

SN54LS399, SN74LS399 QUADRUPLE 2-INPUT MULTIPLEXERS WITH STORAGE

SDLS174 – OCTOBER 1976 – REVISED MARCH 1988

- Single-Rail Outputs on 'LS399
- Selects One of Two 4-Bit Data Sources and Stores Data Synchronously with System Clock
- Applications:
 - Dual Source for Operands and Constants in Arithmetic Processor; Can Release Processor Register Files for Acquiring New Data
 - Implement Separate Registers Capable of Parallel Exchange of Contents Yet Retain External Load Capability
 - Universal Type Register for Implementing Various Shift Patterns: Even Has Compound Left-Right Capabilities

description

This monolithic quadruple two-input multiplexer with storage provides essentially the equivalent functional capabilities of two separate MSI functions (SN54LS157/SN74LS157 and SN54LS175/SN74LS175) in a single 16-pin package.

When the word-select input is low, word 1 (A1, B1, C1, D1) is applied to the flip-flops. A high input to word select will cause the selection of word 2 (A2, B2, C2, D2). The selected word is clocked to the output terminals on the positive-going edge of the clock pulse.

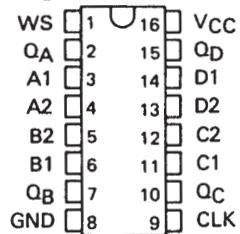
Typical power dissipation is 37 milliwatts. The SN54LS399 is characterized for operation over the full military range of -55°C to 125°C . The SN74LS399 is characterized for operation from 0°C to 70°C .

FUNCTION TABLE

INPUTS		OUTPUTS			
WORD SELECT	CLOCK	Q _A	Q _B	Q _C	Q _D
L	↑	a1	b1	c1	d1
H	↑	a2	b2	c2	d2
X	L	Q _{A0}	Q _{B0}	Q _{C0}	Q _{D0}

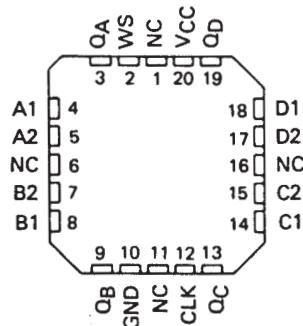
SN54LS399 . . . J OR W PACKAGE
SN74LS399 . . . D OR N PACKAGE

(TOP VIEW)



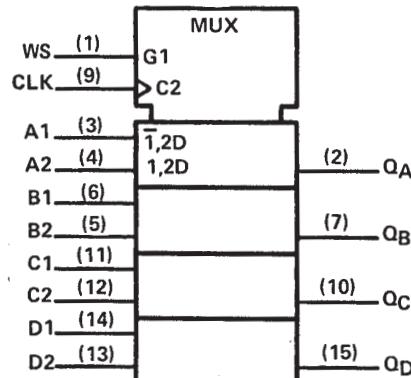
SN54LS399 . . . FK PACKAGE

(TOP VIEW)



NC – No internal connection

logic symbol[†]



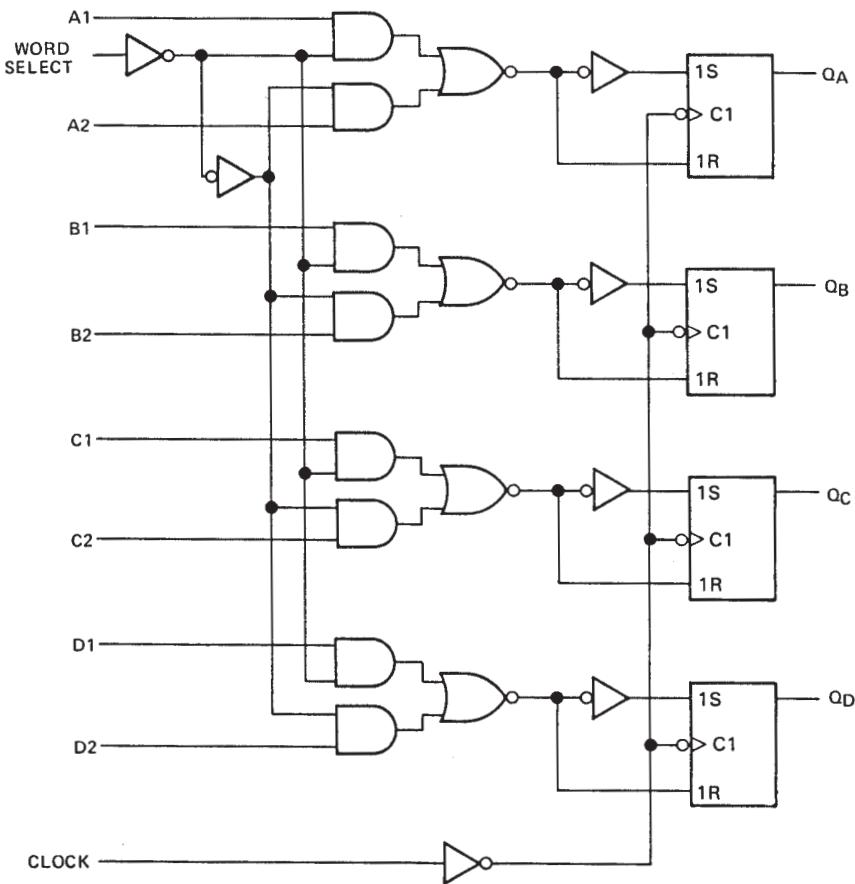
[†]This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers shown are for D, J, N, and W packages.

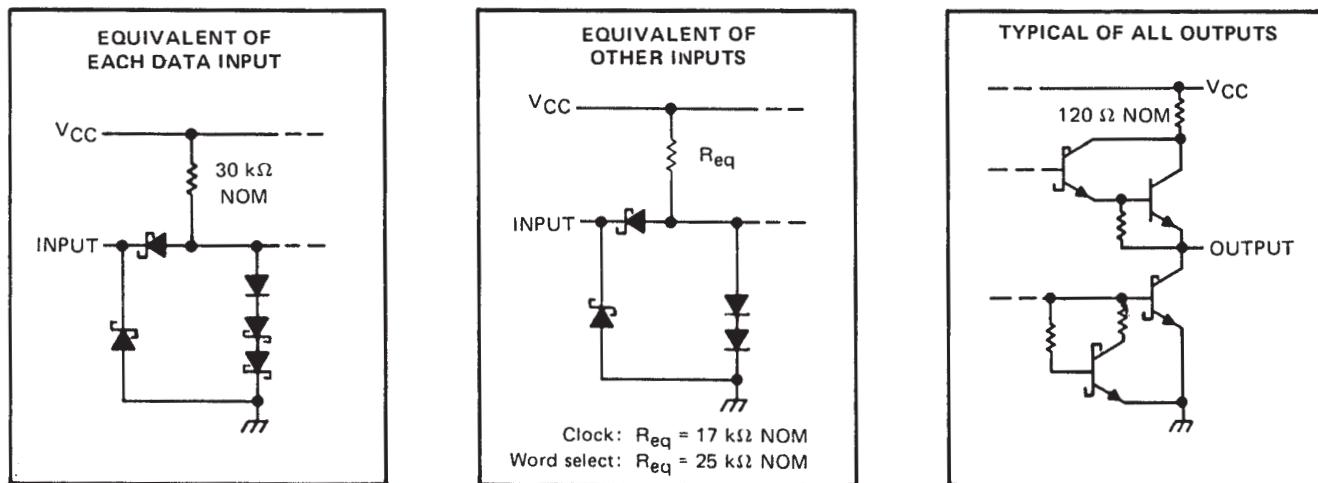
SN54LS399, SN74LS399 QUADRUPLE 2-INPUT MULTIPLEXERS WITH STORAGE

SDLS174 – OCTOBER 1976 – REVISED MARCH 1988

logic diagram (positive logic)



schematics of inputs and outputs



SN54LS399, SN74LS399 QUADRUPLE 2-INPUT MULTIPLEXERS WITH STORAGE

SDLS174 – OCTOBER 1976 – REVISED MARCH 1988

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

NOTE 1: Voltage values are with respect to network ground terminals.

recommended operating conditions

	SN54LS399			SN74LS399			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			-400			-400	μA
Low-level output current, I_{OL}			4			8	mA
Width of clock pulse, high or low level, t_W	20			20			ns
Setup time, t_{SU}	Data	25		25			ns
	Word select	45		45			
Hold time, t_H	Data	0		0			ns
	Word select	0		0			
Operating free-air temperature, T_A	-55	125	0	0	70		$^{\circ}C$

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

PARAMETER	TEST CONDITIONS [†]	SN54LS399			SN74LS399			UNIT
		MIN	TYP [‡]	MAX	MIN	TYP [‡]	MAX	
V _{IH}	High-level input voltage			2			2	V
V _{IL}	Low-level input voltage				0.7		0.8	V
V _{IK}	Input clamp voltage	V _{CC} = MIN, I _I = -18 mA			-1.5		-1.5	V
V _{OH}	High-level output voltage	V _{CC} = MIN, V _{IL} = V _{IL} max	V _{IH} = 2 V, I _{OH} = -400 μ A	2.5	3.4	2.7	3.4	V
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IL} = V _{IL} max	V _{IH} = 2 V, I _{OL} = 4 mA	0.25	0.4	0.25	0.4	V
			I _{OL} = 8 mA			0.35	0.5	
I _I	Input current at maximum input voltage	V _{CC} = MAX, V _I = 7 V			0.1		0.1	mA
I _{IH}	High-level input current	V _{CC} = MAX, V _I = 2.7 V			20		20	μ A
I _{IL}	Low-level input current	V _{CC} = MAX, V _I = 0.4 V			-0.4		-0.4	mA
I _{OS}	Short-circuit output current [§]	V _{CC} = MAX		-20	-100	-20	-100	mA
I _{CC}	Supply current	V _{CC} = MAX, See Note 2		7.3	13	7.3	13	mA

[†] For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

[‡]All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.

Not more than one output should be shorted at a time, due to the low current rating of the MOSFETs, and one second.

NOTE 2: With all outputs open and off, the short-circuit current of the power source should not exceed 100 mA.

NOTE 2: With all outputs open and all inputs except clock low, I_{CC} is measured after applying a momentary 4.5 V, followed by ground, to the clock input.

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

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15 \text{ pF}, \quad R_L = 2 \text{ k}\Omega,$ See Note 3		18	27	ns
t_{PHL}	Propagation delay time, high-to-low-level output			21	32	

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



PACKAGING INFORMATION

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)
8415401EA	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8415401EA SNJ54LS399J
SN54LS399J	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS399J
SN54LS399J	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS399J
SN54LS399J.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS399J
SN54LS399J.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS399J
SN74LS399N	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS399N
SN74LS399N	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS399N
SN74LS399N.A	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS399N
SN74LS399N.A	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS399N
SNJ54LS399J	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8415401EA SNJ54LS399J
SNJ54LS399J	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8415401EA SNJ54LS399J
SNJ54LS399J.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8415401EA SNJ54LS399J
SNJ54LS399J.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8415401EA SNJ54LS399J

⁽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.

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.

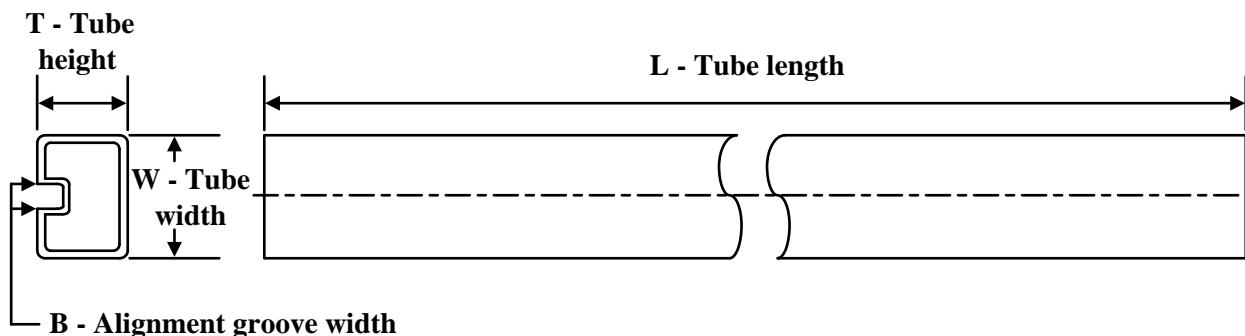
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

OTHER QUALIFIED VERSIONS OF SN54LS399, SN74LS399 :

- Catalog : [SN74LS399](#)
- Military : [SN54LS399](#)

NOTE: Qualified Version Definitions:

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

TUBE


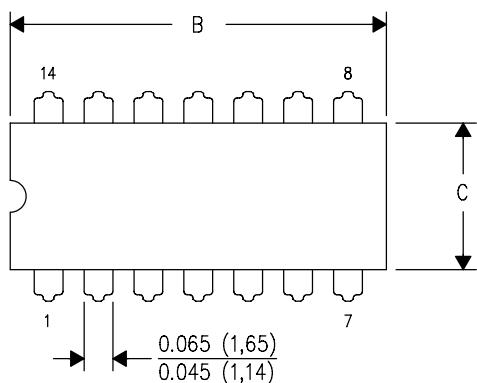
*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μ m)	B (mm)
SN74LS399N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS399N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS399N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS399N.A	N	PDIP	16	25	506	13.97	11230	4.32

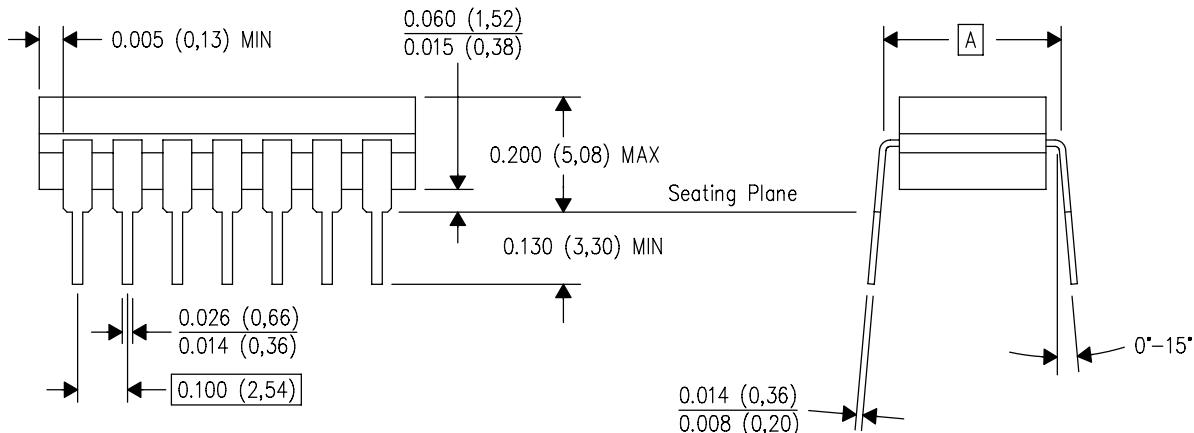
J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



PINS ** DIM	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



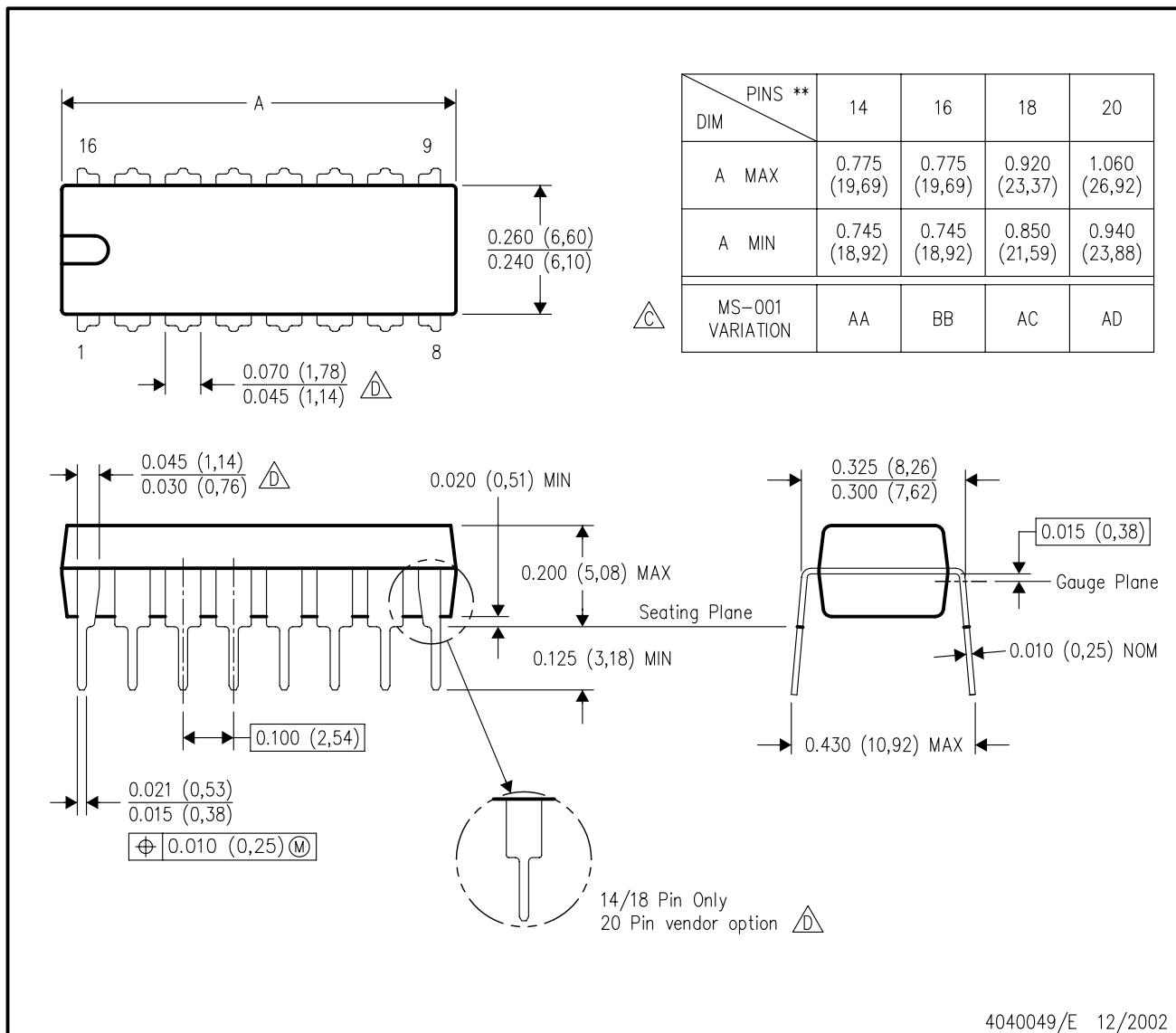
4040083/F 03/03

NOTES: 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.

N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), 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 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](#), [TI's General Quality Guidelines](#), 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. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

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

Copyright © 2026, Texas Instruments Incorporated

Last updated 10/2025