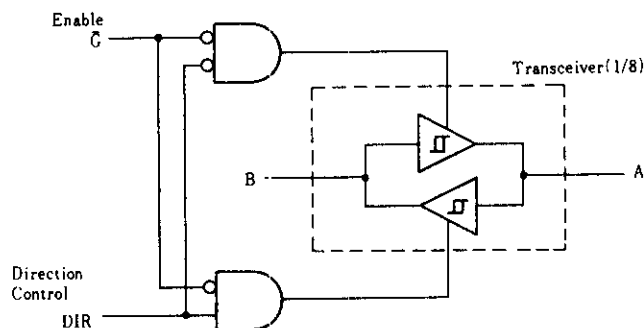


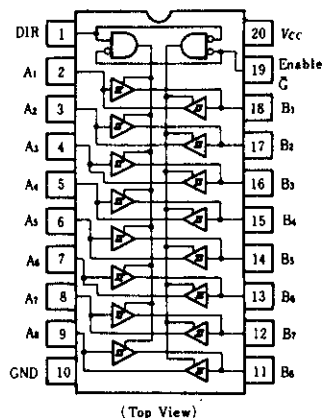
# HD74LS245 ● Octal Bus Transceivers (with three-state outputs)

This octal bus transceiver is designed for synchronous two-way communication between data buses. The control function implementation minimizes external timing requirements. The device allows data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction control (DIR) input. The enable input ( $\bar{G}$ ) can be used to disable the device so that the buses are effectively isolated.

## ■ BLOCK DIAGRAM



## ■ PIN ARRANGEMENT



## ■ FUNCTION TABLE

| ENABLE<br>$\bar{G}$ | DIRECTION<br>CONTROL<br>DIR | OPERATION       |
|---------------------|-----------------------------|-----------------|
| L                   | L                           | B data to A bus |
| L                   | H                           | A data to B bus |
| H                   | X                           | Isolation       |

H; high level,  
L; low level,  
X; irrelevant

## ■ ABSOLUTE MAXIMUM RATINGS

| Item                        | Symbol                 | Ratings    | Unit |
|-----------------------------|------------------------|------------|------|
| Supply voltage              | $V_{CC}$               | 7.0        | V    |
| Input voltage               | DIR, $\bar{G}$<br>A, B | 7.0        | V    |
|                             |                        | 5.5        |      |
| Operating temperature range | $T_{opr}$              | -20 ~ +75  | °C   |
| Storage temperature range   | $T_{stg}$              | -65 ~ +150 | °C   |

## ■ RECOMMENDED OPERATING CONDITIONS

| Item           | Symbol   | min | typ | max | Unit |
|----------------|----------|-----|-----|-----|------|
| Output current | $I_{OH}$ | —   | —   | -15 | mA   |
|                | $I_{OL}$ | —   | —   | 24  | mA   |

## ■ELECTRICAL CHARACTERISTICS ( $T_a = -20 \sim +75^\circ\text{C}$ )

| Item                         | Symbol                     | Test Conditions                                                            | min                     | typ* | max  | Unit          |
|------------------------------|----------------------------|----------------------------------------------------------------------------|-------------------------|------|------|---------------|
| Input voltage                | $V_{IH}$                   |                                                                            | 2.0                     | —    | —    | V             |
|                              | $V_{IL}$                   |                                                                            | —                       | —    | 0.8  |               |
| Hysteresis                   | $V_T^+ - V_T^-$            | $V_{CC} = 4.75\text{V}$                                                    | 0.2                     | 0.4  | —    | V             |
| Output voltage               | $V_{OH}$                   | $V_{CC} = 4.75\text{V}$ , $V_{IH} = 2\text{V}$ ,<br>$V_{IL} = 0.8\text{V}$ | $I_{OH} = -3\text{mA}$  | 2.4  | —    | V             |
|                              |                            |                                                                            | $I_{OH} = -15\text{mA}$ | 2    | —    |               |
|                              | $V_{OL}$                   | $V_{CC} = 4.75\text{V}$ , $V_{IH} = 2\text{V}$ ,<br>$V_{IL} = 0.8\text{V}$ | $I_{OL} = 12\text{mA}$  | —    | 0.4  | V             |
|                              |                            |                                                                            | $I_{OL} = 24\text{mA}$  | —    | 0.5  |               |
| Output current               | $I_{OZH}$                  | $V_{CC} = 5.25\text{V}$                                                    | $V_O = 2.7\text{V}$     | —    | 10   | $\mu\text{A}$ |
|                              | $I_{OZL}$                  | $\bar{G} = 2\text{V}$                                                      | $V_O = 0.4\text{V}$     | —    | -200 |               |
| Input current                | $I_{IH}$                   | $V_{CC} = 5.25\text{V}$ , $V_I = 2.7\text{V}$                              | —                       | —    | 20   | $\mu\text{A}$ |
|                              | $I_{IL}$                   | $V_{CC} = 5.25\text{V}$ , $V_I = 0.4\text{V}$                              | —                       | —    | -0.2 | $\text{mA}$   |
|                              | A or B<br>DIR or $\bar{G}$ | $V_{CC} = 5.25\text{V}$                                                    | $V_I = 5.5\text{V}$     | —    | 0.1  | $\text{mA}$   |
|                              |                            |                                                                            | $V_I = 7\text{V}$       | —    | 0.1  |               |
| Short-circuit output current | $I_{OS}$                   | $V_{CC} = 5.25\text{V}$                                                    | -40                     | —    | -225 | $\text{mA}$   |
| Supply current**             | $I_{CCH}$                  | $V_{CC} = 5.25\text{V}$                                                    | —                       | 48   | 70   | $\text{mA}$   |
|                              | $I_{CCL}$                  |                                                                            | —                       | 62   | 90   |               |
|                              | $I_{CCZ}$                  |                                                                            | —                       | 64   | 95   |               |
| Input clamp voltage          | $V_{IK}$                   | $V_{CC} = 4.75\text{V}$ , $I_{IN} = -18\text{mA}$                          | —                       | —    | -1.5 | V             |

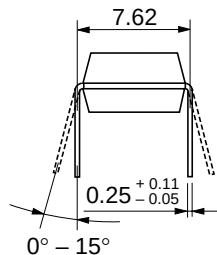
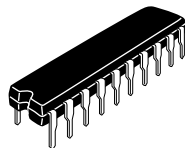
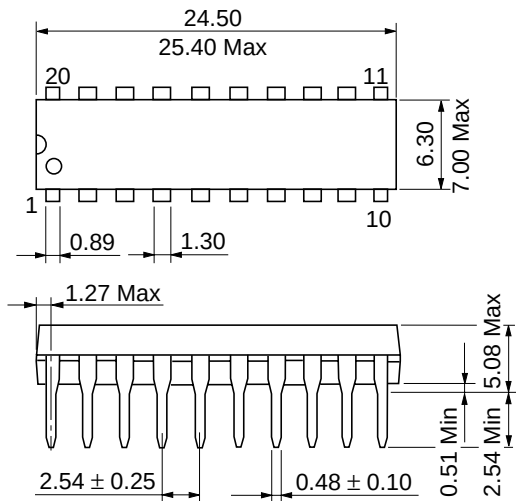
\*  $V_{CC} = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$

\*\*  $I_{CC}$  is measured with all outputs open.

## ■SWITCHING CHARACTERISTICS ( $V_{CC} = 5\text{V}$ , $T_a = 25^\circ\text{C}$ )

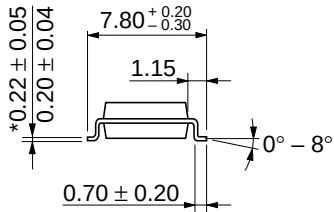
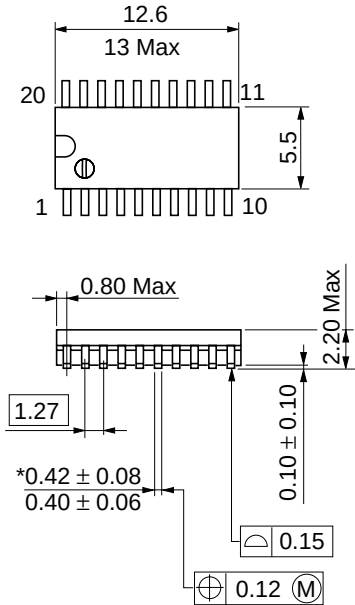
| Item                   | Symbol    | Test Conditions                            | min | typ | max | Unit |
|------------------------|-----------|--------------------------------------------|-----|-----|-----|------|
| Propagation delay time | $t_{PLH}$ | $C_L = 45\text{pF}$<br>$R_L = 667\ \Omega$ | —   | 8   | 15  | ns   |
|                        | $t_{PHL}$ |                                            | —   | 8   | 15  |      |
| Output enable time     | $t_{ZL}$  |                                            | —   | 27  | 40  |      |
|                        | $t_{ZH}$  |                                            | —   | 25  | 40  |      |
| Output disable time    | $t_{LZ}$  | $C_L = 5\text{pF}$                         | —   | 15  | 25  |      |
|                        | $t_{HZ}$  | $R_L = 667\ \Omega$                        | —   | 15  | 25  |      |

Note) Refer to Test Circuit and Waveform of the Common Item



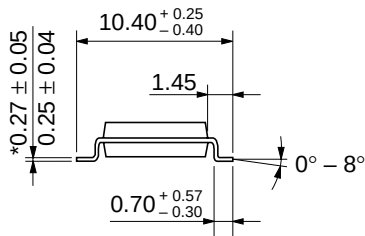
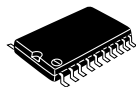
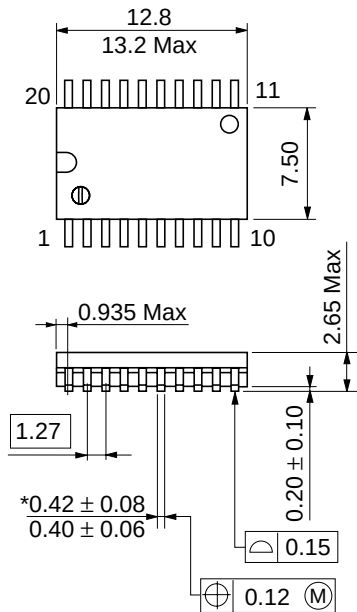
|                          |          |
|--------------------------|----------|
| Hitachi Code             | DP-20N   |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 1.26 g   |

Unit: mm



|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-20DA  |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.31 g   |

$$\frac{\text{*Dimension including the plating thickness}}{\text{Base material dimension}}$$



|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-20DB  |
| JEDEC                    | Conforms |
| EIAJ                     | —        |
| Weight (reference value) | 0.52 g   |

\*Dimension including the plating thickness  
Base material dimension

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