# ABB3009

## High Speed Translator Buffer to LVDS

### FEATURES

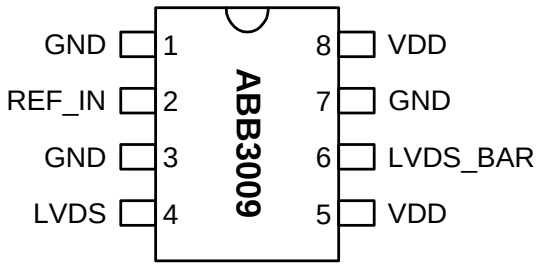
- Differential LVDS output
- Single AC coupled input (min. 100mV swing).
- Input range from DC to 1.0 GHz.
- 2.5V to 3.3V operation.
- Available in 8-Pin SOIC or 3x3mm QFN.

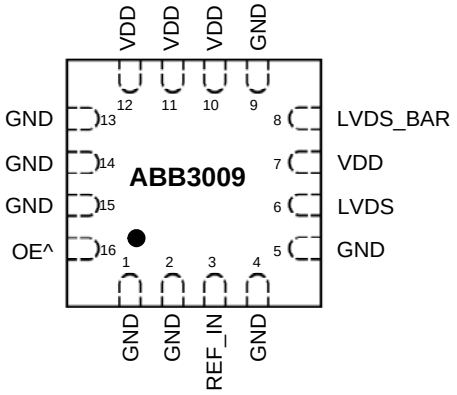
### DESCRIPTION

The ABB3009 is a low cost, high performance, high speed, buffer that reproduces any input frequency from DC to 1.0GHz. It provides a pair of differential LVDS output. Any input signal with at least 100mV swing can be used as reference signal. This chip is ideal for conversion from sine wave, TTL, CMOS, or PECL to LVDS.

### PIN CONFIGURATION

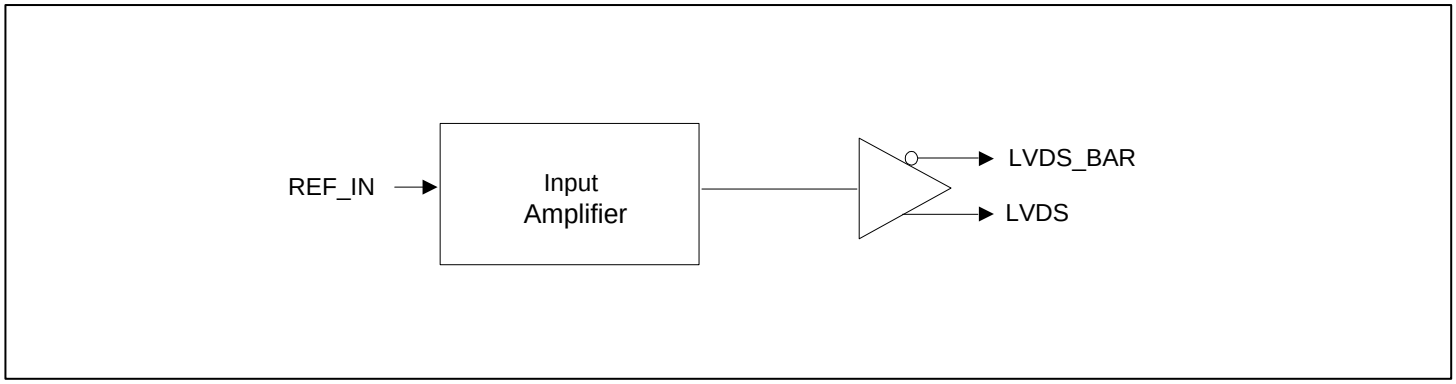
(TOP VIEW)




Note: ^ denotes internal pull up

### BLOCK DIAGRAM



## PIN DESCRIPTIONS

| Name | 8pin SOIC Pin number | 3x3mm QFN Pin number | Type | Description |
|---|---|---|---|---|
| GND | 1,3,7 | 1,2,4,5, 9,13,14,15 | P | Ground. |
| VDD | 5,8 | 7,10,11,12 | P | Power supply. |
| REF_IN | 2 | 3 | I | Reference input signal. The frequency of this signal will be reproduced at the output (after translation to LVDS level). |
| LVDS | 4 | 6 | O | LVDS True output. |
| LVDS_BAR | 7 | 8 | O | LVDS Complementary output. |
| OE | N/A | 16 | I | Output enable ('1' for enable). Internal pull-up (default is '1'). |

## ELECTRICAL SPECIFICATIONS

### 1. Absolute Maximum Ratings

| PARAMETERS | SYMBOL | MIN. | MAX. | UNITS |
|---|---|---|---|---|
| Supply Voltage | $V_{DD}$ | | 4.6 | V |
| Input Voltage, dc | $V_I$ | -0.5 | $V_{DD}$+0.5 | V |
| Output Voltage, dc | $V_O$ | -0.5 | $V_{DD}$+0.5 | V |
| Storage Temperature | $T_S$ | -65 | 150 | °C |
| Ambient Operating Temperature* | $T_A$ | -40 | 85 | °C |
| Junction Temperature | $T_J$ | | 125 | °C |
| Lead Temperature (soldering, 10s) | | | 260 | °C |
| ESD Protection, Human Body Model | | | 2 | kV |

Exposure of the device under conditions beyond the limits specified by Maximum Ratings for extended periods may cause permanent damage to the device and affect product reliability. These conditions represent a stress rating only, and functional operations of the device at these or any other conditions above the operational limits noted in this specification is not implied.

* Note: Operating Temperature is guaranteed by design for all parts (COMMERCIAL and INDUSTRIAL), but tested for COMMERCIAL grade only.

### 2. AC Specifications

| PARAMETERS | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|
| Input Frequency | | 0 | | 1000 | MHz |
| Input signal swing | REF_IN input | 100 | | | mV |
| Output Frequency | | 0 | | 1000 | MHz |

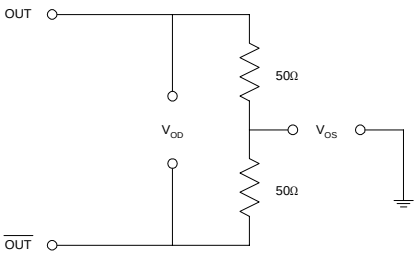
## 3. LVDS Electrical Characteristics

| PARAMETERS | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Output Differential Voltage | $V_{OD}$ | $R_L$ = 100 Ω (see figure) | 247 | 355 | 454 | mV |
| $V_{DD}$ Magnitude Change | $\Delta V_{OD}$ | | -50 | | 50 | mV |
| Output High Voltage | $V_{OH}$ | | | 1.4 | 1.6 | V |
| Output Low Voltage | $V_{OL}$ | | 0.9 | 1.1 | | V |
| Offset Voltage | $V_{OS}$ | | 1.125 | 1.2 | 1.375 | V |
| Offset Magnitude Change | $\Delta V_{OS}$ | | 0 | 3 | 25 | mV |
| Power-off Leakage | $I_{OXD}$ | $V_{out}$ = $V_{DD}$ or GND $V_{DD}$ = 0V | | ±1 | ±10 | uA |
| Output Short Circuit Current | $I_{OSD}$ | | | -5.7 | -8 | mA |

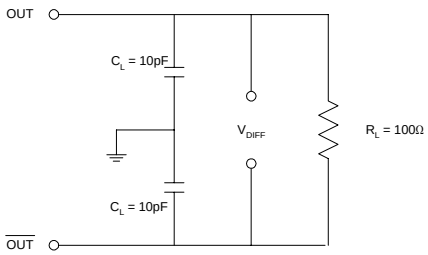
## 4. LVDS Switching Characteristics

| PARAMETERS | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Differential Clock Rise Time | $t_r$ | $R_L$ = 100 Ω $C_L$ = 10 pF (see figure) | 0.2 | 0.7 | 1.0 | ns |
| Differential Clock Fall Time | $t_f$ | | 0.2 | 0.7 | 1.0 | ns |

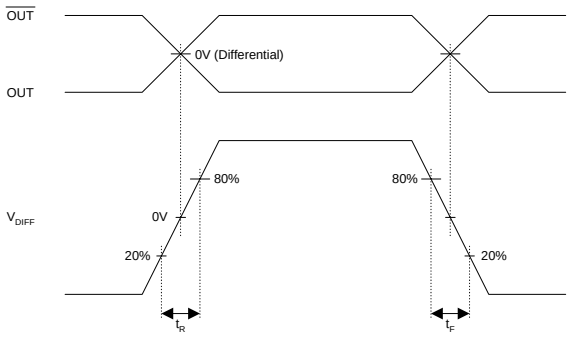
LVDS Levels Test Circuit




LVDS Switching Test Circuit



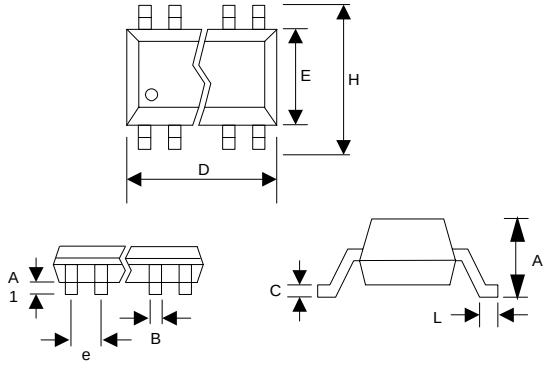

LVDS Transistion Time Waveform



## PACKAGE INFORMATION

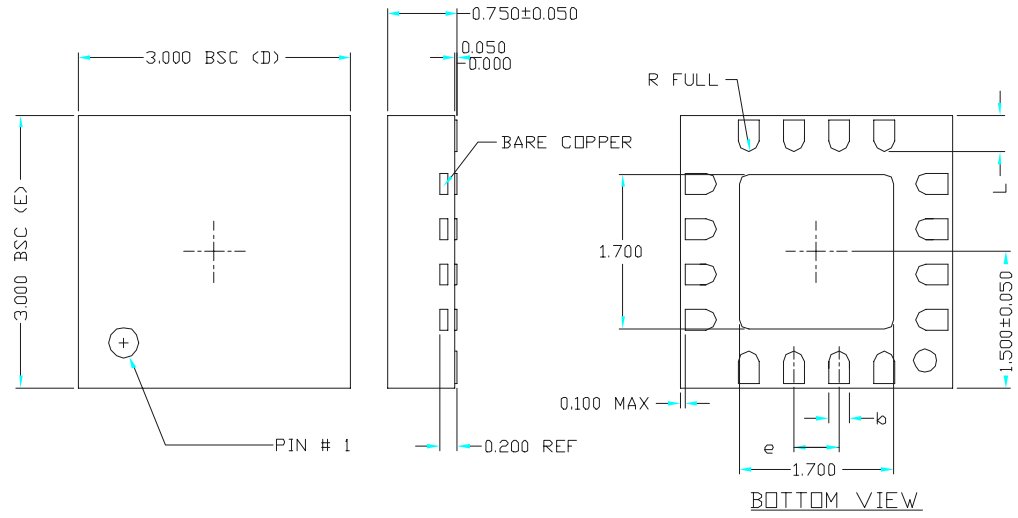
8 PIN ( dimensions in mm )

| | Narrow SOIC | |
|---|---|---|
| Symbol | Min. | Max. |
| A | 1.47 | 1.73 |
| A1 | 0.10 | 0.25 |
| B | 0.33 | 0.51 |
| C | 0.19 | 0.25 |
| D | 4.80 | 4.95 |
| E | 3.80 | 4.00 |
| H | 5.80 | 6.20 |
| L | 0.38 | 1.27 |
| e | 1.27 BSC | |




VARIATIONS:

| SYMBOL | 16 LD | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| e | 0.50 BSC | | |
| b | 0.18 | 0.23 | 0.30 |
| L | 0.30 | 0.40 | 0.50 |
| ND | 4 | | |
| NE | 4 | | |



## ORDERING INFORMATION

*For part ordering, please contact our Sales Department:*

30332 Esperanza., Rancho Santa Margarita, Ca 92688
Ph: 949-546-8000 Fax: 949-546-8001

*PART NUMBER*

The order number for this device is a combination of the following:
Device number, Package type and Operating temperature range

ABB3009 S C

*PART NUMBER*

TEMPERATURE
C=COMMERCIAL
I=INDUSTRAL

PACKAGE TYPE
S=SOIC; Q=QFN

| Order Number | Marking | Package Option |
|---|---|---|
| ABB3009QC-T | A3009QC | QFN - Tape and Reel |
| ABB3009QC | A3009QC | QFN - Tube |
| ABB3009SC-T | ABB3009SC | SOIC -Tape and Reel |
| ABB3009SC | ABB3009SC | SOIC - Tube |