical Characteristics Table)
YM = Date Code Marking
Y = Year (ex: T = 2006)
M = Month (ex: 9 = September)

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	T	U	V	W	X	Y	Z	A	B	C	D	E

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 7)	P_D	500	mW
Thermal Resistance, Junction to Ambient Air (Note 7)	$R_{\theta JA}$	305	°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 8)				Maximum Reverse Leakage Current (Note 9)	
		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 (Note 10)	H9	2.4	2.28	2.52	50	2	1
DDZ9682 (Note 10)	HA	2.7	2.565	2.835	50	1	1
DDZ9683	HB	3.0	2.85	3.15	50	0.8	1
DDZ9684 (Note 10)	HC	3.3	3.13	3.47	50	7.5	1.5
DDZ9685 (Note 10)	HD	3.6	3.42	3.78	50	7.5	2
DDZ9686 (Note 10)	HE	3.9	3.70	4.10	50	5	2
DDZ9687 (Note 10)	HF	4.3	4.09	4.52	50	4	2
DDZ9688 (Note 10)	HG	4.7	4.47	4.94	50	5	3
DDZ9689 (Note 10)	HH	5.1	4.85	5.36	50	5	3
DDZ9690 (Note 10)	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 (Note 10)	HM	7.5	7.13	7.88	50	0.1	5.7
DDZ9694 (Note 10)	HN	8.2	7.79	8.61	50	0.1	6.2
DDZ9696 (Note 10)	HP	9.1	8.65	9.56	50	0.1	6.9
DDZ9697 (Note 10)	HQ	10	9.50	10.50	50	0.1	7.6
DDZ9698	HR	11	10.45	11.55	50	0.05	8.4
DDZ9699 (Note 10)	HS	12	11.40	12.60	50	0.05	9.1
DDZ9700 (Note 10)	HT	13	12.35	13.65	50	0.05	9.8
DDZ9701 (Note 10)	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 (Note 10)	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:
7. Device mounted on ceramic PCB = 7.6mm x 9.4mm x 0.87mm with pad areas 25mm^2 at T_A = +25°C or mounted on FR-5 = 3.5x1.5 inches with recommended pad layout, which can be found on our website at http://www.diodes.com, at T_L = +75°C.
8. Nominal Zener voltage is measured with the device junction in thermal equilibrium at T_T = +30°C ±1°C.
9. Short duration pulse test used to minimize self-heating effect.
10. Qualified to AEC-Q101 Standards for High Reliability. Please contact the Diodes, Inc. sales department for assistance in ordering any products expected to meet automotive requirements.

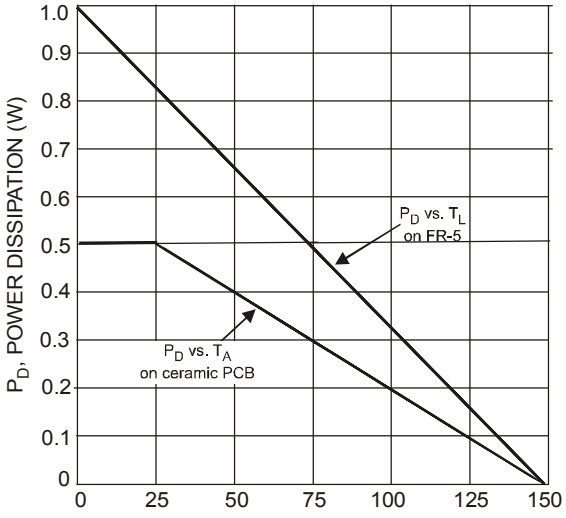


Fig. 1 Power Derating Curve

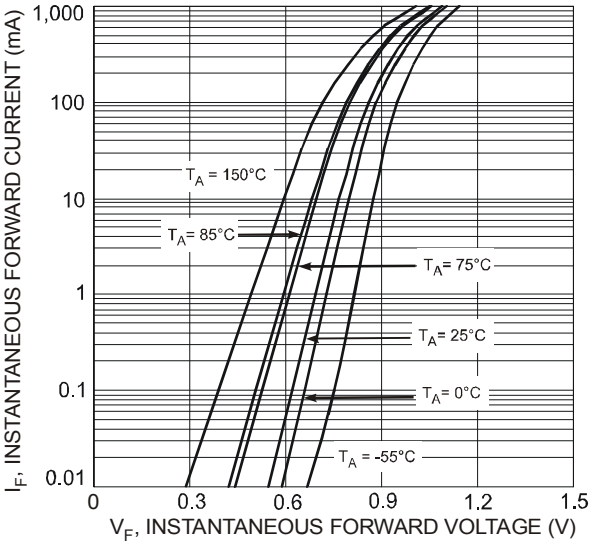


Fig. 2 Typical Forward Characteristics

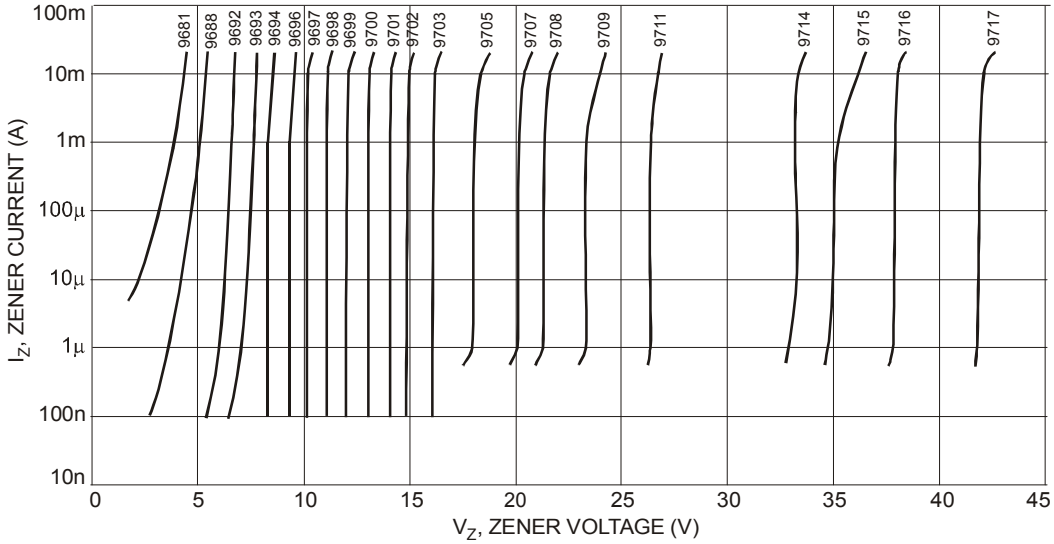


Fig. 3 Typical Zener Breakdown Characteristics

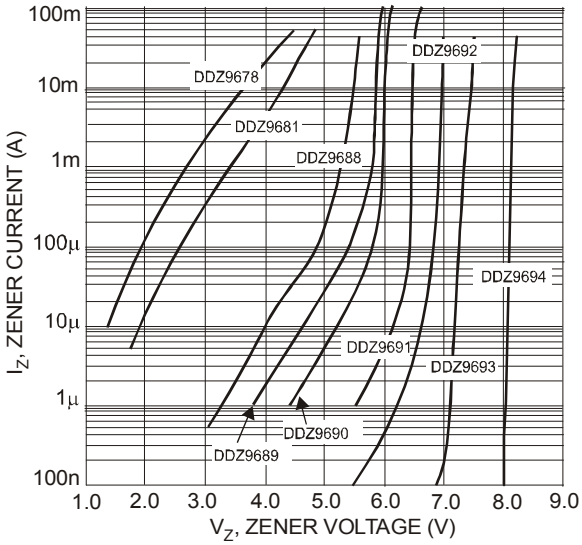


Fig. 4 Typical Zener Breakdown Characteristics, DDZ9678 - DDZ9694

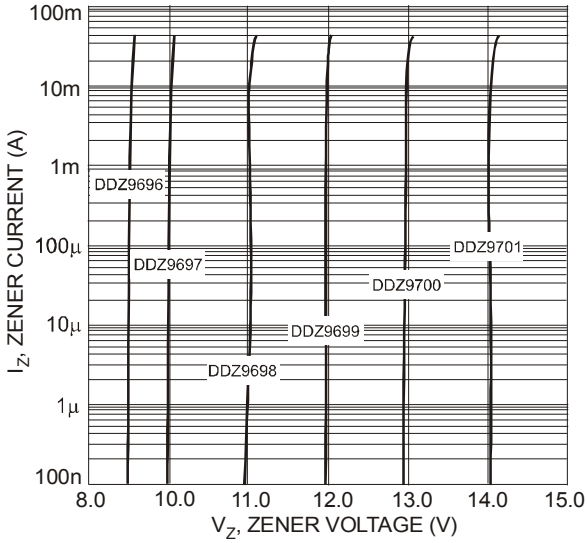


Fig. 5 Typical Zener Breakdown Characteristics, DDZ9696 - DDZ9701

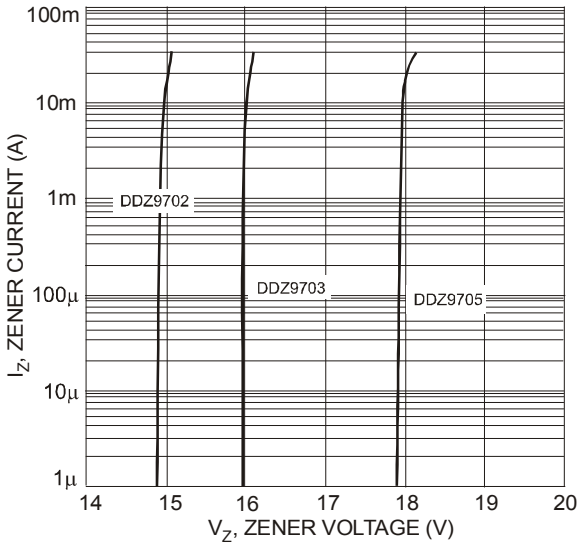


Fig. 6 Typical Zener Breakdown Characteristics, DDZ9702 - DDZ9705

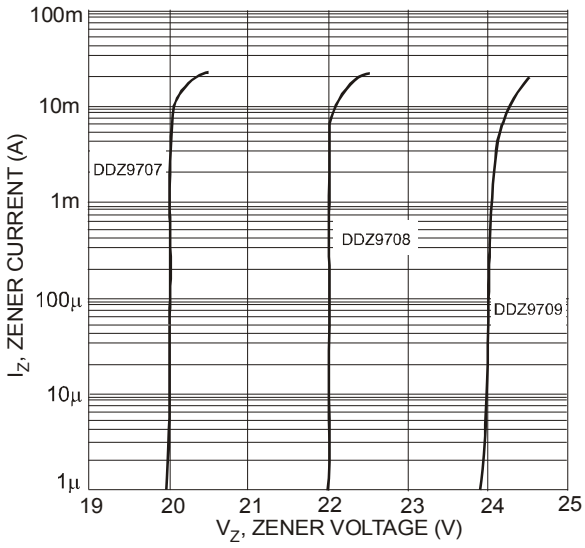


Fig. 7 Typical Zener Breakdown Characteristics, DDZ9707 - DDZ9709

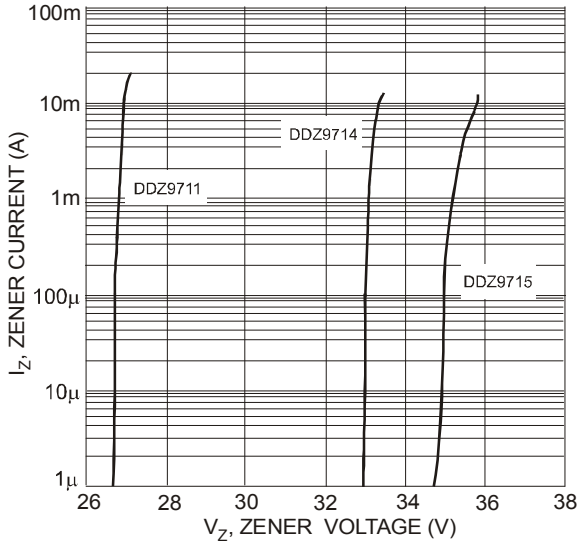


Fig. 8 Typical Zener Breakdown Characteristics, DDZ9711 - DDZ9715

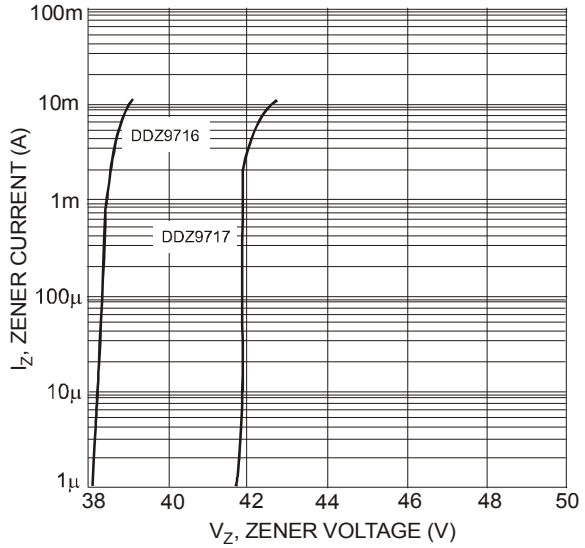


Fig. 9 Typical Zener Breakdown Characteristics, DDZ9716 - DDZ9717

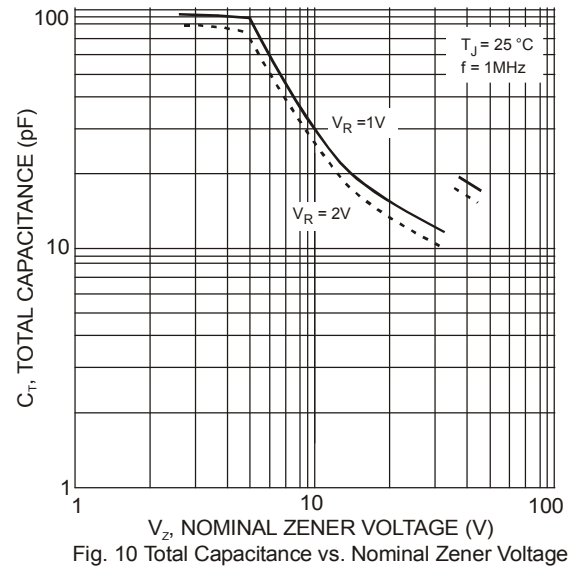


Fig. 10 Total Capacitance vs. Nominal Zener Voltage

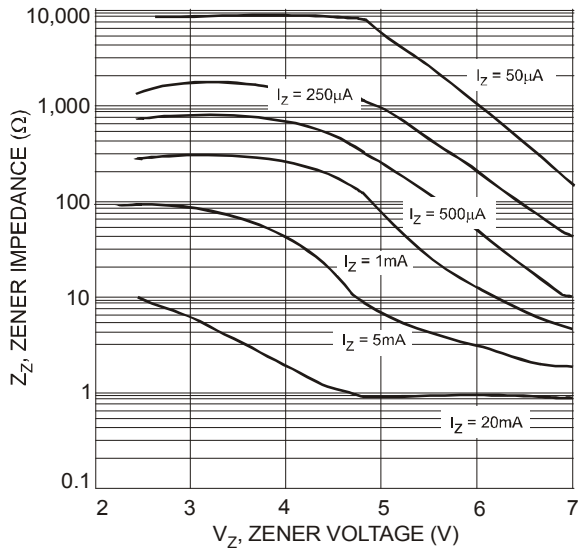


Fig. 11 Typical Zener Impedance Characteristics, DDZ9681 - DDZ9692

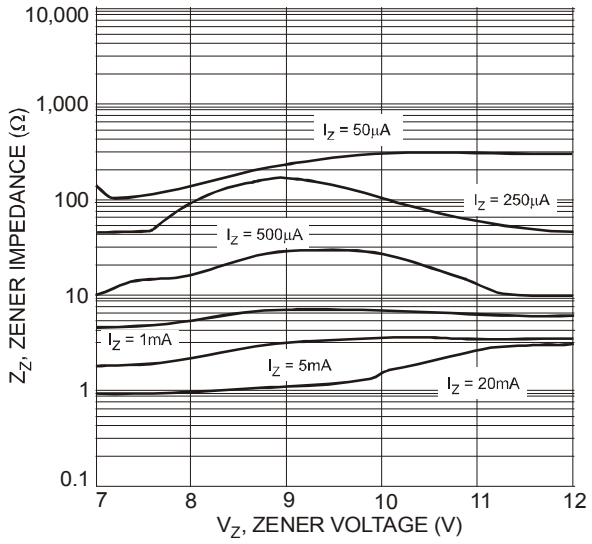


Fig. 12 Typical Zener Impedance Characteristics, DDZ9693 - DDZ9699

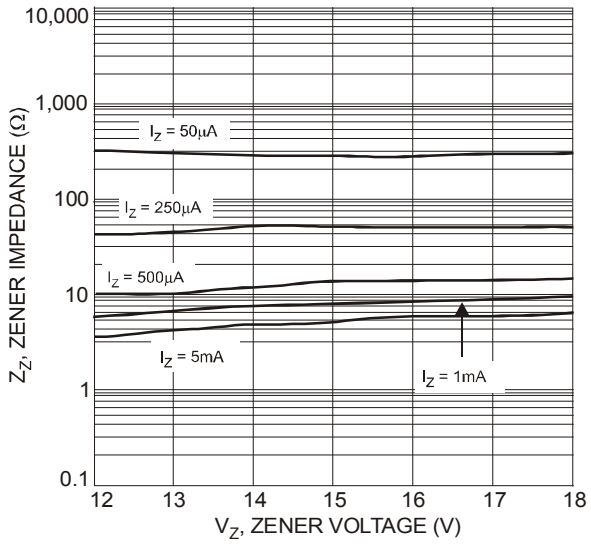


Fig. 13 Typical Zener Impedance Characteristics, DDZ9699 - DDZ9705

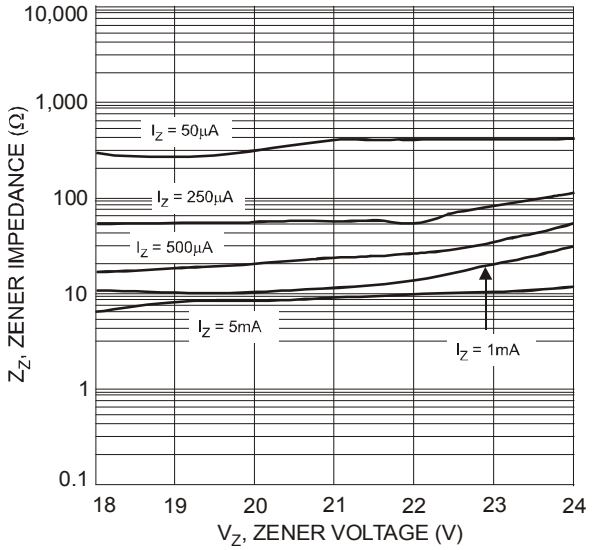


Fig. 14 Typical Zener Impedance Characteristics, DDZ9705 - DDZ9709

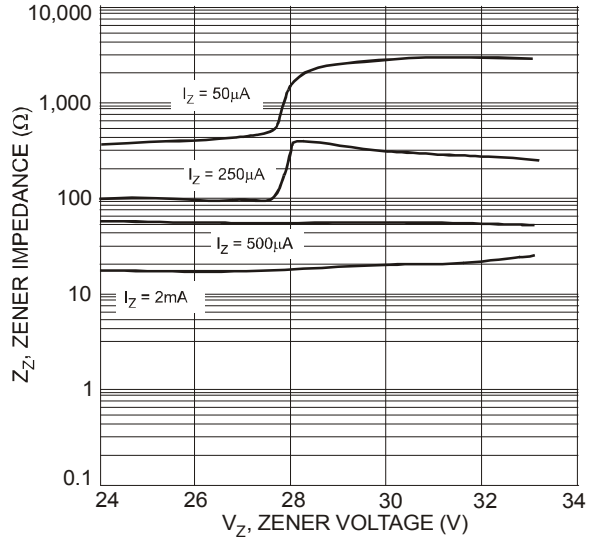


Fig. 15 Typical Zener Impedance Characteristics, DDZ9709 - DDZ9714

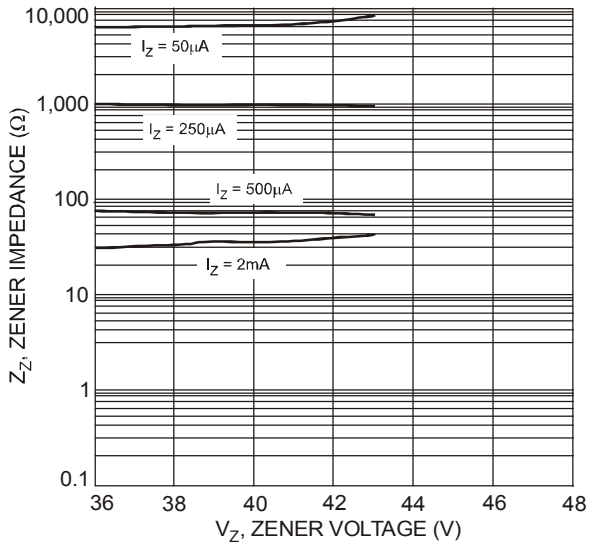


Fig. 16 Typical Zener Impedance Characteristics, DDZ9715 - DDZ9717

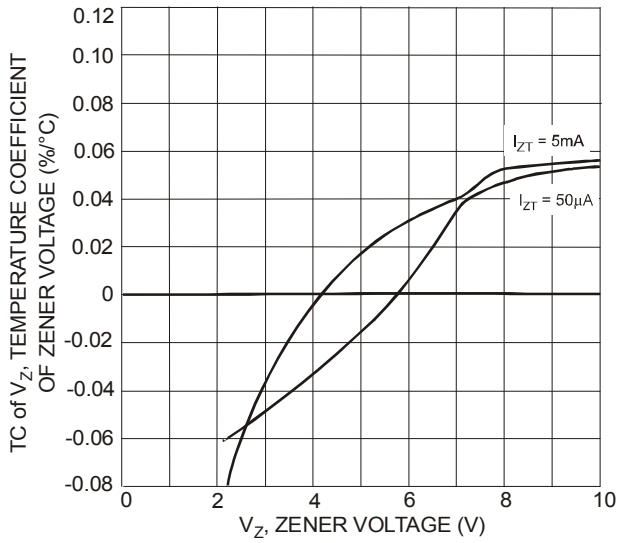


Fig. 17 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9681 - DDZ9697

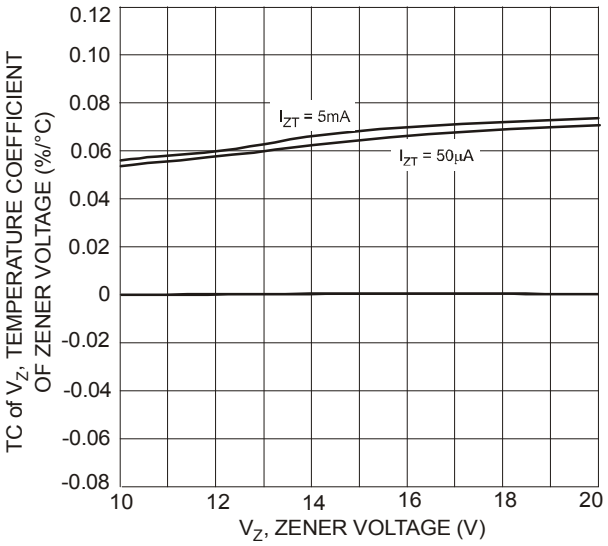


Fig. 18 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9697 - DDZ9707

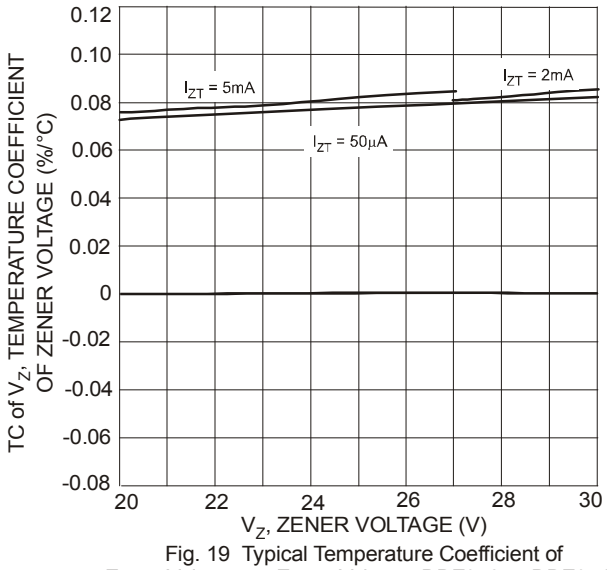


Fig. 19 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9707 - DDZ9713

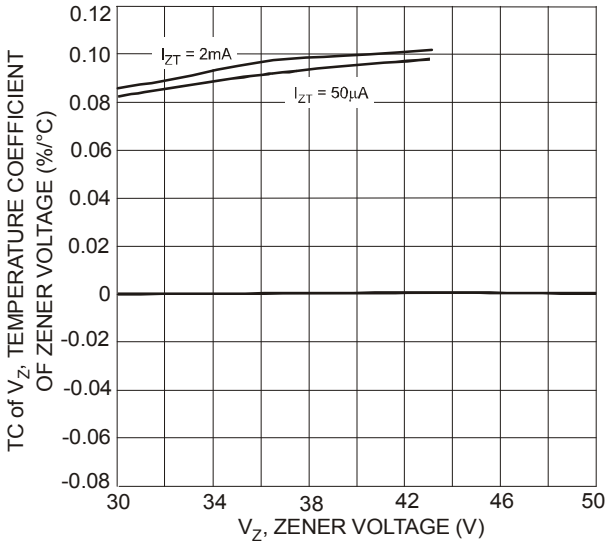


Fig. 20 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ9713 - DDZ9717

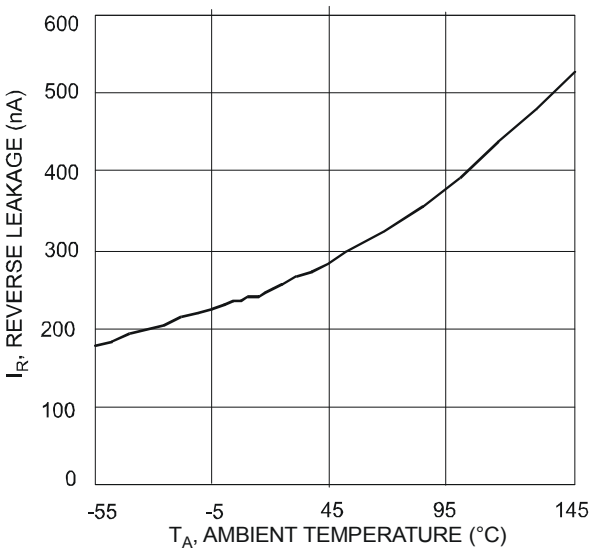
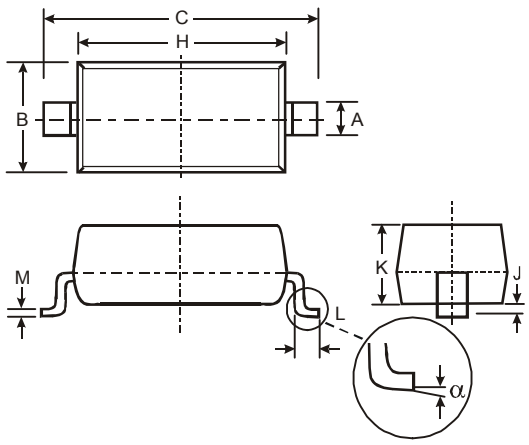


Fig. 21 Typical Leakage vs. Ambient Temperature, DDZ9681

Package Outline Dimensions

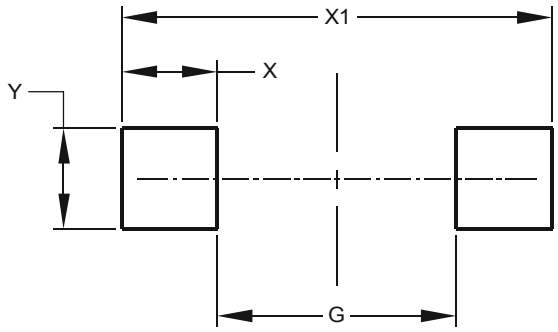
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOD123		
Dim	**Min**	**Max**
A	0.55 Typ	
B	1.40	1.70
C	3.55	3.85
H	2.55	2.85
J	0.00	0.10
K	1.00	1.35
L	0.25	0.40
M	0.10	0.15
α	0	8°
All Dimensions in mm		

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
G	2.250
X	0.900
X1	4.050
Y	0.950