

- MONOLITHIC TEMPERATURE COMPENSATED ZENER REFERENCE CHIPS
- ALL JUNCTIONS COMPLETELY PROTECTED WITH SILICON DIOXIDE
- 8.5 & 9.1 VOLT NOMINAL ZENER VOLTAGE  $\pm 5\%$
- ELECTRICALLY EQUIVALENT TO 1N4765 THRU 1N4772A AND 1N4775 THRU 1N4782A SERIES
- COMPATIBLE WITH ALL WIRE BONDING AND DIE ATTACH TECHNIQUES, WITH THE EXCEPTION OF SOLDER REFLOW

CD4765 thru CD4767A  
and  
CD4770 thru CD4772A  
and  
CD4775 thru CD4777A  
and  
CD4780 thru CD4782A

## MAXIMUM RATINGS

Operating Temperature:  $-65^{\circ}\text{C}$  to  $+175^{\circ}\text{C}$   
Storage Temperature:  $-65^{\circ}\text{C}$  to  $+175^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS @  $25^{\circ}\text{C}$ , unless otherwise specified.

| TYPE<br>NUMBER | ZENER<br>VOLTAGE<br>$V_Z @ I_{ZT}$<br><br>(Note 3)<br>VOLTS | ZENER<br>TEST<br>CURRENT<br>$I_{ZT}$<br>mA | MAXIMUM<br>ZENER<br>IMPEDANCE<br>$Z_{ZT}$<br>OHMS | MAXIMUM<br>VOLTAGE<br>TEMPERATURE<br>STABILITY<br>$\Delta V_{ZT}$<br>MAXIMUM<br>(Note 2)<br>mV | TEMPERATURE<br>RANGE<br>$^{\circ}\text{C}$ | EFFECTIVE<br>TEMPERATURE<br>COEFFICIENT<br>%/ $^{\circ}\text{C}$ |
|----------------|-------------------------------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------|
| CD4765         | 9.1                                                         | 0.5                                        | 350                                               | 68                                                                                             | 0 to +75                                   | 0.01                                                             |
| CD4765A        | 9.1                                                         | 0.5                                        | 350                                               | 141                                                                                            | -55 to +100                                | 0.01                                                             |
| CD4766         | 9.1                                                         | 0.5                                        | 350                                               | 34                                                                                             | 0 to +75                                   | 0.005                                                            |
| CD4766A        | 9.1                                                         | 0.5                                        | 350                                               | 70                                                                                             | -55 to +100                                | 0.005                                                            |
| CD4767         | 9.1                                                         | 0.5                                        | 350                                               | 14                                                                                             | 0 to +75                                   | 0.002                                                            |
| CD4767A        | 9.1                                                         | 0.5                                        | 350                                               | 28                                                                                             | -55 to +100                                | 0.002                                                            |
| CD4770         | 9.1                                                         | 1.0                                        | 200                                               | 68                                                                                             | 0 to +75                                   | 0.01                                                             |
| CD4770A        | 9.1                                                         | 1.0                                        | 200                                               | 141                                                                                            | -55 to +100                                | 0.01                                                             |
| CD4771         | 9.1                                                         | 1.0                                        | 200                                               | 34                                                                                             | 0 to +75                                   | 0.005                                                            |
| CD4771A        | 9.1                                                         | 1.0                                        | 200                                               | 70                                                                                             | -55 to +100                                | 0.005                                                            |
| CD4772         | 9.1                                                         | 1.0                                        | 200                                               | 14                                                                                             | 0 to +75                                   | 0.002                                                            |
| CD4772A        | 9.1                                                         | 1.0                                        | 200                                               | 28                                                                                             | -55 to +100                                | 0.002                                                            |
| CD4775         | 8.5                                                         | 0.5                                        | 350                                               | 64                                                                                             | 0 to +75                                   | 0.01                                                             |
| CD4775A        | 8.5                                                         | 0.5                                        | 350                                               | 132                                                                                            | -55 to +100                                | 0.01                                                             |
| CD4776         | 8.5                                                         | 0.5                                        | 350                                               | 32                                                                                             | 0 to +75                                   | 0.005                                                            |
| CD4776A        | 8.5                                                         | 0.5                                        | 350                                               | 66                                                                                             | -55 to +100                                | 0.005                                                            |
| CD4777         | 8.5                                                         | 0.5                                        | 350                                               | 13                                                                                             | 0 to +75                                   | 0.002                                                            |
| CD4777A        | 8.5                                                         | 0.5                                        | 350                                               | 26                                                                                             | -55 to +100                                | 0.002                                                            |
| CD4780         | 8.5                                                         | 1.0                                        | 200                                               | 64                                                                                             | 0 to +75                                   | 0.01                                                             |
| CD4780A        | 8.5                                                         | 1.0                                        | 200                                               | 132                                                                                            | -55 to +100                                | 0.01                                                             |
| CD4781         | 8.5                                                         | 1.0                                        | 200                                               | 32                                                                                             | 0 to +75                                   | 0.005                                                            |
| CD4781A        | 8.5                                                         | 1.0                                        | 200                                               | 66                                                                                             | -55 to +100                                | 0.005                                                            |
| CD4782         | 8.5                                                         | 1.0                                        | 200                                               | 13                                                                                             | 0 to +75                                   | 0.002                                                            |
| CD4782A        | 8.5                                                         | 1.0                                        | 200                                               | 26                                                                                             | -55 to +100                                | 0.002                                                            |

**NOTE 1** Zener impedance is derived by superimposing on  $I_{ZT}$  A 60Hz rms a.c. current equal to 10% of  $I_{ZT}$

**NOTE 2** The maximum allowable change observed over the entire temperature range i.e., the diode voltage will not exceed the specified mV at any discrete temperature between the established limits, per JEDEC standard No.5.

**NOTE 3** Zener voltage range is  $\pm 5\%$

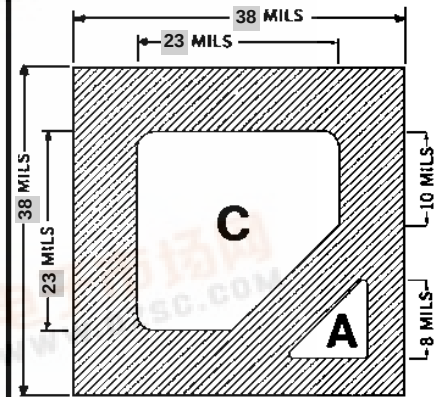


FIGURE 1

## DESIGN DATA

### METALLIZATION:

Top: C (Cathode).....Al  
A (Anode).....Al  
Back: .....Au

AL THICKNESS.....25,000 Å Min

GOLD THICKNESS.....4,000 Å Min

CHIP THICKNESS.....10 Mils

### CIRCUIT LAYOUT DATA:

Backside must be electrically isolated.

**Backside is not cathode.**

For Zener operation cathode must be operated positive with respect to anode.

**TOLERANCES: ALL**  
Dimensions  $\pm 2$  mils



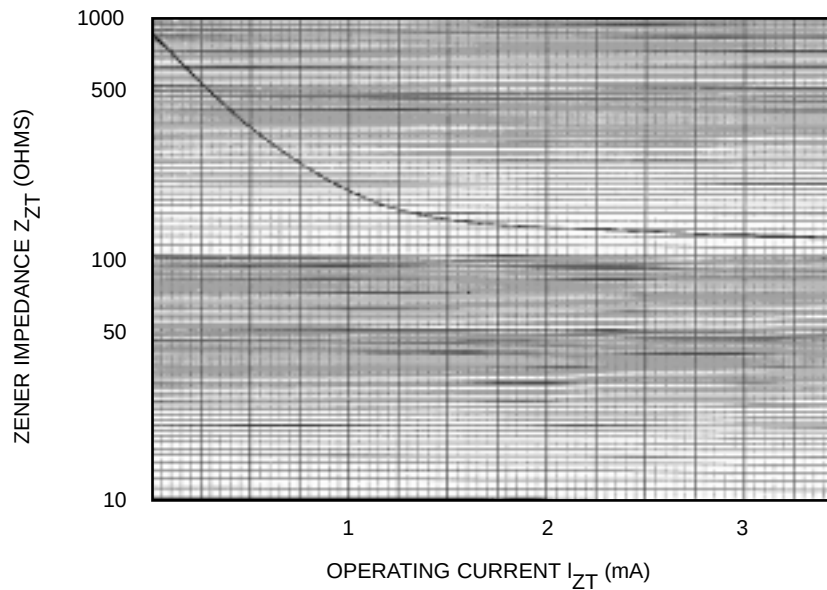
**COMPENSATED DEVICES INCORPORATED**

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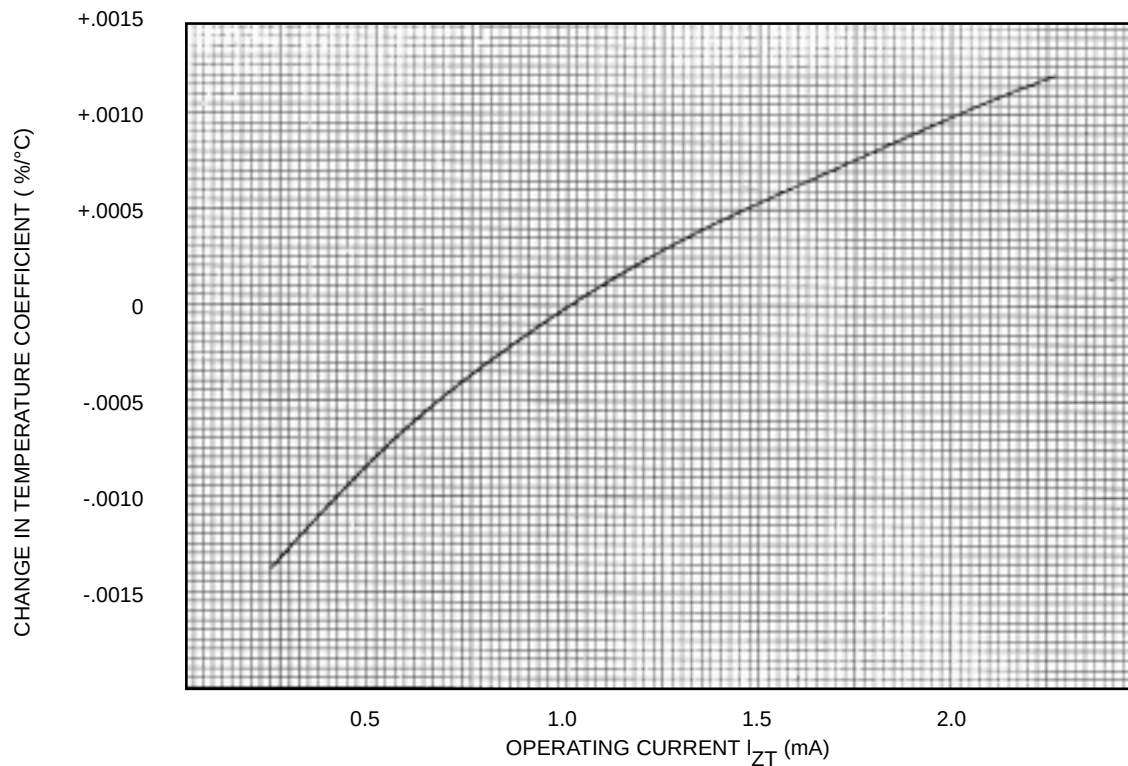
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**CD4765 thru CD4767A thru CD4770 thru CD4772A and  
CD4775 thru CD4777A and CD4780 thru CD4782A**



**FIGURE 2  
ZENER IMPEDANCE  
VS.  
OPERATING CURRENT**



**FIGURE 3  
TYPICAL CHANGE OF TEMPERATURE COEFFICIENT  
WITH CHANGE IN OPERATING CURRENT**