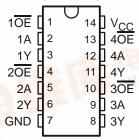
专业PCB打样**SN54AH®125**出**SN74AHC125** QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS

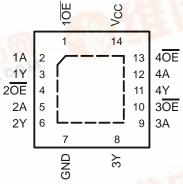
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- Operating Range 2-V to 5.5-V V_{CC}
- Latch-Up Performance Exceeds 250 mA Per JESD 17

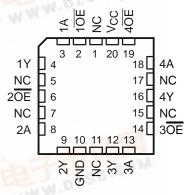
SN54AHC125...J OR W PACKAGE SN74AHC125 . . . D, DB, DGV, N, NS, OR PW PACKAGE (TOP VIEW)



SN74AHC125 . . . RGY PACKAGE (TOP VIEW)



SN54AHC125 . . . FK PACKAGE (TOP VIEW)



NC - No internal connection

description/ordering information

The 'AHC125 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.

To ensure 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.

ORDERING INFORMATION

TA	PACKAGET		ORDERABLE PART NUMBER	TOP-SIDE MARKING
	QFN – RGY	Tape and reel	SN74AHC125RGYR	HA125
	PDIP – N	Tube	SN74AHC125N	SN74AHC125N
and the	SOIC - D	Tube	SN74AHC125D	AHC125
A THE	SOIC - D	Tape and reel	SN74AHC125DR	Ancizo
_40°C to 85°C	SOP – NS	Tape and reel	SN74AHC125NSR	AHC125
	SSOP – DB	Tape and reel	SN74AHC125DBR	HA125
	TSSOP – PW	Tube	SN74AHC125PW	HA125
	1330F - FW	Tape and reel	SN74AHC125PWR	HA125
	TVSOP – DGV	Tape and reel	SN74AHC125DGVR	HA125
	CDIP – J	Tube	SNJ54AHC125J	SNJ54AHC125J
–55°C to 125°C	CFP – W	Tube	SNJ54AHC125W	SNJ54AHC125W
	LCCC – FK	Tube	SNJ54AHC125FK	SNJ54AHC125FK

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

Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



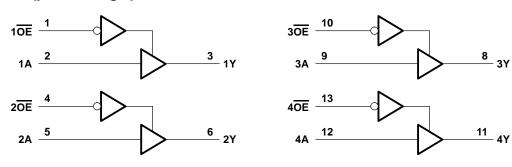
SN54AHC125, SN74AHC125 QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS

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FUNCTION TABLE (each buffer)

INP	UTS	OUTPUT
OE	Α	Y
L	Н	Н
L	L	L
Н	Χ	Z

logic diagram (positive logic)



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

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

Supply voltage range, V _{CC}	–0.5 V to 7 V
Input voltage range, V _I (see Note 1)	–0.5 V to 7 V
Output voltage range, V _O (see Note 1)	$0.5 \text{ V to V}_{CC} + 0.5 \text{ V}$
Input clamp current, I_{IK} ($V_I < 0$)	–20 mA
Output clamp current, I _{OK} (V _O < 0 or V _O > V _{CC})	±20 mA
Continuous output current, I _O (V _O = 0 to V _{CC})	±25 mA
Continuous current through V _{CC} or GND	
Package thermal impedance, θ _{JA} (see Note 2): D package	86°C/W
(see Note 2): DB package	96°C/W
(see Note 2): DGV package	127°C/W
(see Note 2): N package	80°C/W
(see Note 2): NS package	76°C/W
(see Note 2): PW package	113°C/W
(see Note 3): RGY package	47°C/W
Storage temperature range, T _{stq}	–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.
- 3. The package thermal impedance is calculated in accordance with JESD 51-5.



recommended operating conditions (see Note 4)

			SN54A	HC125	SN74A	HC125	UNIT	
			MIN	MAX	MIN	MAX	UNII	
Vсс	Supply voltage		2	5.5	2	5.5	V	
		V _{CC} = 2 V	1.5		1.5			
VIН	High-level input voltage	V _{CC} = 3 V	2.1		2.1		V	
		V _{CC} = 5.5 V	3.85		3.85			
		V _{CC} = 2 V		0.5		0.5		
V_{IL}	Low-level input voltage	V _{CC} = 3 V		0.9		0.9	V	
		V _{CC} = 5.5 V		1.65		1.65		
٧ _I	Input voltage		0	5.5	0	5.5	V	
٧o	Output voltage		0	Vcc	0	VCC	V	
		V _{CC} = 2 V		-50		-50	μΑ	
ІОН	High-level output current	$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		-4		-4	mA	
		$V_{CC} = 5 V \pm 0.5 V$		-8		-8	IIIA	
		V _{CC} = 2 V		50		50	μΑ	
lOL	Low-level output current	$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		4		4	mA	
		$V_{CC} = 5 V \pm 0.5 V$		8		8	ША	
Δt/Δν	Input transition rice or fall rate	$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		100		100	nc/\/	
ΔυΔν	Input transition rise or fall rate	$V_{CC} = 5 V \pm 0.5 V$		20		20	ns/V	
TA	Operating free-air temperature		- 55	125	-40	85	°C	

NOTE 4: 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.

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

DADAMETED	TEST CONDITIONS	V	T,	λ = 25°C	;	SN54AI	HC125	SN74AHC125		LINUT
PARAMETER	TEST CONDITIONS	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
		2 V	1.9	2		1.9		1.9		
	I _{OH} = -50 μA	3 V	2.9	3		2.9		2.9		
Voн		4.5 V	4.4	4.5		4.4		4.4		V
	I _{OH} = -4 mA	3 V	2.58			2.48		2.48		
	I _{OH} = -8 mA	4.5 V	3.94			3.8		3.8		
		2 V			0.1		0.1		0.1	
	I _{OL} = 50 μA	3 V			0.1		0.1		0.1	
VOL		4.5 V			0.1		0.1		0.1	V
	I _{OL} = 4 mA	3 V			0.36		0.5		0.44	
	I _{OL} = 8 mA	4.5 V			0.36		0.5		0.44	
ΙΙ	V _I = 5.5 V or GND	0 V to 5.5 V			±0.1		±1*		±1	μΑ
loz	$V_O = V_{CC}$ or GND	5.5 V			±0.25		±2.5		±2.5	μΑ
Icc	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			4		40		40	μΑ
C _i	$V_I = V_{CC}$ or GND	5 V		4	10				10	pF

^{*} On products compliant to MIL-PRF-38535, this parameter is not production tested at $V_{CC} = 0 \text{ V}$.



SN54AHC125, SN74AHC125 QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS

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switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V \pm 0.3 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	то	LOAD	T	λ = 25°C	;	SN54A	HC125	SN74AI	HC125	UNIT
PARAMETER	(INPUT)	(OUTPUT)	CAPACITANCE	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNII
tPLH	Α	Y	C _I = 15 pF		5.6*	8*	1*	9.5*	1	9.5	ns
t _{PHL}	A		CL = 13 pr		5.6*	8*	1*	9.5*	1	9.5	115
^t PZH	<u>OE</u>	Y	C _L = 15 pF		5.4*	8*	1*	9.5*	1	9.5	ns
t _{PZL}	OE		CL = 13 pr		5.4*	8*	1*	9.5*	1	9.5	115
^t PHZ	<u>OE</u>	Y	C _I = 15 pF		7*	9.7*	1*	11.5*	1	11.5	ns
t _{PLZ}	OE		CL = 13 pr		7*	9.7*	1*	11.5*	1	11.5	115
t _{PLH}	Α	Y	C _I = 50 pF		8.1	11.5	1	13	1	13	ns
^t PHL	A		CL = 30 pr		8.1	11.5	1	13	1	13	115
^t PZH	ŌĒ	Y	C _I = 50 pF		7.9	11.5	1	13	1	13	ns
tPZL	OE	ī	CL = 50 pr		7.9	11.5	1	13	1	13	115
^t PHZ	ŌĒ	Y	C _I = 50 pF		9.5	13.2	1	15	1	15	ns
tPLZ	OE	ī	CL = 50 pr		9.5	13.2	1	15	1	15	115
tsk(o)	ŌE	Υ	C _L = 50 pF			1.5**				1.5	ns

^{*} On products compliant to MIL-PRF-38535, this parameter is not production tested.

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

PARAMETER	FROM	то	LOAD	T,	T _A = 25°C		SN54AI	HC125	SN74A	HC125	UNIT
PARAMETER	(INPUT)	(OUTPUT)	CAPACITANCE	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNII
t _{PLH}	А	Y	C _I = 15 pF		3.8*	5.5*	1*	6.5*	1	6.5	ns
^t PHL	Λ.	ı	CL = 13 pr		3.8*	5.5*	1*	6.5*	1	6.5	115
^t PZH	OE	Y	C _L = 15 pF		3.6*	5.1*	1*	6*	1	6	ns
tPZL	OE	ī	CL = 15 pr		3.6*	5.1*	1*	6*	1	6	115
t _{PHZ}	ŌĒ	Y	C _I = 15 pF		4.6*	6.8*	1*	8*	1	8	ns
t _{PLZ}	OE	ı	CL = 13 pr		4.6*	6.8*	1*	8*	1	8	115
t _{PLH}	А	Y	C _L = 50 pF		5.3	7.5	1	8.5	1	8.5	ns
^t PHL	Λ.	ı	CL = 30 pr		5.3	7.5	1	8.5	1	8.5	115
^t PZH	ŌĒ	Y	C _L = 50 pF		5.1	7.1	1	8	1	8	ns
^t PZL	OE	ı	CL = 30 pr		5.1	7.1	1	8	1	8	115
t _{PHZ}	ŌĒ	Y	C _I = 50 pF		6.1	8.8	1	10	1	10	50
t _{PLZ}	OE	r 	GL = 50 pr		6.1	8.8	1	10	1	10	ns
tsk(o)			C _L = 50 pF			1**				1	ns

^{*} On products compliant to MIL-PRF-38535, this parameter is not production tested.



^{**} On products compliant to MIL-PRF-38535, this parameter does not apply.

^{**} On products compliant to MIL-PRF-38535, this parameter does not apply.

SN54AHC125, SN74AHC125 QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS SCLS256J – DECEMBER 1995 – REVISED JULY 2003

noise characteristics, V_{CC} = 5 V, C_L = 50 pF, T_A = 25°C (see Note 5)

	DADAMETED	SN74AI	UNIT		
	PARAMETER				
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	
VIH(D)	High-level dynamic input voltage	3.5		V	
V _{IL(D)}	Low-level dynamic input voltage		1.5	V	

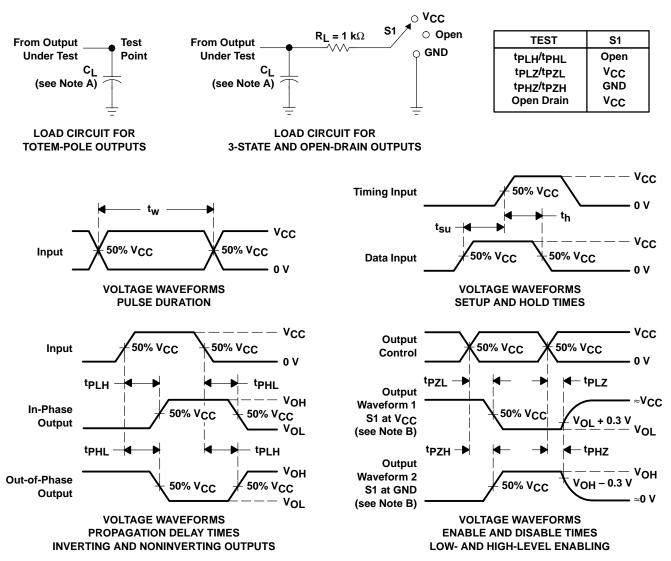
NOTE 5: Characteristics are for surface-mount packages only.

operating characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$

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

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PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_I 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, $Z_O = 50 \Omega$, $t_f \leq 3$ 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 1. Load Circuit and Voltage Waveforms







26-Sep-2005

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
5962-9686801Q2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
5962-9686801QCA	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
5962-9686801QDA	ACTIVE	CFP	W	14	1	TBD	Call TI	Level-NC-NC-NC
SN74AHC125D	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DBLE	OBSOLETE	SSOP	DB	14		TBD	Call TI	Call TI
SN74AHC125DBR	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DBRE4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DGVR	ACTIVE	TVSOP	DGV	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DGVRE4	ACTIVE	TVSOP	DGV	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125DRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125N	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74AHC125NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125PW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125PWE4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125PWG4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125PWLE	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI
SN74AHC125PWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125PWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125PWRG4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHC125RGYR	ACTIVE	QFN	RGY	14	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
SNJ54AHC125FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54AHC125J	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
SNJ54AHC125W	ACTIVE	CFP	W	14	1	TBD	Call TI	Level-NC-NC-NC

(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



PACKAGE OPTION ADDENDUM

26-Sep-2005

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.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

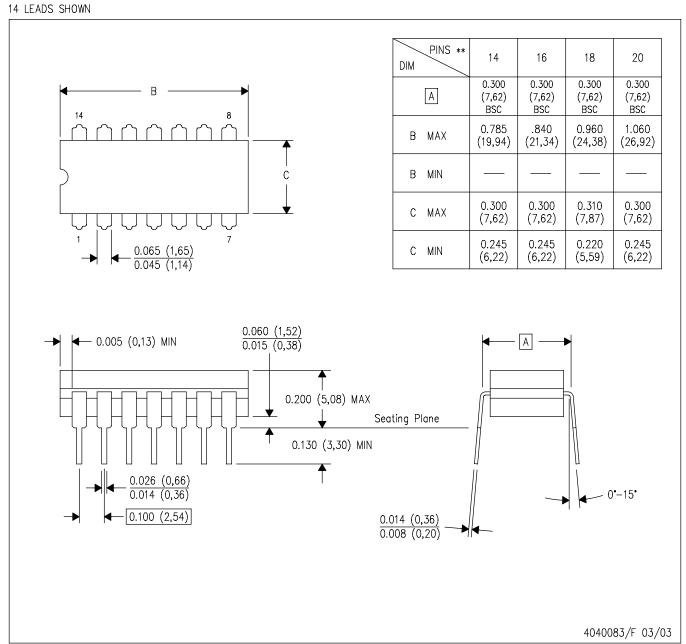
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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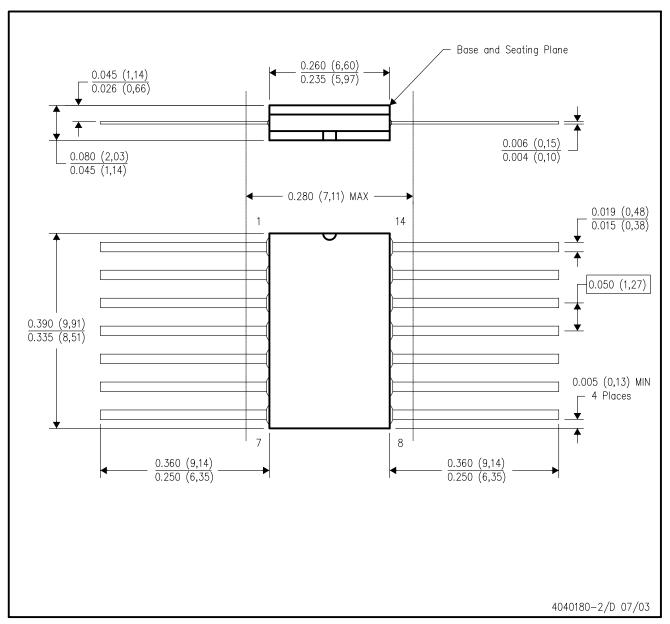
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- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



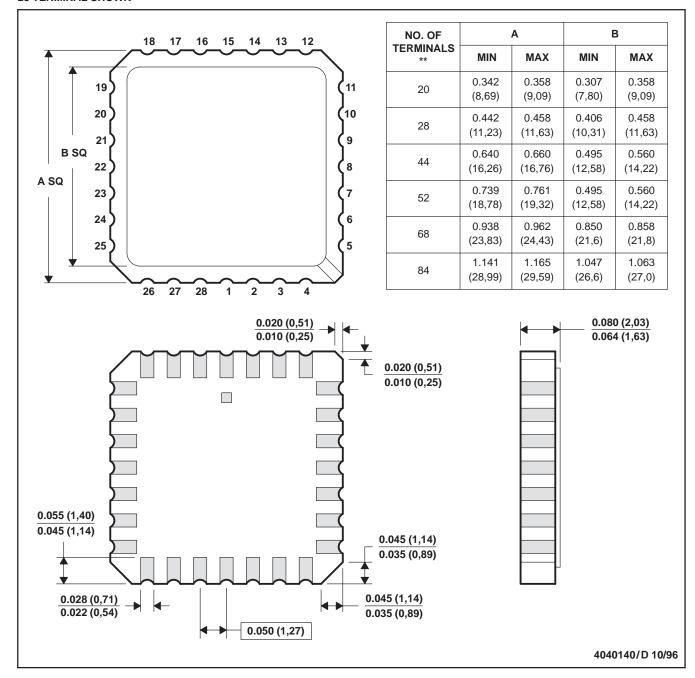
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within MIL STD 1835 GDFP1-F14 and JEDEC MO-092AB



FK (S-CQCC-N**)

28 TERMINAL SHOWN

LEADLESS CERAMIC CHIP CARRIER



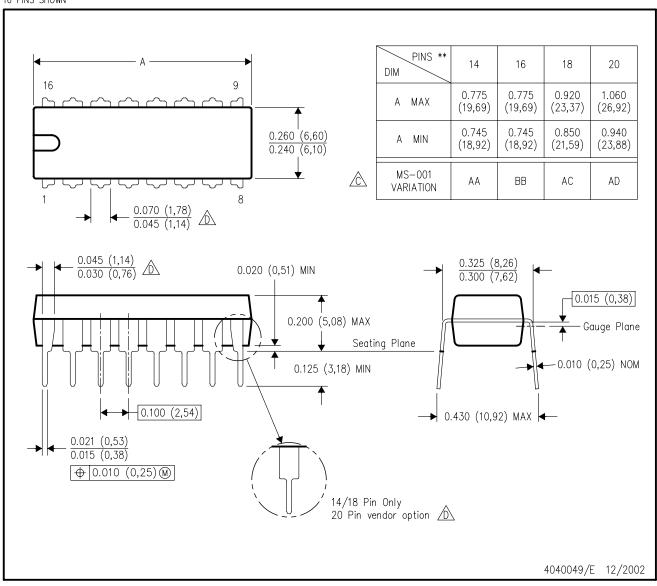
- NOTES: A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. This package can be hermetically sealed with a metal lid.
 - D. The terminals are gold plated.
 - E. Falls within JEDEC MS-004



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN

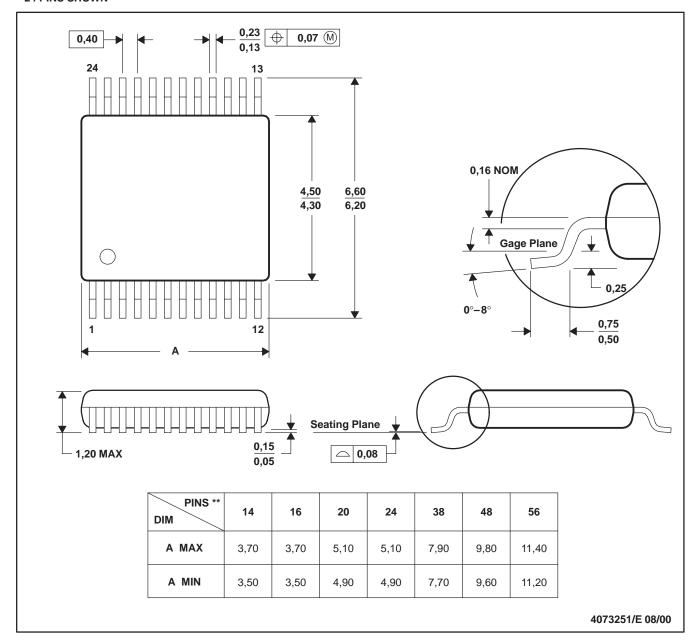


- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- The 20 pin end lead shoulder width is a vendor option, either half or full width.

DGV (R-PDSO-G**)

24 PINS SHOWN

PLASTIC SMALL-OUTLINE



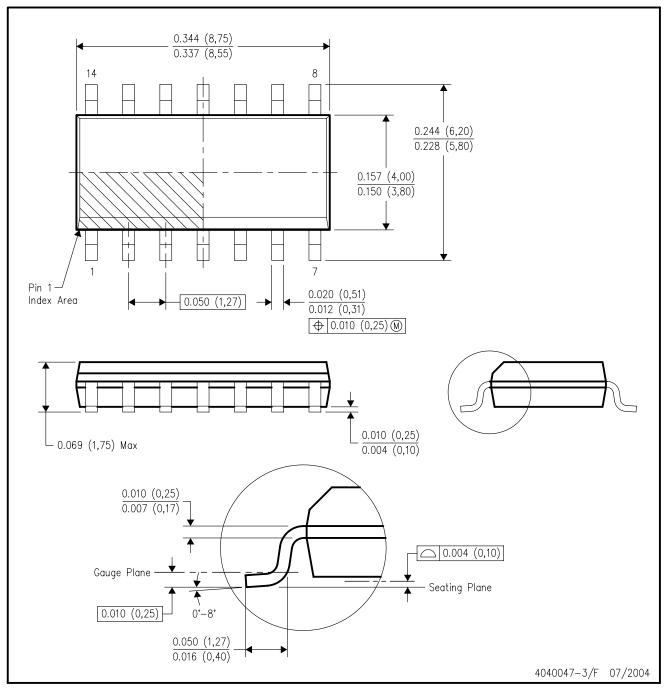
NOTES: A. All linear dimensions are in millimeters.

- 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



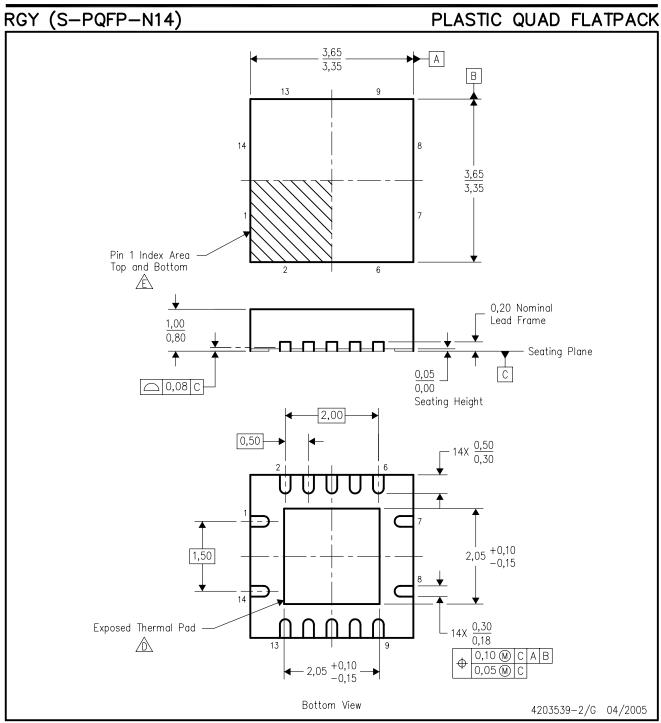
D (R-PDSO-G14)

PLASTIC SMALL-OUTLINE PACKAGE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-012 variation AB.





NOTES: A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
- C. QFN (Quad Flatpack No-Lead) package configuration.
- $ilde{\mathbb{D}}$ The package thermal pad must be soldered to the board for thermal and mechanical performance.
- Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
- F. Package complies to JEDEC MO-241 variation BA.

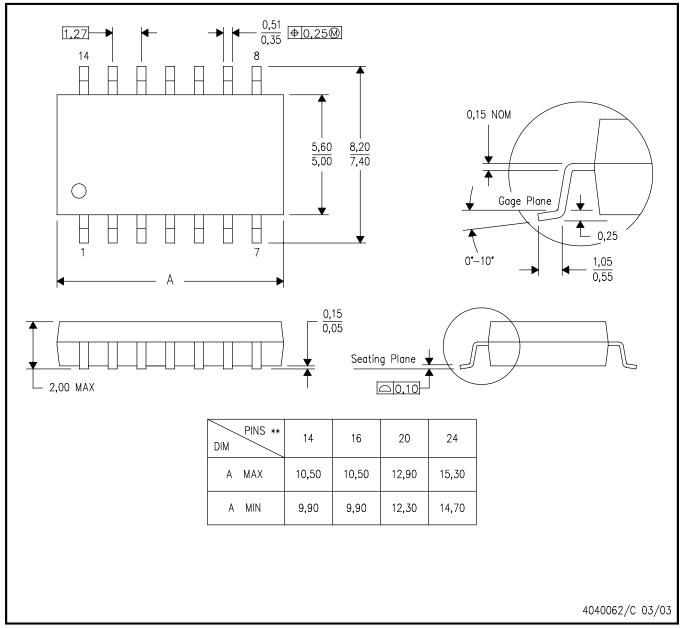


MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



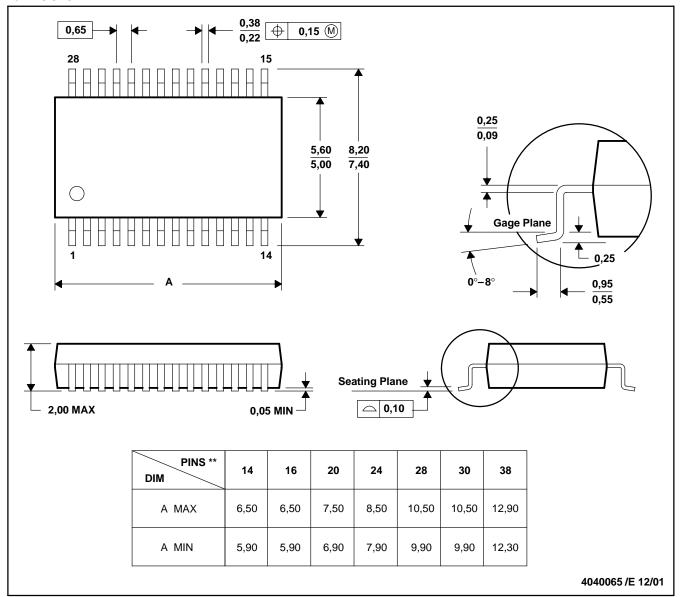
- . All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 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.
- D. Falls within JEDEC MO-150



PW (R-PDSO-G**)

14 PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



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.

D. Falls within JEDEC MO-153

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