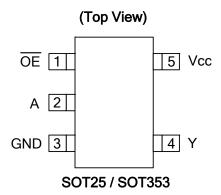


Description

The 74AHCT1G125 is a single non-inverting buffer/bus driver with a 3-state output. The output enters a high impedance state when a HIGH-level is applied to the output enable (\overline{OE}) pin. The device is designed for operation with a power supply range of 4.5V to 5.5V.

Pin Assignments



Features

- Supply Voltage Range from 4.5V to 5.5V
- ± 8 mA Output Drive at 5.0V
- CMOS low power consumption
- Schmitt Trigger Action at All Inputs Make the Circuit Tolerant for Slower Input Rise and Fall Time.
- ESD Protection per JESD 22
 - Exceeds 200-V Machine Model (A115-A)
 - o Exceeds 2000-V Human Body Model (A114-A)
 - o Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- SOT25 and SOT353: Assembled with "Green" Molding Compound (no Br, Sb)
- Lead Free Finish / RoHS Compliant (Note 1)

Applications

- General Purpose Logic
- Wide array of products such as:
 - PCs, networking, notebooks, netbooks, PDAs
 - o Computer peripherals, hard drives, CD/DVD ROM
 - TV, DVD, DVR, set top box
 - o Phones, Personal Navigation / GPS
 - MP3 players ,Cameras, Video Recorders

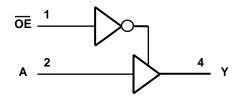
Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.



Pin Descriptions

Pin Name	Pin No.	Description
ŌE	1	Output Enable
Α	2	Data Input
GND	3	Ground
Υ	4	Data Output
V _{CC}	5	Supply Voltage

Logic Diagram



Function Table

Inp	Output	
ŌĒ	Α	Υ
L	Н	Н
L	L	L
Н	X	Z



Absolute Maximum Ratings (Note 2)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	KV
ESD CDM	Charged Device Model ESD Protection	1	KV
ESD MM	Machine Model ESD Protection	200	V
V_{CC}	Supply Voltage Range	-0.5 to 6.5	V
VI	Input Voltage Range	-0.5 to 6.5	V
Vo	Voltage applied to output in high or low state	-0.5 to V _{CC} +0.5	V
I _{IK}	Input Clamp Current V _I <0	-20	mA
l _{OK}	Output Clamp Current (V _O < 0 or V _O > V _{CC})	±20	mA
Io	Continuous output current (V _O = 0 to V _{CC})	±25	mA
I _{CC}	Continuous current through V _{CC}	50	mA
I _{GND}	Continuous current through GND	-50	mA
T_J	Operating Junction Temperature	-40 to 150	°C
T _{STG}	Storage Temperature	-65 to 150	°C

Notes: 2. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

Recommended Operating Conditions (Note 3)

Symbol		Parameter	Min	Max	Unit
V_{CC}	Operating Voltage		4.5	5.5	V
V_{IH}	High-level Input Voltage		2.0		V
V_{IL}	Low-level input voltage			0.8	V
VI	Input Voltage	0	5.5	V	
Vo	Output Voltage		0	V _{CC}	V
I _{OH}	High-level output current			-8	mA
I _{OL}	Low-level output current			8	mA
Δt/ΔV	Input transition rise or fall rate			20	ns/V
T _A	Operating free-air temperature		-40	125	°C

Notes: 3. Unused inputs should be held at V_{CC} or Ground.



Electrical Characteristics

0	D	Table Constitutions	V		25°C		-40°C	to 85°C	-40°C to	o 125ºC	1111
Symbol	Parameter	Test Conditions	V _{CC}	Min	Тур.	Max	Min	Max	Min	Max	Unit
	High Level	$I_{OH} = -50\mu A$	4.5V	4.4	4.5		4.4		4.4		
V_{OH}	Output Voltage	I _{OH} = -8mA	4.5V	3.94			3.8		3.70		V
	Low Level	$I_{OL} = 50\mu A$	4.5V		0	0.1		0.1		0.1	
V_{OL}	Output Voltage	$I_{OL} = 8mA$	4.5V			0.36		0.44		0.55	V
II	Input Current	$V_I = 5.5V$ or GND	0 to 5.5V			±0.1		±1		±2	μΑ
l _{OZ}	Z State Leakage Current	V _O =0 to 5.5V	5.5V			0.25		2.5		10	μΑ
I _{CC}	Supply Current	$V_I = 5.5V$ or GND $I_O=0$	5.5V			1		10		40	μΑ
C _i	Input Capacitance	$V_I = V_{CC} - or$ GND	5.5V		2.0	10		10		10	pF
ΔI _{CC}	Additional Supply Current	One input at 3.4 V Other inputs at V _{CC} or GND	5.5V			1.35		1.5			mA
0	Thermal Resistance	SOT25	(N. 1. 4.)		204						90.00
θ_{JA}	Junction-to- Ambient SOT353	(Note 4)		371						°C/W	
0	Thermal Resistance	SOT25	(N) (A)		52						90.00
θ _{JC} Junction-to- Case	SOT353	(Note 4)		143						°C/W	

Note: 4. Test conditions for SOT25, and SOT353: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.



Switching Characteristics

 $V_{CC} = 5V \pm 0.5V$ (see Figure 1)

Powerton From TO		ТО		25°C		-40°C to 85°C		-40°C to 125°C		l lm!t	
Parameter	(Input)	(OUTPUT)		Min	Тур.	Max	Min	Max	Min	Max	Unit
	t _{pd} A Y	V	C _L =15pF	0.6	3.4	5.5	0.6	6.5	0.6	7.0	ns
l pd		Y	C _L =50pF	0.6	4.7	7.5	0.6	8.5	0.6	9.5	ns
	-	ŌE Y	C _L =15pF	0.6	3.6	5.6	0.6	6.3	0.6	7.0	ns
^t en	t _{en} OE		C _L =50pF	0.6	5.4	8.0	0.6	9.0	0.6	9.5	ns
,	OE V	C _L =15pF	0.6	4.3	6.8	0.6	8.0	0.6	8.5	ns	
t _{dis}	OE	Y	C _L =50pF	0.6	6.1	8.8	0.6	10.0	0.6	11.0	ns

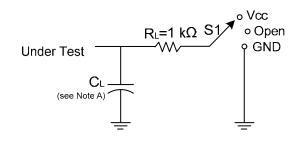
Operating Characteristics

 $T_A = 25$ °C

Parameter		Test Conditions	V _{CC} = 5 V Typ.	Unit
C _{pd}	Power dissipation capacitance	f = 1 MHz No Load	14	pF

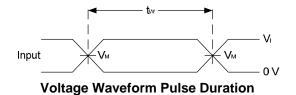


Parameter Measurement Information



TEST	S 1
t _{PLH} /t _{PHL}	Open
t _{PLZ} /t _{PZL}	Vload
t _{PHZ} /t _{PZH}	GND

Vee	In	puts	V	C	V.
Vcc	VI	t _r /t _f	V _M	C _L	V Δ
5V±0.5V	V _{CC}	≤3ns	V _{CC} /2	15pF	0.3V
5V±0.5V	V _{CC}	≤3ns	V _{CC} /2	50pF	0.3V



Output

V_M

V_M

O V

V_M

O V

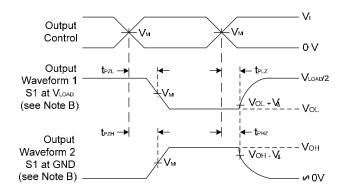
V_M

VoH

VoH

Output

Voltage Waveform Propagation Delay Times
Inverting and Non Inverting Outputs



Voltage Waveform Enable and Disable Times Low and High Level Enabling

Figure 1. Load Circuit and Voltage Waveforms

Notes: A. Includes test lead and test apparatus capacitance.

B. All pulses are supplied at pulse repetition rate ≤ 1 MHz.

C. Inputs are measured separately one transition per measurement.

D. t_{PLZ} and t_{PHZ} are the same as $t_{dis.}$

E. t_{PZL} and t_{PZH} are the same as t_{EN}.

F. t_{PLH} and t_{PHL} are the same as t_{PD} .

Pb,



SINGLE BUFFER GATE WITH 3-STATE OUTPUT

Ordering Information

T4 AHCT1G125 XX - 7

Logic Device Function Package Packing

74 : Logic Prefix 125 : 3-State Buffer W5 : SOT25 7 : Tape & Reel

AHC: 4.5 to 5.5V Family

1G : One gate

Device	Package Packaging 7" Tape		and Reel	
Device	Code	(Note 5)	Quantity	Part Number Suffix
74AHCT1G125W5-7	W5	SOT25	3000/Tape & Reel	-7
74AHCT1G125SE-7	SE	SOT353	3000/Tape & Reel	-7

OE-Low

Notes: 5. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

Marking Information

(Top View)

XX Y W X | W : Week : A Z : 1 2 6 week;

a~z: 27~52 week; z represents 52 and 53 week

SE: SOT353

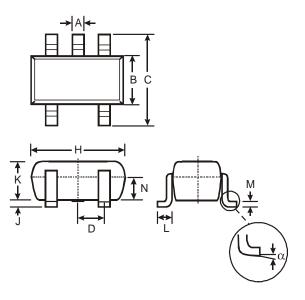
2 3 <u>X</u>: A~Z: Internal code

Part Number	Package	Identification Code
74AHCT1G125W5	SOT25	ZY
74AHCT1G125SE	SOT353	ZY



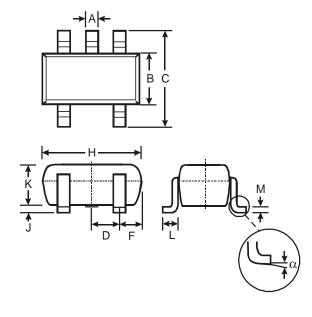
Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT25



	SOT25							
Dim	Min	Max	Тур					
Α	0.35	0.50	0.38					
В	1.50	1.70	1.60					
C	2.70	3.00	2.80					
D	_	_	0.95					
Н	2.90	3.10	3.00					
7	0.013	0.10	0.05					
K	1.00	1.30	1.10					
L	0.35	0.55	0.40					
M	0.10	0.20	0.15					
N	0.70	0.80	0.75					
α	0°	8°						
All D	imensi	ons in	mm					

(2) Package Type: SOT353



SOT353		
Dim	Min	Max
Α	0.10	0.30
В	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
Η	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		



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