



**THE DATASHEET OF  
MCP23S17-E/ML**

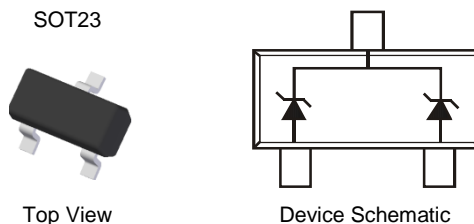


## Features

- Dual Zeners in Common Cathode Configuration
- 300mW Power Dissipation
- Ideally Suited for Automated Insertion
- $\Delta V_Z$  For Both Diodes in One Case is  $\leq 5\%$
- Common Anode Style Available, See AZ23 Series
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Lead Frame (Lead Free Plating). Solderable per MIL-STD-202, Method 208<sup>(3)</sup>
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)



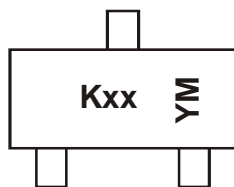
## Ordering Information (Note 4)

Part Number	Qualification	Packaging	Shipping
(Type Number)-7-F*	Commercial	SOT23	3000/Tape & Reel
(Type Number)Q-7-F*	Automotive	SOT23	3000/Tape & Reel

\*Add "-7-F" to the appropriate type number in Electrical Characteristics Table on Page 2. Example: 6.2V Zener = DZ23C6V2-7-F.

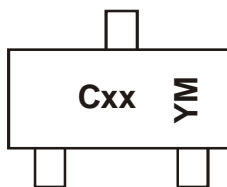
- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



K = SAT (Shanghai Assembly / Test Site)  
 xx = Product Type Marking Code  
 See Electrical Characteristics Table  
 YM = Date Code Marking  
 Y = Year (ex: I = 2021)  
 M = Month (ex: 9 = September)

For DZ23C15-7-F only:  
 Assembly/Test in Shanghai or Chuzhou  
 M or  $\bar{M}$  = Month (ex: 9 = September)



C = CAT (Chengdu Assembly / Test Site)  
 xx = Product Type Marking Code  
 See Electrical Characteristics Table  
 YM = Date Code Marking  
 Y = Year (ex: I = 2021)  
 M = Month (ex: 9 = September)

### Date Code Key

<b>Year</b>	2013	.....	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Code</b>	A	.....	I	J	K	L	M	N	O	P	R	S
<b>Month</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Code</b>	1	2	3	4	5	6	7	8	9	O	N	D

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	300	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	417	$^{\circ}C/W$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^{\circ}C$

Note: 5. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com>.

## Electrical Characteristics (@ $T_A = +25^{\circ}C$ , unless otherwise specified.)

Type Number	Marking Code	Zener Voltage Range (Note 6)	Maximum Zener Impedance $f = 1kHz$		Typical Temperature Coefficient	Minimum Reverse Voltage (Note 6)
		@ $I_{ZT} = 5.0mA$	$Z_{ZT} @ I_{ZT} = 5.0mA$	$Z_{ZK} @ I_{ZK} = 1.0mA$		@ $I_R = 0.1\mu A$
		$V_Z (V)$	$\Omega$	$\Omega$	TC (%/ $^{\circ}C$ )	$V_R (V)$
DZ23C2V7	V1	2.5 to 2.9	83	500	-0.065	—
DZ23C3V0	V2	2.8 to 3.2	95	500	-0.060	—
DZ23C3V3	V3	3.1 to 3.5	95	500	-0.055	—
DZ23C3V6	V4	3.4 to 3.8	95	500	-0.055	—
DZ23C3V9	V5	3.7 to 4.1	95	500	-0.050	—
DZ23C4V3	V6	4.0 to 4.6	95	500	-0.035	—
DZ23C4V7	V7	4.4 to 5.0	78	500	-0.015	—
DZ23C5V1	V8	4.8 to 5.4	60	480	+0.005	0.8
DZ23C5V6	V9	5.2 to 6.0	40	400	+0.020	1.0
DZ23C6V2	VA	5.8 to 6.6	10	200	+0.030	2.0
DZ23C6V8	VB	6.4 to 7.2	8.0	150	+0.045	3.0
DZ23C7V5	VC	7.0 to 7.9	7.0	50	+0.050	5.0
DZ23C8V2	VD	7.7 to 8.7	7.0	50	+0.055	6.0
DZ23C9V1	VE	8.5 to 9.6	10	50	+0.065	7.0
DZ23C10	VF	9.4 to 10.6	15	70	+0.065	7.5
DZ23C11	VG	10.4 to 11.6	20	70	+0.070	8.5
DZ23C12	VH	11.4 to 12.7	20	90	+0.075	9.0
DZ23C13	VI	12.4 to 14.1	25	110	+0.080	10.0
DZ23C15	VJ	13.8 to 15.6	30	110	+0.080	11.0
DZ23C16	VK	15.3 to 17.1	40	170	+0.090	12.0
DZ23C18	VL	16.8 to 19.1	50	170	+0.090	14.0
DZ23C20	VM	18.8 to 21.2	50	220	+0.090	15.0
DZ23C22	VN	20.8 to 23.3	55	220	+0.090	17.0
DZ23C24	VO	22.8 to 25.6	80	220	+0.090	18.0
DZ23C27	VP	25.1 to 28.9	80	250	+0.090	20.0
DZ23C30	VQ	28 to 32	80	250	+0.090	22.5
DZ23C33	VR	31 to 35	80	250	+0.090	25.0
DZ23C36	VS	34 to 38	90	250	+0.090	27.0
DZ23C39	VT	37 to 41	90	300	+0.110	29.0
DZ23C43	VU	40 to 46	100	700	+0.110	32.0
DZ23C47	VV	44 to 50	100	750	+0.110	35.0
DZ23C51	VW	48 to 54	100	750	+0.110	38.0

Note: 6. Short duration pulse test used to minimize self-heating effect.

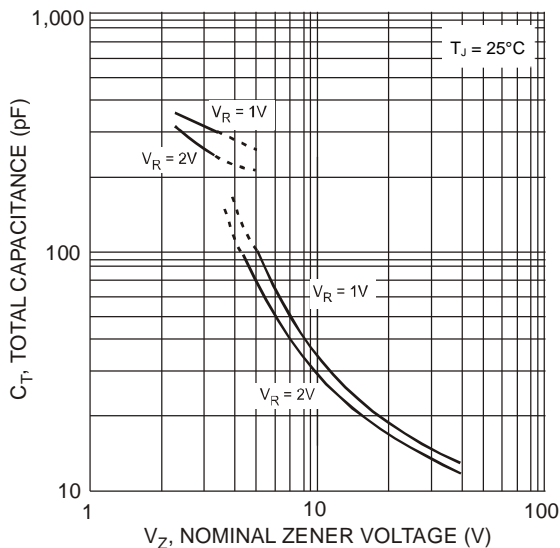
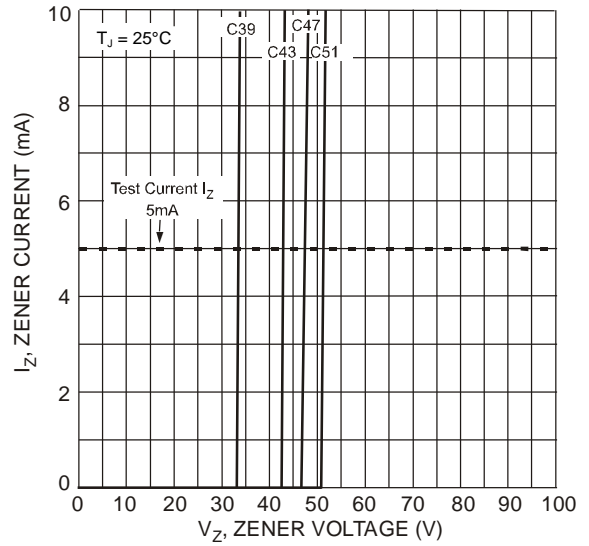
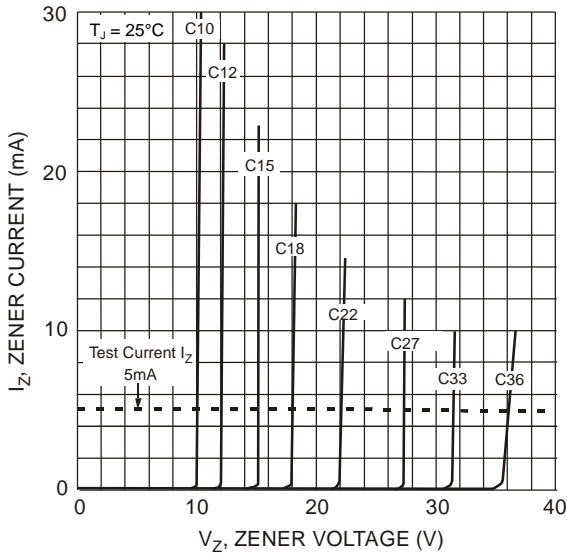
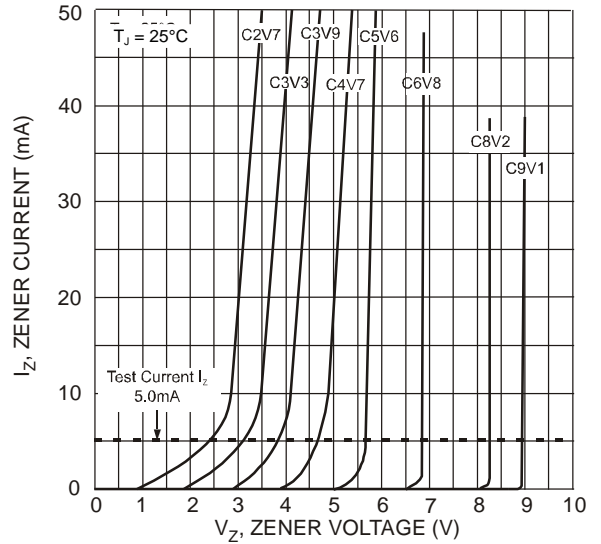
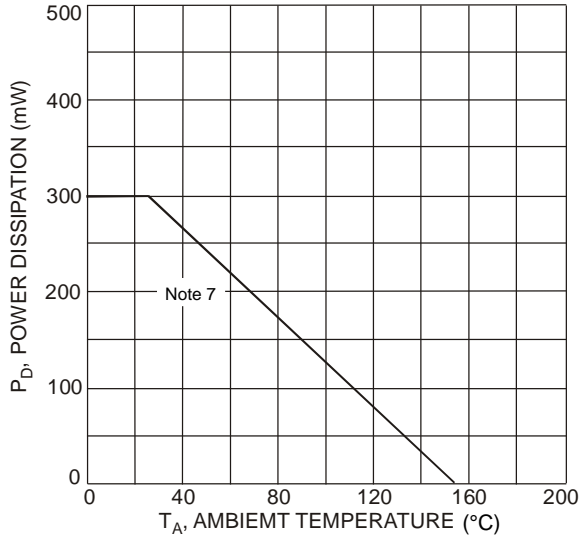
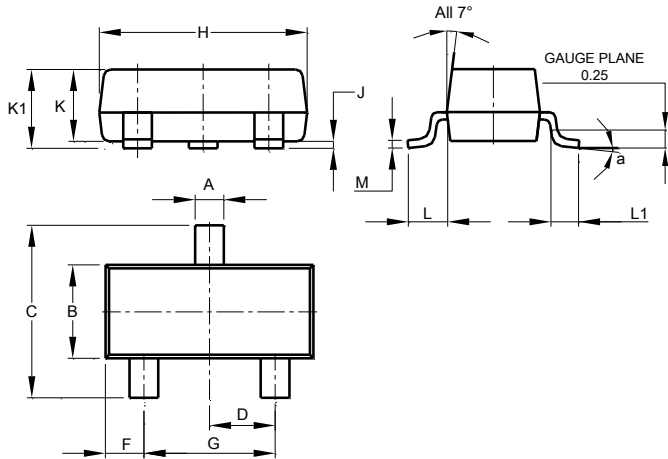


Fig. 5 Typical Total Capacitance vs. Nominal Zener Voltage

**Package Outline Dimensions**

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

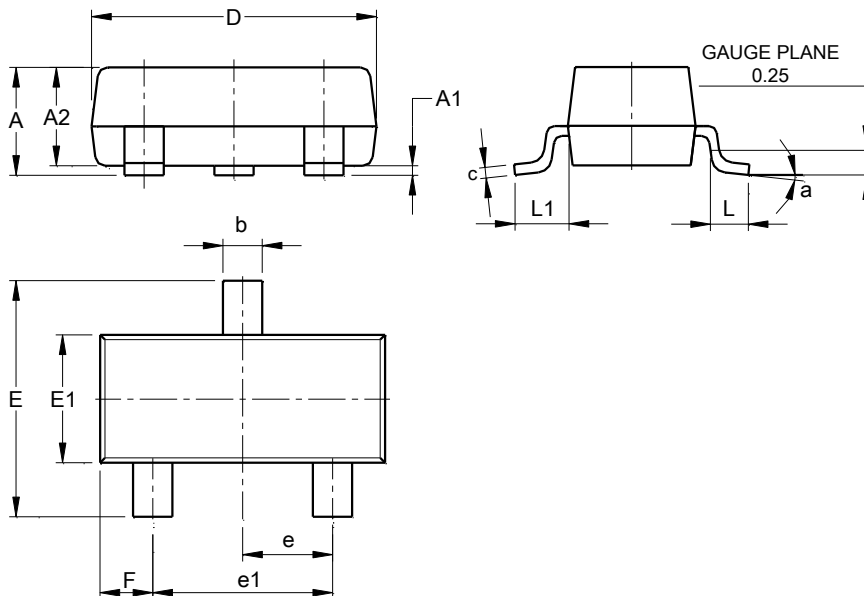
**SOT23**



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

For DZ23C15-7-F only:

**SOT23 (Standard)**

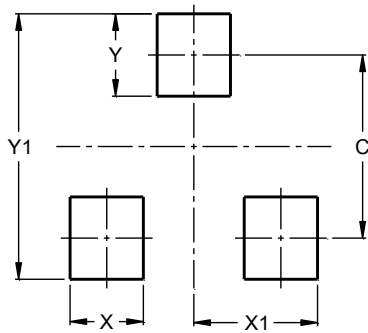


SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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