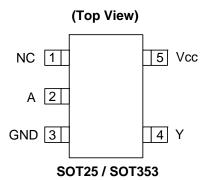


Description

The 74AHCT1G14 is a single 1-input Schmitt-trigger inverter gate with a standard push-pull output. The device is designed for operation with a power supply range of 4.5V to 5.5V. The gate performs the positive Boolean function:

$$Y = \overline{A}$$

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
 - o 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
 - o PCs, networking, notebooks, netbooks, PDAs
 - o Computer peripherals, hard drives, CD/DVD ROM
 - o TV, DVD, DVR, set top box
 - o Cell Phones, Personal Navigation / GPS
 - MP3 players ,Cameras, Video Recorders

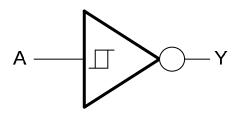
Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.



Pin Descriptions

Pin Name	Pin NO.	Description	
NC	1	No Connection	
Α	2	Data Input	
GND	3	Ground	
Y	4	Data Output	
V _{CC}	5	Supply Voltage	

Logic Diagram



Function Table

Inputs	Output
Α	Υ
Н	L
L	Н



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
I _{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
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	ô

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



Electrical Characteristics

Comple ed	Downwater	Took Conditions	V		T _A =25		-40°C 1	to 85ºC	-40°C to	o 125ºC	l lm!t
Symbol	Parameter	Test Conditions	V _{CC}	Min	Тур.	Max	Min	Max	Min	Max	Unit
.,	Positive-going		4.5V			1.9		1.9		1.9	
V _{T+}	input threshold voltage		5.5V			2.1		2.1		2.1	
	Negative-going		4.5V	0.5			0.5		0.5		
V_{T-}	input threshold voltage		5.5V	0.6			0.6		0.6		
ΔV_{T}	Hysteresis		4.5V	0.4		1.4	0.4	1.4	.35	1.4	
ΔνΤ	(V _{T+} - V _{T-})		5.5V	0.4		1.6	0.4	1.6	.35	1.5	
V _{OH}	High Level	$I_{OH} = -50\mu A$	4.5V	4.4	4.5		4.4		4.4		V
VOH	Output Voltage	$I_{OH} = -8mA$	4.5V	3.94			3.80		3.70		V
\/	High-level Input	$I_{OL} = 50\mu A$	4.5V			0.1		0.1		0.1	
VOL	V _{OL} Voltage	$I_{OL} = 8mA$	4.5V			0.36		0.44		0.55]
II	Input Current	$V_I = 5.5 \text{ V or GND}$	0 to 5.5V			± 0.1		± 1		± 2	μA
I _{CC}	Supply Current	$V_I = 5.5V$ or GND $I_O=0$	5.5V			2		20		40	μA
ΔI _{CC}	Additional Supply Current	One input at 3.4 V Other inputs at V _{CC} or GND	5.5V			1.35		1.5		1.5	mA
Cı	Input Capacitance	$V_I = V_{CC}$ or GND	5.5V		3	10		10		10	pF
0	Thermal Resistance	SOT25	(Note 4)		195						°C/W
θ_{JA}	Junction-to- Ambient	SOT353	(Note 4)		430						°C/W
Aug	Thermal Resistance	SOT25	(Note 4)		58						°C/W
θ_{JC}	Junction-to- Case	SOT353	(Note 4)		155						°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)

		<u> </u>									
Doromotor	From	ТО			25ºC		-40°C t	o 85ºC	-40°C to	o 125ºC	Unit
Parameter	(Input)	(OUTPUT)		Min	Тур.	Max	Min	Max	Min	Max	Unit
4	^	V	C _L =15pF	0.6	4.0	7.0	0.6	8.0	0.6	9.0	ns
^T pd	A	ľ	C _L =50pF	0.6	5.4	8.0	0.6	9.0	0.6	10.0	ns

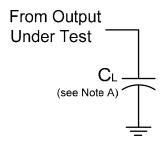


Operating Characteristics

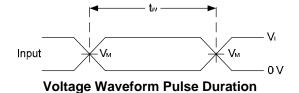
 $T_A = 25 \, {}^{\circ}C$

Parameter		Test Conditions	V _{CC} = 5V Typ.	Unit
C _{pd}	Power dissipation capacitance	f = 1 MHz No Load	10	pF

Parameter Measurement Information



V	Inputs		V	•	
V _{CC}	VI	t _r /t _f	V _M	C _L	
3.3V±0.3V	V _{CC}	≤3ns	V _{CC} /2	15pF	
5V±0.5V	V _{CC}	≤3ns	V _{CC} /2	15pF	
3.3V±0.3V	V _{CC}	≤3ns	V _{CC} /2	50pF	
5V±0.5V	V _{CC}	≤3ns	V _{CC} /2	50pF	



Output

VM

VM

O V

tPLH

VM

VOI

Output

VM

VOI

Output

Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs

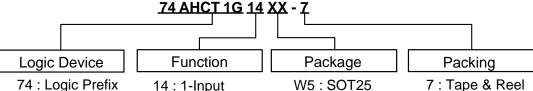
Figure 1. Load Circuit and Voltage Waveforms

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



Ordering Information



AHCT: 2 to 5.5V

Family with TTL input level

Schmitt-Trigger Inverter

SE: SOT353

1G: One gate

	Dovino	Package	Packaging	7" Tape and Reel		
	Device	Code	(Note 5)	Quantity	Part Number Suffix	
Pb,	74AHCT1G14W5-7	W5	SOT25	3000/Tape & Reel	-7	
Pb ,	74AHCT1G14SE-7	SE	SOT353	3000/Tape & Reel	-7	

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.

4

3

Marking Information

(Top View)

5

XX Y W X

2

XX: Identification code

Y: Year 0~9

<u>W</u>: Week: A~Z: 1~26 week;

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

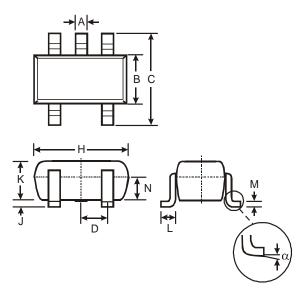
 \underline{X} : $A^{\sim}Z$: Internal code

Part Number	Package	Identification Code
74AHCT1G14W5	SOT25	ZV
74AHCT1G14SE	SOT353	ZV



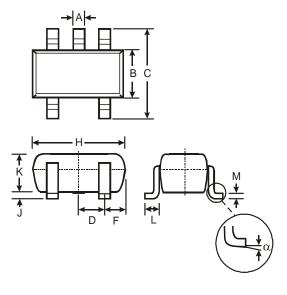
Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT25



	SOT25						
Dim	Min	Max	Тур				
A	0.35	0.50	0.38				
В	1.50	1.70	1.60				
C	2.70	3.00	2.80				
D		_	0.95				
Η	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 Dimensions in mm							

(2) Package Type: SOT353



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



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