







Texas INSTRUMENTS

SN54AHCT125, SN74AHCT125 SCLS264R - DECEMBER 1995 - REVISED FEBRUARY 2024

SNx4AHCT125 Quadruple Bus Buffer Gates With 3-State Outputs

1 Features

- Inputs are TTL-voltage compatible
- Latch-up performance exceeds 250mA per JESD 17

2 Applications

- Enable or disable a digital signal •
- Controlling an indicator LED •
- Debounce a switch •
- Eliminate slow or noisy input signals

3 Description

The 'AHCT125 devices are quadruple bus buffer gates featuring independent line drivers with 3-state outputs. Each output is disabled when the associated output-enable (\overline{OE}) input is high. When \overline{OE} is low, the respective gate passes the data from the A input to its Y output.

For the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

PART NUMBER	RATING	PACKAGE ⁽¹⁾
		J (CDIP, 14)
SN54AHCT125	Military	W (CFP, 14)
		FK (LCCC, 20)
		D (SOIC, 14)
		DB (SSOP, 14)
		DGV (TVSOP, 14)
	Commorgial	N (PDIP, 14)
SN74AHC1125	Commercial	NS (SOP, 14)
		PW (SOP, 14)
		RGY (VQFN, 14)
		BQA (WQFN, 14)

Device Information

For more information, see Section 11. (1)



Pin numbers are for D, DB, DGV, J, N, NS, PW, RGY, and W packages.

Logic Diagram (Positive Logic)



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4 Pin Configuration and Functions

1OE Vcc 14 13 40E 1A 🛛 2 4A 1Y 🛛 3 12 2OE 4] 4Y 11] 30E 2A [5 10 2Y 🛛 3A 6 9 GND [7 8 3Y





Figure 4-2. SN74AHCT125 RGY or BQA Package (Top View)



NC – No internal connection

Figure 4-3. SN54AHCT125 FK Package, (Top View)

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Table 4-1. Pin Functions								
	PIN							
NAME	D, DB, DGV, N, NS, J, W, PW, RGY or BQA	FK	I/O	DESCRIPTION				
1 OE	1	2	I	Output enable for gate 1				
1A	2	3	I	Gate 1 input				
1Y	3	4	0	Gate 1 output				
2 OE	4	6	I	Output enable for gate 2				
2A	5	8	I	Gate 2 input				
2Y	6	9	0	Gate 2 output				
3 OE	10	14	I	Output enable for gate 3				
3A	9	13	I	Gate 3 input				
3Y	8	12	0	Gate 3 output				
4 OE	13	19	I	Output enable for gate 4				
4A	12	18	I	Gate 4 input				
4Y	11	16	0	Gate 4 output				
GND	7	10	_	Ground pin				
NC	_	1, 5, 7, 11, 15, 17	_	No internal connection				
V _{CC}	14	20	_	Power pin				



5 Specifications

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾

			MIN	MAX	UNIT
V _{CC}	Supply voltage range	-0.5	7	V	
VI	Input voltage range ⁽²⁾	-0.5	7	V	
Vo	Output voltage range ⁽²⁾	-0.5	V _{CC} + 0.5	V	
I _{IK}	Input clamp current	V ₁ < 0		-20	mA
I _{OK}	Output clamp current	$V_0 < 0 \text{ or } V_0 > V_{CC}$		±20	mA
I _O	Continuous output current	$V_0 = 0$ to V_{CC}		±25	mA
	Continuous current through V_{CC} or GND		±50	mA	
T _{stg}	Storage temperature range	-65	150	°C	

(1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

5.2 Recommended Operating Conditions⁽¹⁾

		SN54AHCT125		SN74AHCT125		
		MIN	MAX	MIN	MAX	UNIT
V _{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V _{IH}	High-level input voltage	2		2		V
V _{IL}	Low-level input voltage		0.8		0.8	V
VI	Input voltage	0	5.5	0	5.5	V
Vo	Output voltage	0	V _{CC}	0	V _{CC}	V
I _{OH}	High-level output current		-8		-8	mA
I _{OL}	Low-level output current		8		8	mA
Δt/Δv	Input transition rise or fall rate		20		20	ns/V
T _A	Operating free-air temperature	-55	125	-40	85	°C

 All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.

5.3 Thermal Information

		SNx4AHCT125								
THE	RMAL METRIC ⁽¹⁾	D (SOIC)	DB (SSOP)	DGV (TVSOP)	N (PDIP)	NS (SO)	PW (TSSOP)	RGY (VQFN)	BQA (WQFN)	UNIT
		14	14	14	14	14	14	14	14	
θ_{JA}	Package thermal impedance	124.5	96	127	80	76	147.7	87.1	88.3	°C/W

(1) For more information about traditional and new thermal metrics, see the Semiconductor and IC package thermal metrics application report.

5.4 Electrical Characteristics

DADAMETED	TEST CONDITIONS	v	T _A = 25°C		SN54AHCT125		SN74AHCT125			
PARAMETER		Vcc	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
Varia	I _{OH} = –50 μA	15V	4.4	4.5		4.4		4.4		V
VOH	I _{OH} = –8 mA	4.5 V	3.94			3.8		3.8		v
Max	I _{OL} = 50 μA	4.5 V			0.1		0.1		0.1	V
VOL	I _{OL} = 8 mA				0.36		0.44		0.44	v
l ₁	V _I = 5.5 V or GND	0 V to 5.5 V			±0.1		±1 ⁽¹⁾		±1	μA
I _{OZ}	V _O = V _{CC} or GND	5.5 V			±0.25		±2.5		±2.5	μA
I _{CC}	$V_{I} = V_{CC}$ or GND, $I_{O} = 0$	5.5 V			2		20		20	μΑ
ΔI_{CC} ⁽²⁾	One input at 3.4 V, Other inputs at V_{CC} or GND	5.5 V			1.35		1.5		1.5	mA
C _i	V _I = V _{CC} or GND	5 V		4	10				10	pF
Co	$V_{O} = V_{CC}$ or GND	5 V		15						pF

over operating free-air temperature range (unless otherwise noted)

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested at V_{CC} = 0 V.

(2) This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0 V or V_{CC}.

5.5 Switching Characteristics

over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 6-1)

	AMETED FROM TO LOAD		т	_A = 25°C		SN54AH	ICT125	SN74AH	CT125		
PARAMETER	(INPUT)	(OUTPUT)	CAPACITANCE	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
t _{PLH}	^	v	C = 15 pE		3.8 ⁽¹⁾	5.5 <mark>(1)</mark>	1 ⁽¹⁾	6.5 <mark>(1)</mark>	1	6.5	ne
t _{PHL}		I	0 _L = 15 pr		3.8 ⁽¹⁾	5.5 <mark>(1)</mark>	1 ⁽¹⁾	6.5 <mark>(1)</mark>	1	6.5	115
t _{PZH}		×	$C_{1} = 15 \text{ pE}$		3.6 ⁽¹⁾	5.1 <mark>(1)</mark>	1 ⁽¹⁾	6 ⁽¹⁾	1	6	nc
t _{PZL}	UL	I	0L = 15 pr		3.6 ⁽¹⁾	5.1 <mark>(1)</mark>	1 ⁽¹⁾	6 ⁽¹⁾	1	6	115
t _{PHZ}		v	C = 15 pE		4.6 ⁽¹⁾	6.8 <mark>(1)</mark>	1 ⁽¹⁾	8 ⁽¹⁾	1	8	ne
t _{PLZ}	UL	I	0 _L = 15 pr		4.6 ⁽¹⁾	6.8 <mark>(1)</mark>	1 ⁽¹⁾	8 ⁽¹⁾	1	8	115
t _{PLH}	^	v	$C_{1} = 50 \text{ pF}$		5.3	7.5	1	8.5	1	8.5	nc
t _{PHL}	A	I	0L - 30 pr		5.3	7.5	1	8.5	1	8.5	115
t _{PZH}		v	$C_{1} = 50 \text{ pE}$		5.1	7.1	1	8	1	8	nc
t _{PZL}	UL	I	0L - 30 pr		5.1	7.1	1	8	1	8	115
t _{PHZ}		Y	C = 50 pE		6.1	8.8	1	10	1	10	ne
t _{PLZ}			0 _L = 30 pr		6.1	8.8	1	10	1	10	115
t _{sk(o)}			C _L = 50 pF			1 ⁽²⁾				1	ns

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

(2) On products compliant to MIL-PRF-38535, this parameter does not apply.



5.6 Noise Characteristics

 $V_{CC} = 5 V, C_L = 50 pF, T_A = 25^{\circ}C^{(1)}$

	DADAMETED	SN74AHC		
	FARAIVIETER	MIN	MAX	UNIT
V _{OL(P)}	Quiet output, maximum dynamic V _{OL}		0.8	V
V _{OL(V)}	Quiet output, minimum dynamic V _{OL}		-0.8	V
V _{OH(V)}	Quiet output, minimum dynamic V _{OH}	4.4		V
V _{IH(D)}	High-level dynamic input voltage	2		V
V _{IL(D)}	Low-level dynamic input voltage		0.8	V

(1) Characteristics are for surface-mount packages only.

5.7 Operating Characteristics

 V_{CC} = 5 V, T_A = 25°C

	PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd}	Power dissipation capacitance	No load, f = 1 MHz	14	pF



6 Parameter Measurement Information



NOTES: A. C_L includes probe and jig capacitance.

- B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, Z₀ = 50 Ω , t_f \leq 3 ns, t_f \leq 3 ns.
- D. The outputs are measured one at a time with one input transition per measurement.
- E. All parameters and waveforms are not applicable to all devices.

Figure 6-1. Load Circuit and Voltage Waveforms



7 Detailed Description

7.1 Overview

The SNx4AHTC125 devices have four integrated bus buffer gates. Each gate can be individually controlled from their respective output enable pins or tied together and controlled simultaneously. This allows for control of up to four different lines from one device. Often times a microcontroller have multiple function options for a single pin. By using GPIO pins to enable specific buffers, the SNx4AHCT125 can act as a multiplexer to select a specific data line depending on what pin function is selected on the microcontroller. At the same time, the lines that are not selected are isolated from the pin.

7.2 Functional Block Diagram



Pin numbers shown are for the D, DB, DGV, J, N, NS, PW, RGY, and W packages.

7.3 Feature Description

Each buffer has its own output enable. This allows for control of each buffer individually. When the output enable is LOW, the input is passed to the output. When the output enable is HIGH, the output is high impedance. This feature is useful in applications that might require isolation.

7.4 Device Functional Modes

(Each Buffer)								
INI	OUTPUT							
ŌĒ	Α	Y						
L	Н	н						
L	L	L						
Н	x	Z						

Function Table



8 Application and Implementation

Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

8.1 Application Information

In this application, a buffer with a 3-state output is used to disable a data signal as shown in Figure 8-1. The remaining three buffers can be used for signal conditioning in other places in the system, or the inputs can be grounded and the channels left unused.

8.2 Typical Application



Figure 8-1. Typical Application Block Diagram

8.2.1 Design Requirements

8.2.1.1 Power Considerations

Ensure the desired supply voltage is within the range specified in the *Recommended Operating Conditions*. The supply voltage sets the device's electrical characteristics as described in the *Electrical Characteristics* section.

The positive voltage supply must be capable of sourcing current equal to the total current to be sourced by all outputs of the SNx4AHCT125 plus the maximum static supply current, I_{CC} , listed in the *Electrical Characteristics*, and any transient current required for switching. The logic device can only source as much current that is provided by the positive supply source. Be sure to not exceed the maximum total current through V_{CC} listed in the *Absolute Maximum Ratings*.

The ground must be capable of sinking current equal to the total current to be sunk by all outputs of the SNx4AHCT125 plus the maximum supply current, I_{CC} , listed in the *Electrical Characteristics*, and any transient current required for switching. The logic device can only sink as much current that can be sunk into its ground connection. Be sure to not exceed the maximum total current through GND listed in the *Absolute Maximum Ratings*.

The SNx4AHCT125 can drive a load with a total capacitance less than or equal to 50 pF while still meeting all of the data sheet specifications. Larger capacitive loads can be applied; however, it is not recommended to exceed 50 pF.

The SNx4AHCT125 can drive a load with total resistance described by $R_L \ge V_O / I_O$, with the output voltage and current defined in the *Electrical Characteristics* table with V_{OH} and V_{OL} . When outputting in the HIGH state, the output voltage in the equation is defined as the difference between the measured output voltage and the supply voltage at the V_{CC} pin.

Total power consumption can be calculated using the information provided in *CMOS Power Consumption and Cpd Calculation*.

Thermal increase can be calculated using the information provided in *Thermal Characteristics of Standard Linear* and Logic (SLL) Packages and Devices.



CAUTION

The maximum junction temperature, $T_{J(max)}$ listed in the *Absolute Maximum Ratings*, is an additional limitation to prevent damage to the device. Do not violate any values listed in the *Absolute Maximum Ratings*. These limits are provided to prevent damage to the device.

8.2.1.2 Input Considerations

Input signals must cross $V_{IL(max)}$ to be considered a logic LOW, and $V_{IH(min)}$ to be considered a logic HIGH. Do not exceed the maximum input voltage range found in the *Absolute Maximum Ratings*.

Unused inputs must be terminated to either V_{CC} or ground. The unused inputs can be directly terminated if the input is completely unused, or they can be connected with a pull-up or pull-down resistor if the input will be used sometimes, but not always. A pull-up resistor is used for a default state of HIGH, and a pull-down resistor is used for a default state of LOW. The drive current of the controller, leakage current into the SNx4AHCT125 (as specified in the *Electrical Characteristics*), and the desired input transition rate limits the resistor size. A 10-k Ω resistor value is often used due to these factors.

The SNx4AHCT125 has CMOS inputs and thus requires fast input transitions to operate correctly, as defined in the *Recommended Operating Conditions* table. Slow input transitions can cause oscillations, additional power consumption, and reduction in device reliability.

Refer to the *Feature Description* section for additional information regarding the inputs for this device.

8.2.1.3 Output Considerations

The positive supply voltage is used to produce the output HIGH voltage. Drawing current from the output will decrease the output voltage as specified by the V_{OH} specification in the *Electrical Characteristics*. The ground voltage is used to produce the output LOW voltage. Sinking current into the output will increase the output voltage as specified by the V_{OL} specification in the *Electrical Characteristics*.

Push-pull outputs that could be in opposite states, even for a very short time period, should never be connected directly together. This can cause excessive current and damage to the device.

Two channels within the same device with the same input signals can be connected in parallel for additional output drive strength.

Unused outputs can be left floating. Do not connect outputs directly to V_{CC} or ground.

Refer to the Feature Description section for additional information regarding the outputs for this device.

8.2.2 Application Curves



Figure 8-2. Application Timing Diagram

8.3 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating located in the *Recommended Operating Conditions*. Each V_{CC} terminal should have a good bypass capacitor to prevent power disturbance. A 0.1- μ F capacitor is recommended for this device. It is acceptable to parallel multiple bypass capacitors to reject different frequencies of noise. The 0.1- μ F and 1- μ F capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results, as shown in the following layout example.

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8.4 Layout

8.4.1 Layout Guidelines

When using multiple-input and multiple-channel logic devices, inputs must never be left floating. In many cases, functions or parts of functions of digital logic devices are unused (for example, when only two inputs of a triple-input AND gate are used or only 3 of the 4 buffer gates are used). Such unused input pins must not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. All unused inputs of digital logic devices must be connected to a logic high or logic low voltage, as defined by the input voltage specifications, to prevent them from floating. The logic level that must be applied to any particular unused input depends on the function of the device. Generally, the inputs are tied to GND or V_{CC} , whichever makes more sense for the logic function or is more convenient.

8.4.2 Layout Example



Figure 8-3. Example Layout for the SNx4AHCT125



9 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

9.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

9.2 Support Resources

TI E2E[™] support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

9.3 Trademarks

TI E2E[™] is a trademark of Texas Instruments. All trademarks are the property of their respective owners.

9.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

9.5 Glossary

TI Glossary This glossary lists and explains terms, acronyms, and definitions.

10 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

CI	hanges from Revision Q (October 2023) to Revision R (February 2024)	Page
•	Updated RθJA value: RGY = 47 to 87.1, all values in °C/W	5

С	hanges from Revision P (June 2023) to Revision Q (October 2023)	Page
•	Updated RθJA values: D = 86 to 124.5, PW = 113 to 147.7, all values in °C/W	5

11 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.



PACKAGING INFORMATION

Orderable part number	Status	Material type	Package Pins	Package qty Carrier	RoHS	Lead finish/ Ball material	MSL rating/ Peak reflow	Op temp (°C)	Part marking
	(1)	(2)			(3)	(4)	(5)		(0)
5962-9686901Q2A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9686901Q2A SNJ54AHCT 125FK
5962-9686901QCA	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9686901QC A SNJ54AHCT125J
SN74AHCT125BQAR	Active	Production	WQFN (BQA) 14	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHT125
SN74AHCT125BQAR.A	Active	Production	WQFN (BQA) 14	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHT125
SN74AHCT125D	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 125	AHCT125
SN74AHCT125DBR	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125DBR.A	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125DGVR	Active	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125DGVR.A	Active	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125DR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHCT125
SN74AHCT125DR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHCT125
SN74AHCT125N	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74AHCT125N
SN74AHCT125N.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74AHCT125N
SN74AHCT125NSR	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHCT125
SN74AHCT125NSR.A	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHCT125
SN74AHCT125PWR	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125PWR.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125PWRG4	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125PWRG4.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125RGYR	Active	Production	VQFN (RGY) 14	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SN74AHCT125RGYR.A	Active	Production	VQFN (RGY) 14	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HB125
SNJ54AHCT125FK	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9686901Q2A SNJ54AHCT 125FK



Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SNJ54AHCT125FK.A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9686901Q2A SNJ54AHCT 125FK
SNJ54AHCT125J	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9686901QC A SNJ54AHCT125J
SNJ54AHCT125J.A	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9686901QC A SNJ54AHCT125J

⁽¹⁾ **Status:** For more details on status, see our product life cycle.

⁽²⁾ Material type: When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ RoHS values: Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) Lead finish/Ball material: Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ MSL rating/Peak reflow: The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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OTHER QUALIFIED VERSIONS OF SN54AHCT125, SN74AHCT125 :

- Catalog : SN74AHCT125
- Automotive : SN74AHCT125-Q1, SN74AHCT125-Q1
- Enhanced Product : SN74AHCT125-EP, SN74AHCT125-EP
- Military : SN54AHCT125
- NOTE: Qualified Version Definitions:
 - Catalog TI's standard catalog product
 - Automotive Q100 devices qualified for high-reliability automotive applications targeting zero defects
 - Enhanced Product Supports Defense, Aerospace and Medical Applications
 - Military QML certified for Military and Defense Applications

www.ti.com

Texas

STRUMENTS

TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal												
Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AHCT125BQAR	WQFN	BQA	14	3000	180.0	12.4	2.8	3.3	1.1	4.0	12.0	Q1
SN74AHCT125DBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74AHCT125DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74AHCT125NSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74AHCT125PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHCT125PWRG4	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHCT125PWRG4	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHCT125RGYR	VQFN	RGY	14	3000	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1



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PACKAGE MATERIALS INFORMATION

24-Jul-2025



Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AHCT125BQAR	WQFN	BQA	14	3000	210.0	185.0	35.0
SN74AHCT125DBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74AHCT125DR	SOIC	D	14	2500	353.0	353.0	32.0
SN74AHCT125NSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74AHCT125PWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74AHCT125PWRG4	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74AHCT125PWRG4	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74AHCT125RGYR	VQFN	RGY	14	3000	360.0	360.0	36.0

TEXAS INSTRUMENTS

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24-Jul-2025

TUBE



- B - Alignment groove width

*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	Τ (μm)	B (mm)
5962-9686901Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
SN74AHCT125N	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHCT125N	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHCT125N.A	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHCT125N.A	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54AHCT125FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHCT125FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA

RGY 14

3.5 x 3.5, 0.5 mm pitch

GENERIC PACKAGE VIEW

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary. Refer to the product data sheet for package details.





RGY0014A



PACKAGE OUTLINE

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
 The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.



RGY0014A

EXAMPLE BOARD LAYOUT

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).



RGY0014A

EXAMPLE STENCIL DESIGN

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

5. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.



D0014A



PACKAGE OUTLINE

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



NOTES:

- 1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M. 2. This drawing is subject to change without notice. 3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not
- exceed 0.15 mm, per side.
- 4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
- 5. Reference JEDEC registration MS-012, variation AB.



D0014A

EXAMPLE BOARD LAYOUT

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



D0014A

EXAMPLE STENCIL DESIGN

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



NOTES: (continued)

- 8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
- 9. Board assembly site may have different recommendations for stencil design.



BQA 14

2.5 x 3, 0.5 mm pitch

GENERIC PACKAGE VIEW

WQFN - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary. Refer to the product data sheet for package details.





BQA0014A

PACKAGE OUTLINE

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- 2. This drawing is subject to change without notice.
- 3. The package thermal pad must be soldered to the printed circuit board for optimal thermal and mechanical performance.



BQA0014A

EXAMPLE BOARD LAYOUT

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



NOTES: (continued)

- 4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
- 5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.



BQA0014A

EXAMPLE STENCIL DESIGN

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.



MECHANICAL DATA

PLASTIC SMALL-OUTLINE PACKAGE

0,51 0,35 ⊕0,25⊛ 1,27 8 14 0,15 NOM 5,60 8,20 5,00 7,40 \bigcirc Gage Plane ₽ 0,25 7 1 1,05 0,55 0°-10° Δ 0,15 0,05 Seating Plane — 2,00 MAX 0,10PINS ** 14 16 20 24 DIM 10,50 10,50 12,90 15,30 A MAX A MIN 9,90 9,90 12,30 14,70 4040062/C 03/03

NOTES: A. All linear dimensions are in millimeters.

NS (R-PDSO-G**)

14-PINS SHOWN

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



MECHANICAL DATA

PLASTIC SMALL-OUTLINE

MPDS006C - FEBRUARY 1996 - REVISED AUGUST 2000

DGV (R-PDSO-G**)

24 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
- D. Falls within JEDEC: 24/48 Pins MO-153

14/16/20/56 Pins – MO-194



DB0014A



PACKAGE OUTLINE

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M. 2. This drawing is subject to change without notice. 3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not

- exceed 0.15 mm per side. 4. Reference JEDEC registration MO-150.



DB0014A

EXAMPLE BOARD LAYOUT

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.

6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



DB0014A

EXAMPLE STENCIL DESIGN

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

8. Board assembly site may have different recommendations for stencil design.



FK 20

8.89 x 8.89, 1.27 mm pitch

GENERIC PACKAGE VIEW

LCCC - 2.03 mm max height

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary. Refer to the product data sheet for package details.





GENERIC PACKAGE VIEW

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



Images above are just a representation of the package family, actual package may vary. Refer to the product data sheet for package details.



J0014A



PACKAGE OUTLINE

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



NOTES:

- 1. All controlling linear dimensions are in inches. Dimensions in brackets are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- 2. This drawing is subject to change without notice.
- 3. This package is hermitically sealed with a ceramic lid using glass frit.
- Index point is provided on cap for terminal identification only and on press ceramic glass frit seal only.
 Falls within MIL-STD-1835 and GDIP1-T14.



J0014A

EXAMPLE BOARD LAYOUT

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE





N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



NOTES:

- A. All linear dimensions are in inches (millimeters).B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- \triangle The 20 pin end lead shoulder width is a vendor option, either half or full width.



PW0014A



PACKAGE OUTLINE

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M. 2. This drawing is subject to change without notice. 3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not
- exceed 0.15 mm per side.
- 4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
- 5. Reference JEDEC registration MO-153.



PW0014A

EXAMPLE BOARD LAYOUT

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



PW0014A

EXAMPLE STENCIL DESIGN

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



NOTES: (continued)

9. Board assembly site may have different recommendations for stencil design.



^{8.} Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

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