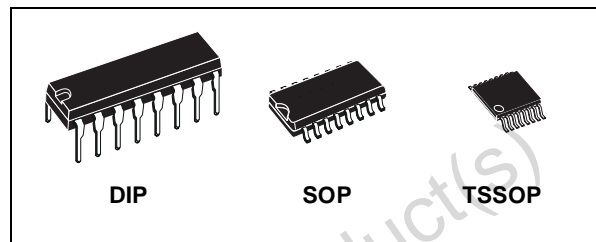




# M74HCT367

## HEX BUS BUFFER WITH 3 STATE OUTPUT NON INVERTING

- HIGH SPEED:  
 $t_{PD} = 14\text{ns}$  (TYP.) at  $V_{CC} = 4.5\text{V}$
- LOW POWER DISSIPATION:  
 $I_{CC} = 4\mu\text{A}$ (MAX.) at  $T_A=25^\circ\text{C}$
- COMPATIBLE WITH TTL OUTPUTS :  
 $V_{IH} = 2\text{V}$  (MIN.)  $V_{IL} = 0.8\text{V}$  (MAX)
- SYMMETRICAL OUTPUT IMPEDANCE:  
 $|I_{OH}| = I_{OL} = 6\text{mA}$  (MIN)
- BALANCED PROPAGATION DELAYS:  
 $t_{PLH} \cong t_{PHL}$
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 367



### ORDER CODES

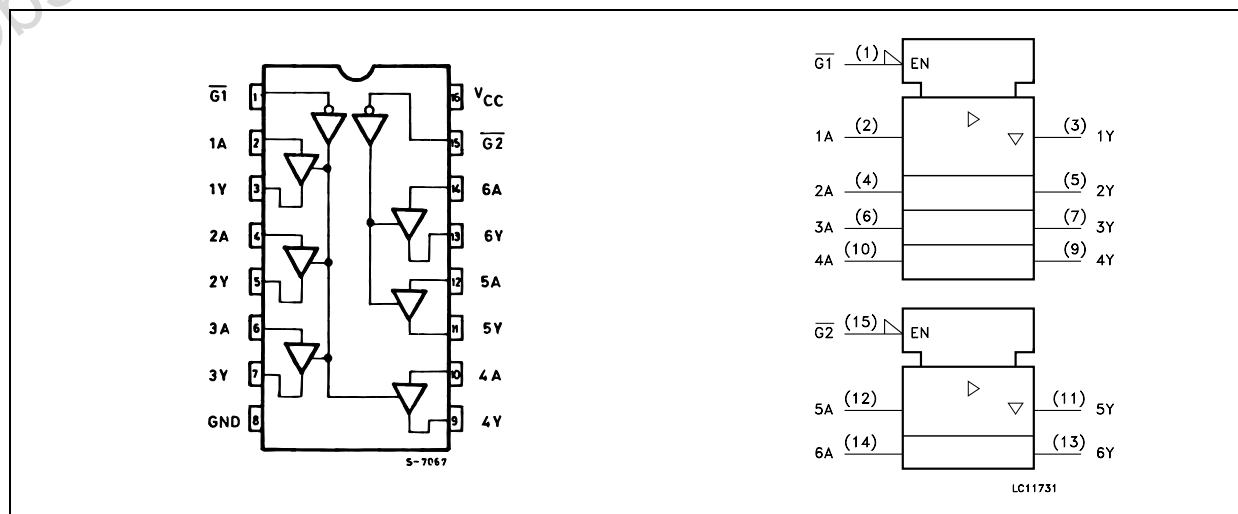
| PACKAGE | TUBE         | T & R           |
|---------|--------------|-----------------|
| DIP     | M74HCT367B1R |                 |
| SOP     | M74HCT367M1R | M74HCT367RM13TR |
| TSSOP   |              | M74HCT367TTR    |

### DESCRIPTION

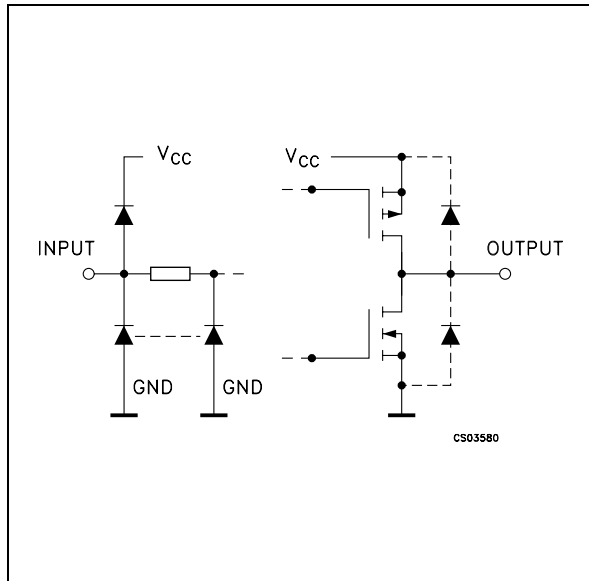
The M74HCT367 is an high speed CMOS HEX BUS BUFFER 3-STATE OUTPUTS fabricated with silicon gate C<sup>2</sup>MOS technology. This device contains six buffers, four buffers are controlled by an enable input ( $\overline{G1}$ ) and the other two buffers are controlled by the other enable input ( $\overline{G2}$ ); the outputs of each buffer group are enabled when  $\overline{G1}$  and/or  $\overline{G2}$  inputs are held low,

and when held high, these outputs are disabled in a high-impedance state. All inputs are equipped with protection circuits against static discharge and transient excess voltage.

### PIN CONNECTION AND IEC LOGIC SYMBOLS



INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

| PIN No              | SYMBOL                         | NAME AND FUNCTION           |
|---------------------|--------------------------------|-----------------------------|
| 1, 15               | $\overline{G1}, \overline{G2}$ | 3 State Output Enable Input |
| 2, 4, 6, 10, 12, 14 | 1A to 6A                       | Data Inputs                 |
| 3, 5, 7, 9, 11, 13  | 1Y to 6Y                       | Data Outputs                |
| 8                   | GND                            | Ground (0V)                 |
| 16                  | V <sub>CC</sub>                | Positive Supply Voltage     |

TRUTH TABLE

| INPUTS         |                | OUTPUTS        |
|----------------|----------------|----------------|
| $\overline{G}$ | A <sub>n</sub> | Y <sub>n</sub> |
| L              | L              | L              |
| L              | H              | H              |
| H              | X              | Z              |

X: Don't Care  
Z: High Impedance

ABSOLUTE MAXIMUM RATINGS

| Symbol                              | Parameter                            | Value                         | Unit |
|-------------------------------------|--------------------------------------|-------------------------------|------|
| V <sub>CC</sub>                     | Supply Voltage                       | -0.5 to +7                    | V    |
| V <sub>I</sub>                      | DC Input Voltage                     | -0.5 to V <sub>CC</sub> + 0.5 | V    |
| V <sub>O</sub>                      | DC Output Voltage                    | -0.5 to V <sub>CC</sub> + 0.5 | V    |
| I <sub>IK</sub>                     | DC Input Diode Current               | ± 20                          | mA   |
| I <sub>OK</sub>                     | DC Output Diode Current              | ± 20                          | mA   |
| I <sub>O</sub>                      | DC Output Current                    | ± 35                          | mA   |
| I <sub>CC</sub> or I <sub>GND</sub> | DC V <sub>CC</sub> or Ground Current | ± 70                          | mA   |
| P <sub>D</sub>                      | Power Dissipation                    | 500(*)                        | mW   |
| T <sub>stg</sub>                    | Storage Temperature                  | -65 to +150                   | °C   |
| T <sub>L</sub>                      | Lead Temperature (10 sec)            | 300                           | °C   |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied

(\*) 500mW at 65 °C; derate to 300mW by 10mW/°C from 65°C to 85°C

RECOMMENDED OPERATING CONDITIONS

| Symbol                          | Parameter  | Value                | Unit |
|---------------------------------|--|----------------------|------|
| V <sub>CC</sub>                 | Supply Voltage   | 4.5 to 5.5           | V    |
| V <sub>I</sub>                  | Input Voltage  | 0 to V <sub>CC</sub> | V    |
| V <sub>O</sub>                  | Output Voltage   | 0 to V <sub>CC</sub> | V    |
| T <sub>op</sub>                 | Operating Temperature                                    | -55 to 125           | °C   |
| t <sub>r</sub> , t <sub>f</sub> | Input Rise and Fall Time (V <sub>CC</sub> = 4.5 to 5.5V) | 0 to 500             | ns   |

## DC SPECIFICATIONS

| Symbol            | Parameter                             | Test Condition         |   | Value                 |      |       |             |      |              | Unit |      |
|-------------------|---------------------------------------|------------------------|---|-----------------------|------|-------|-------------|------|--------------|------|------|
|                   |                                       | V <sub>CC</sub><br>(V) |   | T <sub>A</sub> = 25°C |      |       | -40 to 85°C |      | -55 to 125°C |      |      |
|                   |                                       |                        |   | Min.                  | Typ. | Max.  | Min.        | Max. | Min.         |      | Max. |
| V <sub>IH</sub>   | High Level Input Voltage              | 4.5 to 5.5             |   | 2.0                   |      |       | 2.0         |      | 2.0          |      | V    |
| V <sub>IL</sub>   | Low Level Input Voltage               | 4.5 to 5.5             |   |                       |      | 0.8   |             | 0.8  |              | 0.8  | V    |
| V <sub>OH</sub>   | High Level Output Voltage             | 4.5                    | I <sub>O</sub> = -20 μA   | 4.4                   | 4.5  |       | 4.4         |      | 4.4          |      | V    |
|                   |                                       |                        | I <sub>O</sub> = -6.0 mA  | 4.18                  | 4.31 |       | 4.13        |      | 4.10         |      |      |
| V <sub>OL</sub>   | Low Level Output Voltage              | 4.5                    | I <sub>O</sub> = 20 μA  |                       | 0.0  | 0.1   |             | 0.1  |              | 0.1  | V    |
|                   |                                       |                        | I <sub>O</sub> = 6.0 mA   |                       | 0.17 | 0.26  |             | 0.33 |              | 0.40 |      |
| I <sub>I</sub>    | Input Leakage Current                 | 5.5                    | V <sub>I</sub> = V <sub>CC</sub> or GND   |                       |      | ± 0.1 |             | ± 1  |              | ± 1  | μA   |
| I <sub>OZ</sub>   | High Impedance Output Leakage Current | 5.5                    | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>V <sub>O</sub> = V <sub>CC</sub> or GND  |                       |      | ± 0.5 |             | ± 5  |              | ± 10 | μA   |
| I <sub>CC</sub>   | Quiescent Supply Current              | 5.5                    | V <sub>I</sub> = V <sub>CC</sub> or GND   |                       |      | 4     |             | 40   |              | 80   | μA   |
| Δ I <sub>CC</sub> | Additional Worst Case Supply Current  | 5.5                    | Per Input pin<br>V <sub>I</sub> = 0.5V or<br>V <sub>I</sub> = 2.4V<br>Other Inputs at<br>V <sub>CC</sub> or GND<br>I <sub>O</sub> = 0 |                       |      | 2.0   |             | 2.9  |              | 3.0  | mA   |

AC ELECTRICAL CHARACTERISTICS (C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6ns)

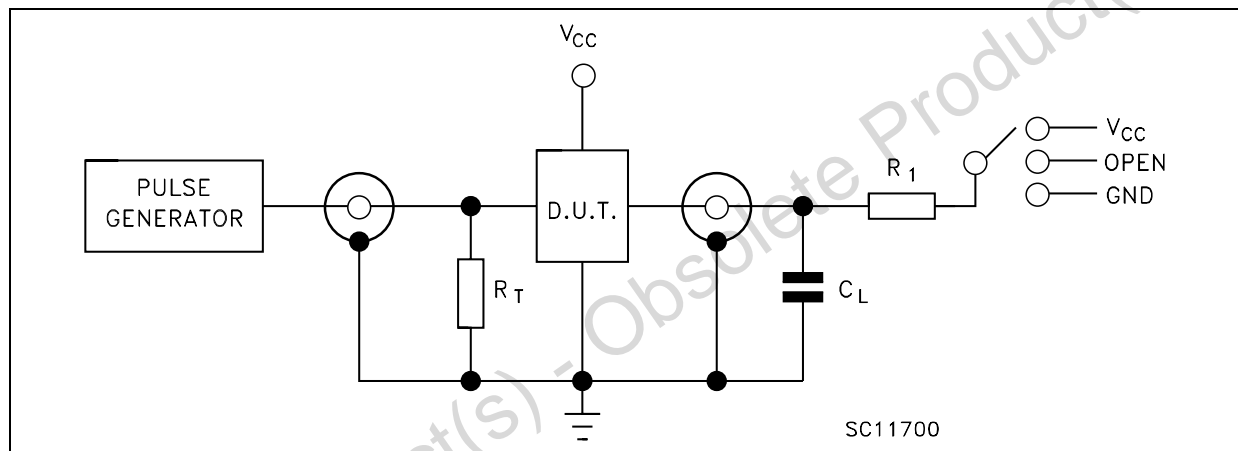
| Symbol                            | Parameter                          | Test Condition         |                        | Value                 |      |      |             |      |              | Unit |      |    |
|-----------------------------------|------------------------------------|------------------------|------------------------|-----------------------|------|------|-------------|------|--------------|------|------|----|
|                                   |                                    | V <sub>CC</sub><br>(V) | C <sub>L</sub><br>(pF) | T <sub>A</sub> = 25°C |      |      | -40 to 85°C |      | -55 to 125°C |      |      |    |
|                                   |                                    |                        |                        | Min.                  | Typ. | Max. | Min.        | Max. | Min.         |      | Max. |    |
| t <sub>TLH</sub> t <sub>THL</sub> | Output Transition Time             | 4.5                    | 50                     |                       | 7    | 12   |             | 15   |              | 18   | ns   |    |
| t <sub>PLH</sub> t <sub>PHL</sub> | Propagation Delay Time             | 4.5                    | 50                     |                       | 14   | 22   |             | 28   |              | 33   | ns   |    |
|                                   |                                    | 4.5                    | 150                    |                       | 18   | 28   |             | 35   |              | 42   |      |    |
| t <sub>PZL</sub> t <sub>PZH</sub> | High Impedance Output Enable Time  | 4.5                    | 50                     | R <sub>L</sub> = 1 KΩ |      | 16   | 25          |      | 31           |      | 38   | ns |
|                                   |                                    | 4.5                    | 150                    | R <sub>L</sub> = 1 KΩ |      | 20   | 31          |      | 39           |      | 47   |    |
| t <sub>PLZ</sub> t <sub>PHZ</sub> | High Impedance Output Disable Time | 4.5                    | 50                     | R <sub>L</sub> = 1 KΩ |      | 18   | 25          |      | 31           |      | 38   | ns |

**CAPACITIVE CHARACTERISTICS**

| Symbol          | Parameter                              | Test Condition         |  | Value                 |      |      |             |      |              | Unit |      |
|-----------------|--|------------------------|--|-----------------------|------|------|-------------|------|--------------|------|------|
|                 |  | V <sub>CC</sub><br>(V) |  | T <sub>A</sub> = 25°C |      |      | -40 to 85°C |      | -55 to 125°C |      |      |
|                 |  |                        |  | Min.                  | Typ. | Max. | Min.        | Max. | Min.         |      | Max. |
| C <sub>IN</sub> | Input Capacitance                      |                        |  |                       | 5    | 10   |             | 10   |              | 10   | pF   |
| C <sub>PD</sub> | Power Dissipation Capacitance (note 1) |                        |  |                       | 47   |      |             |      |              |      | pF   |

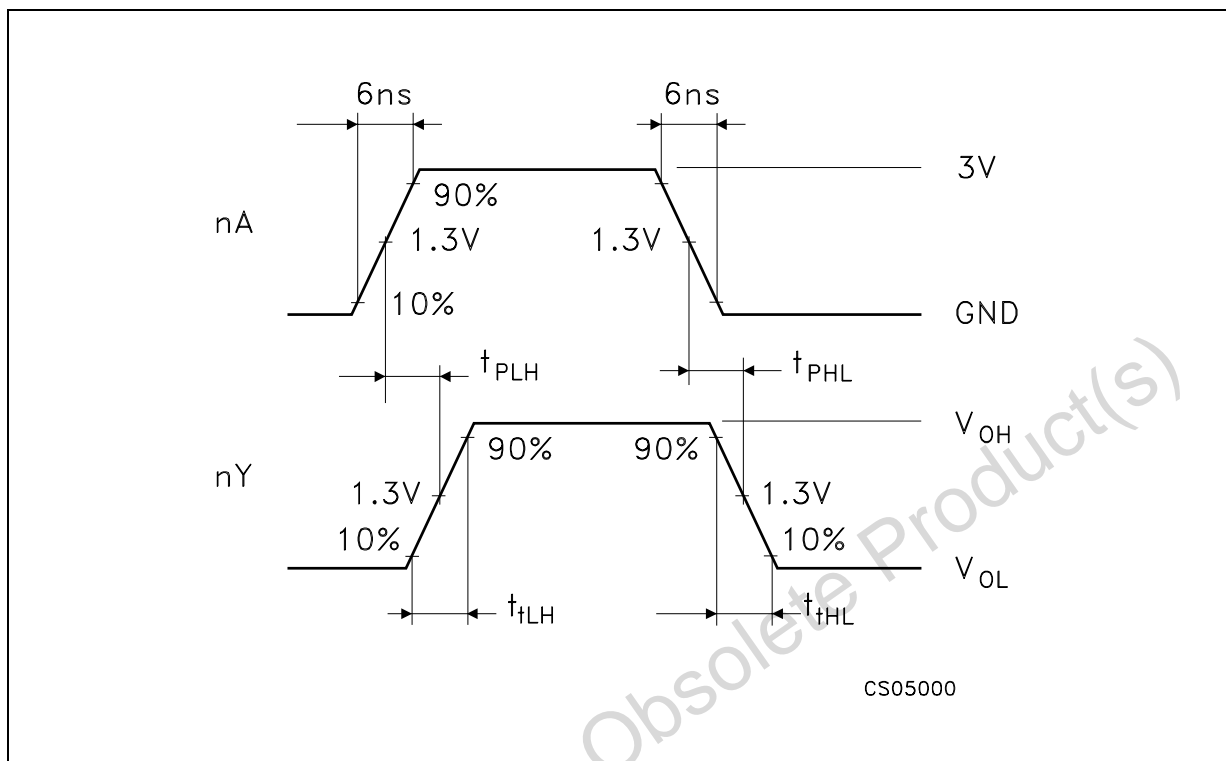
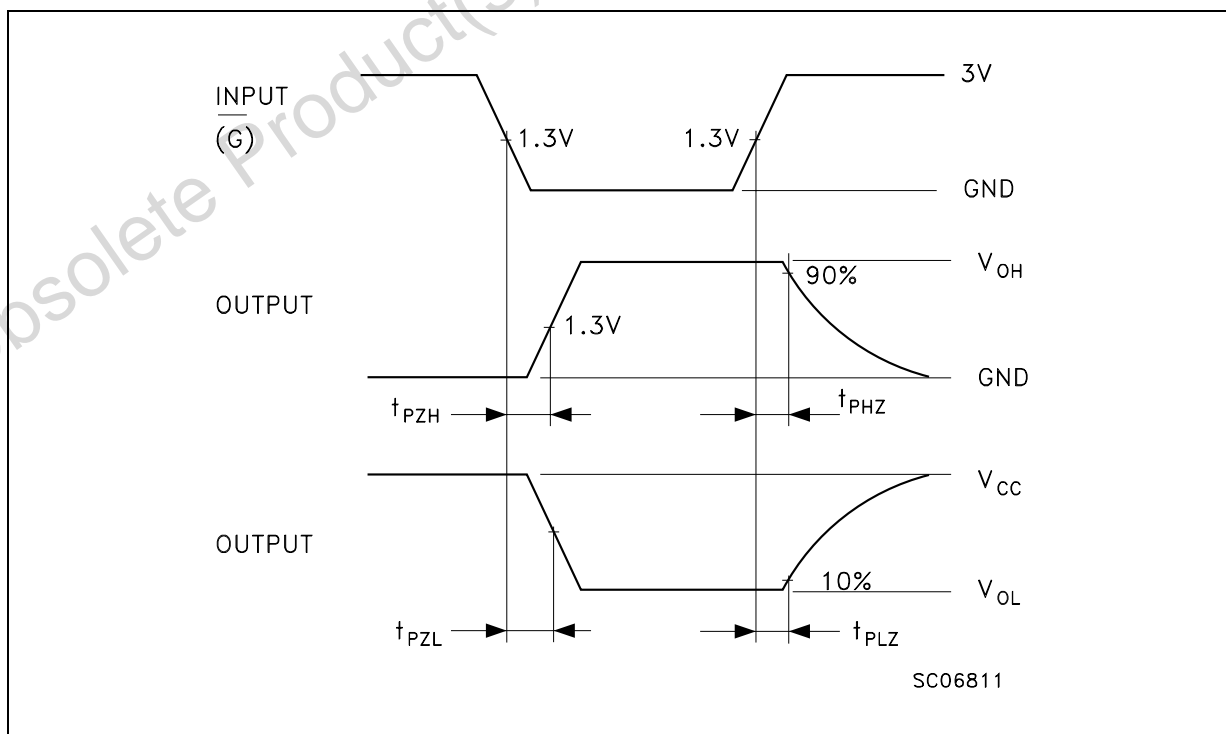
1) C<sub>PD</sub> is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. I<sub>CC(oper)</sub> = C<sub>PD</sub> × V<sub>CC</sub> × f<sub>IN</sub> + I<sub>CC</sub>/6 (per Channel)

**TEST CIRCUIT**



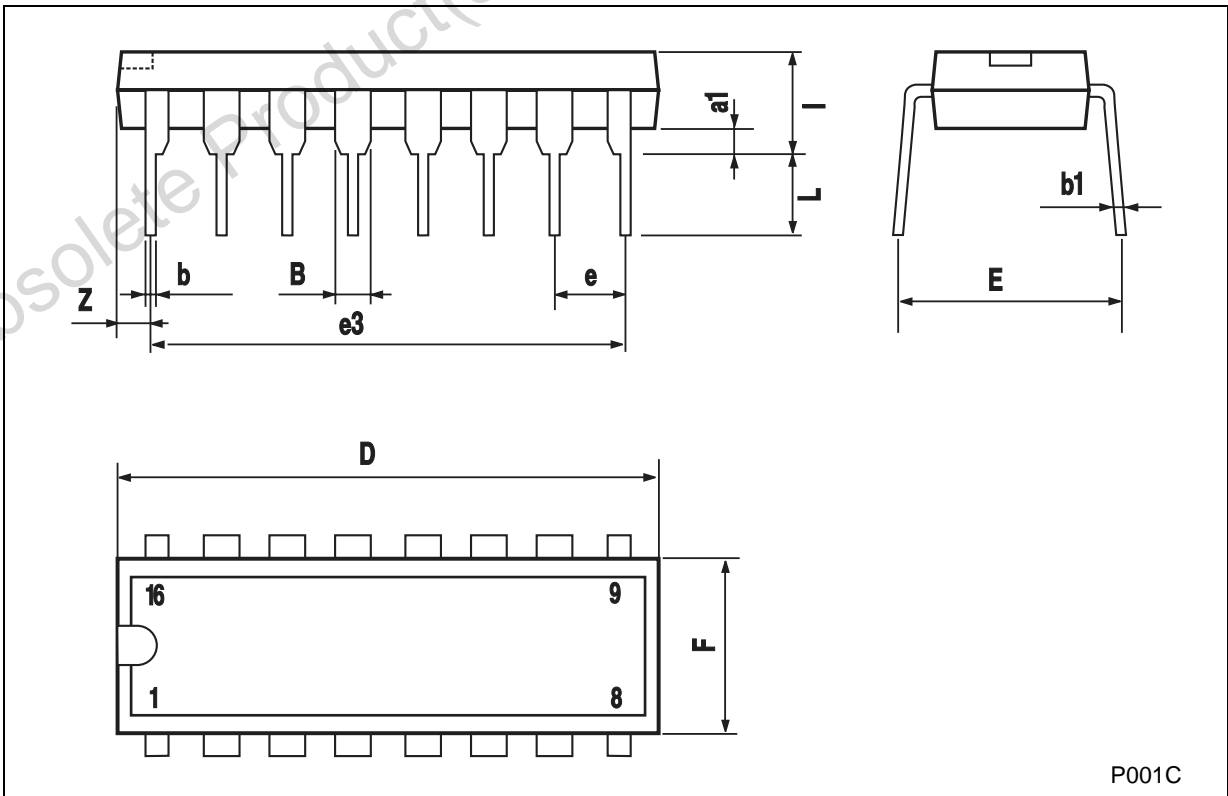
| TEST                                | SWITCH          |
|-------------------------------------|-----------------|
| t <sub>PLH</sub> , t <sub>PHL</sub> | Open            |
| t <sub>PZL</sub> , t <sub>PLZ</sub> | V <sub>CC</sub> |
| t <sub>PZH</sub> , t <sub>PHZ</sub> | GND             |

C<sub>L</sub> = 50pF/150pF or equivalent (includes jig and probe capacitance)  
 R<sub>1</sub> = 1KΩ or equivalent  
 R<sub>T</sub> = Z<sub>OUT</sub> of pulse generator (typically 50Ω)

**WAVEFORM 1 : PROPAGATION DELAY TIMES** ( $f=1\text{MHz}$ ; 50% duty cycle)**WAVEFORM 2 : OUTPUT ENABLE AND DISABLE TIMES** ( $f=1\text{MHz}$ ; 50% duty cycle)

**Plastic DIP-16 (0.25) MECHANICAL DATA**

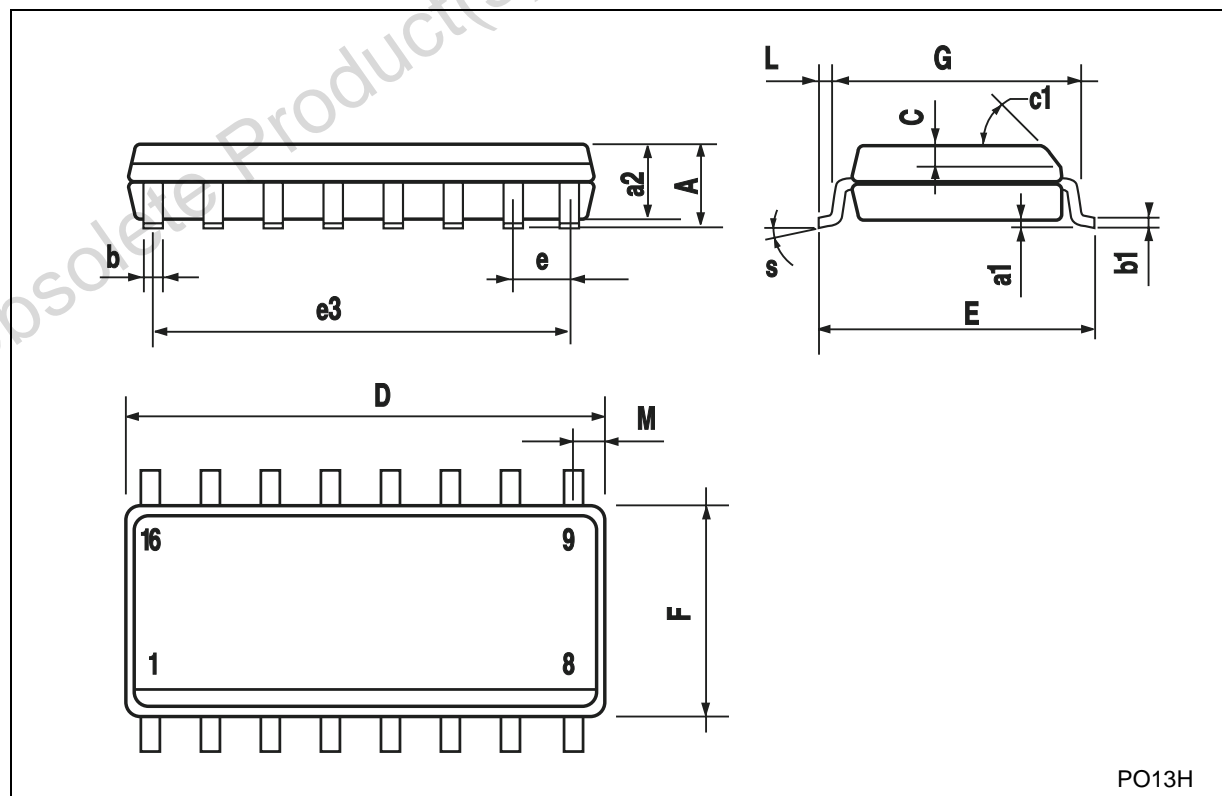
| DIM. | mm.  |       |      | inch  |       |       |
|------|------|-------|------|-------|-------|-------|
|      | MIN. | TYP   | MAX. | MIN.  | TYP.  | MAX.  |
| a1   | 0.51 |       |      | 0.020 |       |       |
| B    | 0.77 |       | 1.65 | 0.030 |       | 0.065 |
| b    |      | 0.5   |      |       | 0.020 |       |
| b1   |      | 0.25  |      |       | 0.010 |       |
| D    |      |       | 20   |       |       | 0.787 |
| E    |      | 8.5   |      |       | 0.335 |       |
| e    |      | 2.54  |      |       | 0.100 |       |
| e3   |      | 17.78 |      |       | 0.700 |       |
| F    |      |       | 7.1  |       |       | 0.280 |
| I    |      |       | 5.1  |       |       | 0.201 |
| L    |      | 3.3   |      |       | 0.130 |       |
| Z    |      |       | 1.27 |       |       | 0.050 |



P001C

## SO-16 MECHANICAL DATA

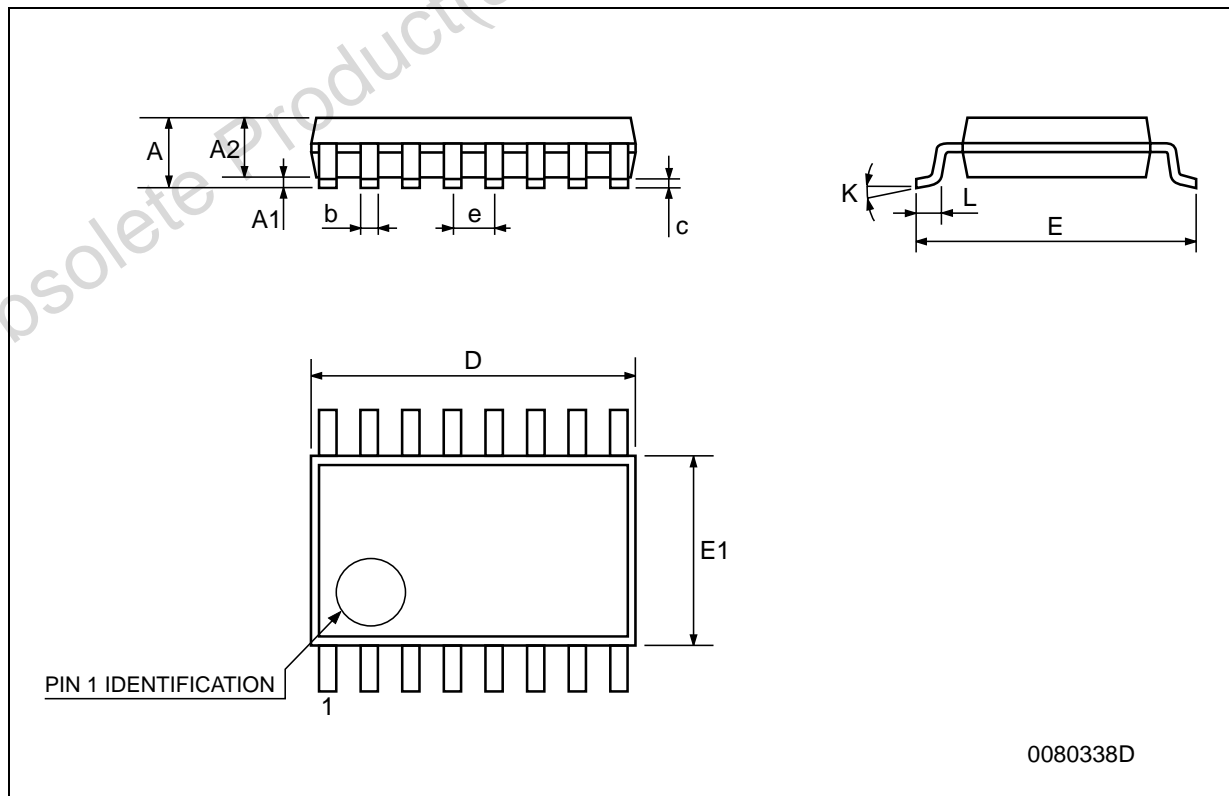
| DIM. | mm.        |      |      | inch  |       |       |
|------|------------|------|------|-------|-------|-------|
|      | MIN.       | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    |            |      | 1.75 |       |       | 0.068 |
| a1   | 0.1        |      | 0.2  | 0.003 |       | 0.007 |
| a2   |            |      | 1.65 |       |       | 0.064 |
| b    | 0.35       |      | 0.46 | 0.013 |       | 0.018 |
| b1   | 0.19       |      | 0.25 | 0.007 |       | 0.010 |
| C    |            | 0.5  |      |       | 0.019 |       |
| c1   | 45° (typ.) |      |      |       |       |       |
| D    | 9.8        |      | 10   | 0.385 |       | 0.393 |
| E    | 5.8        |      | 6.2  | 0.228 |       | 0.244 |
| e    |            | 1.27 |      |       | 0.050 |       |
| e3   |            | 8.89 |      |       | 0.350 |       |
| F    | 3.8        |      | 4.0  | 0.149 |       | 0.157 |
| G    | 4.6        |      | 5.3  | 0.181 |       | 0.208 |
| L    | 0.5        |      | 1.27 | 0.019 |       | 0.050 |
| M    |            |      | 0.62 |       |       | 0.024 |
| S    | 8° (max.)  |      |      |       |       |       |



PO13H

## TSSOP16 MECHANICAL DATA

| DIM. | mm.  |          |      | inch  |            |        |
|------|------|----------|------|-------|------------|--------|
|      | MIN. | TYP.     | MAX. | MIN.  | TYP.       | MAX.   |
| A    |      |          | 1.2  |       |            | 0.047  |
| A1   | 0.05 |          | 0.15 | 0.002 | 0.004      | 0.006  |
| A2   | 0.8  | 1        | 1.05 | 0.031 | 0.039      | 0.041  |
| b    | 0.19 |          | 0.30 | 0.007 |            | 0.012  |
| c    | 0.09 |          | 0.20 | 0.004 |            | 0.0089 |
| D    | 4.9  | 5        | 5.1  | 0.193 | 0.197      | 0.201  |
| E    | 6.2  | 6.4      | 6.6  | 0.244 | 0.252      | 0.260  |
| E1   | 4.3  | 4.4      | 4.48 | 0.169 | 0.173      | 0.176  |
| e    |      | 0.65 BSC |      |       | 0.0256 BSC |        |
| K    | 0°   |          | 8°   | 0°    |            | 8°     |
| L    | 0.45 | 0.60     | 0.75 | 0.018 | 0.024      | 0.030  |





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[NLV27WZ125USG](#) [MC74HCT365ADTR2G](#) [BCM6306KMLG](#) [54FCT240CTDB](#) [Le87401NQC](#) [Le87402MQC](#) [028192B](#) [042140C](#)  
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