

HD74AC125/HD74ACT125

Quad Buffer/Line Driver with 3-State Output

REJ03D0246-0300

Rev.3.00

Nov.12.2004

Description

The HD74AC125/HD74ACT125 is an quad buffer and line driver designed to be employed as a memory address driver, clock driver and bus oriented transmitter/receiver which provides improved PC board density.

Features

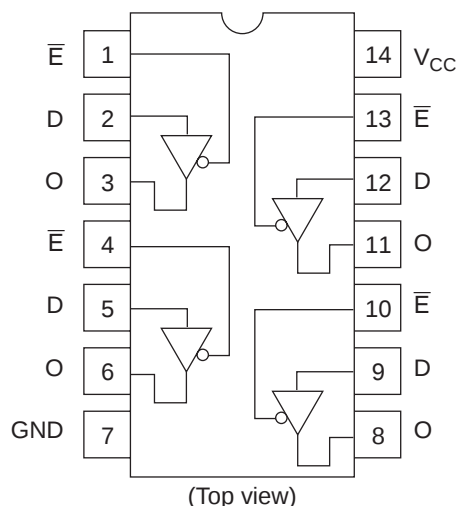
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Outputs Source/Sink 24 mA
- HD74ACT125 has TTL-Compatible Inputs
- Ordering Information: Ex. HD74AC125

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74AC125P	DIP-14 pin	DP-14, -14AV	P	—
HD74AC125FPEL	SOP-14 pin (JEITA)	FP-14DAV	FP	EL (2,000 pcs/reel)
HD74AC125RPEL	SOP-14 pin (JEDEC)	FP-14DNV	RP	EL (2,500 pcs/reel)
HD74AC125TELL	TSSOP-14 pin	TTP-14DV	T	ELL (2,000 pcs/reel)

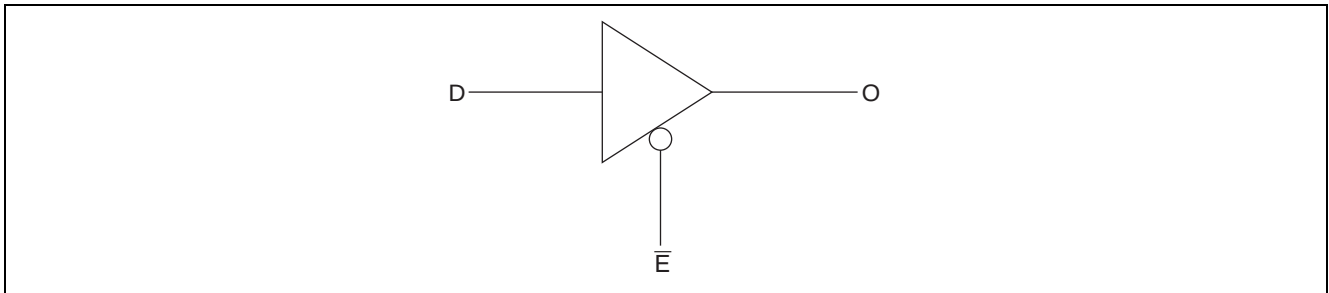
Notes: 1. Please consult the sales office for the above package availability.

2. The packages with lead-free pins are distinguished from the conventional products by adding V at the end of the package code.

Pin Arrangement



Logic Symbol



Pin Names

- D Data Inputs
 $\overline{E}$ 3-State Output Enable Inputs (Active Low)
 O Outputs

Truth Table

Inputs		Output
$\overline{E}$	D	
L	L	L
L	H	H
H	X	Z

- H : High Voltage Level
 L : Low Voltage Level
 X : Immaterial
 Z : High Impedance

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Condition
Supply voltage	V_{CC}	-0.5 to 7	V	
DC input diode current	I_{IK}	-20	mA	$V_I = -0.5V$
		20	mA	$V_I = V_{CC}+0.5V$
DC input voltage	V_I	-0.5 to $V_{CC}+0.5$	V	
DC output diode current	I_{OK}	-50	mA	$V_O = -0.5V$
		50	mA	$V_O = V_{CC}+0.5V$
DC output voltage	V_O	-0.5 to $V_{CC}+0.5$	V	
DC output source or sink current	I_O	± 50	mA	
DC V_{CC} or ground current per output pin	I_{CC}, I_{GND}	± 50	mA	
Storage temperature	T_{stg}	-65 to +150	$^{\circ}C$	

Recommended Operating Conditions: HD74AC125

Item	Symbol	Ratings	Unit	Condition
Supply voltage	V_{CC}	2 to 6	V	
Input and Output voltage	V_I, V_O	0 to V_{CC}	V	
Operating temperature	T_a	-40 to +85	$^{\circ}C$	
Input rise and fall time (except Schmitt inputs) V_{IN} 30% to 70% V_{CC}	t_r, t_f	8	ns/V	$V_{CC} = 3.0V$
				$V_{CC} = 4.5V$
				$V_{CC} = 5.5V$

DC Characteristics: HD74AC125

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Condition
			min.	typ.	max.	min.	max.		
Input Voltage	V _{IH}	3.0	2.1	1.5	—	2.1	—	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V
		4.5	3.15	2.25	—	3.15	—		
		5.5	3.85	2.75	—	3.85	—		
	V _{IL}	3.0	—	1.50	0.9	—	0.9		V _{OUT} = 0.1 V or V _{CC} - 0.1 V
		4.5	—	2.25	1.35	—	1.35		
		5.5	—	2.75	1.65	—	1.65		
Output voltage	V _{OH}	3.0	2.9	2.99	—	2.9	—	V	V _{IN} = V _{IL} or V _{IH} I _{OUT} = -50 µA
		4.5	4.4	4.49	—	4.4	—		
		5.5	5.4	5.49	—	5.4	—		
		3.0	2.58	—	—	2.48	—		V _{IN} = V _{IL} or V _{IH} I _{OH} = -12 mA
		4.5	3.94	—	—	3.80	—		
		5.5	4.94	—	—	4.80	—		
	V _{OL}	3.0	—	0.002	0.1	—	0.1		V _{IN} = V _{IL} or V _{IH} I _{OUT} = 50 µA
		4.5	—	0.001	0.1	—	0.1		
		5.5	—	0.001	0.1	—	0.1		
		3.0	—	—	0.32	—	0.37		V _{IN} = V _{IL} or V _{IH} I _{OL} = 12 mA
		4.5	—	—	0.32	—	0.37		
		5.5	—	—	0.32	—	0.37		
		3.0	—	—	0.32	—	0.37		V _{IN} = V _{IL} or V _{IH} I _{OL} = 24 mA
		4.5	—	—	0.32	—	0.37		
		5.5	—	—	0.32	—	0.37		I _{OL} = 24 mA
Input leakage current	I _{IN}	5.5	—	—	±0.1	—	±1.0	µA	V _{IN} = V _{CC} or GND
3 State current	I _{OZ}	5.5	—	—	±0.5	—	±5.0	µA	V _{IN(OE)} = V _{IL} , V _{IH} V _{IN} = V _{CC} or GND V _{OUT} = V _{CC} or GND
Dynamic output current*	I _{OLD}	5.5	—	—	—	86	—	mA	V _{OLD} = 1.1 V
	I _{OHD}	5.5	—	—	—	-75	—	mA	V _{OHD} = 3.85 V
Quiescent supply current	I _{CC}	5.5	—	—	8.0	—	80	µA	V _{IN} = V _{CC} or ground

*Maximum test duration 2.0 ms, one output loaded at a time.

Recommended Operating Conditions: HD74ACT125

Item	Symbol	Ratings	Unit	Condition
Supply voltage	V _{CC}	2 to 6	V	
Input and output voltage	V _I , V _O	0 to V _{CC}	V	
Operating temperature	Ta	-40 to +85	°C	
Input rise and fall time (except Schmitt inputs) V _{IN} 0.8 to 2.0 V	tr, tf	8	ns/V	V _{CC} = 4.5V V _{CC} = 5.5V

DC Characteristics: HD74ACT125

Item	Sym- bol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Condition	
			min.	typ.	max.	min.	max.			
Input voltage	V _{IH}	4.5	2.0	1.5	—	2.0	—	V	V _{OUT} = 0.1 V or V _{CC} -0.1 V	
		5.5	2.0	1.5	—	2.0	—			
	V _{IL}	4.5	—	1.5	0.8	—	0.8		V _{OUT} = 0.1 V or V _{CC} -0.1 V	
		5.5	—	1.5	0.8	—	0.8			
Output voltage	V _{OH}	4.5	4.4	4.49	—	4.4	—	V	V _{IN} = V _{IL} or V _{IH} I _{OUT} = -50 μA	
		5.5	5.4	5.49	—	5.4	—			
		4.5	3.94	—	—	3.80	—		V _{IN} = V _{IL}	I _{OH} = -24 mA
		5.5	4.94	—	—	4.80	—			I _{OH} = -24 mA
	V _{OL}	4.5	—	0.001	0.1	—	0.1		V _{IN} = V _{IL} or V _{IH} I _{OUT} = 50 μA	
		5.5	—	0.001	0.1	—	0.1			
		4.5	—	—	0.32	—	0.37		V _{IN} = V _{IL}	I _{OL} = 24 mA
		5.5	—	—	0.32	—	0.37			I _{OL} = 24 mA
Input current	I _{IN}	5.5	—	—	±0.1	—	±1.0	μA	V _{IN} = V _{CC} or GND	
3 State current	I _{OZ}	5.5	—	—	±0.5	—	±5.0	μA	V _{IN} = V _{IL} , V _{IH} V _{OUT} = V _{CC} or GND	
I _{CC} /input current	I _{CC} T	5.5	—	0.6	—	—	1.5	mA	V _{IN} = V _{CC} -2.1 V	
Dynamic output current*	I _{OLD}	5.5	—	—	—	86	—	mA	V _{OLD} = 1.1 V	
	I _{OHD}	5.5	—	—	—	-75	—	mA	V _{OHD} = 3.85 V	
Quiescent supply current	I _{CC}	5.5	—	—	8.0	—	80	μA	V _{IN} = V _{CC} or ground	

*Maximum test duration 2.0 ms, one output loaded at a time.

AC Characteristics: HD74AC125

Item	Symbol	V _{CC} (V)* ¹	Ta = +25°C C _L = 50 pF			Ta = -40°C to +85°C C _L = 50 pF		Unit
			Min	Typ	Max	Min	Max	
Propagation delay	t _{PLH}	3.3	1.0	6.5	9.0	1.0	10.0	ns
		5.0	1.0	5.5	7.0	1.0	7.5	
Propagation delay	t _{PHL}	3.3	1.0	6.5	9.0	1.0	10.0	
		5.0	1.0	5.0	7.0	1.0	7.5	
Enable time	t _{ZH}	3.3	1.0	6.0	10.5	1.0	11.0	
		5.0	1.0	5.0	7.0	1.0	8.0	
Enable time	t _{ZL}	3.3	1.0	7.5	10.0	1.0	11.0	
		5.0	1.0	5.5	8.0	1.0	8.5	
Disable time	t _{HZ}	3.3	1.0	7.0	10.0	1.0	10.5	
		5.0	1.0	6.5	9.0	1.0	9.5	
Disable time	t _{LZ}	3.3	1.0	7.5	10.5	1.0	11.5	
		5.0	1.0	6.5	9.0	1.0	9.5	

Note: 1. Voltage Range 3.3 is 3.3 V ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

AC Characteristics: HD74ACT125

Item	Symbol	V_{CC} (V)* ¹	Ta = +25°C CL = 50 pF			Ta = -40°C to +85°C CL = 50 pF		Unit
			Min	Typ	Max	Min	Max	
Propagation delay	t _{PLH}	5.0	1.0	6.5	9.0	1.0	10.0	ns
Propagation delay	t _{PHL}	5.0	1.0	7.0	9.0	1.0	10.0	
Enable time	t _{ZH}	5.0	1.0	6.0	8.5	1.0	9.5	
Enable time	t _{ZL}	5.0	1.0	7.0	9.5	1.0	10.5	
Disable time	t _{HZ}	5.0	1.0	7.0	9.5	1.0	10.5	
Disable time	t _{LZ}	5.0	1.0	7.5	10.0	1.0	10.5	

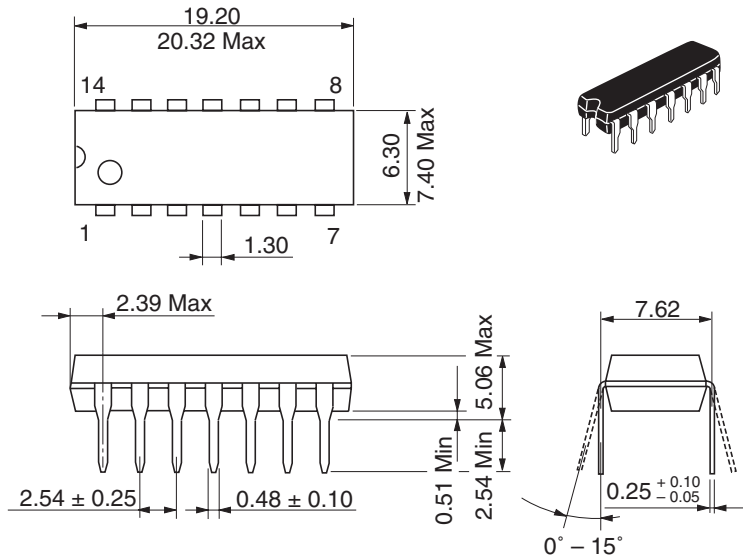
Note: 1. Voltage Range 5.0 is 5.0 V ± 0.5 V

Capacitance

Item	Symbol	Typ	Unit	Condition
Input capacitance	C _{IN}	4.5	pF	V _{CC} = 5.5 V
Power dissipation capacitance	C _{PD}	45.0	pF	V _{CC} = 5.0 V

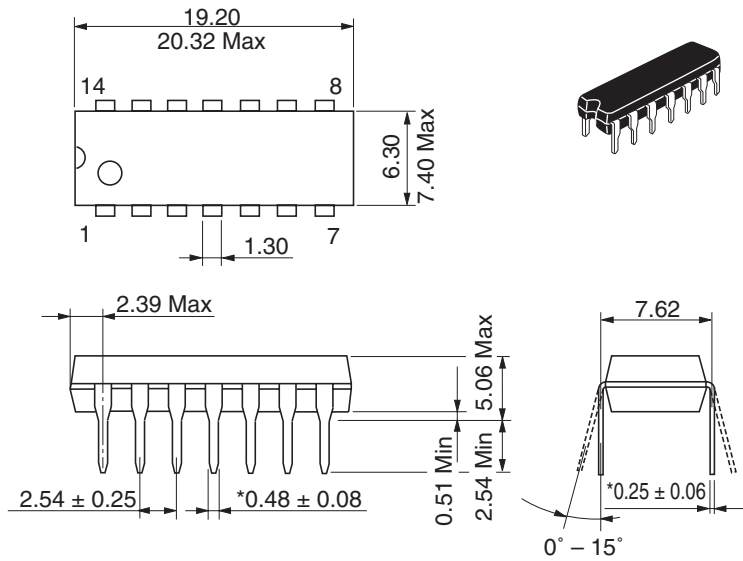
Package Dimensions

As of January, 2003
Unit: mm



Package Code	DP-14
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	0.97 g

Unit: mm

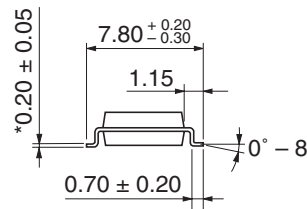
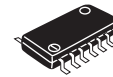
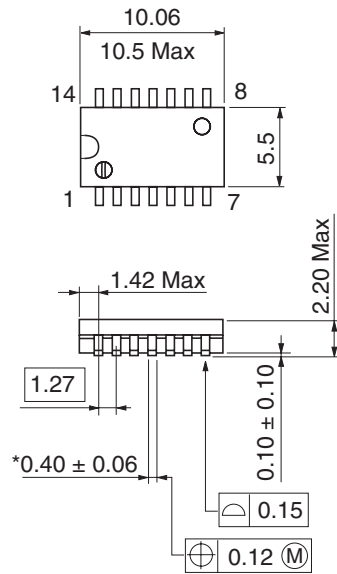


*Ni/Pd/AU Plating

Package Code	DP-14AV
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	0.97 g

As of January, 2003

Unit: mm

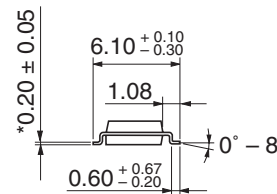
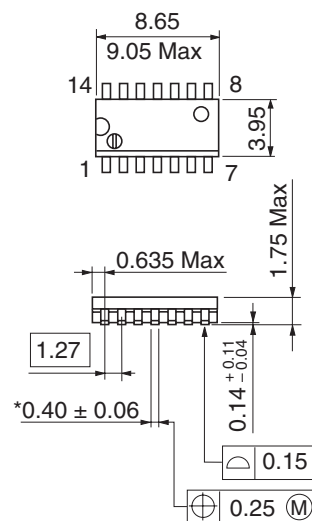


*Ni/Pd/Au plating

Package Code	FP-14DAV
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.23 g

As of January, 2003

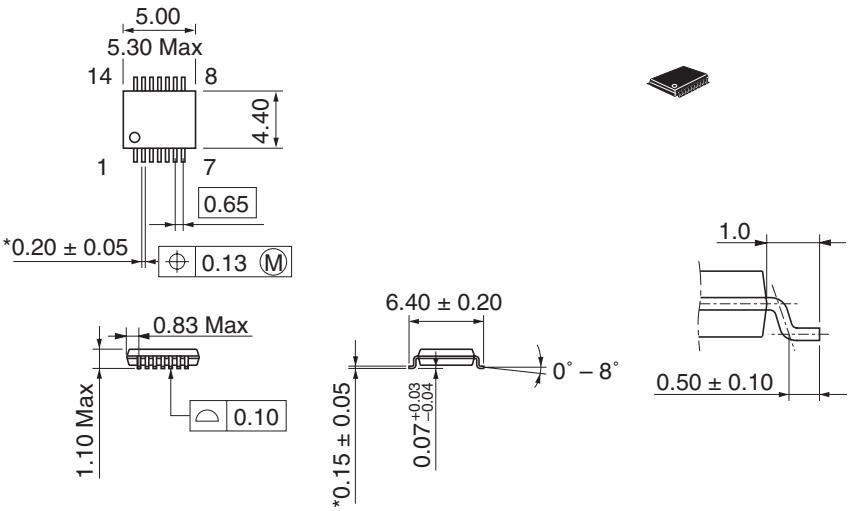
Unit: mm



*Ni/Pd/Au plating

Package Code	FP-14DNV
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	0.13 g

As of January, 2003
Unit: mm



*Ni/Pd/Au plating

Package Code	TTP-14DV
JEDEC	—
JEITA	—
Mass (reference value)	0.05 g

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