

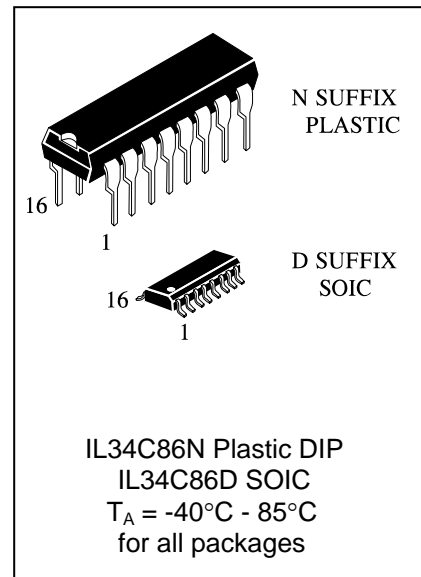
## Differential line receiver

**IL34C86**

Microcircuit IL34C86 consists of four differential line receivers and is a microcircuit that meets international standards of data transmission RS-422, RS-423, and it is widely used in data transmission nets, particularly in a unit for local loop of ATS.

### Functions implemented

This device carries out comparing inputs with low differential signal of 200mV and gives on output full signal with load carrying capacity of  $\pm 6\text{mA}$ , and also has hysteresis to improve noise margin.



### Truth table

| Enable | input                             | output |
|--------|-----------------------------------|--------|
| L      | X                                 | Z      |
| H      | $V_{ID} \geq V_{TH} (\text{max})$ | H      |
| H      | $V_{ID} \leq V_{TH} (\text{max})$ | L      |
| H      | Open*                             | H      |

$V_{ID}$  – difference of inputs A2-A1, or B2-B1, or C2-C1, or D2-D1.

$V_{TH}$  – minimum differential input voltage.

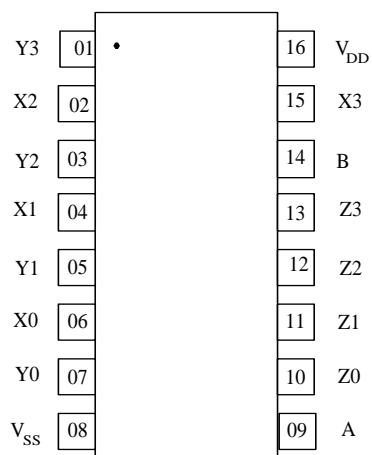
Open\* – no signals delivered to inputs.

### Pin Definitions and Functions

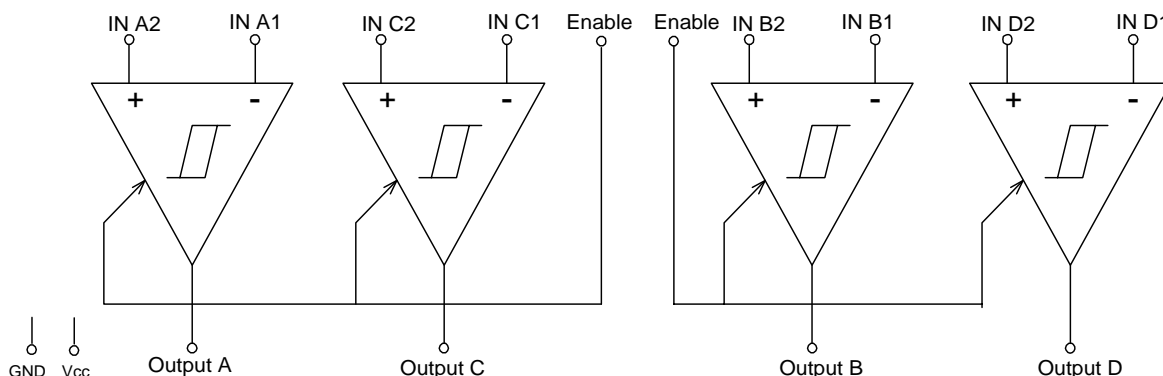
| Pin | Symbol          | Functions  |
|-----|-----------------|--|
| 01  | A1              | Input of receiver A  |
| 02  | A2              | Input of receiver A  |
| 03  | A               | Output of receiver A   |
| 04  | En A/C          | input of switching outputs of A and C receivers into the third state |
| 05  | C               | Output of receiver C   |
| 06  | C2              | 2 Input of receiver C  |
| 07  | C1              | 1 Input of receiver C  |
| 08  | GND             | General pin  |
| 09  | D1              | 1 Input of receiver D.   |
| 10  | D2              | 2 Input of receiver D.   |
| 11  | D               | Output of receiver D.  |
| 12  | En B/D          | input of switching outputs of B and D receivers into the third state |
| 13  | B               | Output of receiver B.  |
| 14  | B2              | 2 Input of receiver C  |
| 15  | B1              | 1 Input of receiver C  |
| 16  | V <sub>DD</sub> | Pin of power supply from source of voltage                           |

L – Low voltage level  
 H – High voltage level  
 X – any level of voltage  
 Z – the third state of output .

### Pin Configuration



Block Diagram



Limiting and extreme parameters

Table 1

| Parameter  | Symbol     | Limiting mode |      | Extreme mode |       | Unit |
|--|------------|---------------|------|--------------|-------|------|
|  |            | min           | max  | min          | max   |      |
| Supply voltage   | $V_{DD}$   | 4.50          | 5.50 | —            | 7     | V    |
| Input voltage  | $V_{CM}$   | —             | —    | -14          | 14    |      |
| differential input voltage                                       | $V_{DIFF}$ | —             | —    | -14          | 14    |      |
| Voltage on input Enable  | $V_{IN}$   | —             | —    | —            | 7     |      |
| Output current   | —          | —             | —    | -25          | +25   | mA   |
| transition time when switching in, switching off on input Enable | $t_r, t_f$ | —             | 500  | —            | —     | ns   |
| Dissipated power   | DIP        | —             | —    | —            | 1645* | mW   |
|  | SO         | —             | —    | —            | 1190* |      |
| Operation temperature  | $T_A$      | -40           | +85  | —            | —     | °C   |
| Storage temperature  | $T_{STG}$  | —             | —    | -65          | +150  |      |
| Temperature of soldering, 4s                                     | $T_L$      | —             | —    | —            | 260   |      |

\* - at increasing temperature higher than 25°C  $P_D$  decreased on 13.89mW/°C for DIP package and on 9.80mW/°C for SO package.

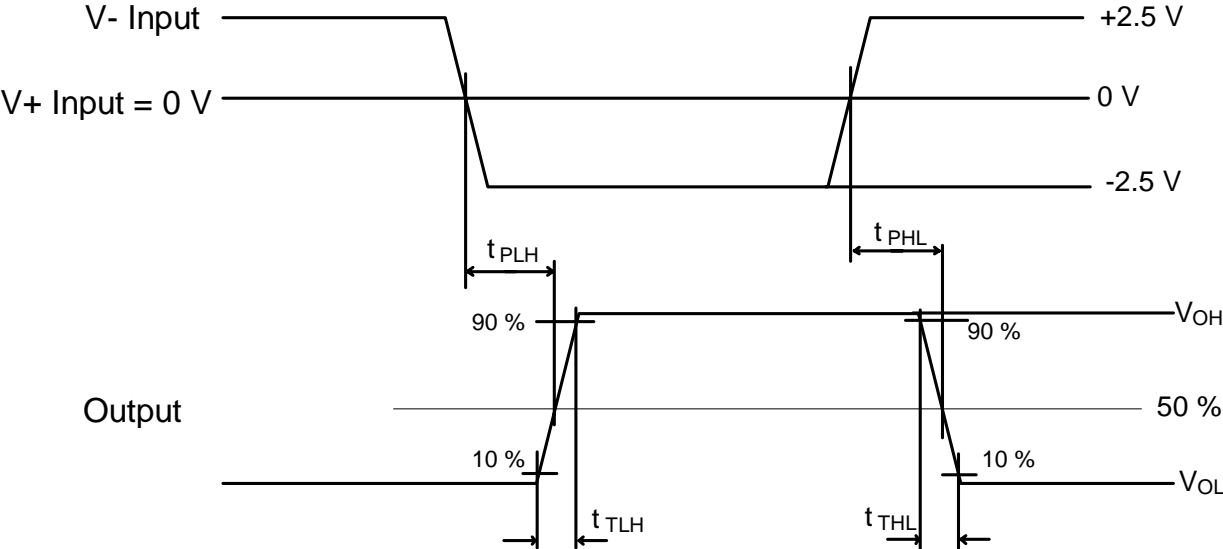
## Electrical Characteristics

Table 2

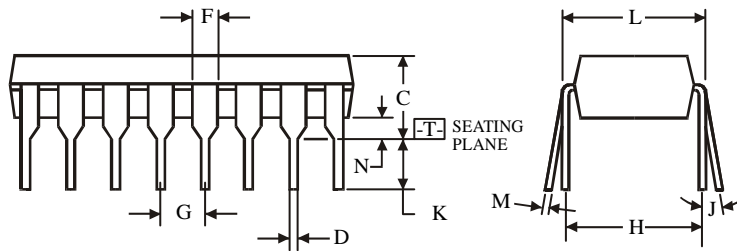
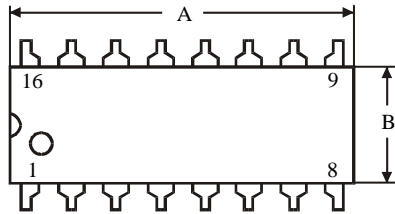
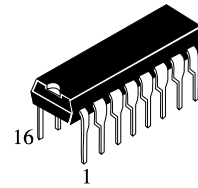
T = -40° ÷ +85°C

| Parameter   | Symbol               | Test Conditions  | Values |           | Unit    |
|---|----------------------|--|--------|-----------|---------|
|   |                      |  | min    | max.      |         |
| Minimum differential input voltage                        | $V_{TH}$             | $-7V < V_{Cm} < +7V$   | -200   | 200       | mV      |
| input resistance  | $R_{IN}$             | $V_{IN} = -7V, +7V$ (the rest inputs on "ground")  | 5.0    | 10        | kOhm    |
| input current   | $I_{IN}$             | $V_{IN} = -10V$ (the rest inputs on "ground")<br>$V_{IN} = +10V$ (the rest inputs on "ground") | —      | +1.5      | mA      |
|   |                      |  | —      | -2.5      |         |
| minimum output voltage of high level                      | $V_{OH}$             | $V_{DD} = 4.5V, V_{DIFF} = +1V, I_{OUT} = -6.0mA$  | 3.8    | —         | V       |
| maximum output voltage of low level                       | $V_{OL}$             | $V_{DD} = 5.5V, V_{DIFF} = -1V, I_{OUT} = +6.0mA$  | —      | 0.3       |         |
| minimum input voltage of high level on input Enable       | $V_{IH}$             | —  | 2.0    | —         | V       |
| maximum input voltage of low level on input Enable        | $V_{IL}$             | —  | —      | 0.8       |         |
| maximum output current of the third state                 | $I_{OZ}$             | $V_{OUT} = V_{DD}$ or $0V$   | —      | $\pm 0.5$ | $\mu A$ |
| maximum input current on input Enable                     | $I_I$                | $V_{IN} = V_{DD}$ or $0V$  | —      | $\pm 1.0$ | $\mu A$ |
| consumption current                                       | $I_{CC}$             | $V_{DD} = 5.5V, V_{DIFF} = +1V$  | —      | 23        | mA      |
| time of propagation delay at switching off, switching on  | $t_{PLH}, t_{PHL}$   | $C_L = 50pF, V_{DIFF} = 2.5V, V_{Cm} = 0V$   | —      | 30        | ns      |
| Transition time when switching in, switching off          | $t_{RISE}, t_{FALL}$ | $C_L = 50pF, V_{DIFF} = 2.5V, V_{Cm} = 0V$   | —      | 9         |         |
| time of the third state propagation delay on input Enable | $t_{PZL}, t_{PHZ}$   | $C_L = 50pF, V_{DIFF} = 2.5V, R_L = 1000kOhm$  | —      | 18        |         |
| time of the third state propagation delay on input Enable | $t_{PZL}, t_{PZH}$   | $C_L = 50pF, V_{DIFF} = 2.5V, R_L = 1000kOhm$  | —      | 21        |         |

**Time diagram  
of signals at changing dynamic parameters**  
 $t_{PLH}$ ,  $t_{PHL}$ ,  $t_{TLH}$ ,  $t_{THL}$ ,  $t_{PZH}$ ,  $t_{PHZ}$ ,  $t_{PZL}$ ,  $t_{PLZ}$



**N SUFFIX PLASTIC DIP  
(MS - 001BB)**



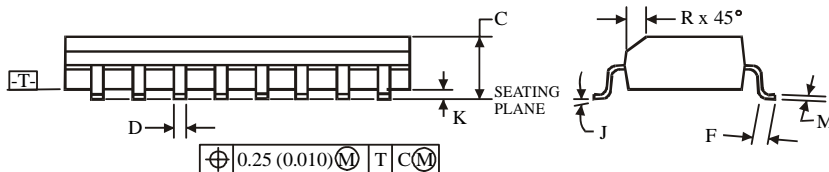
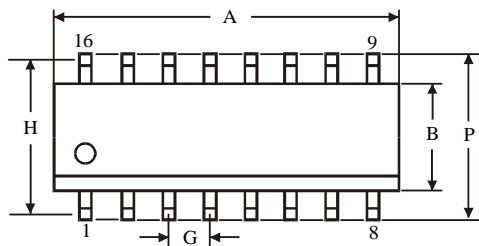
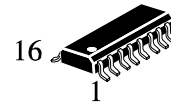
$\oplus 0.25 (0.010) \text{ (M) } \text{ T}$

**NOTES:**

- Dimensions "A", "B" do not include mold flash or protrusions.  
Maximum mold flash or protrusions 0.25 mm (0.010) per side.

| Dimension, mm |       |       |
|---------------|-------|-------|
| Symbol        | MIN   | MAX   |
| A             | 18.67 | 19.69 |
| B             | 6.1   | 7.11  |
| C             |       | 5.33  |
| D             | 0.36  | 0.56  |
| F             | 1.14  | 1.78  |
| G             | 2.54  |       |
| H             | 7.62  |       |
| J             | 0°    | 10°   |
| K             | 2.92  | 3.81  |
| L             | 7.62  | 8.26  |
| M             | 0.2   | 0.36  |
| N             | 0.38  |       |

**D SUFFIX SOIC  
(MS - 012AC)**



$\oplus 0.25 (0.010) \text{ (M) } \text{ T } \text{ (CM)}$

**NOTES:**

- Dimensions A and B do not include mold flash or protrusion.
- Maximum mold flash or protrusion 0.15 mm (0.006) per side for A; for B - 0.25 mm (0.010) per side.

| Dimension, mm |      |      |
|---------------|------|------|
| Symbol        | MIN  | MAX  |
| A             | 9.8  | 10   |
| B             | 3.8  | 4    |
| C             | 1.35 | 1.75 |
| D             | 0.33 | 0.51 |
| F             | 0.4  | 1.27 |
| G             | 1.27 |      |
| H             | 5.72 |      |
| J             | 0°   | 8°   |
| K             | 0.1  | 0.25 |
| M             | 0.19 | 0.25 |
| P             | 5.8  | 6.2  |
| R             | 0.25 | 0.5  |