

# 74HC125 Quadruple Buffers with 3-State Outputs

## 1. General Description

### 1.1 Description

This device contains four independent buffers with 3-state outputs. Each gate performs the Boolean function  $Y=A$  in positive logic.

### 1.2 Features

- Buffered inputs
- Wide operating voltage range of 2V to 6V

- Wide operating temperature of  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$

### 1.3 Device Information

PART NUMBER	PACKAGE
74HC125	DIP
	SOP
	SSOP
	TSSOP

## 2. Connection Diagrams and Pin Description

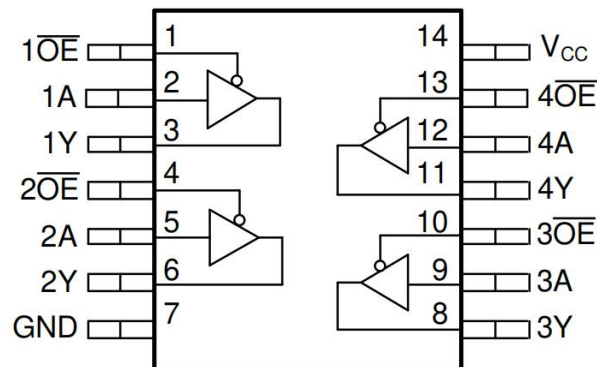


Figure 2.1 Top View

PIN No.	NAME	I/O	FUNCTION
1	$\overline{1OE}$	I	Channel 1, Output Enable, Active Low
2	1A	I	Channel 1, Input A
3	1Y	O	Channel 1, Output Y
4	$\overline{2OE}$	I	Channel 2, Output Enable, Active Low
5	2A	I	Channel 2, Input A
6	2Y	O	Channel 2, Output Y
7	GND		Ground
8	3Y	O	Channel 3, Output Y
9	3A	I	Channel 3, Input A
10	$\overline{3OE}$	I	Channel 3, Output Enable, Active Low
11	4Y	O	Channel 4, Output Y
12	4A	I	Channel 4, Input A
13	$\overline{4OE}$	I	Channel 4, Output Enable, Active Low
14	VCC		Supply Voltage

### 3. System Diagram

#### 3.1 Logic Diagram

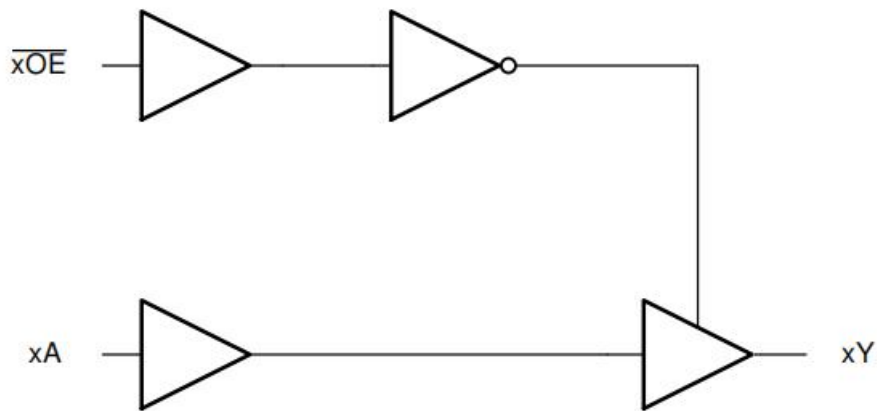


Figure 3.1: 74HC125 Logic Diagram

#### 3.2 Function Table

INPUT		OUTPUT
$\overline{OE}$	A	Y
0	1	1
0	0	0
1	X	Z

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
$V_{CC}$	Supply Voltage	-0.5	7	V
$P_D$	Power Dissipation		500	mW
$T_J$	Junction Temperature		125	°C
$T_{OP}$	Operating Temperature	-40	85	°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 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
		$V_{CC}=4.5V, I_o=-6mA$	4.0	--	--	V
		$V_{CC}=6V, I_o=-7.8mA$	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
		$V_{CC}=4.5V, I_o=6mA$	--	--	0.26	V
		$V_{CC}=6V, I_o=7.8mA$	--	--	0.26	V
$I_I$	Input Leakage Current	$V_{CC}=6V, V_I=V_{CC}$ or GND	--	0	$\pm 1$	$\mu A$
$I_{OZ}$	High Impedance Output Leakage Current	$V_{CC}=6V, V_O=V_{CC}$ or GND	--	--	$\pm 2$	$\mu A$
$I_{CC}$	Quiescent Supply Current	$V_{CC}=6V, V_I=V_{CC}/GND$	--	0	10	$\mu A$

## 5. Application Information

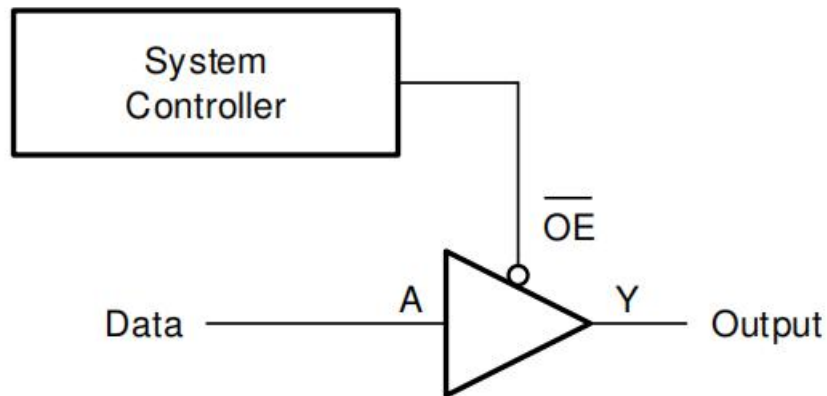


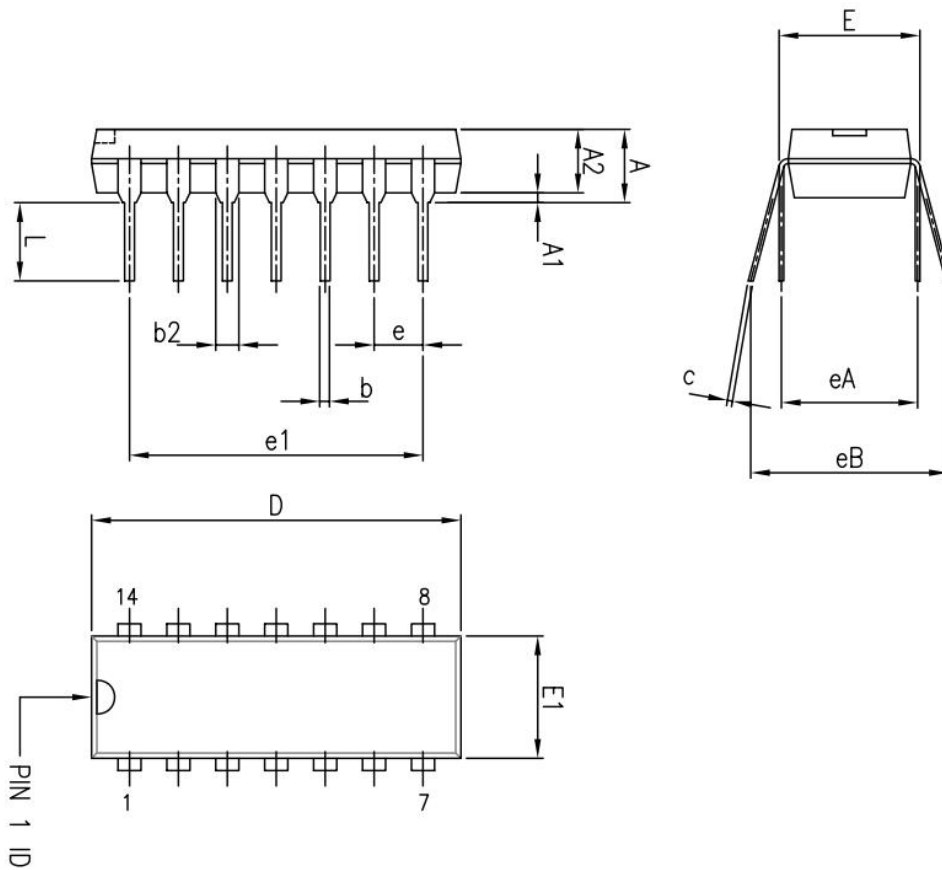
Figure 5.1: Typical application schematic

## 6. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
74HC125ND14ATBE	DIP	14	Tube	25
74HC125NS14ARDQ	SOP	14	Tape & Reel	4000
74HC125SS14ARBQ	SSOP	14	Tape & Reel	2000
74HC125TS14ARDQ	TSSOP	14	Tape & Reel	4000

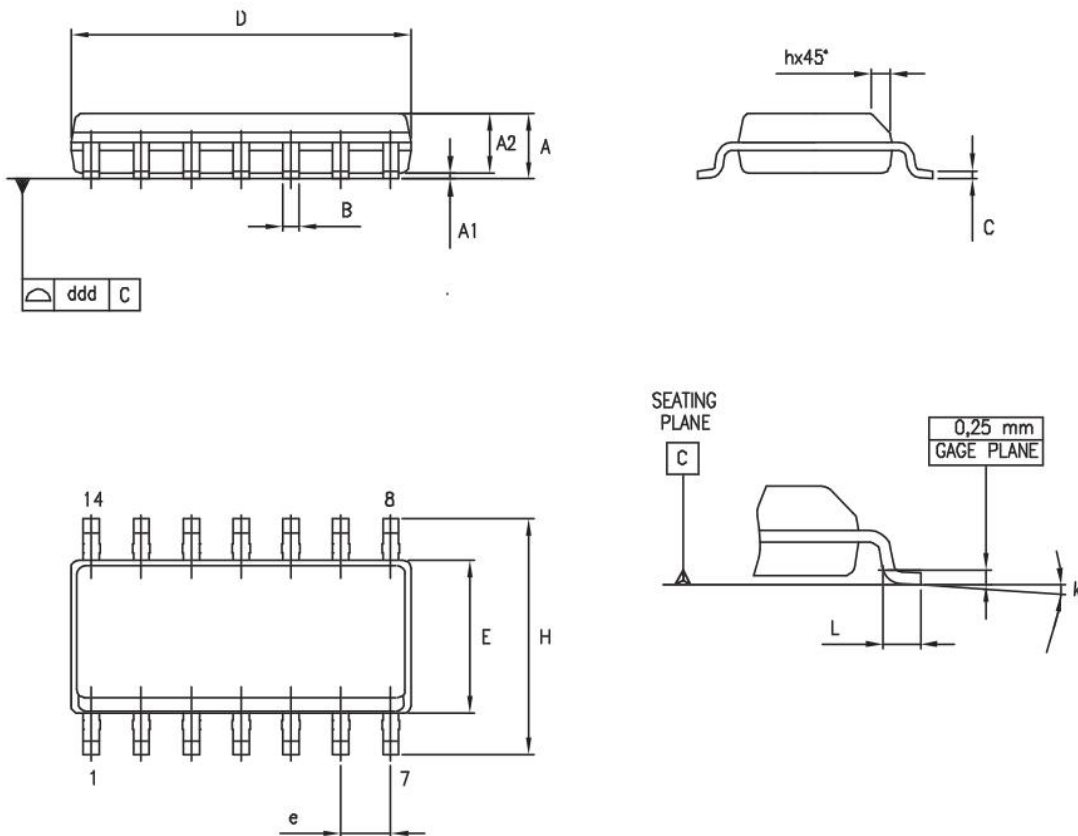
## 7. Package Information

### 7.1 DIP14



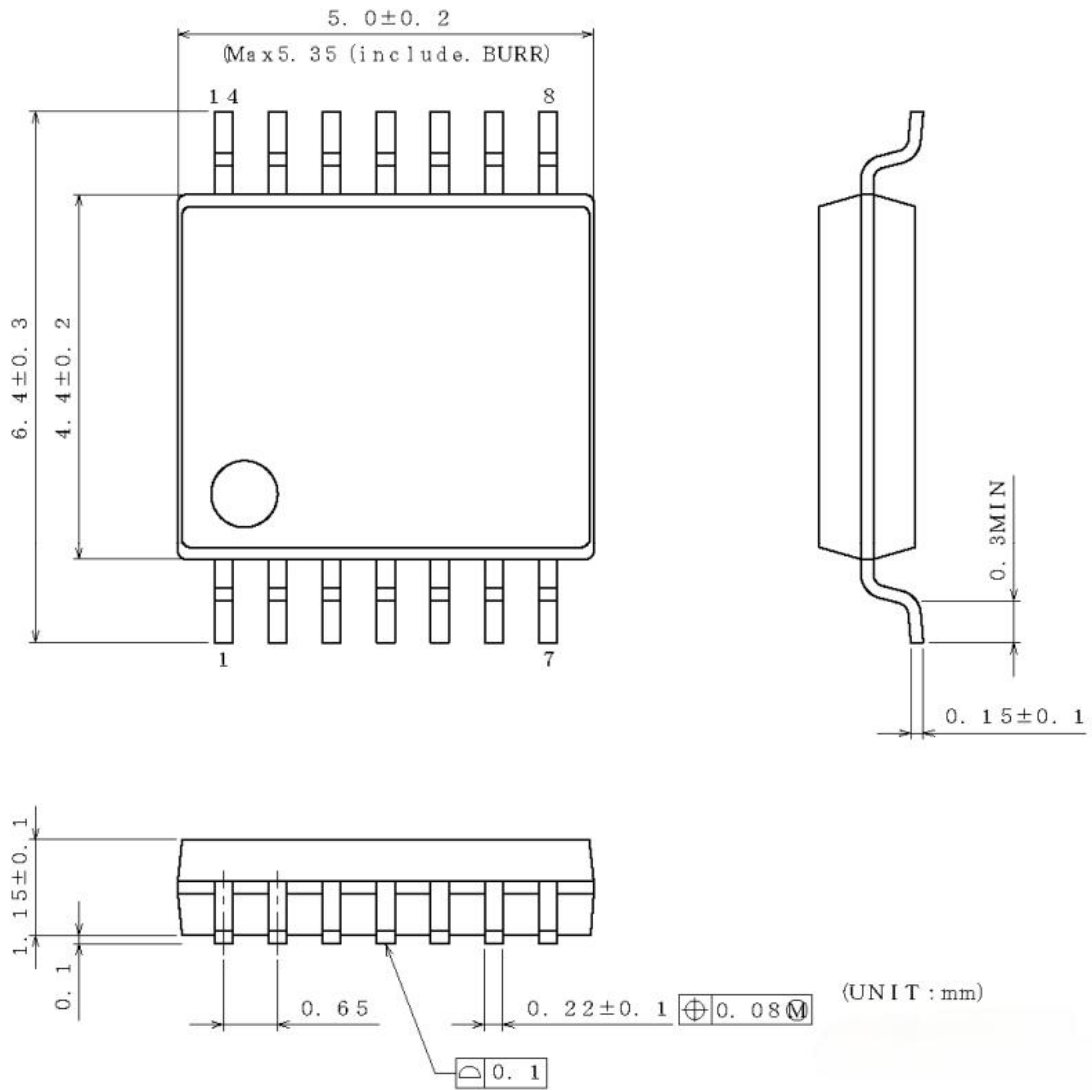
Dimensions						
Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.33			0.21
A1	0.38			0.015		
A2	2.92	3.30	4.95	0.11	0.13	0.19
b	0.36	0.46	0.56	0.014	0.018	0.022
b2	1.14	1.52	1.78	0.04	0.06	0.07
c	0.20	0.25	0.36	0.007	0.009	0.01
D	18.67	19.05	19.69	0.73	0.75	0.77
E	7.62	7.87	8.26	0.30	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

## 7.2 SOP14

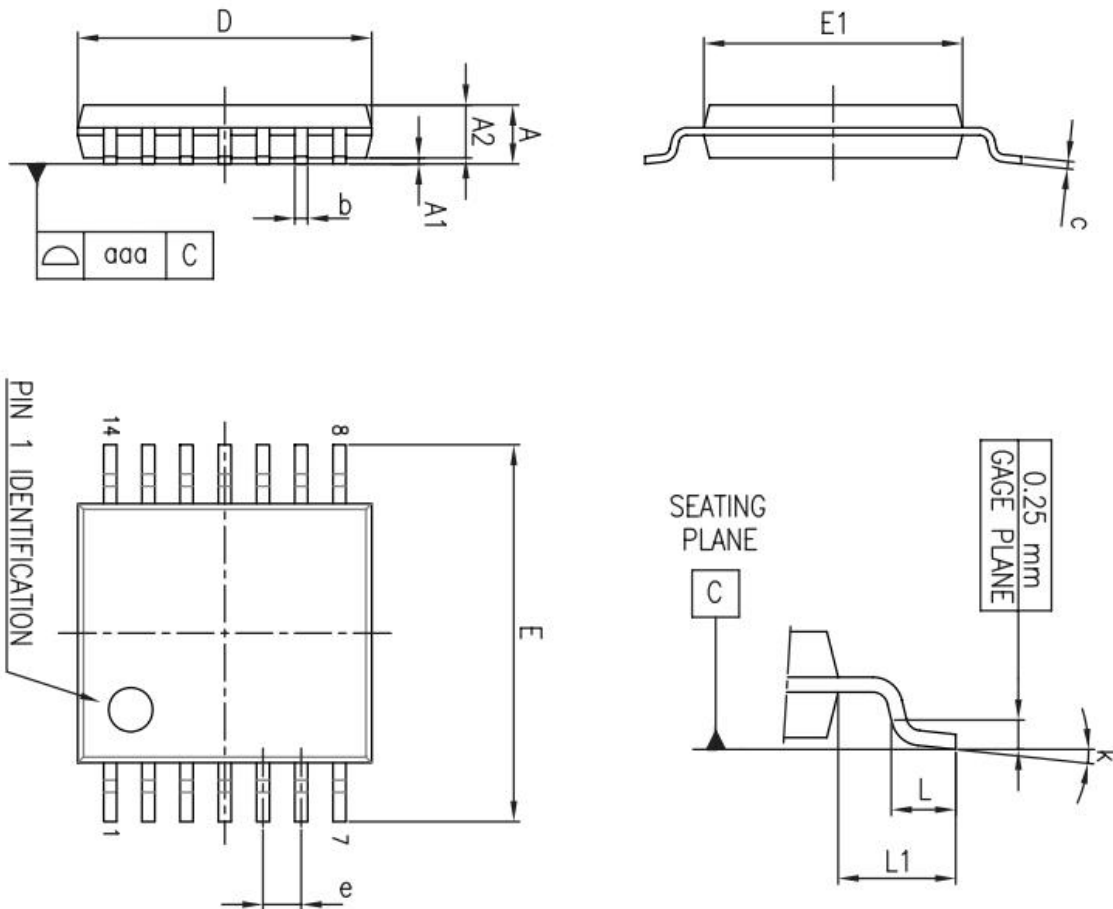


Dimensions						
Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35		1.75	0.05		0.068
A1	0.10		0.25	0.004		0.009
A2	1.10		1.65	0.04		0.06
B	0.33		0.51	0.01		0.02
C	0.19		0.25	0.007		0.009
D	8.55		8.75	0.33		0.34
E	3.80		4.0	0.15		0.15
e		1.27			0.05	
H	5.80		6.20	0.22		0.24
h	0.25		0.50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

### 7.3 SSOP14



## 7.4 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