SURFACE MOUNT PRECISION ZENER DIODE

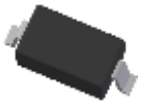
Features

- Very Tight Tolerance on V_Z
- Ideally Suited for Automated Assembly Processes
- 500mW Power Dissipation on FR-4 PCB (Note 1)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 2 & 3)**
- **Halogen and Antimony Free. "Green" Device (Notes 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 5)**

Mechanical Data

- Case: SOD123
- Case Material: Molded Plastic, "Green Molding Compound". 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

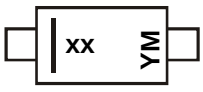
Ordering Information (Notes 5 & 6)

Part Number	Qualification	Case	Packaging
DDZ(V_Z Rank)-7*	Commercial	SOD123	3,000/Tape & Reel
DDZ(V_Z Rank)Q-7*	Automotive	SOD123	3,000/Tape & Reel

* Example: The part number for the 6.2 Volt device would be DDZ6V2B-7.

Notes:
1. Device mounted on FR-4 PC board with 4" x 4" copper pads.
2. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
3. 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.
4. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
5. 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/.
6. 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: D = 2016)
M = Month (ex: 9 = September)

Date Code Key

Year	2003	2004	…	2012	2013	2014	2015	2016	2017	2018	2019	2020
Code	P	R	…	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 7) @T_L = +75°C	P_D	500	mW
Power Dissipation (Note 8) @T_A = +25°C	P_D	410	mW
Power Dissipation (Note 9) @T_A = +25°C	P_D	310	mW
Thermal Resistance, Junction to Ambient Air (Note 8)	$R_{\theta JA}$	305	°C/W
Thermal Resistance, Junction to Ambient Air (Note 9)	$R_{\theta JA}$	403	°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	Marking Code	Zener Voltage Range (Note 10)			Maximum Zener Impedance f = 1kHz			Maximum Reverse Current (Note 10)	
		V_Z @ I_{ZT}		I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}	I_{ZK}	I_R	@ V_R
		Min (V)	Max (V)	mA	Ω		mA	µA	V
DDZ5V1B	KM	4.94	5.20	20	17	480	1	5	1.5
DDZ5V6B	KN	5.45	5.73	20	11	400	1	0.5	2.5
DDZ6V2B	KO	5.96	6.27	20	7	150	1	0.5	4.0
DDZ6V8B	KP	6.49	6.83	20	5	150	0.5	0.5	5.0
DDZ6V8C	YP	6.66	7.01	20	5	150	0.5	0.5	5.0
DDZ7V5B	KQ	7.07	7.45	20	6	120	0.5	0.5	6.0
DDZ7V5C	YQ	7.29	7.67	20	6	120	0.5	0.5	6.0
DDZ8V2B	KR	7.78	8.19	20	8	120	0.5	0.5	6.5
DDZ8V2C	YR	8.03	8.45	20	8	120	0.5	0.5	6.5
DDZ9V1B	KS	8.57	9.01	20	8	120	0.5	0.5	7.0
DDZ9V1C	YS	8.83	9.30	20	8	120	0.5	0.5	7.0
DDZ10B	KT	9.41	9.90	20	8	120	0.5	0.1	8.0
DDZ10C	YT	9.70	10.20	20	8	120	0.5	0.1	8.0
DDZ11B	KU	10.50	11.05	10	10	120	0.5	0.1	8.4
DDZ11C	YU	10.82	11.38	10	10	120	0.5	0.1	8.4
DDZ12B	KV	11.44	12.03	10	12	110	0.5	0.1	9.1
DDZ12C	YV	11.74	12.35	10	12	110	0.5	0.1	9.1
DDZ13B	KW	12.55	13.21	10	14	110	0.5	0.1	10.0
DDZ14	GX	13.65	14.35	10	16	110	0.5	0.05	11.0
DDZ14B	KX	13.89	14.62	10	16	110	0.5	0.05	11.0
DDZ15	GY	14.80	15.57	10	18	150	0.5	0.05	12.0
DDZ16B	KY	15.25	16.04	10	18	150	0.5	0.05	12.0
DDZ16	YY	15.69	16.51	10	18	150	0.5	0.05	12.0
DDZ17	KZ	16.82	17.70	10	23	150	0.5	0.05	14.0
DDZ18C	YZ	17.42	18.33	10	23	150	0.5	0.05	14.0
DDZ19	ZJ	18.63	19.59	10	28	200	0.5	0.05	15.0
DDZ20C	PJ	19.23	20.22	10	28	200	0.5	0.05	15.0
DDZ21	ZK	20.64	21.71	5	30	200	0.5	0.05	17.0
DDZ22D	2K	21.52	22.63	5	30	200	0.5	0.05	17.0
DDZ23	ZL	22.61	23.77	5	35	200	0.5	0.05	19.0
DDZ24C	PL	23.12	24.31	5	35	200	0.5	0.05	19.0
DDZ26	ZM	24.97	26.26	5	45	250	0.5	0.05	21.0
DDZ27D	2M	26.29	27.64	5	45	250	0.5	0.05	21.0
DDZ28	ZN	27.70	29.13	5	55	250	0.5	0.05	23.0
DDZ30D	2N	29.02	30.51	5	55	250	0.5	0.05	23.0
DDZ31	ZO	30.32	31.88	5	65	250	0.5	0.05	25.0
DDZ33	RP	32.14	33.79	5	75	250	0.5	0.05	27.0
DDZ34	ZP	32.79	34.49	5	75	250	0.5	0.05	27.0
DDZ36	ZQ	35.36	37.19	5	85	250	0.5	0.05	30.0
DDZ39F	5Q	38.02	39.98	5	85	250	0.5	0.05	30.0
DDZ43	ZR	42.14	43.86	5	90	—	—	0.05	33.0

Notes: 7. $R_{\Theta JL}$ = 132°C/W
8. Device mounted on Alumina ceramic PC board, single-sided, 14mm x 14mm x 1.0mm, 2oz copper traces, with copper pad area 40mm^2.
9. Device mounted on FR-4 PC board, single-sided, 25mm x 25mm x 1.6mm, 2oz copper traces with 1x minimum recommended pad layout.
10. Short duration pulse test used to minimize self-heating effect.

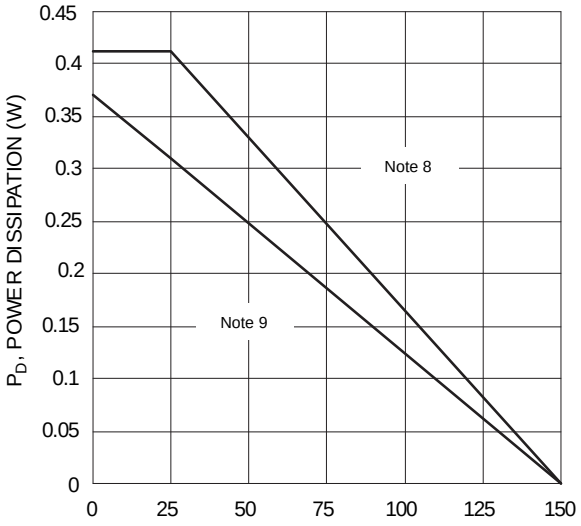


Fig. 1 Power Derating Curve

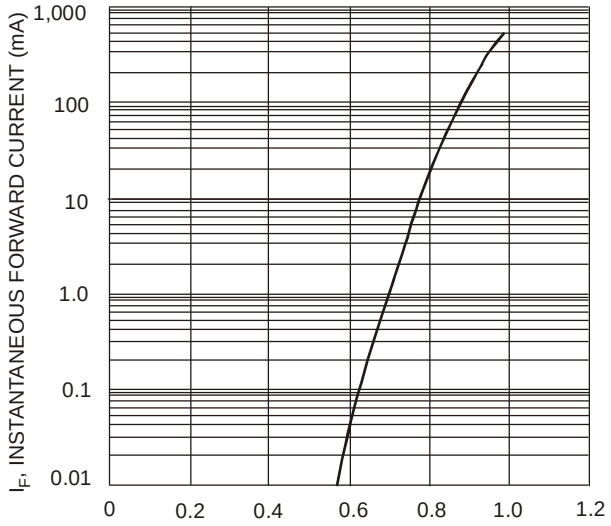


Fig. 2 Typical Forward Characteristics

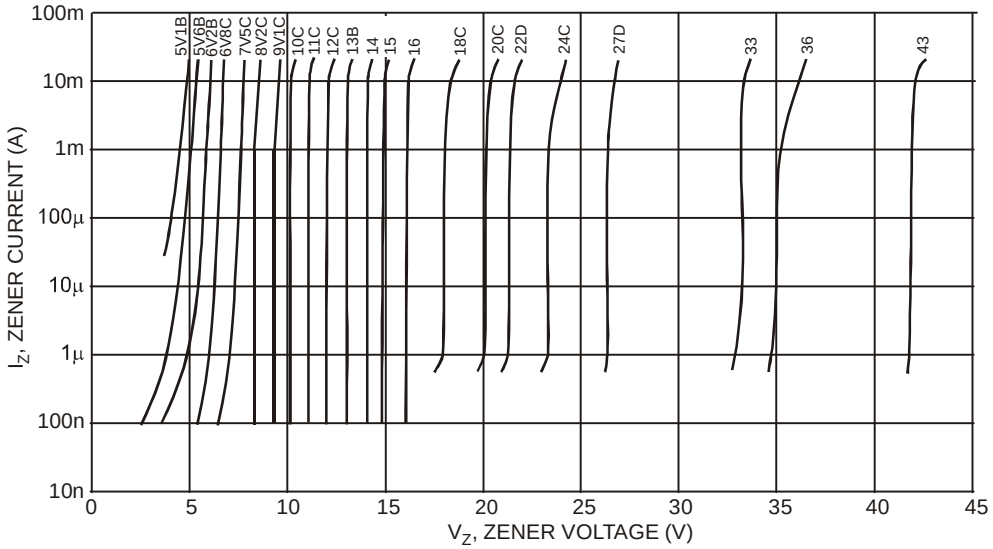


Fig. 3 Typical Zener Breakdown Characteristics

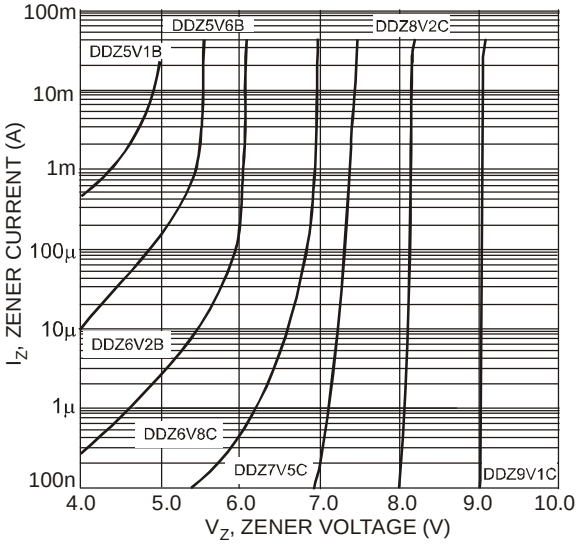


Fig. 4 Typical Zener Breakdown Characteristics, DDZ5V1B - DDZ9V1C

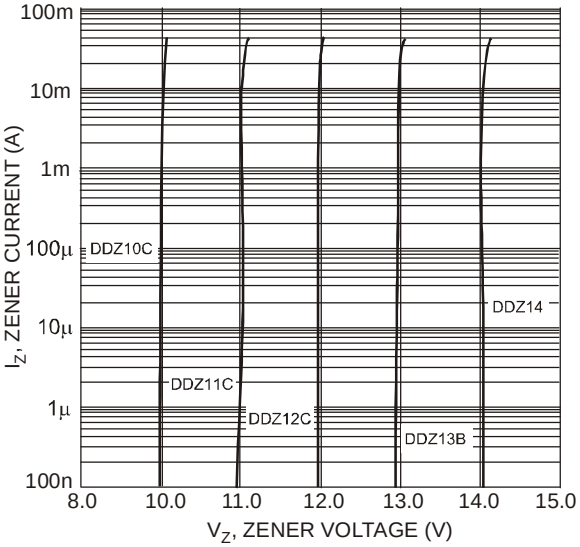


Fig. 5 Typical Zener Breakdown Characteristics, DDZ10C - DDZ14

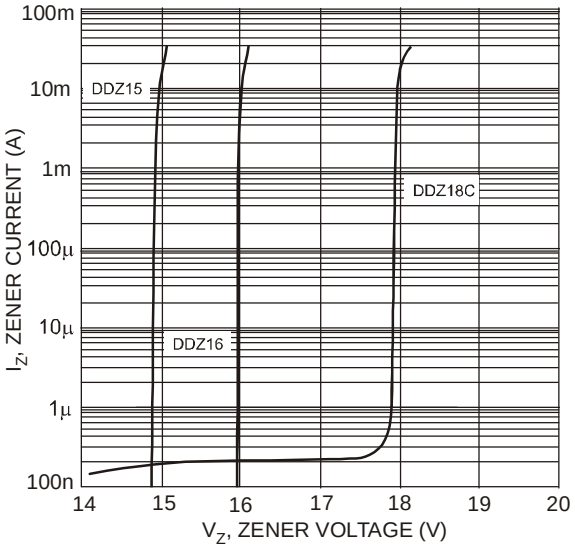


Fig. 6 Typical Zener Breakdown Characteristics, DDZ15 - DDZ18C

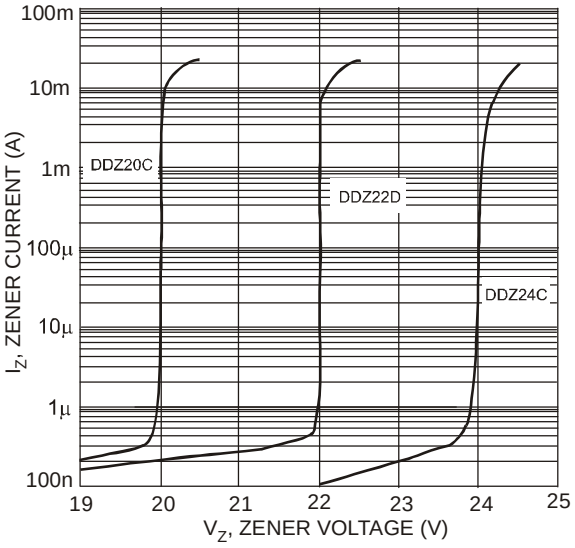


Fig. 7 Typical Zener Breakdown Characteristics, DDZ20C - DDZ24C

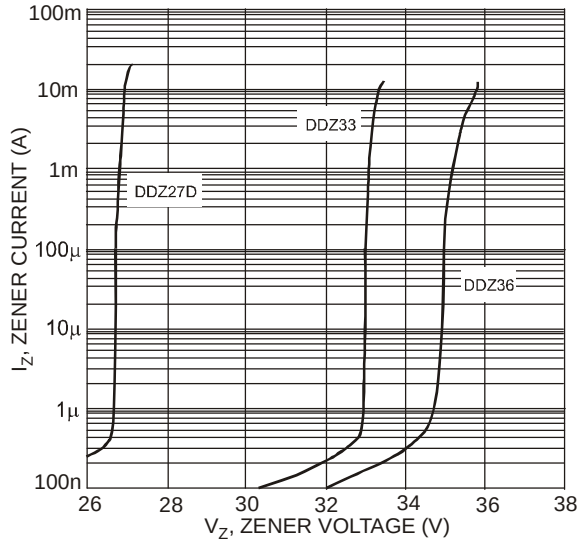


Fig. 8 Typical Zener Breakdown Characteristics, DDZ27D - DDZ36

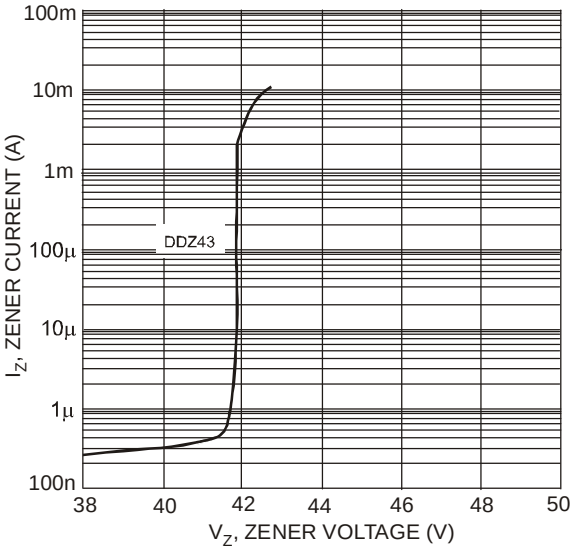


Fig. 9 Typical Zener Breakdown Characteristics, DDZ43

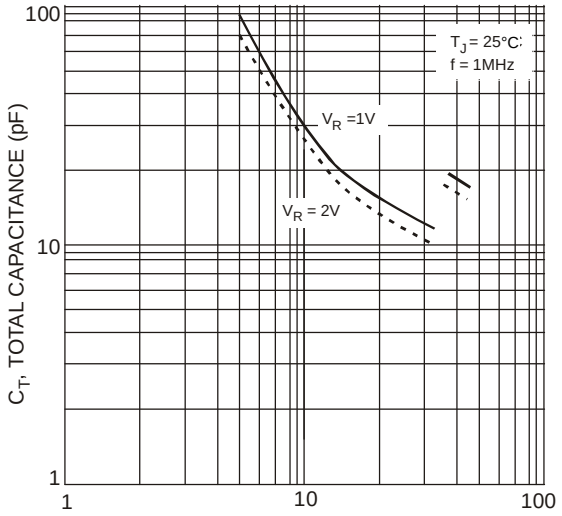


Fig. 10 Typical Total Capacitance vs. Nominal Zener Voltage

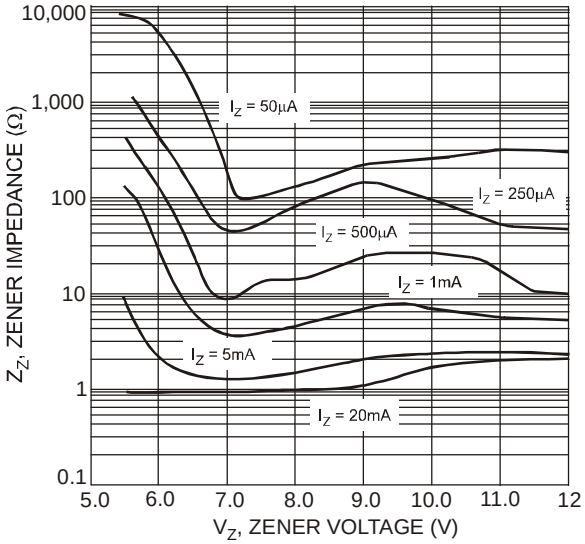


Fig. 11 Typical Zener Impedance Characteristics, DDZ5V6B - DDZ12C

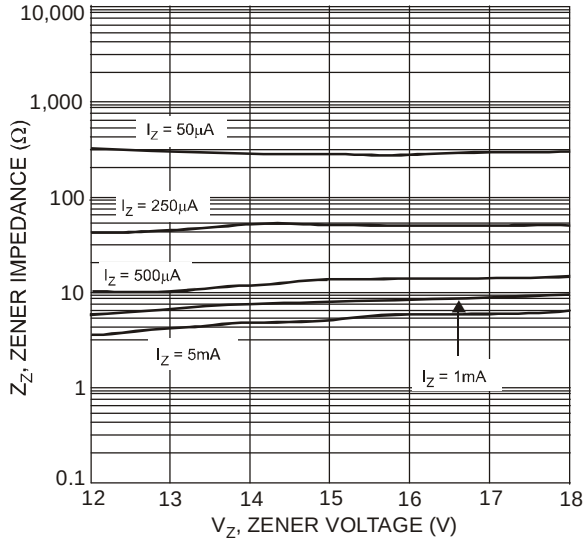


Fig. 12 Typical Zener Impedance Characteristics, DDZ12C - DDZ18C

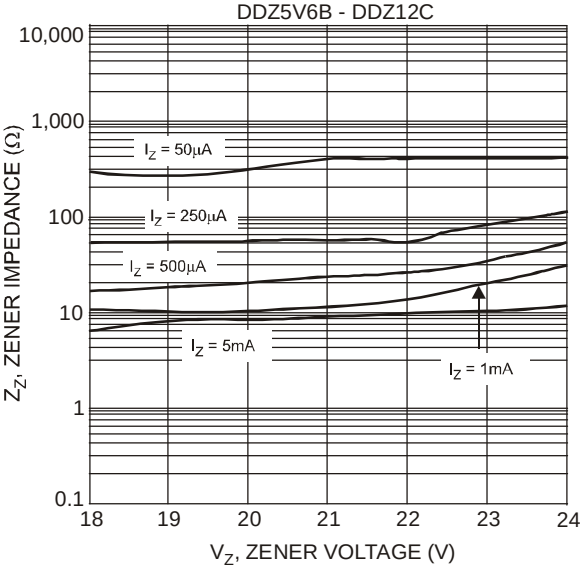


Fig. 13 Typical Zener Impedance Characteristics, DDZ18C - DDZ24C

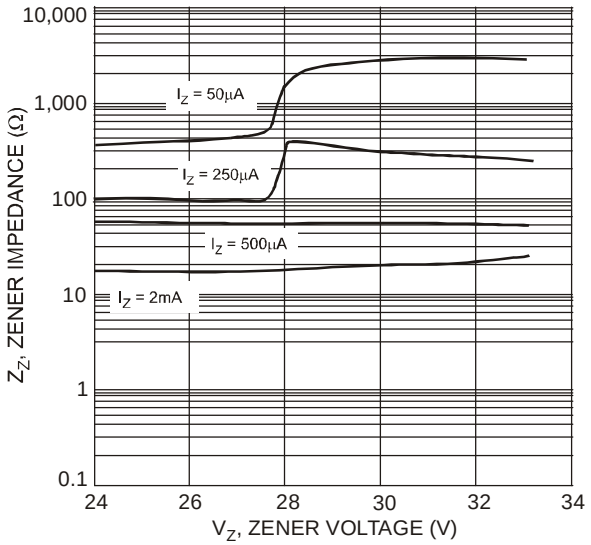


Fig. 14 Typical Zener Impedance Characteristics, DDZ24C - DDZ33

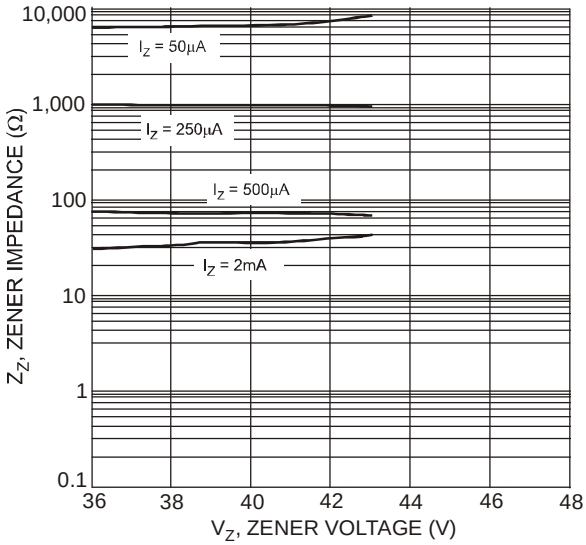


Fig. 15 Typical Zener Impedance Characteristics, DDZ36 - DDZ43

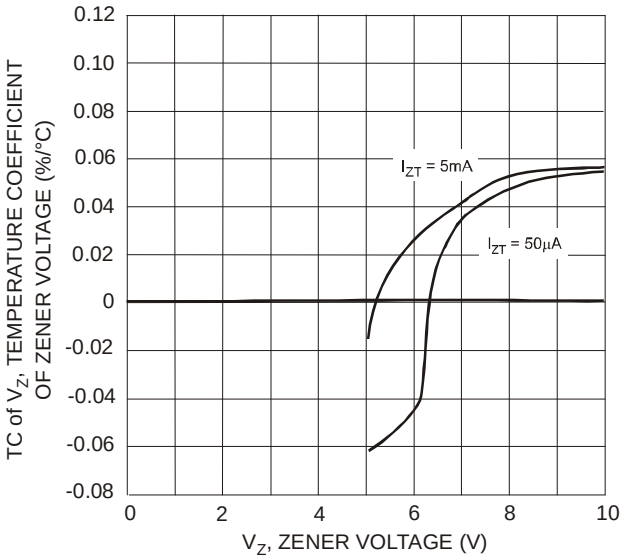


Fig. 16 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ5V1B-DDZ10C

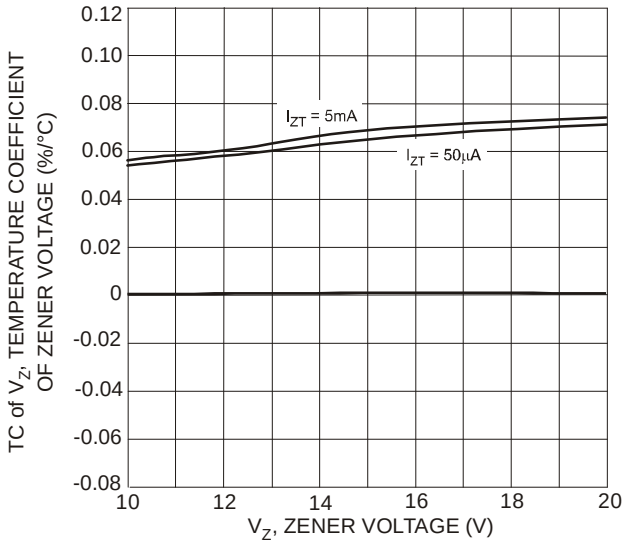


Fig. 17 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ10C-DDZ20C

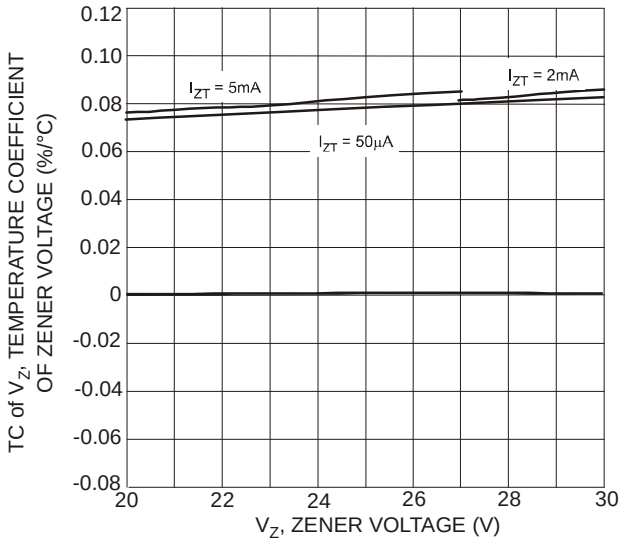


Fig. 18 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ20C-DDZ30D

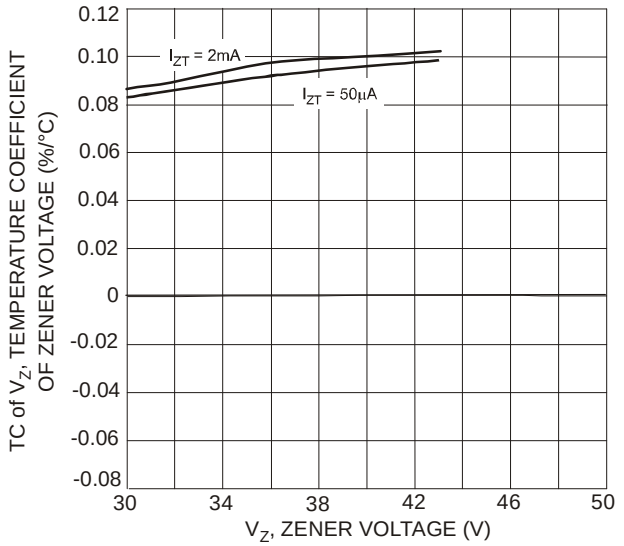
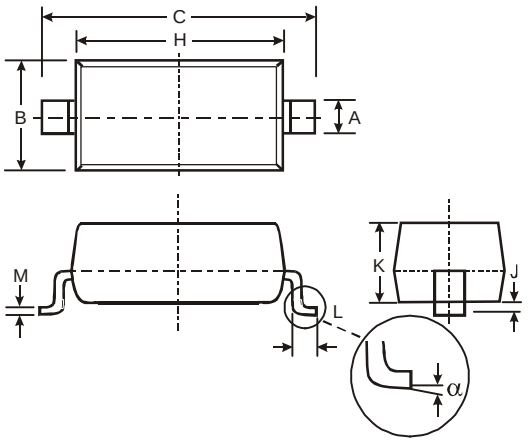


Fig. 19 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZ30D-DDZ43

Package Outline Dimensions

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

SOD123

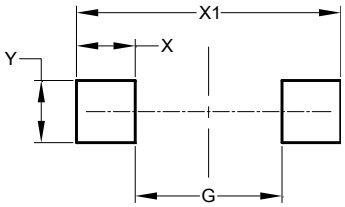


SOD123		
Dim	**Min**	**Max**
A	0.55 Typ	
B	1.40	1.70
C	3.55	3.85
H	2.55	2.85
J	0.00	0.10
K	1.00	1.35
L	0.25	0.40
M	0.10	0.15
α	0	8°
All Dimensions in mm		

Suggested Pad Layout

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

SOD123



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

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