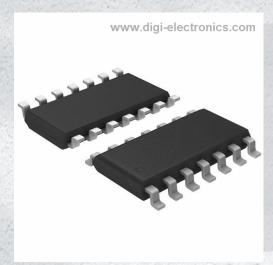


SN74HCU04DT Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number SN74HCU04DT-DG

Manufacturer

Texas Instruments

Manufacturer Product Number

SN74HCU04DT

Description

IC INVERTER 6CH 1-INP 14SOIC

Detailed Description

Inverter IC 6 Channel 14-SOIC



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.



Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
SN74HCU04DT	Texas Instruments
Series:	Product Status:
74HCU	Last Time Buy
Logic Type:	Number of Circuits:
Inverter	6
Number of Inputs:	Features:
1	
Voltage - Supply:	Current - Quiescent (Max):
2V ~ 6V	2 μΑ
Current - Output High, Low:	Input Logic Level - Low:
5.2mA, 5.2mA	0.5V ~ 1.8V
Input Logic Level - High:	Max Propagation Delay @ V, Max CL:
1.7V ~ 4.8V	14ns @ 6V, 50pF
Operating Temperature:	Mounting Type:
-40°C ~ 85°C	Surface Mount
Supplier Device Package:	Package / Case:
14-SOIC	14-SOIC (0.154", 3.90mm Width)
Base Product Number:	
74HCU04	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	

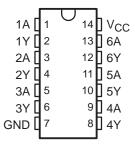
8542.39.0001

SN54HCU04, SN74HCU04 HEX INVERTERS

SCLS079E - MARCH 1984 - REVISED MARCH 2004

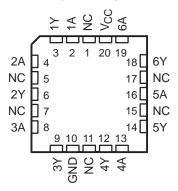
- Wide Operating Voltage Range of 2 V to 6 V
- Outputs Can Drive Up To 10 LSTTL Loads
- Low Power Consumption, 20-μA Max I_{CC}

SN54HCU04 . . . J OR W PACKAGE SN74HCU04 . . . D, DB, N, NS, OR PW PACKAGE (TOP VIEW)



- Typical t_{pd} = 7 ns
- ±4-mA Output Drive at 5 V
- Low Input Current of 1 μA Max
- Unbuffered Outputs

SN54HCU04 . . . FK PACKAGE (TOP VIEW)



NC - No internal connection

description/ordering information

The 'HCU04 devices contain six independent inverters. They perform the Boolean function $Y = \overline{A}$ in positive logic.

ORDERING INFORMATION

TA	PACKA	GE [†]	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube of 25	SN74HCU04N	SN74HCU04N
		Tube of 50	SN74HCU04D	
	SOIC - D	Reel of 2500	SN74HCU04DR	HCU04
-40°C to 85°C		Reel of 250	SN74HCU04DT	
	SOP - NS	Reel of 2000	SN74HCU04NSR	HCU04
	SSOP - DB	Reel of 2000	SN74HCU04DBR	HU04
		Reel of 90	SN74HCU04PW	
	TSSOP - PW	Reel of 2000	SN74HCU04PWR	HCU04
		Reel of 250	SN74HCU04PWT	
	CDIP – J	Tube of 25	SNJ54HCU04J	SNJ54HCU04J
−55°C to 125°C	CFP – W	Tube of 150	SNJ54HCU04W	SNJ54HCU04W
	LCCC – FK	Tube of 55	SNJ54HCU04FK	SNJ54HCU04FK

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



SN54HCU04, SN74HCU04 HEX INVERTERS

SCLS079E - MARCH 1984 - REVISED MARCH 2004

FUNCTION TABLE (each inverter)

INPUT A	OUTPUT Y
Н	L
L	Н

logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V _{CC}		–0.5 V to 7 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) (see	e Note 1)	±20 mA
Output clamp current, I _{OK} (V _O < 0 or V _O > V _{CC}	y) (see Note 1)	±20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})		±25 mA
Continuous current through V _{CC} or GND		±50 mA
Package thermal impedance, θ_{JA} (see Note 2):	D package	86°C/W
	DB package	96°C/W
	N package	80°C/W
	NS package	76°C/W
	PW package	113°C/W
Storage temperature range, T _{stg}		-65°C to 150°C

[†] 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.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions (see Note 3)

			SN	SN54HCU04			174HCU0)4	
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
Vcc	V _{CC} Supply voltage				6	2	5	6	V
VIH High-level input		V _{CC} = 2 V	1.7			1.7			
	High-level input voltage	V _{CC} = 4.5 V	3.6			3.6			V
		V _{CC} = 6 V	4.8			4.8			
		V _{CC} = 2 V			0.5			0.5	
VIL	Low-level input voltage	V _{CC} = 4.5 V			1.35			1.35	V
		V _{CC} = 6 V			1.8			1.8	
VI	Input voltage		0		VCC	0		VCC	V
٧o	Output voltage		0		VCC	0		VCC	V
TA	Operating free-air temperature		-55		125	-40		85	°C

NOTE 3: 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.



SCLS079E - MARCH 1984 - REVISED MARCH 2004

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

24244555	TEOT 001	DITIONS	.,	T,	ղ = 25°C	;	SN54H	CU04	SN74HCU04		
PARAMETER	TEST CON	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT	
			2 V	1.8			1.8		1.8		
		I _{OH} = -20 μA	4.5 V	4			4		4		
Voн	$V_I = V_{CC}$ or GND		6 V	5.5			5.5		5.5		V
		$I_{OH} = -4 \text{ mA}$	4.5 V	3.98			3.7		3.84		
		$I_{OH} = -5.2 \text{ mA}$	6 V	5.48			5.2		5.34		
	V _I = V _{CC} or GND		2 V			0.2		0.2		0.2	
		I _{OL} = 20 μA	4.5 V			0.5		0.5		0.5	
VOL			6 V			0.5		0.5		0.5	V
		I _{OL} = 4 mA	4.5 V			0.26		0.4		0.33	
		I _{OL} = 5.2 mA	6 V			0.26		0.4		0.33	
lį	VI = VCC or 0		6 V			±100		±1000		±1000	nA
Icc	$V_I = V_{CC}$ or 0,	IO = 0	6 V			2		40		20	μΑ
Ci			2 V to 6 V		3	10		10		10	pF

switching characteristics over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Figure 1)

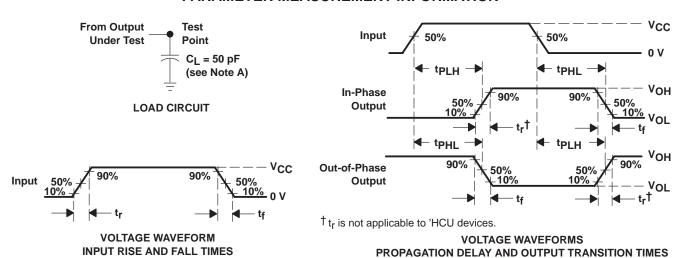
DADAMETED	FROM	TO (OUTPUT)	.,	T,	ղ = 25°C	;	SN54H	CU04	SN74H	CU04	LINUT
PARAMETER	(INPUT)		vcc	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
t _{pd} A		2 V		40	80		120		100		
	А	Y	4.5 V		8	16		24		20	ns
·			6 V		7	14		20		17	
		Y	2 V		38	75		110		95	
t _f			4.5 V		8	15		22		19	ns
			6 V		6	13		19		16	

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

	PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd}	Power dissipation capacitance per inverter	No load	20	pF

SCLS079E - MARCH 1984 - REVISED MARCH 2004

PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_I includes probe and test-fixture capacitance.

- B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, $Z_O = 50 \ \Omega$, $t_f = 6 \ ns$, $t_f = 6 \ ns$.
- C. The outputs are measured one at a time, with one input transition per measurement.
- D. tpLH and tpHL are the same as tpd.

Figure 1. Load Circuit and Voltage Waveforms





PACKAGE OPTION ADDENDUM

www.ti.com 2-Feb-2025

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp	Op Temp (°C)	Device Marking (4/5)	Samples
86010012A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	86010012A SNJ54HCU 04FK	Samples
8601001CA	ACTIVE	CDIP	J	14	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8601001CA SNJ54HCU04J	Samples
SN54HCU04J	ACTIVE	CDIP	J	14	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	SN54HCU04J	Samples
SN74HCU04D	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI	-40 to 85	HCU04	
SN74HCU04DR	ACTIVE	SOIC	D	14	2500	RoHS & Green	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	HCU04	Samples
SN74HCU04DT	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI	-40 to 85	HCU04	
SN74HCU04N	ACTIVE	PDIP	N	14	25	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74HCU04N	Samples
SN74HCU04NE4	ACTIVE	PDIP	N	14	25	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74HCU04N	Samples
SN74HCU04NSR	ACTIVE	SOP	NS	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HCU04	Samples
SN74HCU04PW	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 85	HCU04	
SN74HCU04PWR	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	HCU04	Samples
SN74HCU04PWRG4	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HCU04	Samples
SN74HCU04PWT	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 85	HCU04	
SNJ54HCU04FK	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	86010012A SNJ54HCU 04FK	Samples
SNJ54HCU04J	ACTIVE	CDIP	J	14	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	8601001CA SNJ54HCU04J	Samples

⁽¹⁾ The marketing status values are defined as follows: **ACTIVE:** Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design. PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

SN74HCU04DT Texas Instruments IC INVERTER 6CH 1-INP 14SOIC



PACKAGE OPTION ADDENDUM

www.ti.com 2-Feb-2025

(2) RoHS: TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (CI) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

- (3) MSL, Peak Temp. The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.
- (4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.
- (5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.
- (6) Lead finish/Ball material Orderable Devices 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.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

OTHER QUALIFIED VERSIONS OF SN54HCU04, SN74HCU04:

Catalog: SN74HCU04

Military: SN54HCU04

NOTE: Qualified Version Definitions:

- Catalog TI's standard catalog product
- Military QML certified for Military and Defense Applications



PACKAGE MATERIALS INFORMATION

www.ti.com 7-Dec-2024

TAPE AND REEL INFORMATION





A0	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74HCU04DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HCU04NSR	SOP	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74HCU04PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74HCU04PWRG4	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1



PACKAGE MATERIALS INFORMATION

www.ti.com 7-Dec-2024



*All dimensions are nominal

7 ill difficiente de la frontina											
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)				
SN74HCU04DR	SOIC	D	14	2500	353.0	353.0	32.0				
SN74HCU04NSR	SOP	NS	14	2000	356.0	356.0	35.0				
SN74HCU04PWR	TSSOP	PW	14	2000	356.0	356.0	35.0				
SN74HCU04PWRG4	TSSOP	PW	14	2000	356.0	356.0	35.0				



PACKAGE MATERIALS INFORMATION

www.ti.com 7-Dec-2024

TUBE



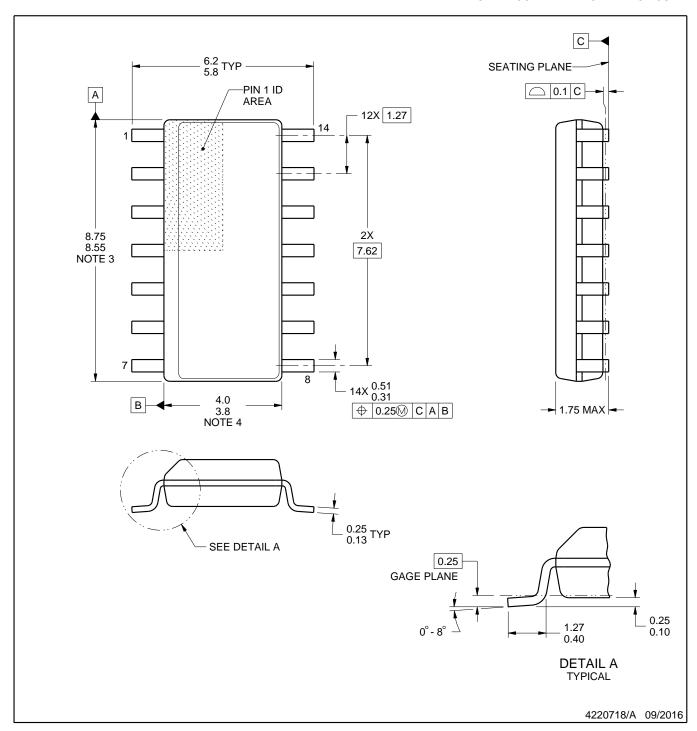
*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
86010012A	FK	LCCC	20	55	506.98	12.06	2030	NA
SN74HCU04N	N	PDIP	14	25	506	13.97	11230	4.32
SN74HCU04N	N	PDIP	14	25	506	13.97	11230	4.32
SN74HCU04NE4	N	PDIP	14	25	506	13.97	11230	4.32
SN74HCU04NE4	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54HCU04FK	FK	LCCC	20	55	506.98	12.06	2030	NA



SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



NOTES:

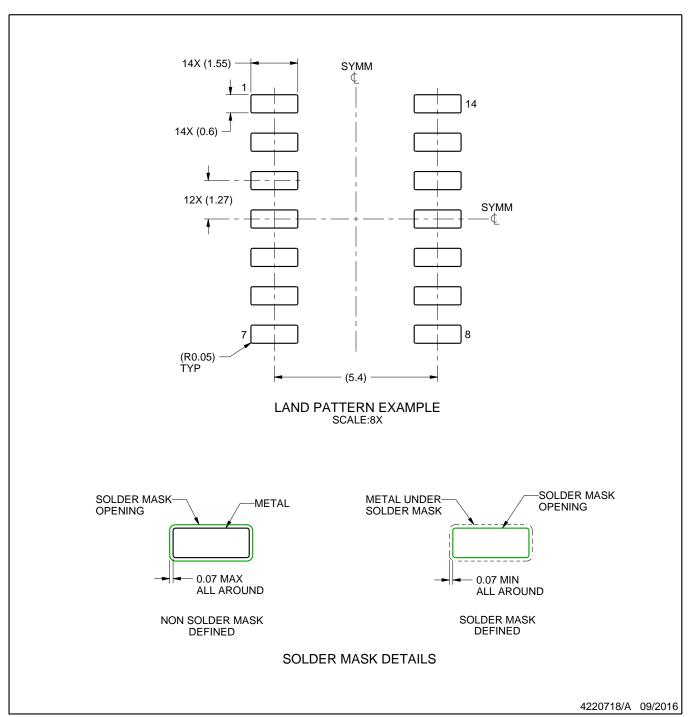
- 1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

 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.



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.



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.

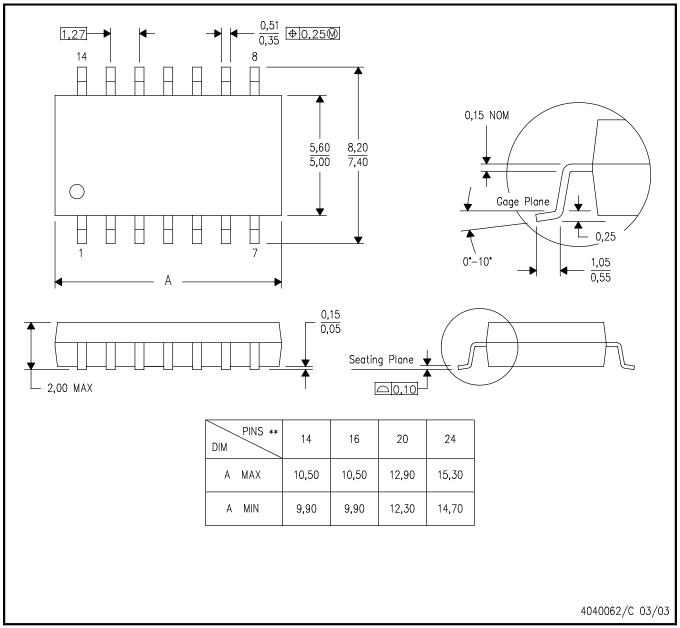


MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



NOTES:

- . 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.



GENERIC PACKAGE VIEW

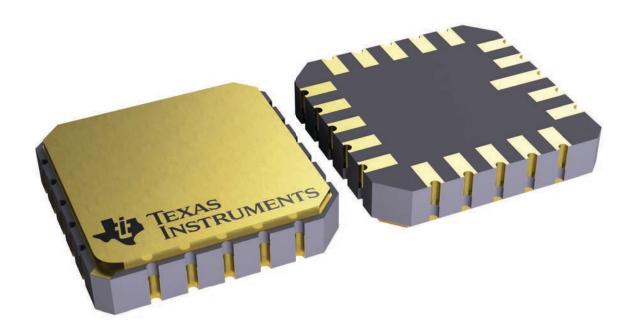
FK 20

LCCC - 2.03 mm max height

8.89 x 8.89, 1.27 mm pitch

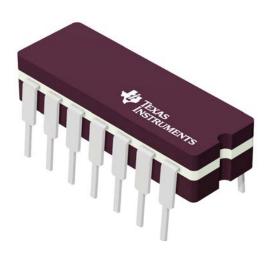
LEADLESS CERAMIC CHIP CARRIER

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



INSTRUMENTS www.ti.com

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.

4040083-5/G

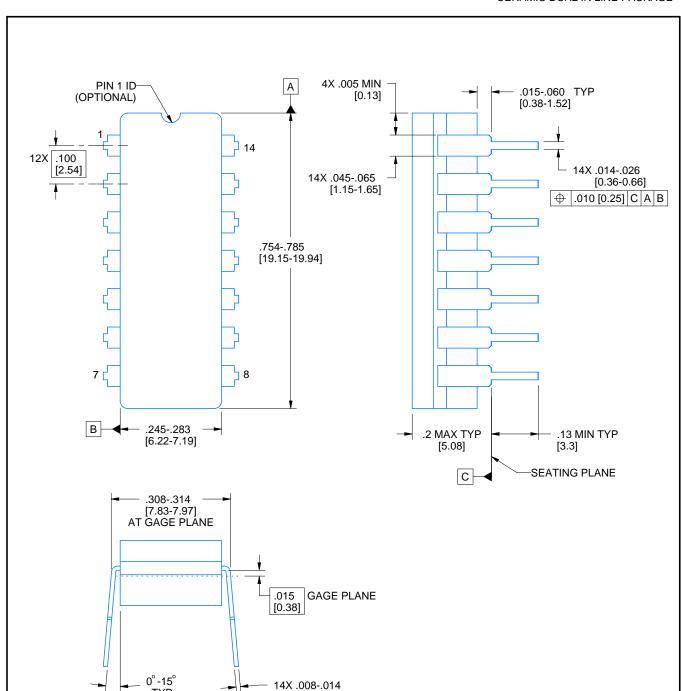


PACKAGE OUTLINE

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE

4214771/A 05/2017



NOTES:

J0014A

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.

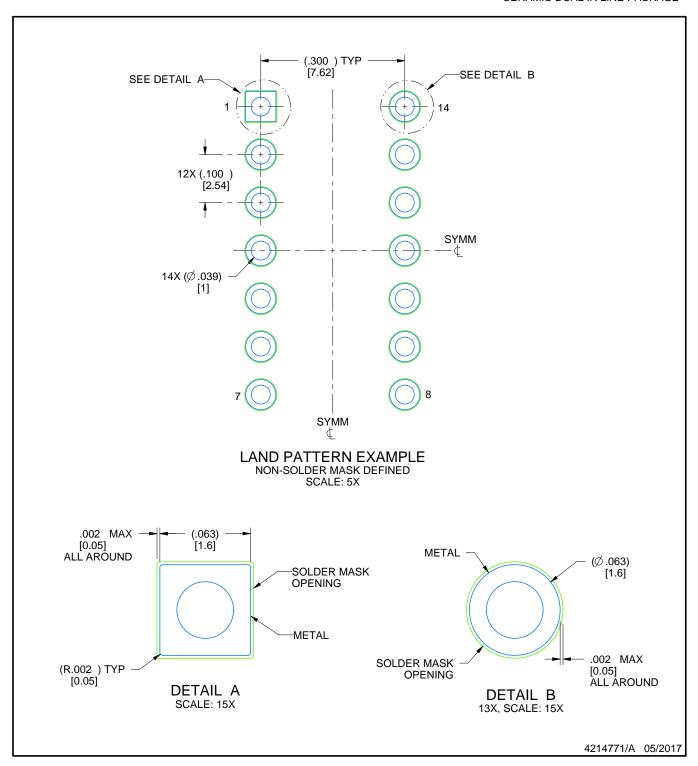
[0.2-0.36]

- 2. This drawing is subject to change without notice.
- 3. This package is hermitically sealed with a ceramic lid using glass frit.
- His package is remitted by sealed with a ceramic its using glass mit.
 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.



CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE

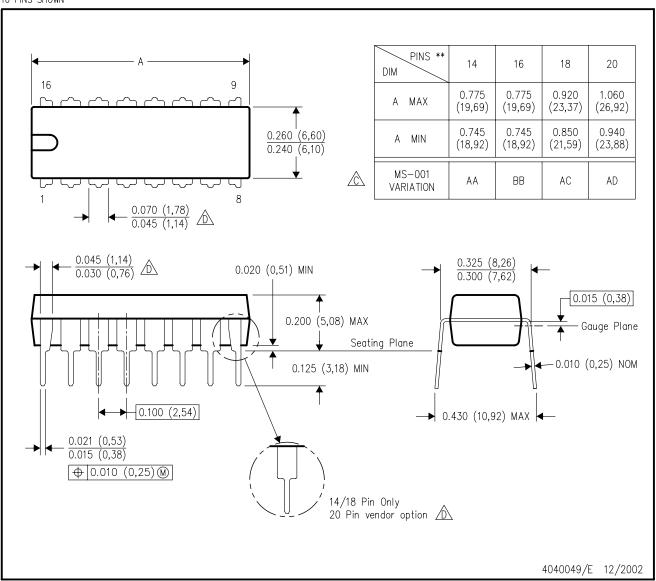


MECHANICAL DATA

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



NOTES:

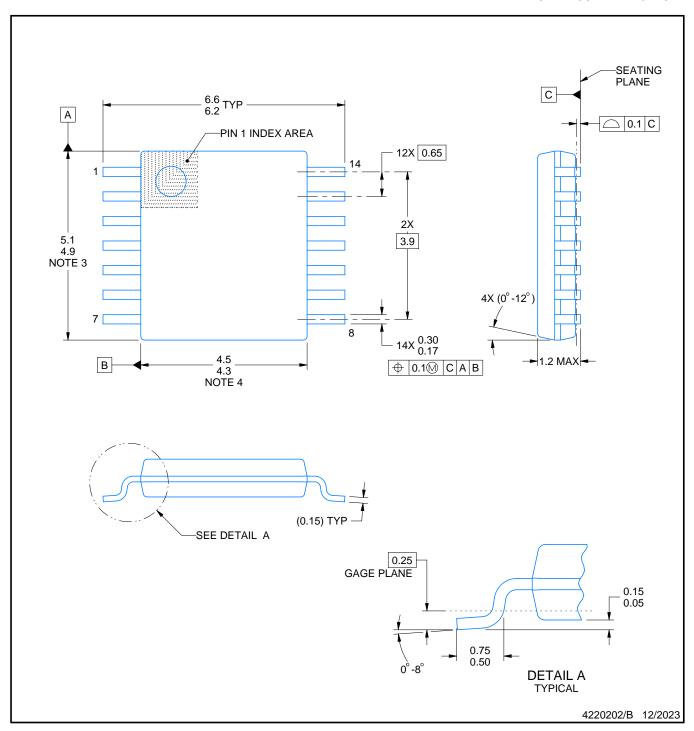
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- The 20 pin end lead shoulder width is a vendor option, either half or full width.





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.



SMALL OUTLINE PACKAGE



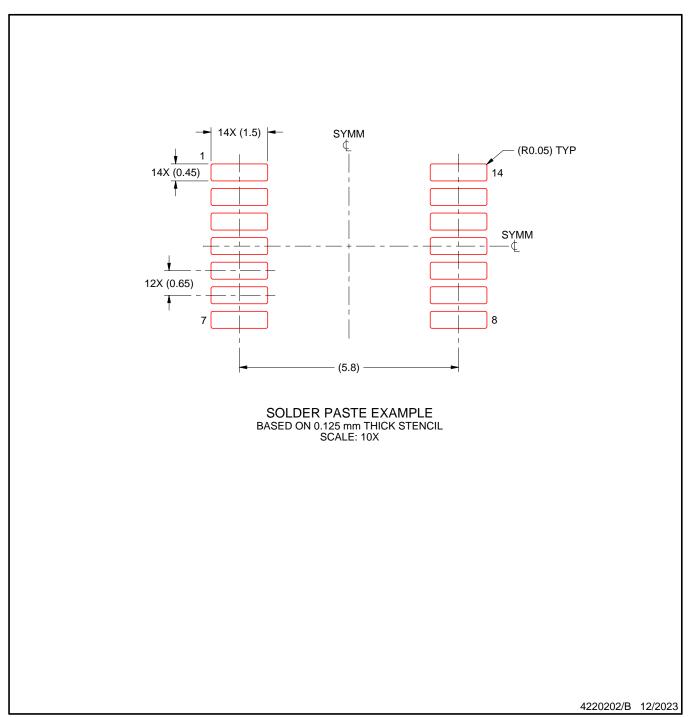
NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

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



SMALL OUTLINE PACKAGE



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.



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265 Copyright © 2025. Texas Instruments Incorporated



OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com

















Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com