

74HC86 Quadruple 2-input XOR gates

1. General Description

1.1 Description

This device contains four independent dual input XOR gates. Each gate performs the Boolean function $Y = A \oplus B$ in positive logic.

1.2 Features

- Buffered Inputs
- Wide operating voltage range $V_{CC}=2V$ to $6V$
- Wide operating temperature range of $0^{\circ}C$ to $70^{\circ}C$

- Supports fanout up to 10 LSTTL loads
- Can significantly reduce power consumption compared to LSTTL logic ICs.

1.3 Device Information

PART NUMBER	PACKAGE
74HC86	DIP
	SOP
	TSSOP

2. Connection Diagrams and Pin Description

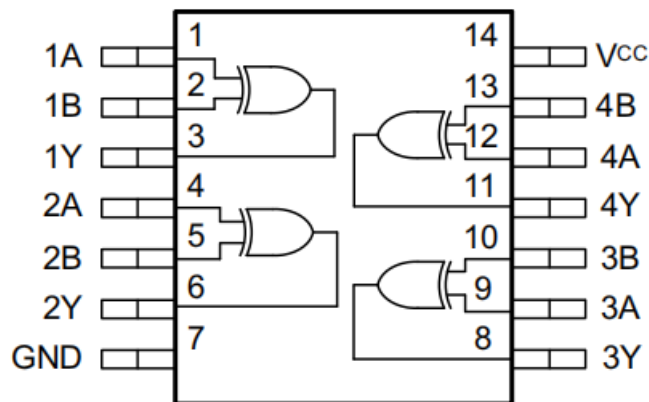


Figure 2.1 Top View



NAME	PIN	I/O	DESCRIPTION
1A	1	Input	Channel 1, Input A
1B	2	Input	Channel 1, Input B
1Y	3	Output	Channel 1,Output Y
2A	4	Input	Channel 2,Input A
2B	5	Input	Channel 2, Input B
2Y	6	Output	Channel 2,Output Y
GND	7	-	Ground
3Y	8	Output	Channel 3,Output Y
3A	9	Input	Channel 3, Input A
3B	10	Input	Channel 3, Input B
4Y	11	Output	Channel 4,Output Y
4A	12	Input	Channel 4, Input A
4B	13	Input	Channel 4, Input B
Vcc	14	-	Positive Supply

3. System Diagram

3.1 Logic Diagram

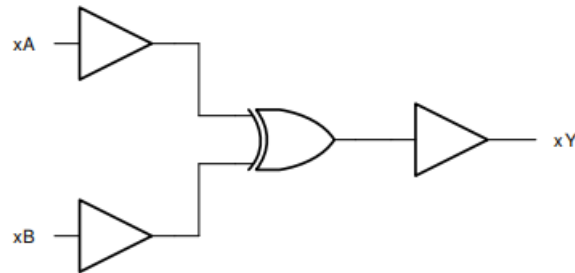


Figure 3.1: 74HC86 Logic Diagram

3.2 Function Table

Inputs		Output
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

1≡High State, 0≡Low State.

4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
V _{CC}	Supply Voltage	-0.5	7	V
P _D	Power Dissipation		500	mW
T _J	Junction Temperature		125	°C
T _{OP}	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 Recommended Operating Conditions.



4.2 Recommended Operating Conditions

Symbol	Parameter	Test Condition	MIN	NOM	MAX	Unit
V_{CC}	Supply Voltage		2	5	6	V
V_{IH}	High Level Input Voltage	$V_{CC}=2V$	1.5			V
		$V_{CC}=4.5V$	3.15			V
		$V_{CC}=6V$	4.2			V
V_{IL}	Low Level Input Voltage	$V_{CC}=2V$			0.5	V
		$V_{CC}=4.5V$			1.35	V
		$V_{CC}=6V$			1.8	V
V_I	Input voltage		0		V_{CC}	V

4.3 Electrical Characteristics

($T_a=25^{\circ}C$, voltages are referenced to GND (ground=0V), unless otherwise specified)

Symbol	Parameter	Test Condition	MIN	TYP	MAX	Unit
V_{OH}	High Level Output Voltage	$V_{CC}=2V, I_o=-20\mu A$	1.9	--	--	V
		$V_{CC}=4.5V, I_o=-20\mu A$	4.4	--	--	V
		$V_{CC}=6V, I_o=-20\mu A$	5.9	--	--	V
		$V_{CC}=4.5V, I_o=-4mA$	4.0	--	--	V
		$V_{CC}=6V, I_o=-5.2mA$	5.5	--	--	V
V_{OL}	Low Level Output Voltage	$V_{CC}=2V, I_o=20\mu A$	--	--	0.1	V
		$V_{CC}=4.5V, I_o=20\mu A$	--	--	0.1	V
		$V_{CC}=6V, I_o=20\mu A$	--	--	0.1	V
		$V_{CC}=4.5V, I_o=4mA$	--	--	0.26	V
		$V_{CC}=6V, I_o=5.2mA$	--	--	0.26	V
I_I	Input Leakage Current	$V_{CC}=6V, V_I=V_{CC}$ or GND	--	--	± 1	μA
I_{CC}	Quiescent Supply Current	$V_{CC}=6V, V_I=V_{CC}/GND$	--	--	10	μA

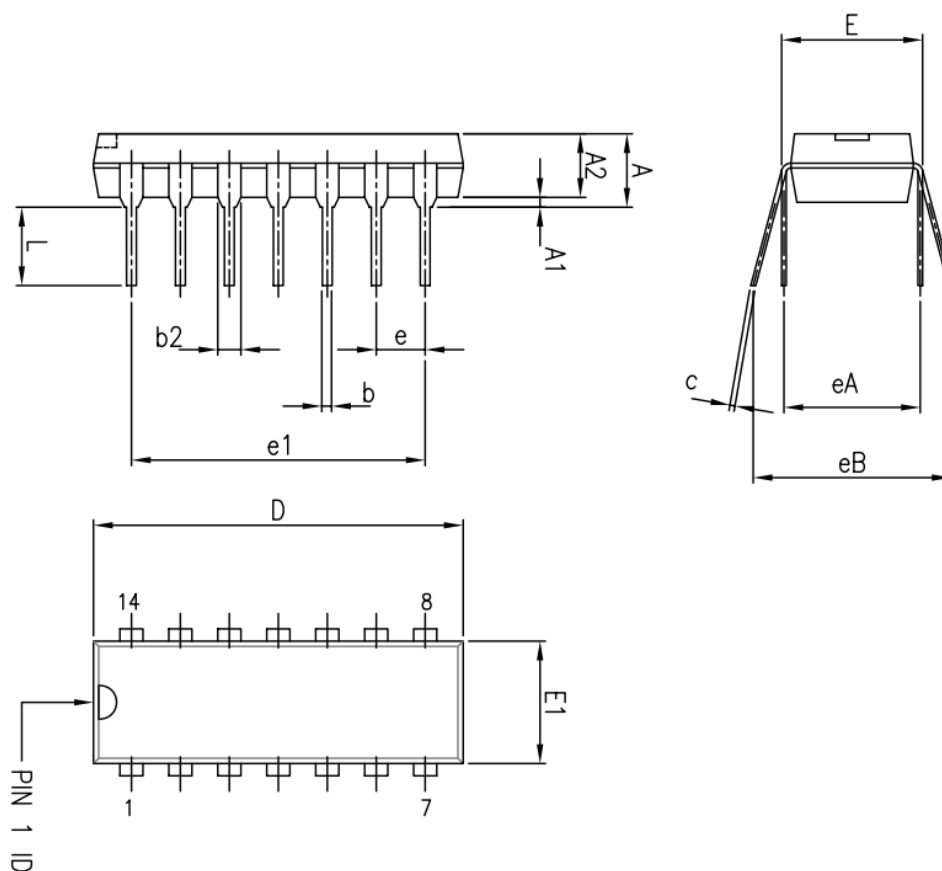


5. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
74HC86ND14ATBE	DIP	14	Tube	25
74HC86NS14ARDQ	SOP	14	Tape & Reel	4000
74HC86TS14ARBQ	TSSOP	14	Tape & Reel	2000

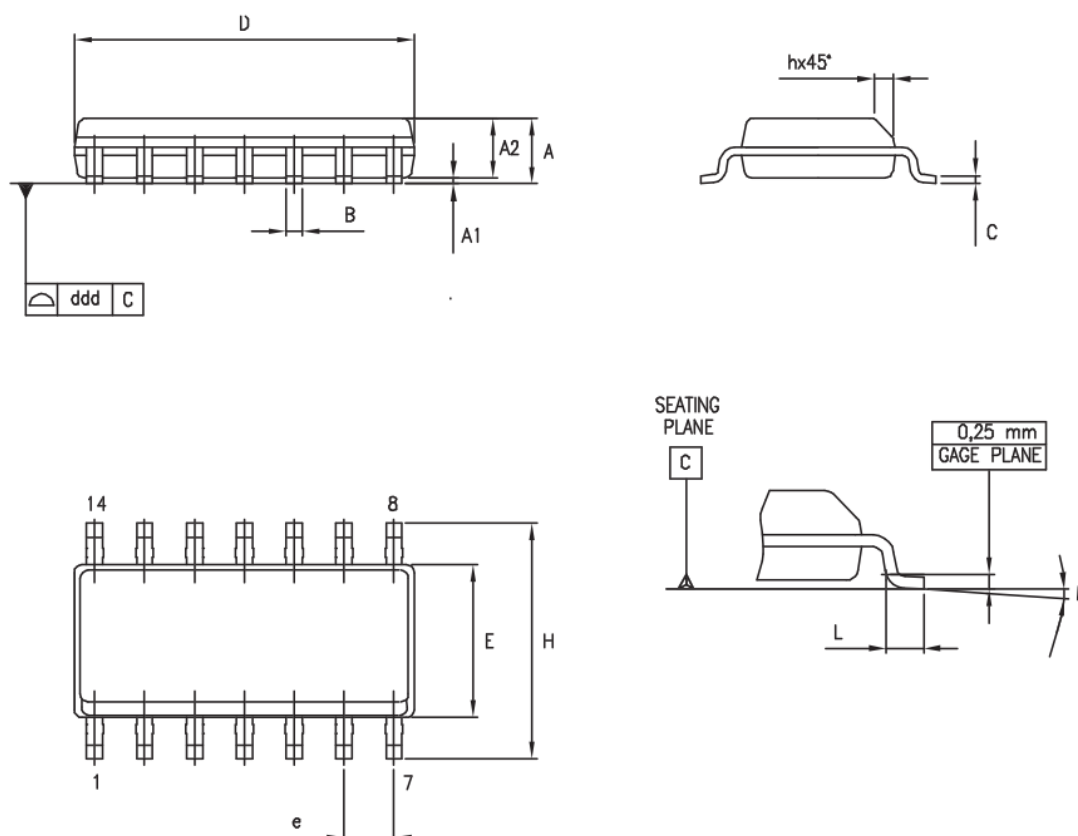
6. Package Information

6.1 DIP14



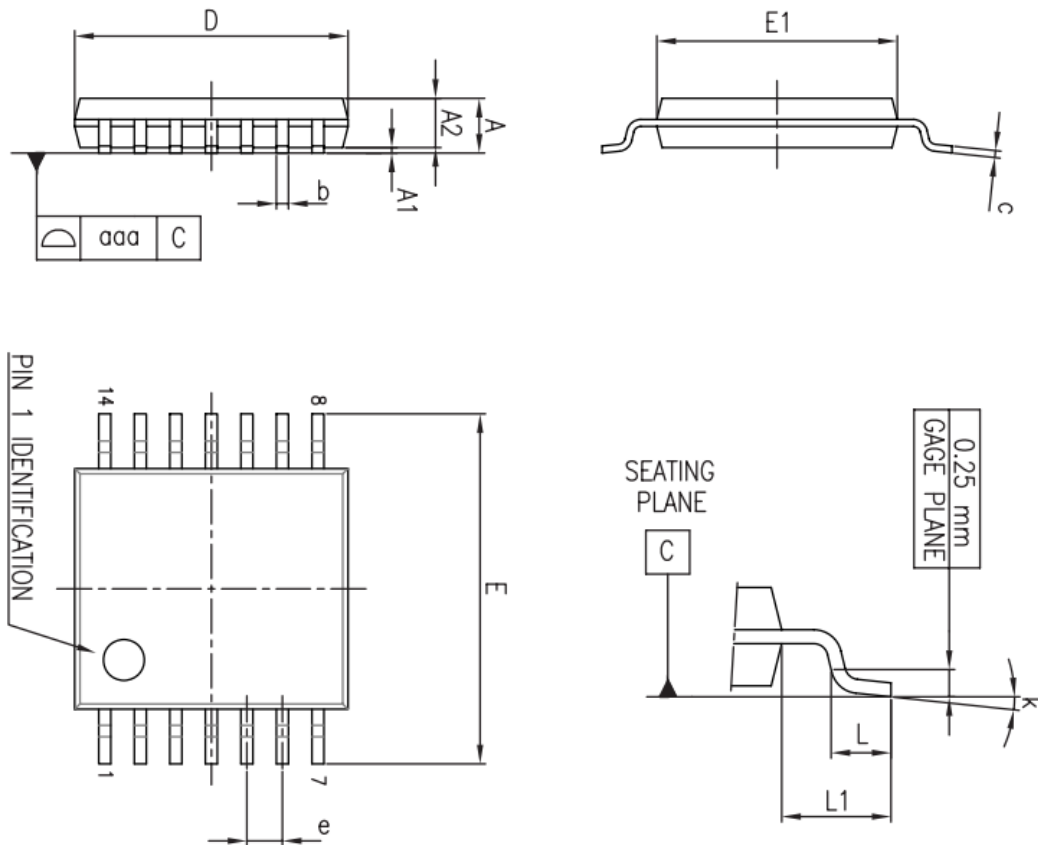
Dimensions						
Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.33			0.21
A1	0.38			0.015		
A2	2.92	3.30	4.95	0.11	0.13	0.19
b	0.36	0.46	0.56	0.014	0.018	0.022
b2	1.14	1.52	1.78	0.04	0.06	0.07
c	0.20	0.25	0.36	0.007	0.009	0.01
D	18.67	19.05	19.69	0.73	0.75	0.77
E	7.62	7.87	8.26	0.30	0.31	0.32
E1	6.10	6.35	7.11	0.24	0.25	0.28
e		2.54			0.10	
e1		15.24			0.60	
eA		7.62			0.30	
eB			10.92			0.43
L	2.92	3.30	3.81	0.11	0.13	0.15

6.2 SOP14



Dimensions						
Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35		1.75	0.05		0.068
A1	0.10		0.25	0.004		0.009
A2	1.10		1.65	0.04		0.06
B	0.33		0.51	0.01		0.02
C	0.19		0.25	0.007		0.009
D	8.55		8.75	0.33		0.34
E	3.80		4.0	0.15		0.15
e		1.27			0.05	
H	5.80		6.20	0.22		0.24
h	0.25		0.50	0.009		0.02
L	0.40		1.27	0.015		0.05
k	8° (max.)					
ddd			0.10			0.004

6.3 TSSOP14



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.20			0.047
A1	0.05		0.15	0.002	0.004	0.006
A2	0.80	1.00	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	4.90	5.00	5.10	0.193	0.197	0.201
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.169	0.173	0.176
e		0.65			0.0256	
L	0.45	0.60	0.75	0.018	0.024	0.030
L1		1.00			0.039	
k	0°		8°	0°		8°
aaa			0.10			0.004