

MC74AC125, MC74ACT125

Quad Buffer with 3-State Outputs

- Outputs Source/Sink
- 'ACT125 Has TTL Compatible Inputs

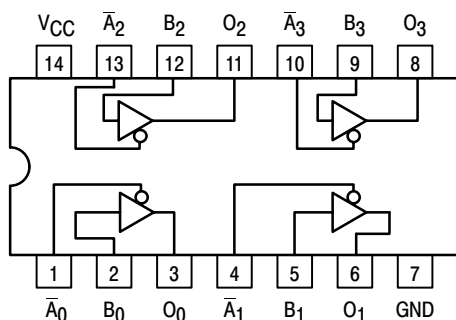


Figure 1. Pinout: 14-Lead Packages Conductors (Top View)

PIN ASSIGNMENT

PIN	FUNCTION
\bar{A}_n, B_n	Inputs
O_n	Outputs

FUNCTION TABLE

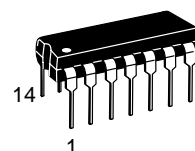
Inputs		Output
\bar{A}_n	B_n	O_n
L	L	L
L	H	H
H	X	Z

NOTE: H = High Voltage Level;
L = Low Voltage Level;
Z = High Impedance;
X = Immaterial

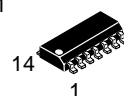


ON Semiconductor™

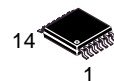
<http://onsemi.com>



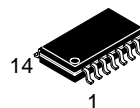
PDIP-14
N SUFFIX
CASE 646



SO-14
D SUFFIX
CASE 751A



TSSOP-14
DT SUFFIX
CASE 948G



EIAJ-14
M SUFFIX
CASE 965

ORDERING INFORMATION

Device	Package	Shipping
MC74AC125N	PDIP-14	25 Units/Rail
MC74ACT125N	PDIP-14	25 Units/Rail
MC74AC125D	SOIC-14	55 Units/Rail
MC74AC125DR2	SOIC-14	2500 Tape & Reel
MC74ACT125D	SOIC-14	55 Units/Rail
MC74ACT125DR2	SOIC-14	2500 Tape & Reel
MC74AC125DT	TSSOP-14	96 Units/Rail
MC74AC125DTR2	TSSOP-14	2500 Tape & Reel
MC74ACT125DT	TSSOP-14	96 Units/Rail
MC74ACT125DTR2	TSSOP-14	2500 Tape & Reel
MC74AC125M	EIAJ-14	50 Units/Rail
MC74AC125MEL	EIAJ-14	2000 Tape & Reel
MC74ACT125M	EIAJ-14	50 Units/Rail
MC74ACT125MEL	EIAJ-14	2000 Tape & Reel

DEVICE MARKING INFORMATION

See general marking information in the device marking section on page 116 of this data sheet.

MC74AC125, MC74ACT125

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
V_{in}	DC Input Voltage (Referenced to GND)	-0.5 to $V_{CC} + 0.5$	V
V_{out}	DC Output Voltage (Referenced to GND)	-0.5 to $V_{CC} + 0.5$	V
I_{in}	DC Input Current, per Pin	± 20	mA
I_{out}	DC Output Sink/Source Current, per Pin	± 50	mA
I_{CC}	DC V_{CC} or GND Current per Output Pin	± 50	mA
T_{stg}	Storage Temperature	-65 to +150	$^{\circ}\text{C}$

*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit	
V_{CC}	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V_{in}, V_{out}	DC Input Voltage, Output Voltage (Ref. to GND)	0	-	V_{CC}	V	
t_r, t_f	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	$V_{CC} @ 3.0\text{ V}$	-	150	-	ns/V
		$V_{CC} @ 4.5\text{ V}$	-	40	-	
		$V_{CC} @ 5.5\text{ V}$	-	25	-	
T_J	Junction Temperature (PDIP)	-	-	140	$^{\circ}\text{C}$	
T_A	Operating Ambient Temperature Range	-40	25	85	$^{\circ}\text{C}$	
I_{OH}	Output Current – HIGH	-	-	-24	mA	
I_{OL}	Output Current – LOW	-	-	24	mA	

1. V_{in} from 30% to 70% V_{CC} ; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2. V_{in} from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

MC74AC125, MC74ACT125

DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74AC		74AC	Unit	Conditions
			T _A = +25°C		T _A = -40°C to +85°C		
			Typ	Guaranteed Limits			
V _{IH}	Minimum High Level Input Voltage	3.0	1.5	2.1	2.1	V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V
		4.5	2.25	3.15	3.15		
		5.5	2.75	3.85	3.85		
V _{IL}	Maximum Low Level Input Voltage	3.0	1.5	0.9	0.9	V	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		
V _{OH}	Minimum High Level Output Voltage	3.0	2.99	2.9	2.9	V	I _{OUT} = - 50 μA
		4.5	4.46	4.4	4.4		
		5.5	5.49	5.4	5.4		
		3.0	-	2.56	2.46	V	*V _{IN} = V _{IL} or V _{IH} -12 mA I _{OH} - 24 mA - 24 mA
		4.5	-	3.86	3.76		
		5.5	-	4.86	4.76		
V _{OL}	Minimum Low Level Output Voltage	3.0	0.002	0.1	0.1	V	I _{OUT} = 50 μA
		4.5	0.001	0.1	0.1		
		5.5	0.001	0.1	0.1		
		3.0	-	0.36	0.44	V	*V _{IN} = V _{IL} or V _{IH} 12 mA I _{OL} 24 mA 24 mA
		4.5	-	0.36	0.44		
		5.5	-	0.36	0.44		
I _{IN}	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μA	V _I = V _{CC} , GND
I _{OZ}	V _I (OE) = V _{IL} , V _{IH} V _I = V _{CC} , GND V _O = V _{CC} , GND	5.5	-	±0.5	±5.0	μA	V _I (OE) = V _{IL} , V _{IH} V _I = V _{CC} , GND V _O = V _{CC} , GND
I _{OLD}	†Minimum Dynamic Output Current	5.5	-	-	75	mA	V _{OLD} = 1.65 V Max
I _{OHD}		5.5	-	-	-75	mA	V _{OHD} = 3.85 V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	-	8.0	80	μA	V _{IN} = V _{CC} or GND

*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one input loaded at a time.

NOTE: I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V.

MC74AC125, MC74ACT125

AC CHARACTERISTICS

Symbol	Parameter	V _{CC} * (V)	74AC		74AC		Unit
			T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Data to Output	3.3 5.0	1.0 1.0	9.0 7.0	1.0 1.0	10 7.5	ns
t _{PHL}	Propagation Delay Data to Output	3.3 5.0	1.0 1.0	9.0 7.0	1.0 1.0	10 7.5	ns
t _{PZH}	Output Enable Time	3.3 5.0	1.0 1.0	10.5 7.0	1.0 1.0	11 8.0	ns
t _{PZL}	Output Enable Time	3.3 5.0	1.0 1.0	10 8.0	1.0 1.0	11 8.5	ns
t _{PHZ}	Output Disable Time	3.3 5.0	1.0 1.0	10 9.0	1.0 1.0	10.5 9.5	ns
t _{PLZ}	Output Disable Time	3.3 5.0	1.0 1.0	10.5 9.0	1.0 1.0	11.5 9.5	ns

*Voltage Range 3.3 V is 3.3 V ±0.3 V.
Voltage Range 5.0 V is 5.0 V ±0.5 V.

DC CHARACTERISTICS

Symbol	Parameter	V _{CC} (V)	74ACT		74ACT		Unit	Conditions
			T _A = +25°C		T _A = -40°C to +85°C			
			Typ	Guaranteed Limits				
V _{IH}	Minimum High Level Input Voltage	4.5	1.5	2.2	2.0		V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V
		5.5	1.5	2.0	2.0			
V _{IL}	Maximum Low Level Input Voltage	4.5	1.5	0.8	0.8		V	V _{OUT} = 0.1 V or V _{CC} - 0.1 V
		5.5	1.5	0.8	0.8			
V _{OH}	Minimum High Level Output Voltage	4.5	4.49	4.4	4.4		V	I _{OUT} = - 50 μA
		5.5	5.49	5.4	5.4			
		4.5	-	3.86	3.76		V	*V _{IN} = V _{IL} or V _{IH} - 24 mA
		5.5	-	4.86	4.76			
V _{OL}	Minimum Low Level Output Voltage	4.5	0.001	0.1	0.1		V	I _{OUT} = - 50 μA
		5.5	0.001	0.1	0.1			
		4.5	-	0.36	0.44		V	*V _{IN} = V _{IL} or V _{IH} - 24 mA
		5.5	-	0.36	0.44			
I _{IN}	Maximum Input Leakage Current	5.5	-	±0.1	±1.0		μA	V _I = V _{CC} , GND
I _{OZ}	V _I (OE) = V _{IL} , V _{IH} V _I = V _{CC} , GND V _O = V _{CC} , GND	5.5	-	±0.5	±5.0		μA	V _I (OE) = V _{IL} , V _{IH} V _I = V _{CC} , GND V _O = V _{CC} , GND
ΔI _{CCCT}	Additional Max. I _{CC} /Input	5.5	0.6	-	1.5		mA	V _I = V _{CC} - 2.1 V
I _{OLD}	†Minimum Dynamic Output Current	5.5	-	-	75		mA	V _{OLD} = 1.65 V Max
I _{OHD}		5.5	-	-	-75		mA	V _{OHD} = 3.85 V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	-	8.0	80		μA	V _{IN} = V _{CC} or GND

*All outputs loaded; thresholds on input associated with output under test.
†Maximum test duration 2.0 ms, one input loaded at a time.

MC74AC125, MC74ACT125

AC CHARACTERISTICS

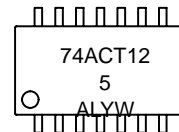
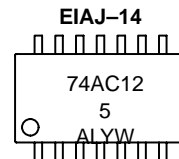
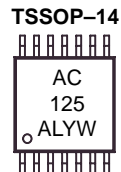
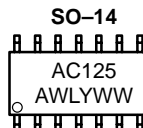
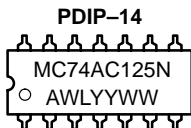
Symbol	Parameter	V _{CC} * (V)	74ACT		74ACT		Unit
			T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Data to Output	5.0	1.0	9.0	1.0	10	ns
t _{PHL}	Propagation Delay Data to Output	5.0	1.0	9.0	1.0	10	ns
t _{PZH}	Output Enable Time	5.0	1.0	8.5	1.0	9.5	ns
t _{PZL}	Output Enable Time	5.0	1.0	9.5	1.0	10.5	ns
t _{PHZ}	Output Disable Time	5.0	1.0	9.5	1.0	10.5	ns
t _{PLZ}	Output Disable Time	5.0	1.0	10	1.0	10.5	ns

*Voltage Range 5.0 V is 5.0 V ±0.5 V.

CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = 5.0 V
C _{PD}	Power Dissipation Capacitance	45	pF	V _{CC} = 5.0 V

MARKING DIAGRAMS



A = Assembly Location
 WL, L = Wafer Lot
 YY, Y = Year
 WW, W = Work Week