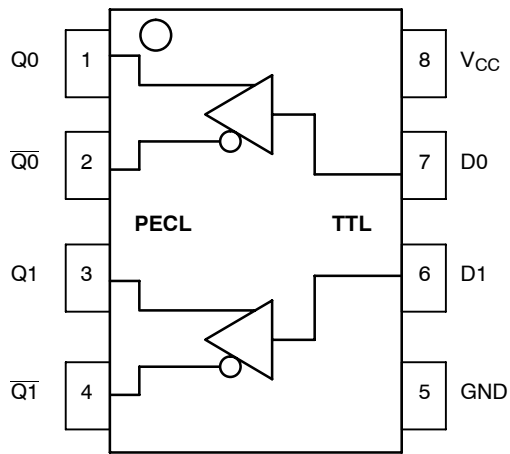


## MC10ELT22, MC100ELT22



**Table 1. PIN DESCRIPTION**

| Pin                   | Function                   |
|-----------------------|----------------------------|
| $Q_n, \overline{Q_n}$ | PECL Differential Outputs* |
| $D_n$                 | TTL Inputs                 |
| $V_{CC}$              | Positive Supply            |
| GND                   | Ground                     |

\*Output state undetermined when inputs are open.

**Figure 1. Logic Diagram and Pinout Assignment**

**Table 2. ATTRIBUTES**

| Characteristics   | Value                |
|---|----------------------|
| Internal Input Pulldown Resistor                              | N/A                  |
| Internal Input Pullup Resistor                                | N/A                  |
| ESD Protection Human Body Model<br>Machine Model              | > 2 kV<br>> 200 V    |
| Moisture Sensitivity, Indefinite Time Out of Drypack (Note 1) | Level 1              |
| Flammability Rating Oxygen Index: 28 to 34                    | UL 94 V-0 @ 0.125 in |
| Transistor Count  | 51                   |
| Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test        |                      |

1. For additional information, see Application Note AND8003/D.

# MC10ELT22, MC100ELT22

**Table 3. MAXIMUM RATINGS**

| Symbol           | Parameter                                | Condition 1         | Condition 2        | Rating                                     | Units        |
|------------------|--|---------------------|--------------------|--|--------------|
| V <sub>CC</sub>  | Positive Power Supply                    | GND = 0 V           |                    | 7  | V            |
| V <sub>IN</sub>  | Input Voltage                            | GND = 0 V           |                    | $GND + 0.025 \leq V_I \leq V_{CC} - 0.025$ | V            |
| I <sub>out</sub> | Output Current                           | Continuous Surge    |                    | 50<br>100                                  | mA<br>mA     |
| T <sub>A</sub>   | Operating Temperature Range              |                     |                    | –40 to +85                                 | °C           |
| T <sub>stg</sub> | Storage Temperature Range                |                     |                    | –65 to +150                                | °C           |
| θ <sub>JA</sub>  | Thermal Resistance (Junction–to–Ambient) | 0 lfpm<br>500 lfpm  | 8 SOIC<br>8 SOIC   | 190<br>130                                 | °C/W<br>°C/W |
| θ <sub>JC</sub>  | Thermal Resistance (Junction–to–Case)    | Standard Board      | 8 SOIC             | 41 to 44                                   | °C/W         |
| θ <sub>JA</sub>  | Thermal Resistance (Junction–to–Ambient) | 0 lfpm<br>500 lfpm  | 8 TSSOP<br>8 TSSOP | 185<br>140                                 | °C/W<br>°C/W |
| θ <sub>JC</sub>  | Thermal Resistance (Junction–to–Case)    | Standard Board      | 8 TSSOP            | 41 to 44 ± 5%                              | °C/W         |
| T <sub>sol</sub> | Wave Solder                              | <2 to 3 sec @ 248°C |                    | 265  | °C           |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

**Table 4. 10ELT SERIES PECL DC CHARACTERISTICS** V<sub>CC</sub> = 5.0 V; GND = 0.0 V (Note 2)

| Symbol          | Characteristic               | –40°C |      |      | 25°C |      |      | 85°C |      |      | Unit |
|-----------------|------------------------------|-------|------|------|------|------|------|------|------|------|------|
|                 |                              | Min   | Typ  | Max  | Min  | Typ  | Max  | Min  | Typ  | Max  |      |
| I <sub>CC</sub> | Power Supply Current         |       |      | 22   |      |      | 22   |      |      | 22   | mA   |
| V <sub>OH</sub> | Output HIGH Voltage (Note 3) | 3920  | 4010 | 4110 | 4020 | 4105 | 4190 | 4090 | 4185 | 4280 | mV   |
| V <sub>OL</sub> | Output LOW Voltage (Note 3)  | 3050  | 3200 | 3350 | 3050 | 3210 | 3370 | 3050 | 3227 | 3405 | mV   |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

- Output parameters vary 1:1 with V<sub>CC</sub>. V<sub>CC</sub> can vary ± 0.25 V.
- Outputs are terminated through a 50 Ω resistor to V<sub>CC</sub> – 2.0 V.

**Table 5. 100ELT SERIES PECL DC CHARACTERISTICS** V<sub>CC</sub> = 5.0 V; GND = 0.0 V (Note 4)

| Symbol          | Characteristic               | –40°C |      |      | 25°C |      |      | 85°C |      |      | Unit |
|-----------------|------------------------------|-------|------|------|------|------|------|------|------|------|------|
|                 |                              | Min   | Typ  | Max  | Min  | Typ  | Max  | Min  | Typ  | Max  |      |
| I <sub>CC</sub> | Power Supply Current         |       |      | 22   |      |      | 22   |      |      | 22   | mA   |
| V <sub>OH</sub> | Output HIGH Voltage (Note 5) | 3915  | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4050 | 4120 | mV   |
| V <sub>OL</sub> | Output LOW Voltage (Note 5)  | 3170  | 3305 | 3445 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | mV   |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

- Output parameters vary 1:1 with V<sub>CC</sub>. V<sub>CC</sub> can vary ± 0.25 V.
- Outputs are terminated through a 50 Ω resistor to V<sub>CC</sub> – 2.0 V.

# MC10ELT22, MC100ELT22

**Table 6. TTL INPUT DC CHARACTERISTICS**  $V_{CC} = 4.75 \text{ V to } 5.25 \text{ V}$ ;  $T_A = -40^\circ\text{C to } 85^\circ\text{C}$

| Symbol    | Characteristic            | Condition   | Min                            | Typ | Max                        | Unit          |
|-----------|---------------------------|---|--------------------------------|-----|----------------------------|---------------|
| $I_{IH}$  | Input HIGH Current        | $V_{IN} = 2.7 \text{ V}$ ;<br>$V_{IN} = (V_{CC} - 0.025) \text{ V}$     |                                |     | 20                         | $\mu\text{A}$ |
| $I_{IHH}$ | Input HIGH Current        | $V_{IN} = 7.0 \text{ V}$  |                                |     | 100                        | $\mu\text{A}$ |
| $I_{IL}$  | Input LOW Current         | $V_{IN} = 0.5 \text{ V}$ ;<br>$V_{IN} = (\text{GND} + 0.025) \text{ V}$ |                                |     | -0.6                       | $\text{mA}$   |
| $V_{IK}$  | Input Clamp Diode Voltage | $I_{IN} = -18 \text{ mA}$   |                                |     | -1.2                       | $\text{V}$    |
| $V_{IH}$  | Input HIGH Voltage        |   | 2.0                            |     | $V_{CC} - 0.025 \text{ V}$ | $\text{V}$    |
| $V_{IL}$  | Input LOW Voltage         |   | $\text{GND} + 0.025 \text{ V}$ |     | 0.8                        | $\text{V}$    |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

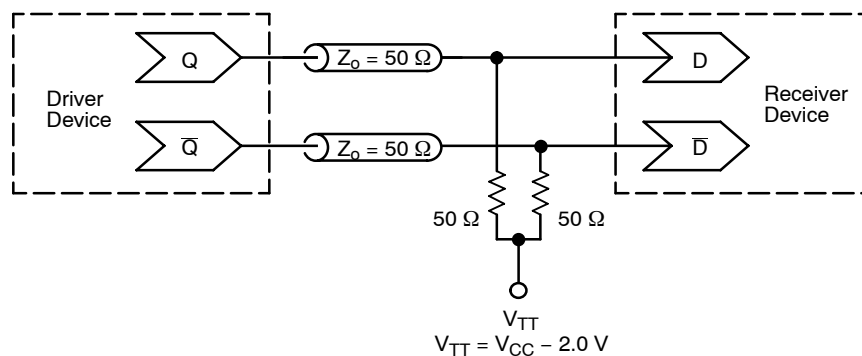
**Table 7. AC CHARACTERISTICS**  $V_{CC} = 4.75 \text{ V to } 5.25 \text{ V}$ ;  $\text{GND} = 0.0 \text{ V}$

| Symbol       | Characteristic  | -40°C |           |            | 25°C |           |            | 85°C |           |            | Unit         |
|--------------|---|-------|-----------|------------|------|-----------|------------|------|-----------|------------|--------------|
|              |   | Min   | Typ       | Max        | Min  | Typ       | Max        | Min  | Typ       | Max        |              |
| $f_{MAX}$    | Maximum Input Frequency                                       |       |           |            |      | 500       |            |      |           |            | $\text{MHz}$ |
| $t_{PLH}$    | Propagation Delay (Note 6)<br>1.5 V to 50%                    | 0.6   |           | 1.2        | 0.9  | 1.2       | 1.5        | 0.6  |           | 1.35       | $\text{ns}$  |
| $t_{PHL}$    | Propagation Delay (Note 6)<br>1.5 V to 50%                    | 0.4   |           | 1.0        | 0.5  | 0.8       | 1.1        | 0.7  |           | 1.30       | $\text{ns}$  |
| $t_{skew}$   | Within-Device Skew (Note 7)<br>Device-to-Device Skew (Note 8) |       | 50<br>300 | 100<br>600 |      | 50<br>300 | 100<br>600 |      | 50<br>350 | 100<br>750 | $\text{ps}$  |
| $t_{JITTER}$ | CLOCK Random Jitter (RMS)                                     |       |           |            |      | 0.5       |            |      |           |            | $\text{ps}$  |
| $t_r/t_f$    | Output Rise/Fall Time<br>(20–80%)                             | 0.4   |           | 1.6        | 0.4  |           | 1.6        | 0.4  |           | 1.6        | $\text{ns}$  |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

6. Specifications for standard TTL input signal.
7. Skew is measured between outputs under identical transitions and conditions on any one device.
8. Device-to-Device Skew for identical transitions at identical  $V_{CC}$  levels.

## MC10ELT22, MC100ELT22



**Figure 2. Typical Termination for Output Driver and Device Evaluation**  
**(See Application Note AND8020/D – Termination of ECL Logic Devices.)**

### ORDERING INFORMATION

| Device          | Package              | Shipping <sup>†</sup> |
|-----------------|----------------------|-----------------------|
| MC10ELT22D      | SO-8                 | 98 Units / Rail       |
| MC10ELT22DG     | SO-8<br>(Pb-Free)    | 98 Units / Rail       |
| MC10ELT22DR2    | SO-8                 | 2500 Tape & Reel      |
| MC10ELT22DR2G   | SO-8<br>(Pb-Free)    | 2500 Tape & Reel      |
| MC10ELT22DT     | TSSOP-8              | 100 Units / Rail      |
| MC10ELT22DTG    | TSSOP-8<br>(Pb-Free) | 100 Units / Rail      |
| MC10ELT22DTR2   | TSSOP-8              | 2500 Tape & Reel      |
| MC10ELT22DTR2G  | TSSOP-8<br>(Pb-Free) | 2500 Tape & Reel      |
| MC100ELT22D     | SO-8                 | 98 Units / Rail       |
| MC100ELT22DG    | SO-8<br>(Pb-Free)    | 98 Units / Rail       |
| MC100ELT22DR2   | SO-8                 | 2500 Tape & Reel      |
| MC100ELT22DR2G  | SO-8<br>(Pb-Free)    | 2500 Tape & Reel      |
| MC100ELT22DT    | TSSOP-8              | 100 Units / Rail      |
| MC100ELT22DTG   | TSSOP-8<br>(Pb-Free) | 100 Units / Rail      |
| MC100ELT22DTR2  | TSSOP-8              | 2500 Tape & Reel      |
| MC100ELT22DTR2G | TSSOP-8<br>(Pb-Free) | 2500 Tape & Reel      |

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

## MC10ELT22, MC100ELT22

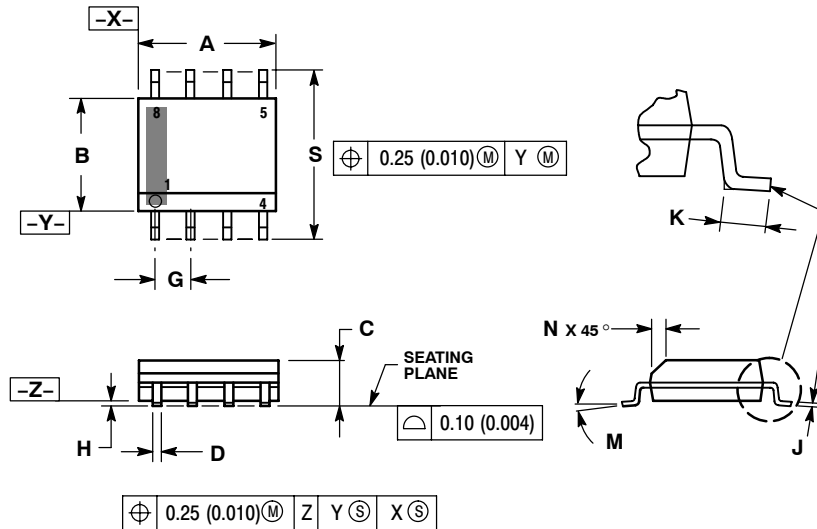
### Resource Reference of Application Notes

- AN1405/D** – ECL Clock Distribution Techniques
- AN1406/D** – Designing with PECL (ECL at +5.0 V)
- AN1503/D** – ECLinPS™ I/O SPiCE Modeling Kit
- AN1504/D** – Metastability and the ECLinPS Family
- AN1568/D** – Interfacing Between LVDS and ECL
- AN1672/D** – The ECL Translator Guide
- AND8001/D** – Odd Number Counters Design
- AND8002/D** – Marking and Date Codes
- AND8020/D** – Termination of ECL Logic Devices
- AND8066/D** – Interfacing with ECLinPS
- AND8090/D** – AC Characteristics of ECL Devices

# MC10ELT22, MC100ELT22

## PACKAGE DIMENSIONS

SOIC-8 NB  
CASE 751-07  
ISSUE AH

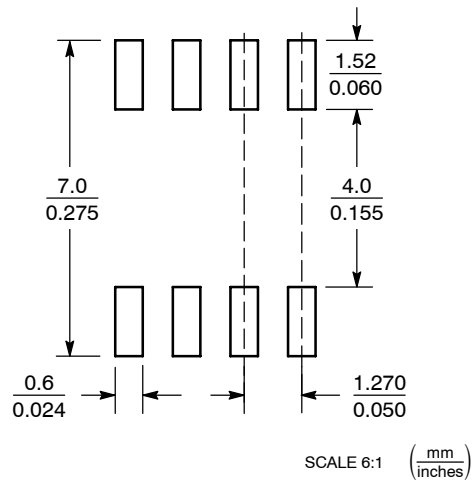


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 4.80        | 5.00 | 0.189     | 0.197 |
| B   | 3.80        | 4.00 | 0.150     | 0.157 |
| C   | 1.35        | 1.75 | 0.053     | 0.069 |
| D   | 0.33        | 0.51 | 0.013     | 0.020 |
| G   | 1.27 BSC    |      | 0.050 BSC |       |
| H   | 0.10        | 0.25 | 0.004     | 0.010 |
| J   | 0.19        | 0.25 | 0.007     | 0.010 |
| K   | 0.40        | 1.27 | 0.016     | 0.050 |
| M   | 0°          | 8°   | 0°        | 8°    |
| N   | 0.25        | 0.50 | 0.010     | 0.020 |
| S   | 5.80        | 6.20 | 0.228     | 0.244 |

### SOLDERING FOOTPRINT\*

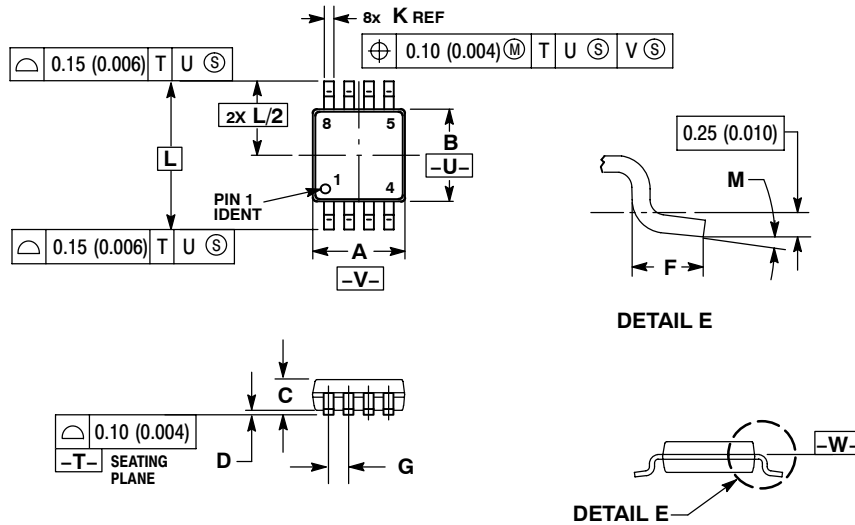


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MC10ELT22, MC100ELT22

## PACKAGE DIMENSIONS

### TSSOP-8 DT SUFFIX PLASTIC TSSOP PACKAGE CASE 948R-02 ISSUE A




#### NOTES:

1. DIMENSIONS AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
6. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 2.90        | 3.10 | 0.114     | 0.122 |
| B   | 2.90        | 3.10 | 0.114     | 0.122 |
| C   | 0.80        | 1.10 | 0.031     | 0.043 |
| D   | 0.05        | 0.15 | 0.002     | 0.006 |
| F   | 0.40        | 0.70 | 0.016     | 0.028 |
| G   | 0.65 BSC    |      | 0.026 BSC |       |
| K   | 0.25        | 0.40 | 0.010     | 0.016 |
| L   | 4.90 BSC    |      | 0.193 BSC |       |
| M   | 0°          | 6°   | 0°        | 6°    |

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