# Differential line receiver

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.

N SUFFIX
PLASTIC

16

1

D SUFFIX
SOIC

16

1

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 $\pm$ 6mA, and also has hysteresis to improve noise margin.

IL34C86N Plastic DIP
IL34C86D SOIC
T_A = -40°C - 85°C
for all packages
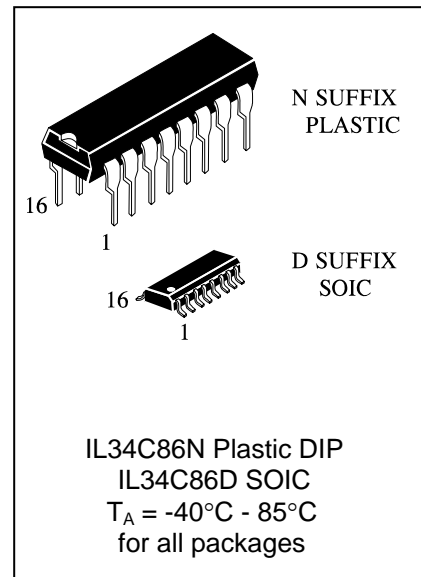
Truth table

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

V_{ID} – difference of inputs A2-A1, or B2-B1, or C2-C1, or D2-D1.
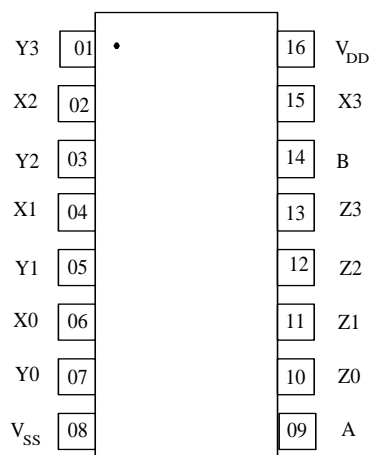V_{TH} – minimum differential input voltage.
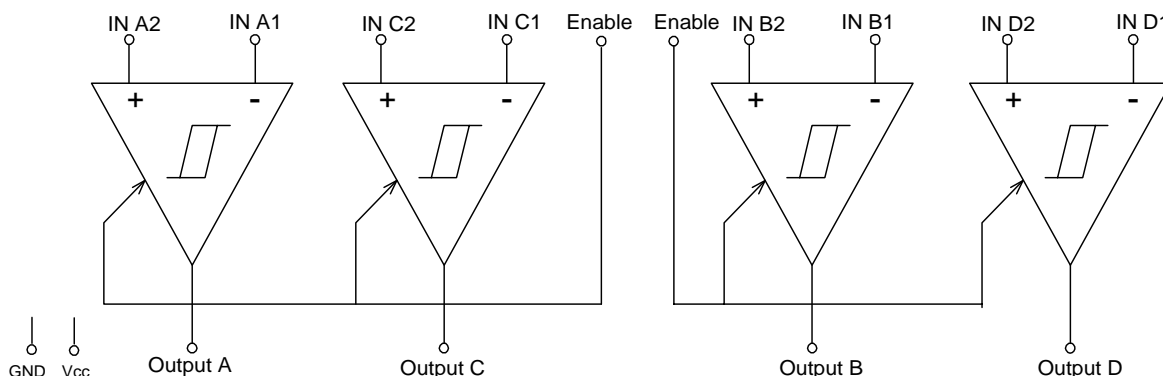Open[*] – no signals delivered to inputs.

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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$_{DD}$	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

Y3	01	•	16	V$_{DD}$
X2	02		15	X3
Y2	03		14	B
X1	04		13	Z3
Y1	05		12	Z2
X0	06		11	Z1
Y0	07		10	Z0
V$_{SS}$	08		09	A

Block Diagram

Limiting and extreme parameters

Table 1

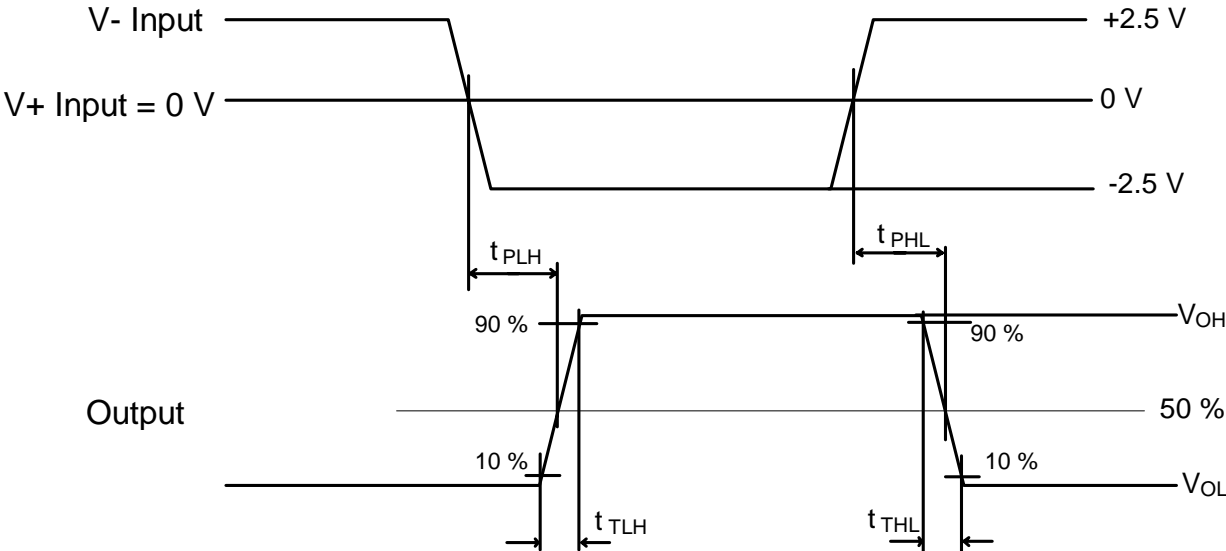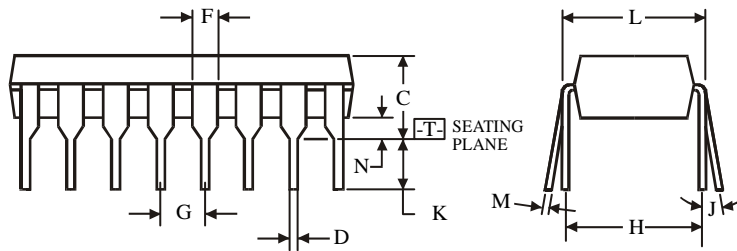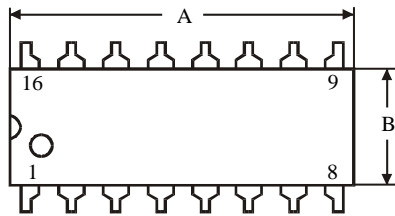| Parameter	Symbol	Limiting mode		Extreme mode		Unit
		min	max	min	max	
Supply voltage	V_{DD}	4.50	5.50	—	7	V
Input voltage	V_{CM}	—	—	-14	14	
differential input voltage	V_{DIFF}	—	—	-14	14	
Voltage on input Enable	V_{IN}	—	—	—	7	
Output current	—	—	—	-25	+25	mA
transition time when switching in, switching off on input Enable	t_r, t_f	—	500	—	—	ns
Dissapated DIP power	P_D	—	—	—	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= -40^0 ÷ +85^{0}C

Parameter	Symbol	Test Conditions	Values min	Values max.	Unit
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") 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} = -6.0hmÀ	3.8	—	V
maximum output voltage of low level	V_{OL}	V_{DD} = 5.5V, V_{DIFF} = -1V, I_{OUT} = +6.0hmÀ	—	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	—	±0.5	µA
maximum input current on input Enable	I_I	V_{IN} = V_{DD} or 0V	—	±1.0	µA
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_{PLZ}, 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}

V- Input — +2.5 V

V+ Input = 0 V — 0 V

-2.5 V

t_{PLH} t_{PHL}

90 % V_{OH} 90 %

Output 50 %

10 % V_{OL} 10 %

t_{TLH} t_{THL}

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N SUFFIX PLASTIC DIP
(MS - 001BB)

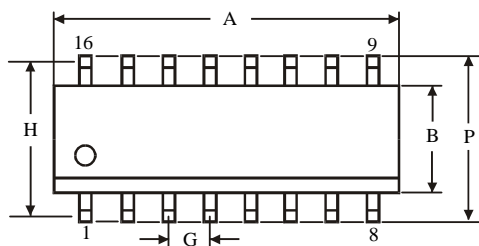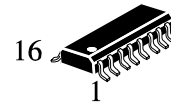|	Dimension, mm	
Symbol	**MIN**	**MAX**
A	18.67	19.69
B	6.1	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	
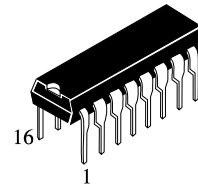
⊕ 0.25 (0.010) Ⓜ T

NOTES:

1. Dimensions "A", "B" do not include mold flash or protrusions.

   Maximum mold flash or protrusions 0.25 mm (0.010) per side.

D SUFFIX SOIC
(MS - 012AC)

	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
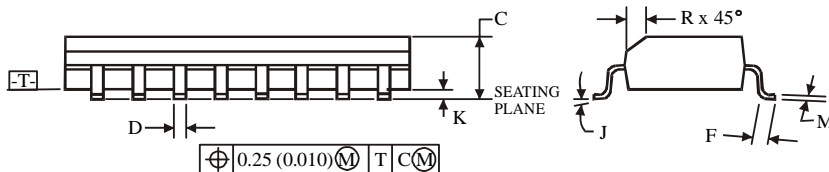
⊕ 0.25 (0.010) Ⓜ T CⓂ

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.

2. Maximum mold flash or protrusion 0.15 mm (0.006) per side
   for A; for B – 0.25 mm (0.010) per side.

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