SDLS058

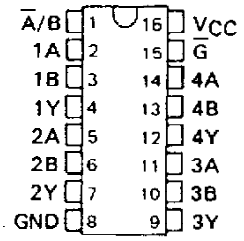
SN54157, SN54LS157, SN54LS158, SN54S157, SN54S158, SN74157, SN74LS157, SN74LS158, SN74S157, SN74S158
QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

MARCH 1974 – REVISED MARCH 1988

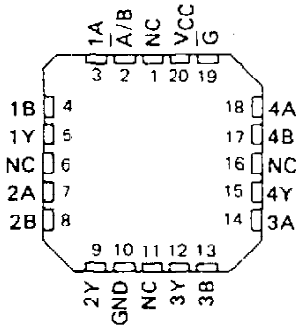
- Buffered Inputs and Outputs
- Three Speed/Power Ranges Available

TYPES	TYPICAL AVERAGE PROPAGATION TIME	TYPICAL POWER DISSIPATION
'157	9 ns	150 mW
'LS157	9 ns	49 mW
'S157	5 ns	250 mW
'LS158	7 ns	24 mW
'S158	4 ns	195 mW

SN54157, SN54LS157, SN54S157, SN54LS158, SN54S158 . . . J OR W PACKAGE
SN74157 . . . N PACKAGE
SN74LS157, SN74S157, SN74LS158, SN74S158 . . . D OR N PACKAGE
(TOP VIEW)



SN54LS157, SN54S157, SN54LS158, SN54S158 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

applications

- Expand Any Data Input Point
- Multiplex Dual Data Buses
- Generate Four Functions of Two Variables (One Variable Is Common)
- Source Programmable Counters

description

These monolithic data selectors/multiplexers contain inverters and drivers to supply full on-chip data selection to the four output gates. A separate strobe input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs. The '157, 'LS157, and 'S157 present true data whereas the 'LS158 and 'S158 present inverted data to minimize propagation delay time.

FUNCTION TABLE

INPUTS				OUTPUT Y	
STROBE $\overline{G}$	SELECT $\overline{A}$/B	A	B	'157, 'LS157, 'S157	'LS158 'S158
H	X	X	X	L	H
L	L	L	X	L	H
L	L	H	X	H	L
L	H	X	L	L	H
L	H	X	H	H	L

H = high level, L = low level, X = irrelevant

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

Supply voltage, V_{CC} (See Note 1) . . . . . 7 V
Input voltage: '157, 'S158 . . . . . 5.5 V
'LS157, 'LS158 . . . . . 7 V
Operating free-air temperature range: SN54' . . . . . −55°C to 125°C
SN74' . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

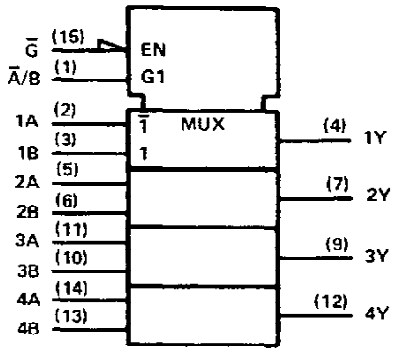
NOTE 1: Voltage values are with respect to network ground terminal.

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

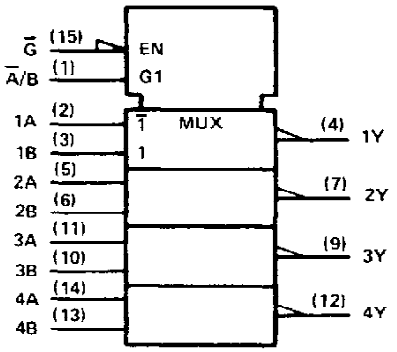
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logic symbols†

'157, 'LS157, 'S157



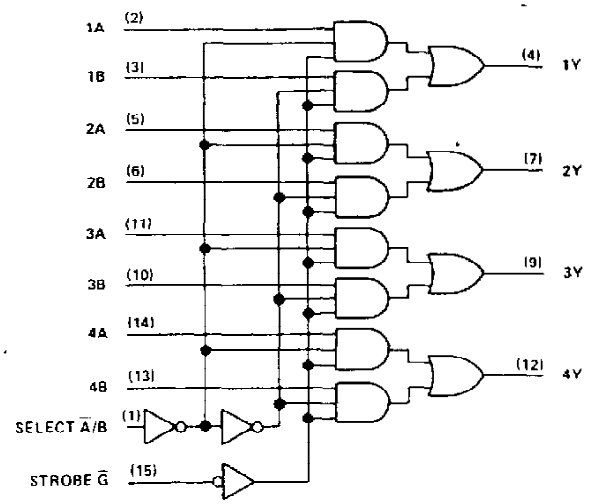
'158, 'LS158, 'S158



† These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

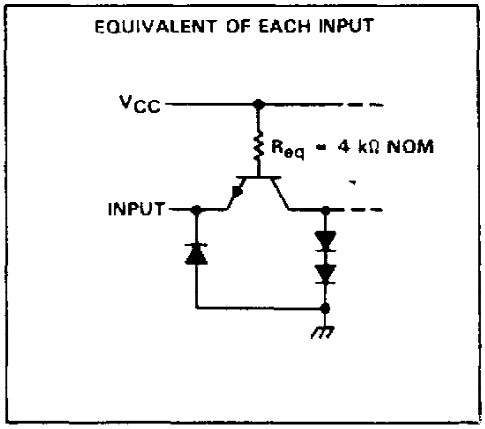
logic diagram (positive logic)

'157

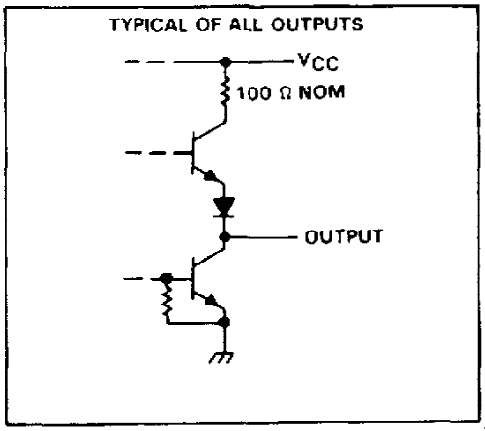


schematics of inputs and outputs

'157

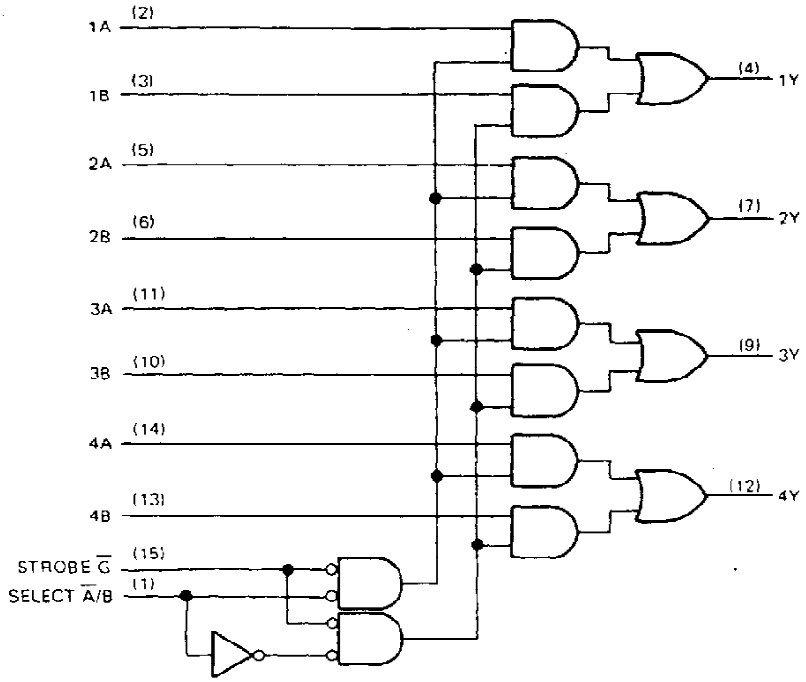


'157

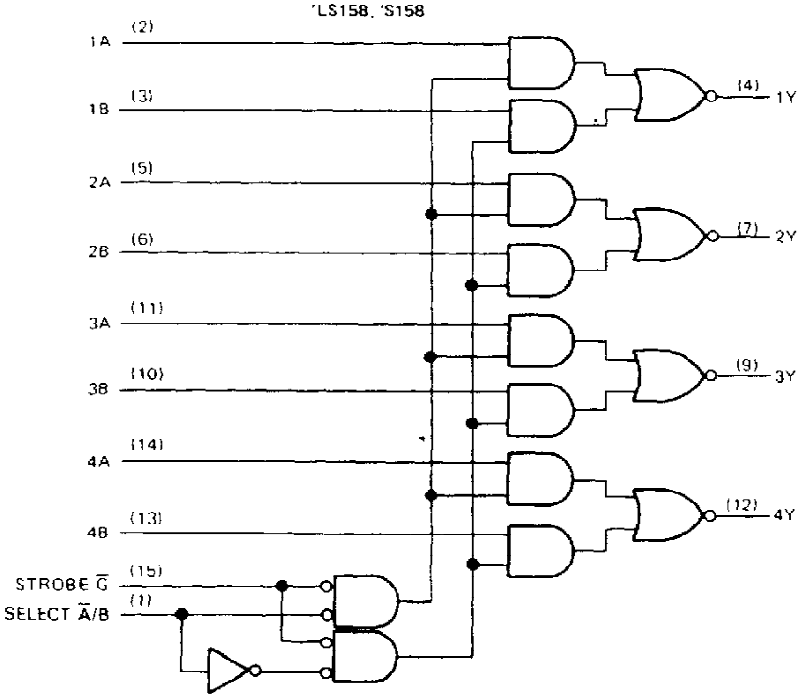


logic diagrams (positive logic)

'LS157, 'S157



'LS158, 'S158

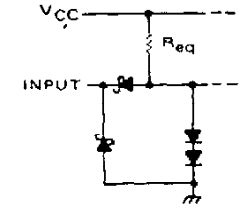


Pin numbers shown are for D, J, N, and W packages.

schematics of inputs and outputs

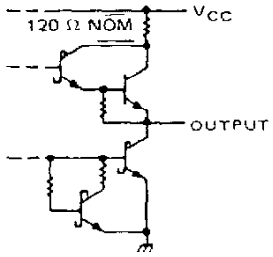
'LS157, 'LS158

EQUIVALENT OF EACH INPUT



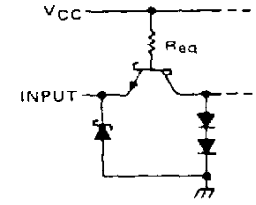
S or G inputs: R_{eq} = 8.5 kΩ NOM
A or B inputs: R_{eq} = 17 kΩ NOM

TYPICAL OF ALL OUTPUTS



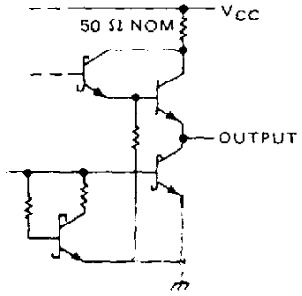
'S157, 'S158

EQUIVALENT OF EACH INPUT



S or G inputs: R_{eq} = 1.4 kΩ NOM
A or B inputs: R_{eq} = 2.8 kΩ NOM

TYPICAL OF ALL OUTPUTS



recommended operating conditions

	SN54157			SN74157			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}			−800			−800	μA
Low-level output current, I_{OL}			16			16	mA
Operating free-air temperature, T_A	−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS†		SN54157			SN74157			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH}	High-level input voltage			2			2			V
V_{IL}	Low-level input voltage					0.8			0.8	V
V_{IK}	Input clamp voltage	V_{CC} = MIN,	I_I = −12 mA			−1.5			−1.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IL} = 0.8 V,	V_{IH} = 2 V, I_{OH} = −800 μA	2.4	3.4		2.4	3.4		V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IL} = 0.8 V,	V_{IH} = 2 V, I_{OL} = 16 mA		0.2	0.4		0.2	0.4	V
I_I	Input current at maximum input voltage	V_{CC} = MAX,	V_I = 5.5 V			1			1	mA
I_{IH}	High-level input current	V_{CC} = MAX,	V_I = 2.4 V			40			40	μA
I_{IL}	Low-level input current	V_{CC} = MAX,	V_I = 0.4 V			−1.6			−1.6	mA
I_{OS}	Short-circuit output current§	V_{CC} = MAX		−20		−55	−18		−55	mA
I_{CC}	Supply current	V_{CC} = MAX,	See Note 2		30	48		30	48	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 V, T_A = 25°C.
§Not more than one output should be shorted at a time and duration of short-circuit should not exceed one second.
NOTE 2: I_{CC} is measured with 4.5 V applied to all inputs and all outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER¶	FROM (INPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Data	C_L = 15 pF, R_L = 400 Ω, See Note 3		9	14	ns
t_{PHL}				9	14	
t_{PLH}	Strobe $\overline{G}$			13	20	ns
t_{PHL}				14	21	
t_{PLH}	Select $\overline{A}$/B			15	23	ns
t_{PHL}				18	27	

¶t_{PLH} = propagation delay time, low-to-high-level output
t_{PHL} = propagation delay time, high-to-low-level output
NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

recommended operating conditions

		SN54LS'			SN74LS'			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
I_{OH}	High-level output current			−400			−400	μA
I_{OL}	Low-level output current			4			8	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER			TEST CONDITIONS†			SN54LS'			SN74LS'			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} = MAX,	V_{IH} = 2 V, I_{OH} = −400 μA		2.5	3.4		2.7	3.4		V
V_{OL}	Low-level output voltage		V_{CC} = MIN, 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	$\overline{A}/B$ or $\overline{G}$	V_{CC} = MAX,	V_I = 7 V				0.2			0.2	mA
		A or B						0.1			0.1	
I_{IH}	High-level input current	$\overline{A}/B$ or $\overline{G}$	V_{CC} = MAX,	V_I = 2.7 V				40			40	μA
		A or B						20			20	
I_{IL}	Low-level input current	$\overline{A}/B$ or $\overline{G}$	V_{CC} = MAX,	V_I = 0.4 V				−0.8			−0.8	mA
		A or B						−0.4			−0.4	
I_{OS}	Short-circuit output current§		V_{CC} = MAX			−20		−100	−20		−100	mA
I_{CC}	Supply current		V_{CC} = MAX,	See Note 2	'LS157		9.7	16		9.7	16	mA
					'LS158		4.8	8		4.8	8	
			V_{CC} = MAX, All A inputs at 4.5 V, All other inputs at 0 V		'LS158		6.5	11		6.5	11	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ Not more than one output should be shorted at a time and duration of short-circuit should not exceed one second.
NOTE 2: I_{CC} is measured with 4.5 V applied to all inputs and all outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER¶	FROM (INPUT)	TEST CONDITIONS	'LS157			'LS158			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Data	C_L = 15 pF, R_L = 2 kΩ, See Note 3		9	14		7	12	ns
t_{PHL}				9	14		10	15	
t_{PLH}	Strobe $\overline{G}$			13	20		11	17	ns
t_{PHL}				14	21		18	24	
t_{PLH}	Select $\overline{A}/B$			15	23		13	20	ns
t_{PHL}				18	27		16	24	

¶ t_{PLH} = propagation delay time, low-to-high-level output
t_{PHL} = propagation delay time, high-to-low-level output
NOTE 3: Load circuits and voltage diagrams are shown in Section 1.

recommended operating conditions

	SN54S157 SN54S158			SN74S157 SN74S158			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}			−1			−1	mA
Low-level output current, I_{OL}			20			20	mA
Operating free-air temperature, T_A	−55		125	0		70	°C

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

PARAMETER			TEST CONDITIONS†		SN54S157 SN74S157			SN54S158 SN74S158			UNIT
					MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH}	High-level input voltage				2			2			V
V_{IL}	Low-level input voltage						0.8			0.8	V
V_{IK}	Input clamp voltage		V_{CC} = MIN, I_I = −18 mA				−1.2			−1.2	V
V_{OH}	High-level output voltage		V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = −1 mA	Series 54S	2.5	3.4		2.5	3.4		V
				Series 74S	2.7	3.4		2.7	3.4		
V_{OL}	Low-level output voltage		V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OL} = 20 mA				0.5			0.5	V
I_I	Input current at maximum input voltage		V_{CC} = MAX, V_I = 5.5 V				1			1	mA
I_{IH}	High-level input current	$\overline{A}/B$ or $\overline{G}$	V_{CC} = MAX, V_I = 2.7 V				100			100	µA
		A or B					50			50	
I_{IL}	Low-level input current	$\overline{A}/B$ or $\overline{G}$	V_{CC} = MAX, V_I = 0.5 V				−4			−4	mA
		A or B					−2			−2	
I_{OS}	Short-circuit ouput current§		V_{CC} = MAX		−40		−100	−40		−100	mA
I_{CC}	Supply current		V_{CC} = MAX, All inputs at 4.5 V, See Note 2			50	78		39	61	mA
			V_{CC} = MAX, A inputs at 4.5 V, B,G,S, inputs at 0 V, See Note 2							81	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.
Note 2: I_{CC} is measured with all outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER¶	FROM (INPUT)	TEST CONDITIONS	SN54S157 SN74S157			SN54S158 SN74S158			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Data	C_L = 15 pF, R_L = 280 Ω, See Note 3		5	7.5		4	6	ns
t_{PHL}				4.5	6.5		4	6	
t_{PLH}	Strobe $\overline{G}$			8.5	12.5		6.5	11.5	ns
t_{PHL}				7.5	12		7	12	
t_{PLH}	Select $\overline{A}/B$			9.5	15		8	12	ns
t_{PHL}				9.5	15		8	12	

¶ t_{PLH} = propagation delay time, low-to-high-level output
t_{PHL} = propagation delay time, high-to-low-level output
NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
76002012A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
7600201EA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
7600201FA	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
76033012A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
7603301EA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
7603301FA	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
JM38510/07903BEA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
JM38510/07903BFA	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
JM38510/07904BEA	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI
JM38510/07904BFA	OBSOLETE	CFP	W	16		TBD	Call TI	Call TI
JM38510/30903B2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
JM38510/30903BEA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
JM38510/30903BFA	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
SN54157J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SN54LS157J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SN54LS158J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SN54S157J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SN54S158J	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI
SN74157N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SN74157N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SN74LS157D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS157DG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS157DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS157DRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS157N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS157N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SN74LS157NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS157NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS157NSRE4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS158D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS158DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS158DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS158DRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS158N	ACTIVE	PDIP	N	16	25	Pb-Free	CU NIPDAU	Level-NC-NC-NC

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
						(RoHS)		
SN74LS158N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SN74LS158NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS158NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS158NSRE4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S157D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S157DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S157N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74S157N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SN74S157NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74S157NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S157NSRE4	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S158D	OBSOLETE	SOIC	D	16		TBD	Call TI	Call TI
SN74S158DR	OBSOLETE	SOIC	D	16		TBD	Call TI	Call TI
SN74S158N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SN74S158N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI
SNJ54157J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54157W	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS157FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS157J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS157W	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS158FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS158J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS158W	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S157FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S157J	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S157W	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S158FK	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI
SNJ54S158J	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI
SNJ54S158W	OBSOLETE	CFP	W	16		TBD	Call TI	Call TI

(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.

(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.

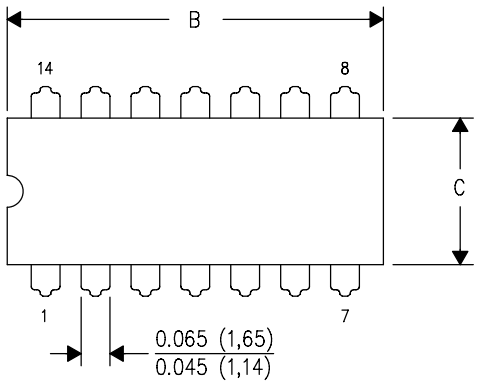
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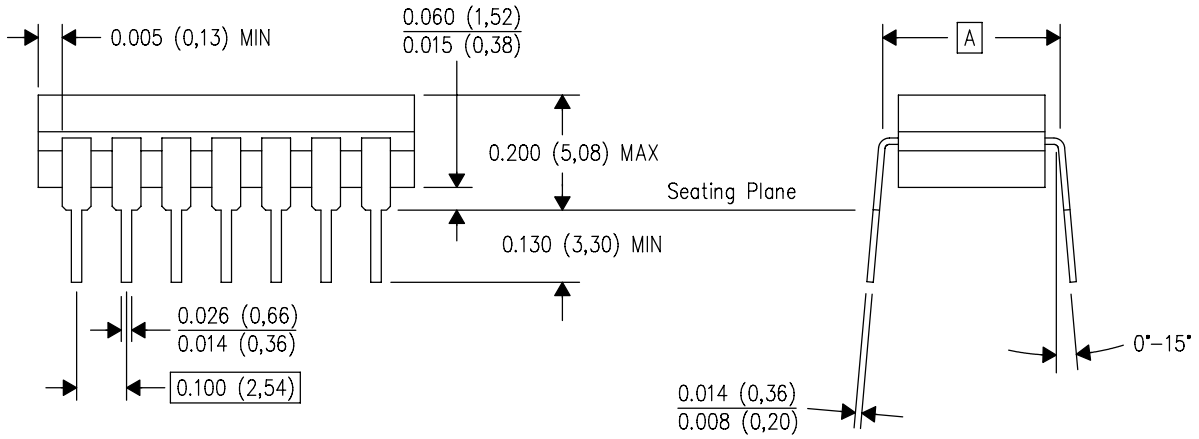
J (R–GDIP–T**)

14 LEADS SHOWN

CERAMIC DUAL IN–LINE PACKAGE



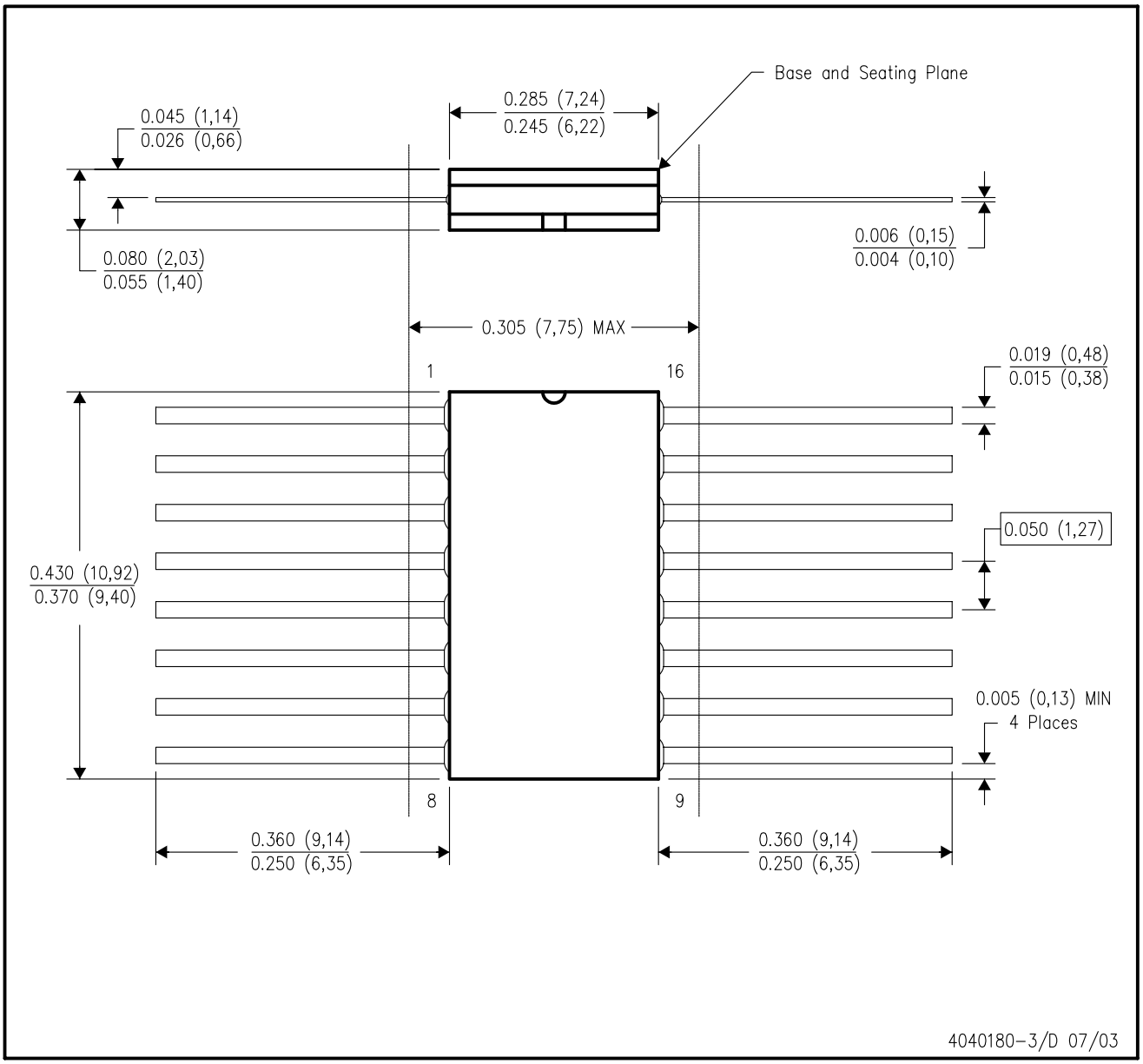
DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



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.

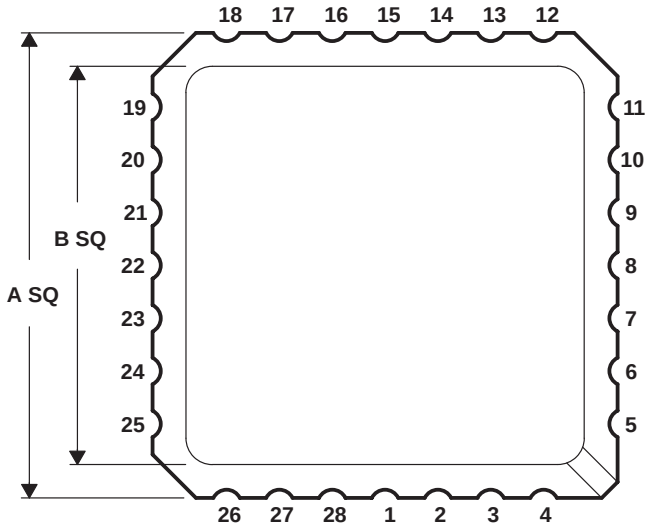
W (R–GDFP–F16) CERAMIC DUAL FLATPACK



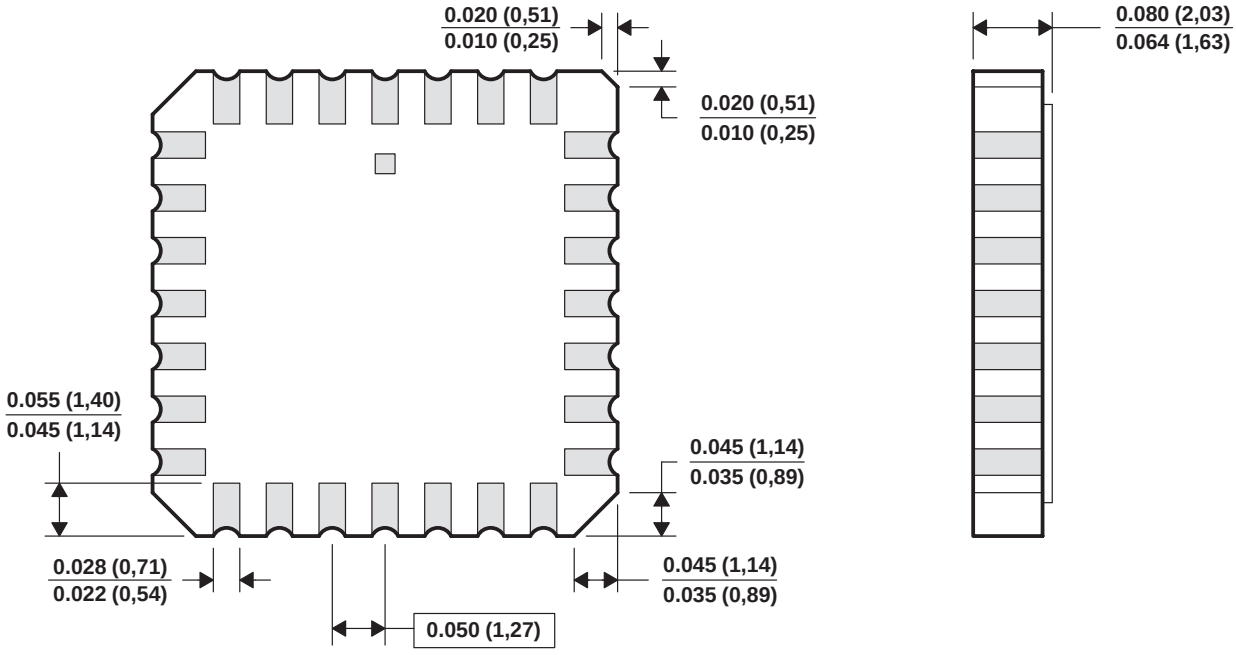
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a ceramic lid using glass frit.
D. Index point is provided on cap for terminal identification only.
E. Falls within MIL STD 1835 GDFP1–F16 and JEDEC MO–092AC

FK (S-CQCC-N)** **LEADLESS CERAMIC CHIP CARRIER**

28 TERMINAL SHOWN



NO. OF TERMINALS **	A		B	
	MIN	MAX	MIN	MAX
20	0.342 (8,69)	0.358 (9,09)	0.307 (7,80)	0.358 (9,09)
28	0.442 (11,23)	0.458 (11,63)	0.406 (10,31)	0.458 (11,63)
44	0.640 (16,26)	0.660 (16,76)	0.495 (12,58)	0.560 (14,22)
52	0.739 (18,78)	0.761 (19,32)	0.495 (12,58)	0.560 (14,22)
68	0.938 (23,83)	0.962 (24,43)	0.850 (21,6)	0.858 (21,8)
84	1.141 (28,99)	1.165 (29,59)	1.047 (26,6)	1.063 (27,0)



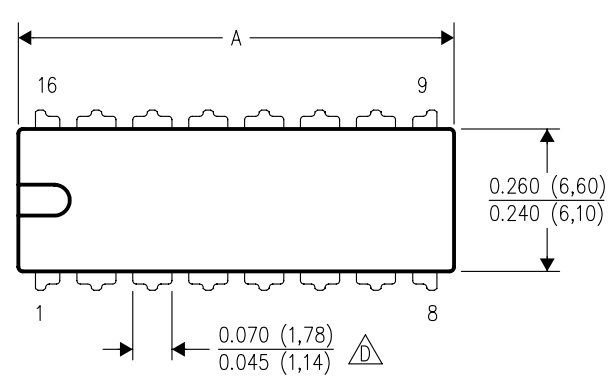
4040140/D 10/96

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

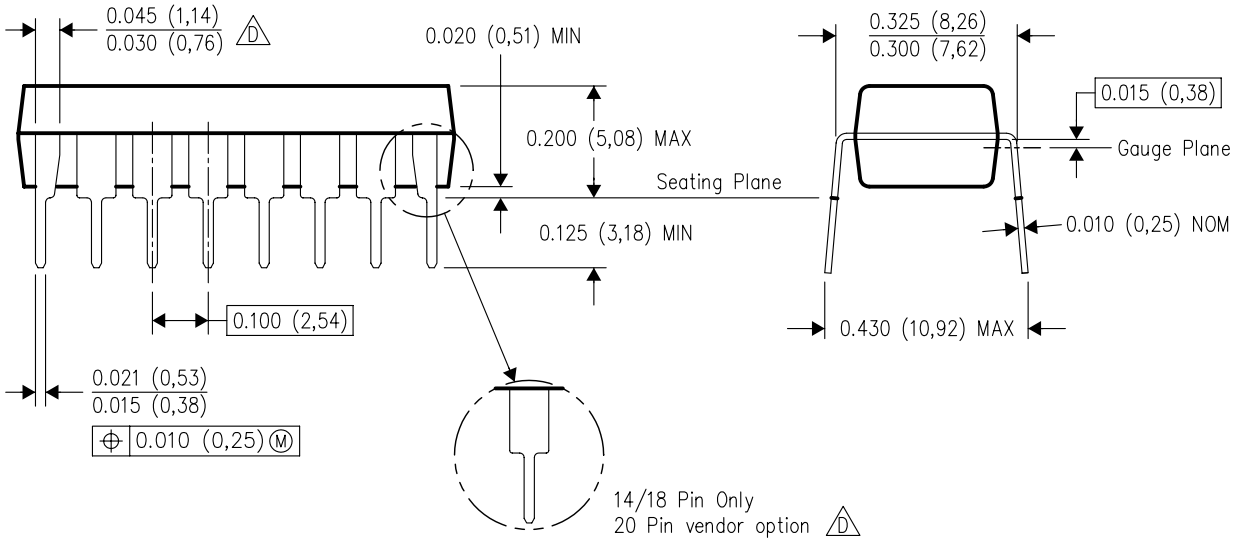
N (R–PDIP–T**)

PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN



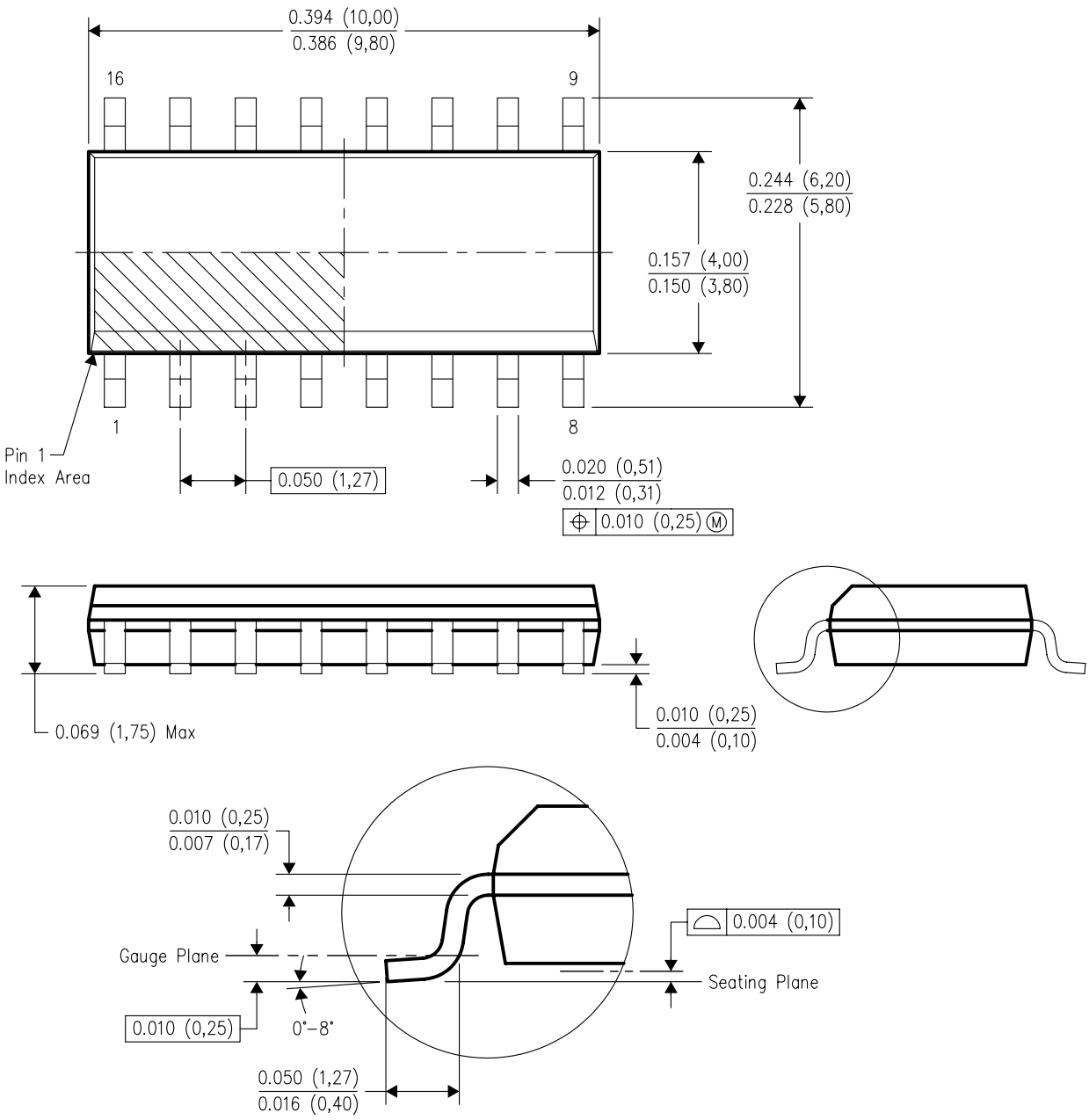
DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS–001 VARIATION (C)	AA	BB	AC	AD



4040049/E 12/2002

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

D (R–PDSO–G16) PLASTIC SMALL–OUTLINE PACKAGE

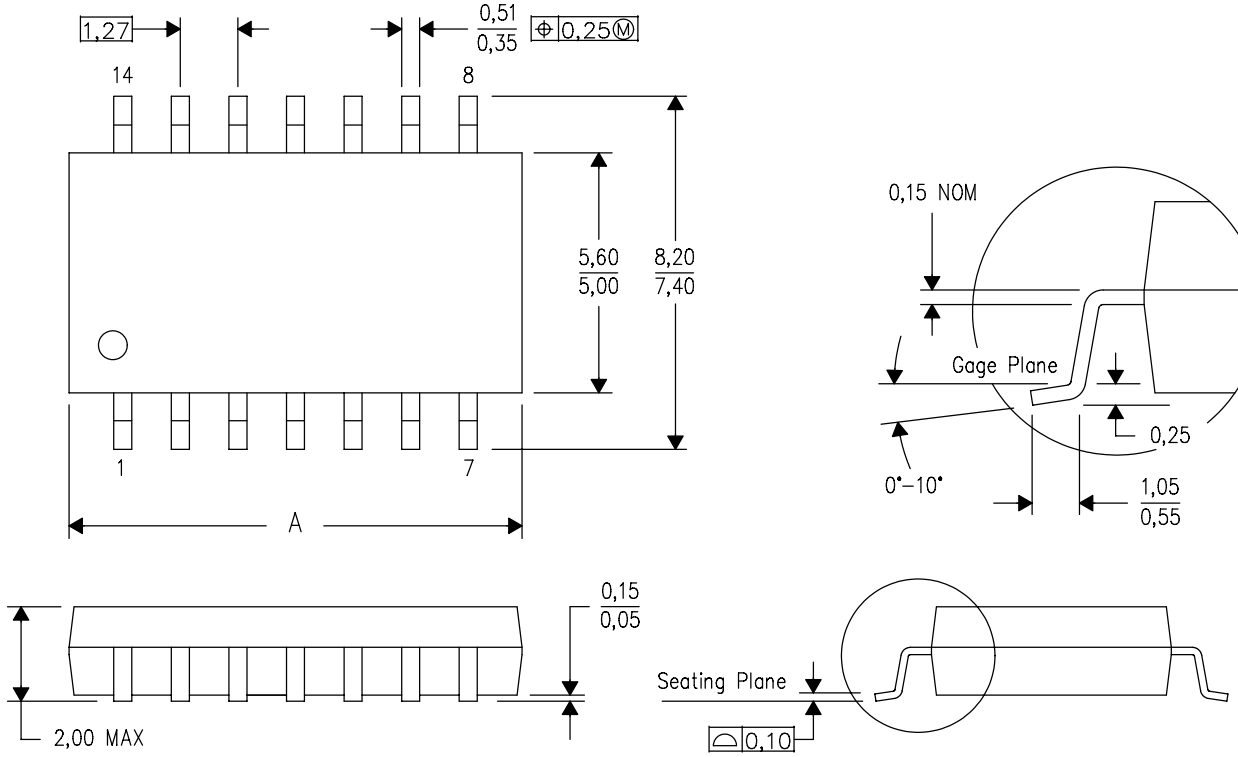


NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
D. Falls within JEDEC MS–012 variation AC.

MECHANICAL DATA

NS (R-PDSO-G)** **PLASTIC SMALL-OUTLINE PACKAGE**

14-PINS SHOWN



DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

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.

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