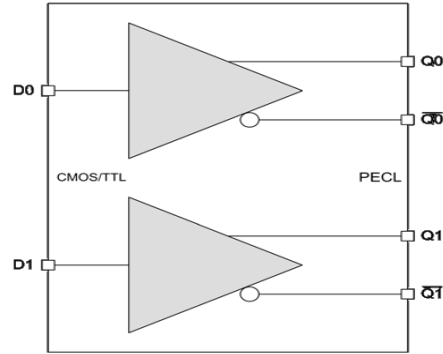


**FEATURES**

- 0.5ns Typical Propagation Delay
- <100ps Typical Output to Output Skew
- Flow Through Pinouts
- Differential PECL Output
- RoHS Compliant Pb Free Packages

**BLOCK DIAGRAM**



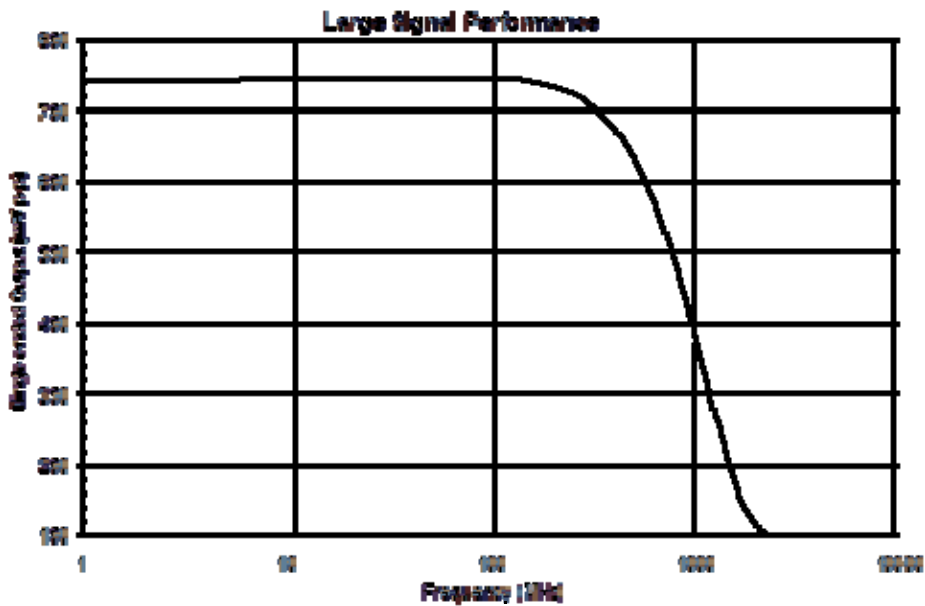
**DESCRIPTION**

The CTS100ELT22 is a dual CMOS/TTL to differential PECL translator. Because PECL (Positive ECL) levels are used, only V<sub>CC</sub> and ground are required. The small outline packaging and the low skew, dual gate design of the CTS100ELT22 makes it ideal for applications that require the translation of a clock and a data signal.

The CTS100ELT22 is a direct replacement for the ON Semi MC100ELT22, MC100LVELT22 and Micrel SY89322V.

**ENGINEERING NOTES**

When the D input is left floating, the Q output is forced HIGH, and the  $\overline{Q}$  output is forced LOW.



**CTS100ELT22 Large Signal Bandwidth**

## ELECTRICAL SPECIFICATIONS

Absolute Maximum Ratings are those values beyond which device life may be impaired.

| Symbol             | Characteristic              | Condition         | Rating      | Unit |
|--------------------|-----------------------------|-------------------|-------------|------|
| $V_{CC}$           | DC Power Supply             | ( $V_{EE} = 0V$ ) | 0 to +8.0   | V    |
| $V_{IN}$           | Input Voltage               | ( $V_{EE} = 0V$ ) | 0 to +6.0   | V    |
| $I_{OUT}$          | Output Current              | Continuous        | 50          | mA   |
|                    |                             | Surge             | 100         |      |
| $T_A$              | Operating Temperature Range |                   | -40 to +85  | °C   |
| $T_{STG}$          | Storage Temperature Range   |                   | -65 to +150 | °C   |
| ESD <sub>HBM</sub> | Human Body Model            |                   | 2500        | V    |
| ESD <sub>MM</sub>  | Machine Model               |                   | 200         | V    |
| ESD <sub>CDM</sub> | Charged Device Model        |                   | 2500        | V    |

### TTL/CMOS Input DC Characteristics (GND = 0.0V, $V_{CC} = +3.3V$ to 5.5V)

| Symbol    | Characteristic            | Condition         | Min | Typ | Max  | Unit |
|-----------|---------------------------|-------------------|-----|-----|------|------|
| $I_{IH}$  | Input HIGH Current        | $V_{IN} = 2.7V$   |     |     | 15   | μA   |
| $I_{IHH}$ | Input HIGH Current        | $V_{IN} = V_{CC}$ |     |     | 20   | μA   |
| $I_{IL}$  | Input LOW Current         | $V_{IN} = 0.5V$   |     |     | -0.1 | mA   |
| $V_{IK}$  | Input Clamp Diode Voltage | $I_{IN} = -18mA$  |     |     | -1.2 | V    |
| $V_{IH}$  | Input HIGH Voltage        |                   | 2   |     |      | V    |
| $V_{IL}$  | Input LOW Voltage         |                   |     |     | 0.8  | V    |

### LVPECL DC Characteristics (GND = 0.0V, $V_{CC} = +3.3V$ )

| Symbol   | Characteristic                     | -40 °C |     |      | 0 °C |     |      | 25 °C |      |      | 85 °C |     |      | Unit |
|----------|------------------------------------|--------|-----|------|------|-----|------|-------|------|------|-------|-----|------|------|
|          |                                    | Min    | Typ | Max  | Min  | Typ | Max  | Min   | Typ  | Max  | Min   | Typ | Max  |      |
| $V_{OH}$ | Output HIGH Voltage <sup>1,2</sup> | 2160   |     | 2420 | 2205 |     | 2420 | 2235  | 2345 | 2420 | 2255  |     | 2420 | mV   |
| $V_{OL}$ | Output LOW Voltage <sup>1,2</sup>  | 1470   |     | 1745 | 1490 |     | 1680 | 1490  | 1595 | 1680 | 1490  |     | 1680 | mV   |
| $I_{CC}$ | Power Supply Current <sup>3</sup>  |        |     | 24   |      |     | 24   |       |      | 24   |       |     | 25   | Ma   |

<sup>1</sup> Each output is terminated through a 50Ω resistor to  $V_{CC} - 2V$ .

<sup>2</sup> Output parameters vary 1:1 with  $V_{CC}$ .

<sup>3</sup>  $I_{CC}$  measurements must be done with outputs open.

**PECL DC Characteristics (GND = 0.0V, V<sub>CC</sub> = +5.0V)**

| Symbol          | Characteristic                     | -40 °C |     |      | 0 °C |     |      | 25 °C |      |      | 85 °C |     |      | Unit |
|-----------------|------------------------------------|--------|-----|------|------|-----|------|-------|------|------|-------|-----|------|------|
|                 |                                    | Min    | Typ | Max  | Min  | Typ | Max  | Min   | Typ  | Max  | Min   | Typ | Max  |      |
| V <sub>OH</sub> | Output HIGH Voltage <sup>1,2</sup> | 3860   |     | 4120 | 3905 |     | 4120 | 3935  | 4045 | 4120 | 3955  |     | 4120 | mV   |
| V <sub>OL</sub> | Output LOW Voltage <sup>1,2</sup>  | 3170   |     | 3445 | 3190 |     | 3380 | 3190  | 3295 | 3380 | 3190  |     | 3380 | mV   |
| I <sub>EE</sub> | Power Supply Current <sup>3</sup>  |        |     | 24   |      |     | 24   |       |      | 24   |       |     | 25   | mA   |

<sup>1</sup> Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

<sup>2</sup> Output parameters vary 1:1 with V<sub>CC</sub>.

<sup>3</sup> I<sub>CC</sub> measurements must be done with outputs open.

**AC Characteristics (GND = 0.0V, V<sub>CC</sub> = +3.0V to +5.5V)**

| Symbol                             | Characteristic                           | -40 °C |     |     | 0 °C |     |     | 25 °C |     |     | 85 °C |     |     | Unit |
|------------------------------------|--|--------|-----|-----|------|-----|-----|-------|-----|-----|-------|-----|-----|------|
|                                    |  | Min    | Typ | Max | Min  | Typ | Max | Min   | Typ | Max | Min   | Typ | Max |      |
| t <sub>PLH</sub> /t <sub>PHL</sub> | Propagation Delay to Output <sup>1</sup> | 100    |     | 550 | 100  |     | 550 | 100   |     | 550 | 100   |     | 550 | ps   |
| t <sub>R</sub> /t <sub>F</sub>     | Output Rise/Fall Times Q (20%-80%)       | 80     |     | 250 | 80   |     | 250 | 80    |     | 250 | 80    |     | 250 | ps   |
| f <sub>MAX</sub>                   | Maximum Frequency <sup>2</sup>           | 800    |     |     | 800  |     |     | 800   |     |     | 800   |     |     | MHz  |

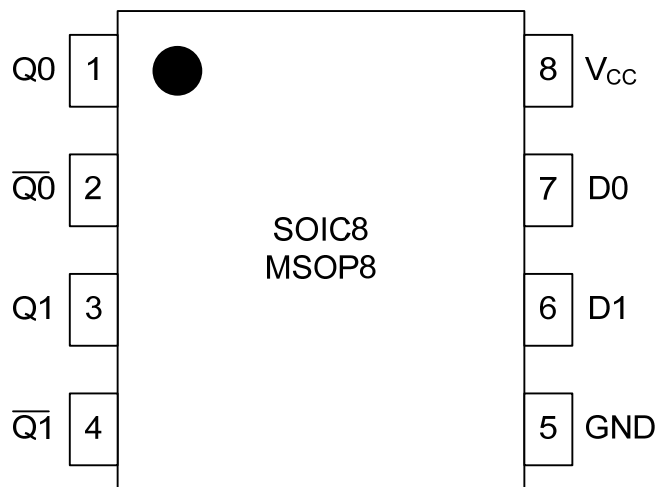
<sup>1</sup> Propagation delay is measured from +1.5V on the input to 50% of the PECL output swing.

<sup>2</sup> Output as -3dB.

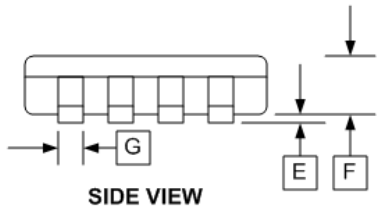
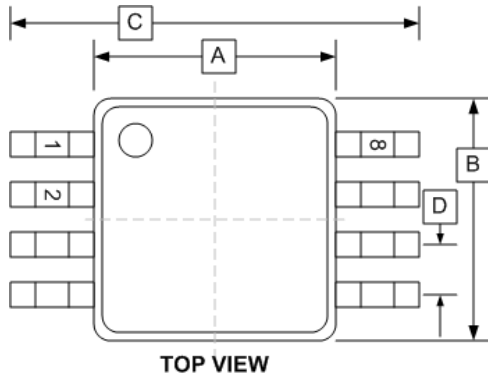
### Pin Description and Configuration

#### Pin Assignments

| Pin | Name            | Type   | Function        |
|-----|-----------------|--------|-----------------|
| 1   | Q0              | Output | PECL Output     |
| 2   | $\overline{Q0}$ | Output | PECL Output     |
| 3   | Q1              | Output | PECL Output     |
| 4   | $\overline{Q1}$ | Output | PECL Output     |
| 5   | GND             | Power  | Negative Supply |
| 6   | D1              | Input  | Data Input      |
| 7   | D0              | Input  | Data Input      |
| 8   | V <sub>CC</sub> | Power  | Positive Supply |

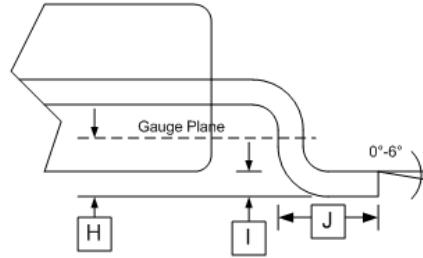


**PACKAGE DIMENSIONS**

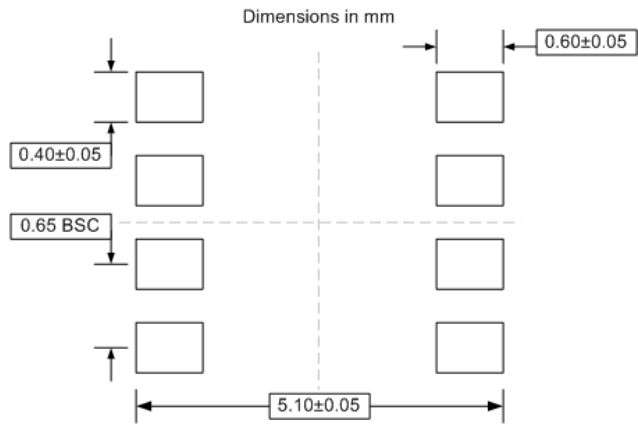


| DIM | INCHES      |     |
|-----|-------------|-----|
|     | MIN         | MAX |
| A   | 0.118±0.004 |     |
| B   | 0.118±0.004 |     |
| C   | 0.192±0.008 |     |
| D   | 0.0256 TYP  |     |
| E   | 0.004±0.002 |     |
| F   | 0.034±0.002 |     |
| G   | 0.009±0.014 |     |
| H   | 0.010       |     |
| I   | 0.006±0.002 |     |
| J   | 0.021±0.004 |     |

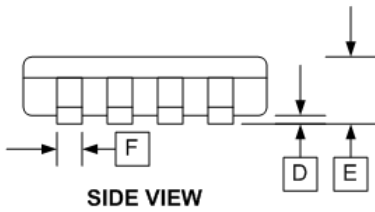
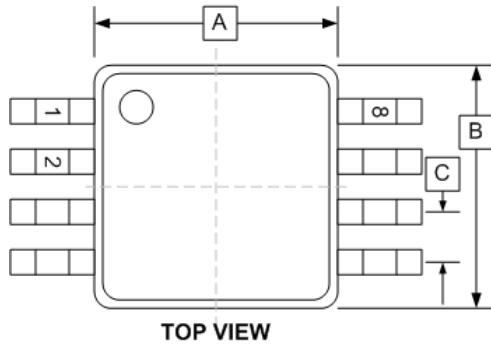
**MSOP8 (T)**



**PCB LAND PATTERN/FOOTPRINT**

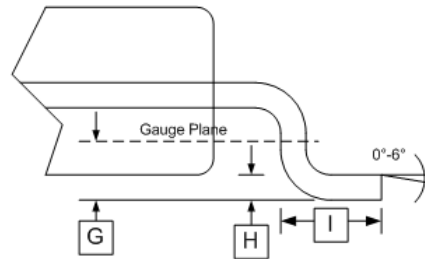


### PACKAGE DIMENSIONS

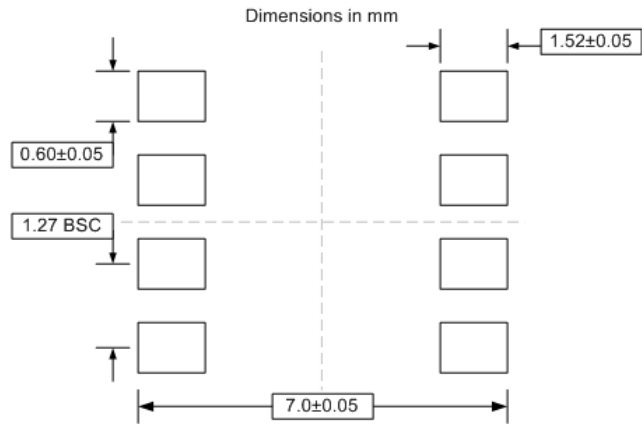


| DIM | mm       |      |
|-----|----------|------|
|     | MIN      | MAX  |
| A   | 3.81     | 3.99 |
| B   | 4.80     | 4.98 |
| C   | 1.27 BSC |      |
| D   | 0.10     | 0.25 |
| E   | 1.37     | 1.68 |
| F   | 0.36     | 0.48 |
| G   | 0.25     |      |
| H   | 0.19     | 0.25 |
| I   | 0.41     | 0.86 |

### SOIC8 (D)



### PCB LAND PATTERN/FOOTPRINT



### PART ORDERING INFORMATION

| Part Number   | Package | Marking                |
|---------------|---------|------------------------|
| CTS100ELT22DG | SOIC8   | CTS100G / ELT22 / YYWW |
| CTS100ELT22TG | MSOP8   | HT22G / YYWW           |