

# DIFFERENTIAL COMPARATORS

## MCC1710 MCC1710C

### Advance Information

#### MONOLITHIC DIFFERENTIAL VOLTAGE COMPARATOR CHIP

... designed for use in level detection, low-level sensing, and memory applications.

The MCC1710 and MCC1710C employ phosphosilicate passivation that protects the entire die surface area, including metalization interconnects. All dice have a minimum gold-backed thickness of 4000 Angstroms. The interconnecting metalization and bonding pads are of evaporated aluminum.

- Differential Input Characteristics –  
Input Offset Voltage = 1.0 mV  
Offset Voltage Drift = 3.0  $\mu\text{V}/^\circ\text{C}$
- Fast Response Time – 40 ns
- Output Compatible With All Saturating Logic Forms –  
 $V_{\text{out}} = +3.2 \text{ V}$  to  $-0.5 \text{ V}$  typical
- Low Output Impedance – 200 ohms

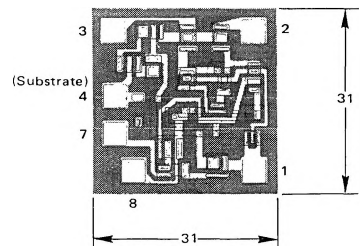
MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Rating                      | Symbol                   | Value       | Unit             |
|-----------------------------|--------------------------|-------------|------------------|
| Power Supply Voltage        | $V^+$                    | +14         | Vdc              |
|                             | $V^-$                    | -7.0        |                  |
| Differential Input Signal   | $V_{\text{in}}$          | $\pm 5.0$   | Volts            |
| Common Mode Input Swing     | $\text{CM}V_{\text{in}}$ | $\pm 7.0$   | Volts            |
| Peak Load Current           | $I_L$                    | 10          | mA               |
| Operating Temperature Range | $T_A$                    | -55 to +125 | $^\circ\text{C}$ |
| Junction Temperature Range  | $T_J$                    | -65 to +150 | $^\circ\text{C}$ |

#### DIFFERENTIAL COMPARATOR CHIP INTEGRATED CIRCUIT

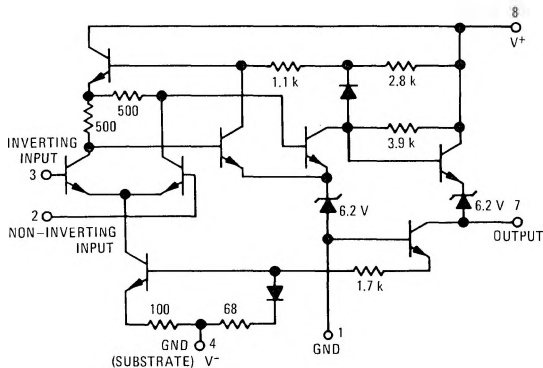
MONOLITHIC SILICON EPITAXIAL PASSIVATED

#### OUTLINE DIMENSIONS and BONDING DIAGRAM

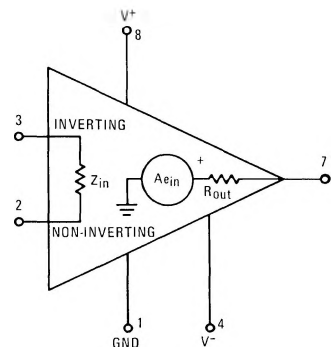


All dimensions are nominal and in mils ( $10^{-3}$  inches).  
Die Dimensions  
Thickness = 8.0  
Bonding Pads = 4.0 x 4.0

#### CIRCUIT SCHEMATIC



#### EQUIVALENT CIRCUIT



## MCC1710, MCC1710C (continued)

### ELECTRICAL CHARACTERISTICS ( $V^+ = +12$ Vdc, $V^- = -6.0$ Vdc, $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic                                                               | Symbol     | MCC1710 |      |     | MCC1710C |      |     | Unit            |
|------------------------------------------------------------------------------|------------|---------|------|-----|----------|------|-----|-----------------|
|                                                                              |            | Min     | Typ  | Max | Min      | Typ  | Max |                 |
| Input Offset Voltage<br>( $V_O = 1.4$ Vdc)                                   | $V_{IO}$   | —       | 1.0  | 2.0 | —        | 1.5  | 5.0 | mVdc            |
| Input Bias Current<br>( $V_O = 1.4$ Vdc)                                     | $I_B$      | —       | 12   | 20  | —        | 15   | 25  | $\mu\text{Adc}$ |
| Output Resistance                                                            | $R_{out}$  | —       | 200  | —   | —        | 200  | —   | Ohms            |
| Positive Output Voltage<br>( $V_{in} \geq 5.0$ mV, $0 \leq I_O \leq 5.0$ mA) | $V_{OH}$   | 2.5     | 3.2  | 4.0 | 2.5      | 3.2  | 4.0 | Vdc             |
| Negative Output Voltage<br>( $V_{in} \leq -5.0$ mV)                          | $V_{OL}$   | -1.0    | -0.5 | 0   | -1.0     | -0.5 | 0   | Vdc             |
| Output Sink Current<br>( $V_{in} \geq -5.0$ mV, $V_{out} \geq 0$ )           | $I_S$      | 2.0     | 2.5  | —   | 2.0      | 2.5  | —   | mAdc            |
| Common Mode Rejection Ratio<br>( $V^- = -7.0$ Vdc, $R_S \leq 200 \Omega$ )   | $CM_{rej}$ | —       | 100  | —   | —        | 100  | —   | dB              |
| Propagation Delay Time<br>For Positive and Negative Going Input Pulse        | $t_{pd}$   | —       | 40   | —   | —        | 40   | —   | ns              |
| Power Supply Current<br>( $V_{out} \leq 0$ Vdc)                              | $I_{D^+}$  | —       | 6.4  | 9.0 | —        | 6.4  | 9.0 | mAdc            |
|                                                                              | $I_{D^-}$  | —       | 5.5  | 7.0 | —        | 5.5  | 7.0 | mAdc            |
| DC Quiescent Power Dissipation                                               | $P_D$      | —       | 115  | 150 | —        | 110  | 150 | mW              |

See current MCC1710/1710C data sheet for additional information.

### PACKAGING AND HANDLING

The MCC1710/MCC1710C differential comparator is now available as a single monolithic die or encapsulated in the TO-91, TO-99, and TO-116 hermetic packages. The phosphosilicate passivation protects the metalization and active area of the die but care must be exercised when removing the dice from the shipping carrier to avoid scratching the bonding pads. A vacuum pickup is useful for handling of dice. Tweezers are not recommended for this purpose.

The non-spill type shipping carrier consists of a compartmentalized tray and fitted cover. Die are placed in the carrier with geometry side up.