

# 74LVC1G17 Single Schmitt-Trigger Buffer

## 1. General Description

### 1.1 Description

This single Schmitt-trigger buffer is designed for 1.65-V to 5.5-V V<sub>CC</sub> operation.

The 74LVC1G17 device contains one buffer and performs the Boolean function  $Y = A$ .

The CMOS device has high output drive while maintaining low static power dissipation over a broad V<sub>CC</sub> operating range.

### 1.2 Features

- Supports 5V V<sub>CC</sub> operation
- Inputs accept voltages to 5.5V
- Provides down translation to V<sub>CC</sub>
- Low power consumption, 10μA max I<sub>CC</sub>

- ±24mA output drive at 3.3V
- I<sub>off</sub> supports live insertion, partial-power-down mode, and back-drive protection

### 1.3 Device Information

| PART NUMBER | PACKAGE |
|-------------|---------|
| 74LVC1G17   | SOT23   |
|             | SC70    |
|             | SOT5X3  |
|             | DFN     |
|             | DSBGA   |

## 2. Connection Diagrams and Pin Description

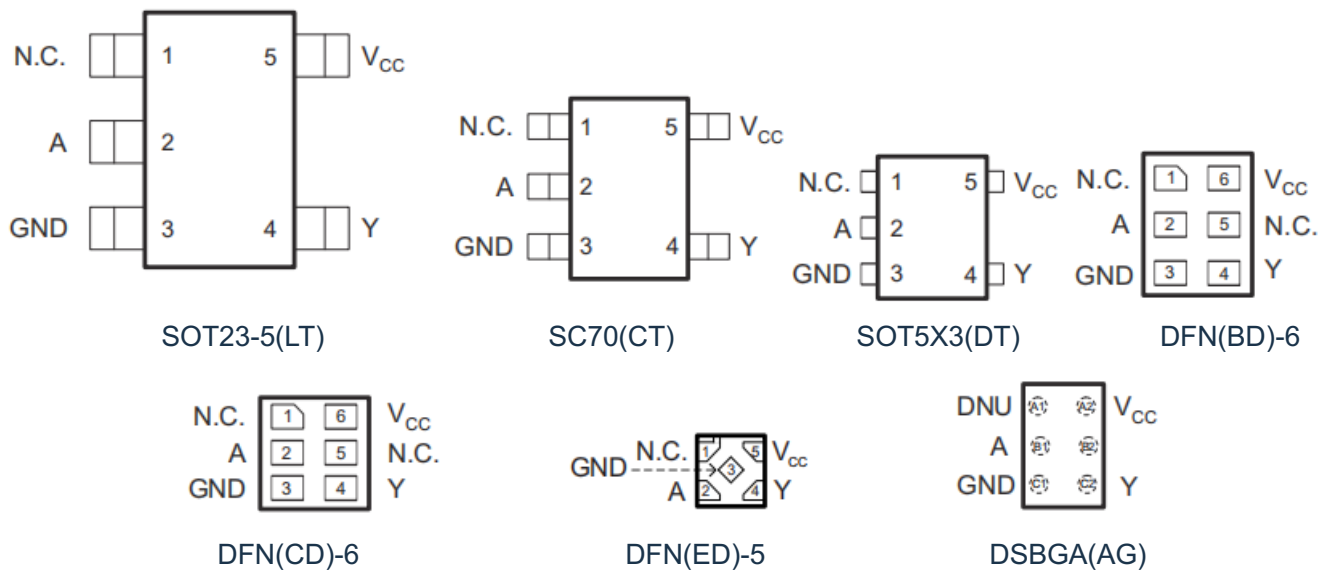


Figure 2.1 Top View

| PIN No.  |       |    |    | NAME | I/O | FUNCTION       |
|----------|-------|----|----|------|-----|----------------|
| LT/CT/DT | BD/CD | ED | AG |      |     |                |
| 1        | 1,5   | 1  | -- | NC   |     | No Connected   |
| 2        | 2     | 2  | 2  | A    | I   | Input          |
| 3        | 3     | 3  | 3  | GND  |     | Ground         |
| 4        | 4     | 4  | 4  | Y    | O   | Output         |
| 5        | 6     | 5  | 5  | VCC  |     | Supply Voltage |

## 3. System Diagram

### 3.1 Logic Diagram



Figure 3.1: 74LVC1G17 Logic Diagram

### 3.2 Function Table

| Input | Output |
|-------|--------|
| A     | Y      |
| 1     | 1      |
| 0     | 0      |

X = don't care, 1≡High State, 0≡Low State,Z=High Impedance



## 4. Specifications

### 4.1 Absolute Maximum Ratings

| Symbol          | Parameter                                                                                    | MIN  | MAX                   | Unit |
|-----------------|----------------------------------------------------------------------------------------------|------|-----------------------|------|
| V <sub>CC</sub> | Supply Voltage                                                                               | -0.5 | 6.5                   | V    |
| V <sub>I</sub>  | Input Voltage Range                                                                          | -0.5 | 6.5                   | V    |
| V <sub>O</sub>  | Voltage Range(applied to any output in the high-impedance or power-off state) <sup>(1)</sup> | -0.5 | 6.5                   | V    |
|                 | Voltage Range(applied to any output in the high or low state)                                | -0.5 | V <sub>CC</sub> + 0.5 | V    |
| I <sub>O</sub>  | Continuous Output Current                                                                    |      | ±50                   | mA   |
| T <sub>J</sub>  | Junction Temperature                                                                         |      | 125                   | °C   |
| T <sub>OP</sub> | Operating Temperature                                                                        | 0    | 70                    | °C   |

Absolute maximum ratings are those values beyond which the device could be permanently damaged. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under normal operating conditions.

### 4.2 Electrical Characteristics

#### 4.2.1 DC Specifications

(T<sub>a</sub>=25°C, voltages are referenced to GND (ground=0V), unless otherwise specified)

| Symbol          | Parameter                 | Test Condition         | MIN | TYP | MAX | Unit |
|-----------------|---------------------------|------------------------|-----|-----|-----|------|
| I <sub>OH</sub> | High Level Output Current | V <sub>CC</sub> =1.65V | --  | --  | -4  | mA   |
|                 |                           | V <sub>CC</sub> =2.3V  | --  | --  | -8  | mA   |
|                 |                           | V <sub>CC</sub> =3V    | --  | --  | -16 | mA   |
|                 |                           |                        | --  | --  | -24 | mA   |
|                 |                           | V <sub>CC</sub> =4.5V  | --  | --  | -32 | mA   |
| I <sub>OL</sub> | Low Level Output Current  | V <sub>CC</sub> =1.65V | --  | --  | 4   | mA   |
|                 |                           | V <sub>CC</sub> =2.3V  | --  | --  | 8   | mA   |
|                 |                           | V <sub>CC</sub> =3V    | --  | --  | 16  | mA   |
|                 |                           |                        | --  | --  | 24  | mA   |
|                 |                           | V <sub>CC</sub> =4.5V  | --  | --  | 32  | mA   |



| Symbol          | Parameter                                         | Test Condition                                                                       | MIN          | TYP  | MAX      | Unit    |
|-----------------|---------------------------------------------------|--------------------------------------------------------------------------------------|--------------|------|----------|---------|
| $V_{T+}$        | (Positive-going input threshold voltage)          | $V_{CC}=1.65V$                                                                       | 0.76         | --   | 1.13     | V       |
|                 |                                                   | $V_{CC}=2.3V$                                                                        | 1.08         | --   | 1.56     | V       |
|                 |                                                   | $V_{CC}=3V$                                                                          | 1.48         | --   | 1.92     | V       |
|                 |                                                   | $V_{CC}=4.5V$                                                                        | 2.19         | --   | 2.74     | V       |
|                 |                                                   | $V_{CC}=5.5V$                                                                        | 2.65         | --   | 3.33     |         |
| $V_{T-}$        | (Negative-going input threshold voltage)          | $V_{CC}=1.65$                                                                        | 0.38         | --   | 0.62     | V       |
|                 |                                                   | $V_{CC}=2.3V$                                                                        | 0.59         | --   | 0.91     | V       |
|                 |                                                   | $V_{CC}=3V$                                                                          | 0.85         | --   | 1.15     | V       |
|                 |                                                   | $V_{CC}=4.5V$                                                                        | 1.35         | --   | 1.85     | V       |
|                 |                                                   | $V_{CC}=5.5V$                                                                        | 1.75         |      | 2.25     | V       |
| $\Delta V_T$    | $\Delta V_T$ Hysteresis ( $V_{T+} - V_{T-}$ )     | $V_{CC}=1.65V$                                                                       | 0.35         | --   | 0.65     | V       |
|                 |                                                   | $V_{CC}=2.3V$                                                                        | 0.45         | --   | 0.8      | V       |
|                 |                                                   | $V_{CC}=3V$                                                                          | 0.5          | --   | 0.9      | V       |
|                 |                                                   | $V_{CC}=4.5V$                                                                        | 0.65         | --   | 1.05     | V       |
|                 |                                                   | $V_{CC}=5.5V$                                                                        | 0.8          | --   | 1.2      | V       |
| $V_{OH}$        | High Level Output Voltage                         | $V_{CC}=1.65V$ to $5.5V, I_{OH}=-100\mu A$                                           | $V_{CC}-0.1$ | --   | --       | V       |
|                 |                                                   | $V_{CC}=1.65V, I_O=-4mA$                                                             | --           | 1.47 | --       | V       |
|                 |                                                   | $V_{CC}=2.3V, I_O=-8mA$                                                              | --           | 2.15 | --       | V       |
|                 |                                                   | $V_{CC}=3V, I_O=-16mA$                                                               | --           | 2.8  | --       | V       |
|                 |                                                   | $V_{CC}=3V, I_O=-24mA$                                                               | --           | 2.7  | --       | V       |
|                 |                                                   | $V_{CC}=4.5V, I_O=-32mA$                                                             | --           | 4.2  | --       | V       |
| $V_{OL}$        | Low Level Output Voltage                          | $V_{CC}=1.65V$ to $5.5V, I_{OH}=100\mu A$                                            | --           | --   | 0.1      | V       |
|                 |                                                   | $V_{CC}=1.65V, I_O=4mA$                                                              | --           | 0.09 | --       | V       |
|                 |                                                   | $V_{CC}=2.3V, I_O=8mA$                                                               | --           | 0.1  | --       | V       |
|                 |                                                   | $V_{CC}=3V, I_O=16mA$                                                                | --           | 0.15 | --       | V       |
|                 |                                                   | $V_{CC}=3V, I_O=24mA$                                                                | --           | 0.25 | --       | V       |
|                 |                                                   | $V_{CC}=4.5V, I_O=32mA$                                                              | --           | 0.25 | --       | V       |
| $I_I$           | A Inputs Leakage Current                          | $V_{CC}=0$ to $5.5V, V_I=V_{CC}$ or GND                                              | --           | 0    | $\pm 1$  | $\mu A$ |
| $I_{off}$       | Power Off Leakage Current                         | $V_{CC}=0V, V_I$ or $V_O=5.5V$                                                       | --           | 0    | $\pm 10$ | $\mu A$ |
| $I_{CC}$        | Quiescent Supply Current                          | $V_{CC}=1.65V$ to $5.5V, V_I=V_{CC}$ or GND, $I_O=0$                                 | --           | 0    | 10       | $\mu A$ |
| $\Delta I_{CC}$ | Additional Quiescent Supply Current Per Input Pin | $V_{CC}=3V$ to $5.5V$ , one input at $V_{CC}-0.6V$ , Other inputs at $V_{CC}$ or GND | --           | 0    | 500      | $\mu A$ |

## 5. Application Information

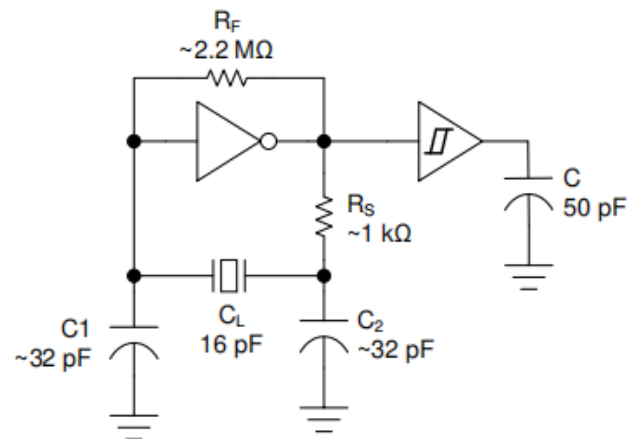


Figure 5.1: Application Schematic

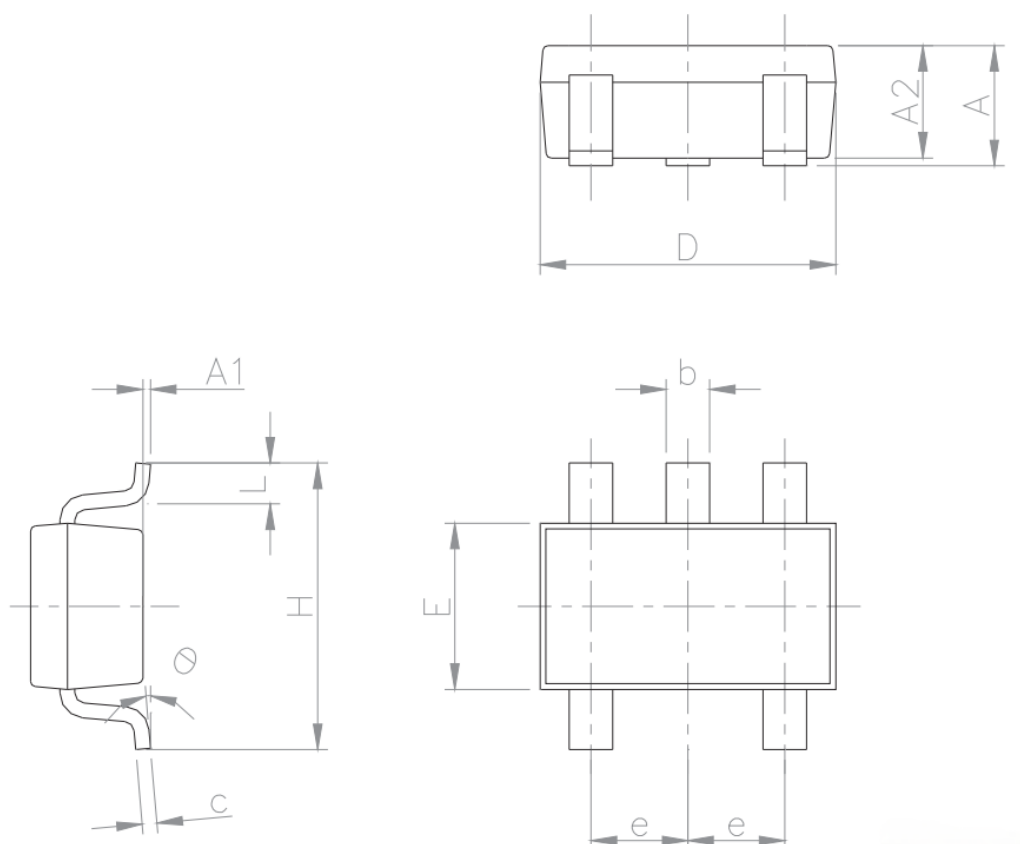


## 6. Ordering Information

| Orderable Device  | Package Type | Pins | Packing     | Package Qty |
|-------------------|--------------|------|-------------|-------------|
| 74LVC1G17LT05ARCQ | SOT23        | 5    | Tape & Reel | 3000        |
| 74LVC1G17CT05ARCQ | SC70         | 5    | Tape & Reel | 3000        |
| 74LVC1G17DT05ARDQ | SOT5x3       | 5    | Tape & Reel | 4000        |
| 74LVC1G17BD06AREQ | DFN(BD)      | 6    | Tape & Reel | 5000        |
| 74LVC1G17CD06AREQ | DFN(CD)      | 6    | Tape & Reel | 5000        |
| 74LVC1G17ED05ARCQ | DFN          | 5    | Tape & Reel | 3000        |
| 74LVC1G17AG05ARCQ | DSBGA        | 5    | Tape & Reel | 3000        |

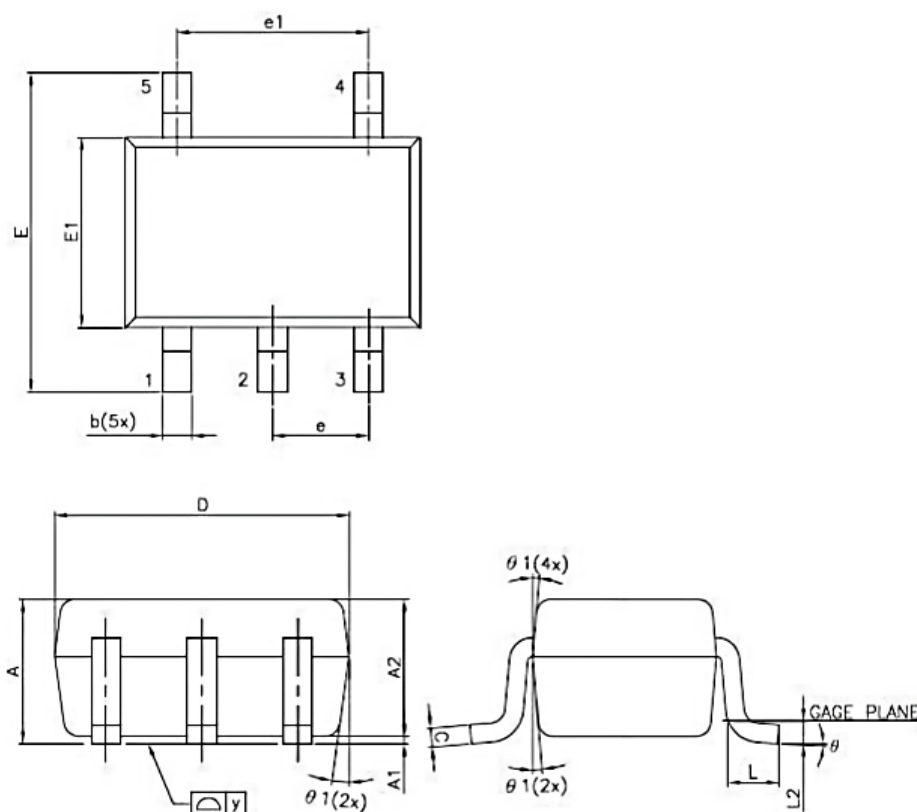
## 7. Package Information

### 7.1 SOT23-5



| Symbol | Dimensions  |      |            |        |       |       |
|--------|-------------|------|------------|--------|-------|-------|
|        | Millimeters |      |            | Inches |       |       |
|        | Min.        | Typ. | Max.       | Min.   | Typ.  | Max.  |
| A      | 0.90        | -    | 1.45       | 0.035  | -     | 0.057 |
| A1     | -           | -    | 0.15       | -      | -     | 0.006 |
| A2     | 0.90        | -    | 1.30       | 0.035  | -     | 0.051 |
| b      | 0.35        | -    | 0.50       | 0.014  | -     | 0.020 |
| c      | 0.09        | -    | 0.20       | 0.004  | -     | 0.008 |
| D      | 2.80        | -    | 3.05       | 0.110  | -     | 0.120 |
| E      | 1.50        | -    | 1.75       | 0.059  | -     | 0.069 |
| e      | -           | 0.95 | -          | -      | 0.037 | -     |
| H      | 2.60        | -    | 3.00       | 0.102  | -     | 0.118 |
| L      | 0.10        | -    | 0.60       | 0.004  | -     | 0.024 |
| θ      | 0 degrees   | -    | 10 degrees | -      | -     | -     |

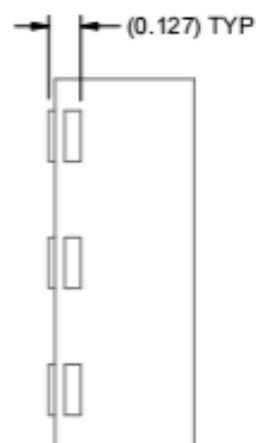
## 7.2 SC70



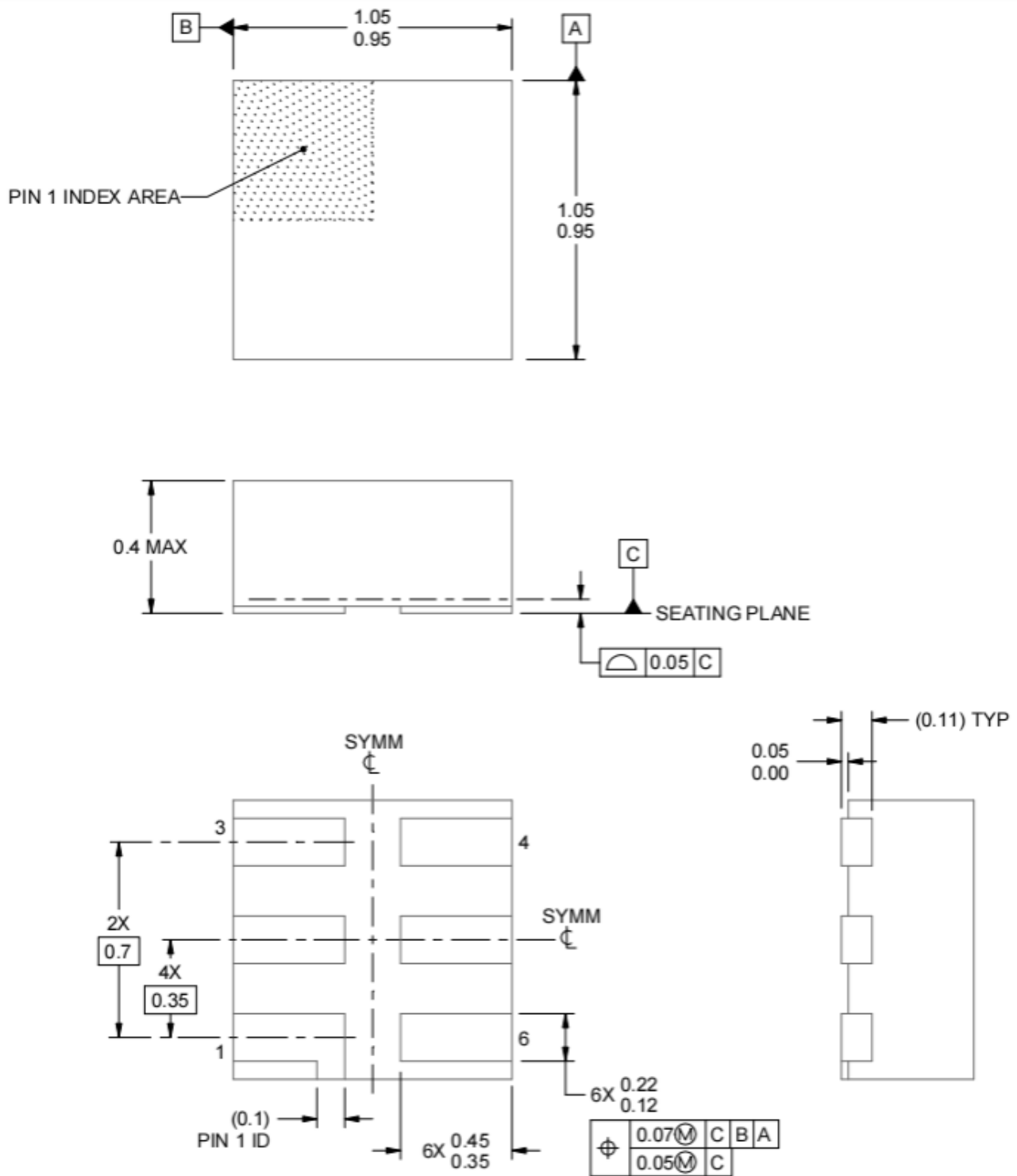
| Symbol   | Dim in mm |      |      |
|----------|-----------|------|------|
|          | MIN       | TYP  | MAX  |
| A        | 0.90      | 1.00 | 1.10 |
| A1       | 0.00      | 0.05 | 0.10 |
| A2       | 0.90      | 0.95 | 1.00 |
| b        | 0.15      | 0.25 | 0.35 |
| C        | 0.10      | 0.12 | 0.15 |
| D        | 1.80      | 2.00 | 2.20 |
| E        | 2.15      | 2.25 | 2.35 |
| E1       | 1.15      | 1.25 | 1.35 |
| e        | 0.650TYP. |      |      |
| e1       | 1.20      | 1.30 | 1.40 |
| L        | 0.25      | 0.30 | 0.40 |
| L2       | 0.15TYP.  |      |      |
| Y        | 0.00      | 0.05 | 0.10 |
| $\theta$ | 4°        | 8°   | 12°  |



ALTERNATIVE PACKAGE  
SINGULATION VIEW



## 7.5 DFN(CE)-6



[illegible]

## 7.7 DSBGA

