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SN54155, SN54156, SN54LS155A, SN54LS156, SN74155, SN74156, SN74LS155A, SN74LS156 DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

SDLS057 - MARCH 1974 - REVISED MARCH 1988

- **Applications:**
Dual 2-to 4-Line Decoder
Dual 1-to 4-Line Demultiplexer
3-to 8-Line Decoder
1-to 8-Line Demultiplexer

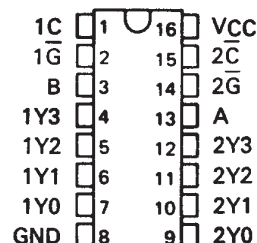
- **Individual Strobes Simplify Cascading for Decoding or Demultiplexing Larger Words**

- **Input Clamping Diodes Simplify System Design**

- **Choice of Outputs:**
Totem Pole ('155, 'LS155A)
Open-Collector ('156, 'LS156)

SN54155, SN54156, SN54LS155A,
SN54LS156 . . . J OR W PACKAGE
SN74155, SN74156 . . . N PACKAGE
SN74LS155A, SN74LS156 . . . D OR N PACKAGE

(TOP VIEW)



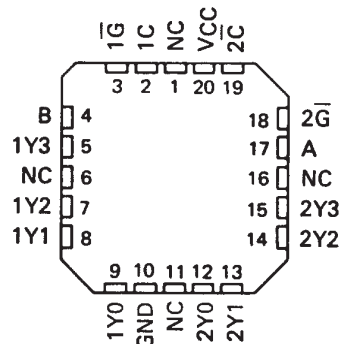
TYPES	TYPICAL AVERAGE PROPAGATION DELAY 3 GATE LEVELS	TYPICAL POWER DISSIPATION
'155, '156	21 ns	125 mW
'LS155A	18 ns	31 mW
'LS156	32 ns	31 mW

description

These monolithic transistor-transistor-logic (TTL) circuits feature dual 1-line-to-4-line demultiplexers with individual strobes and common binary-address inputs in a single 16-pin package. When both sections are enabled by the strobes, the common binary-address inputs sequentially select and route associated input data to the appropriate output of each section. The individual strobes permit activating or inhibiting each of the 4-bit sections as desired. Data applied to input 1C is inverted at its outputs and data applied at 2C is not inverted through its outputs. The inverter following the 1C data input permits use as a 3-to-8-line decoder or 1-to-8-line demultiplexer without external gating. Input clamping diodes are provided on all of these circuits to minimize transmission-line effects and simplify system design.

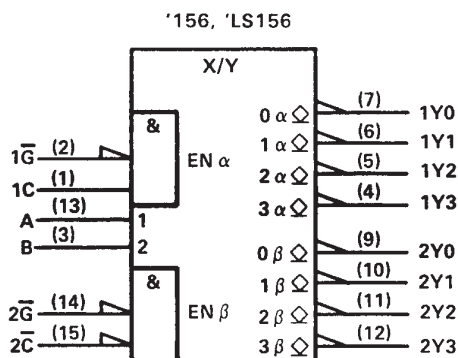
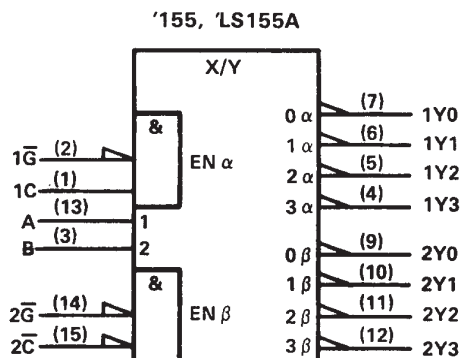
SN54LS155A, SN54LS156 . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

logic symbols (2-line to 4-line decoder)[†]



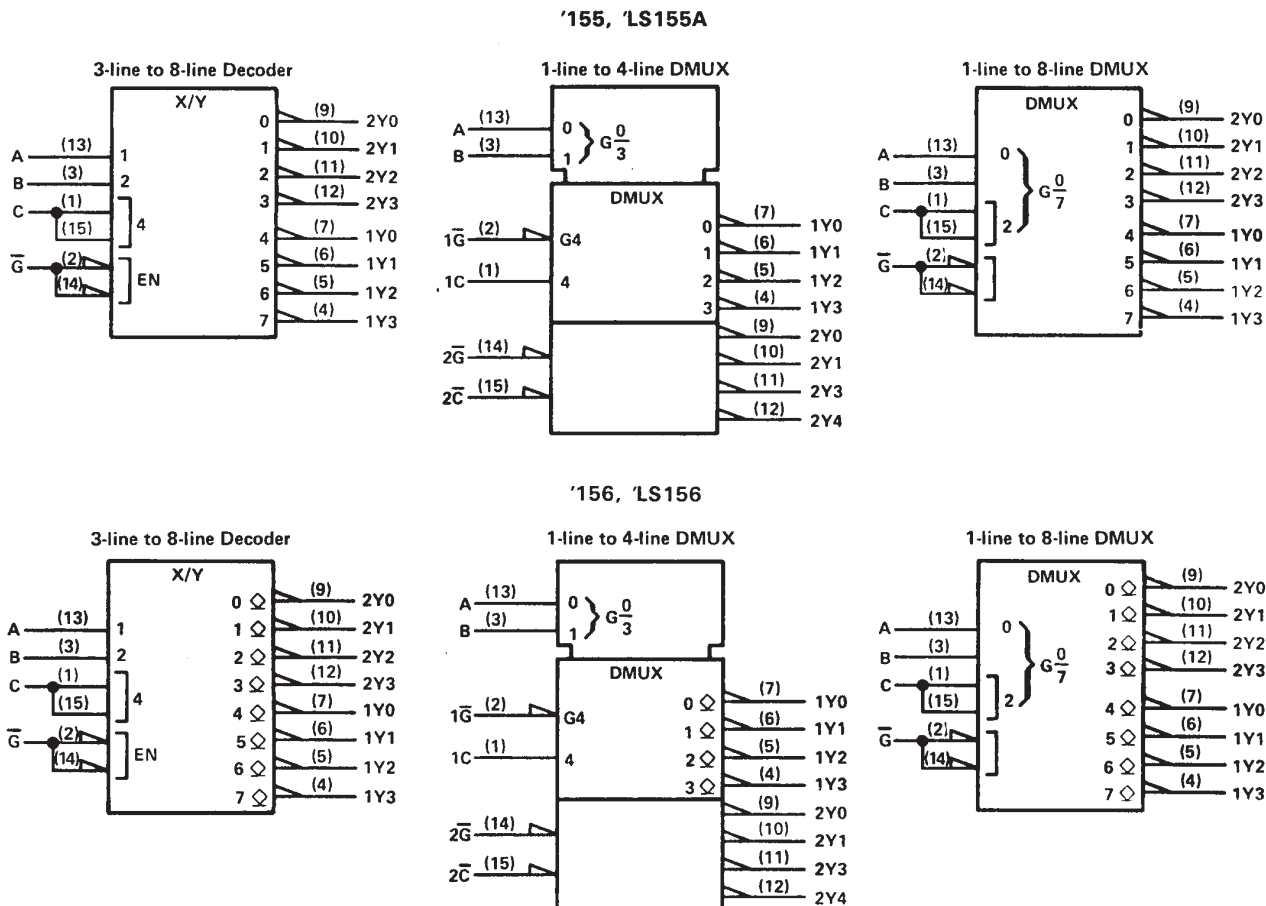
[†]These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12. For alternative symbols for other applications, see the following page.

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

**SN54155, SN54156, SN54LS155A, SN54LS156,
SN74155, SN74156, SN74LS155A, SN74LS156
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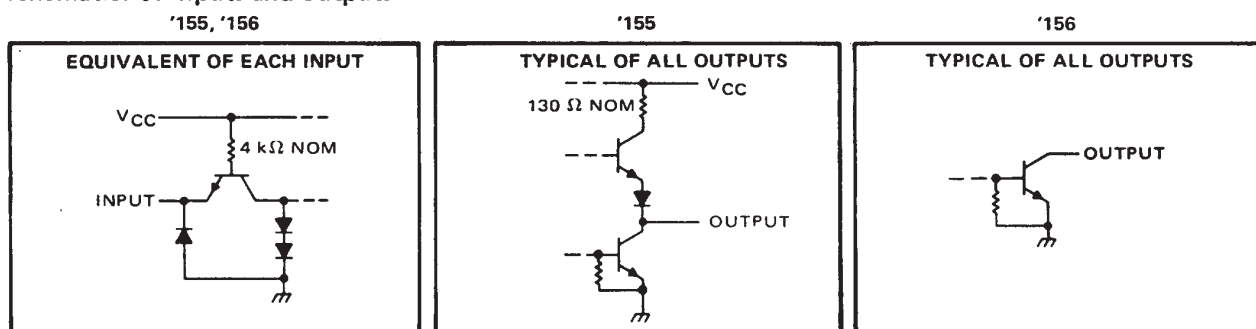
additional logic symbols (alternatives)†



†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.

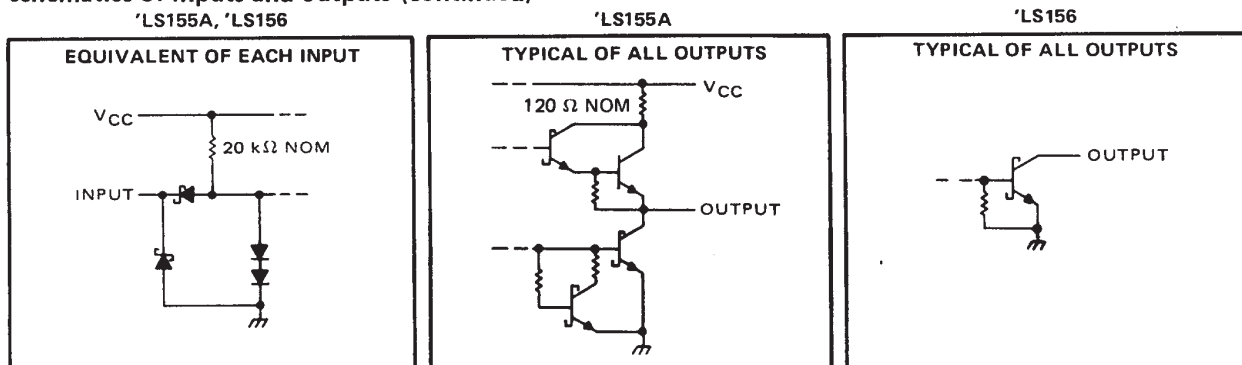
schematics of inputs and outputs



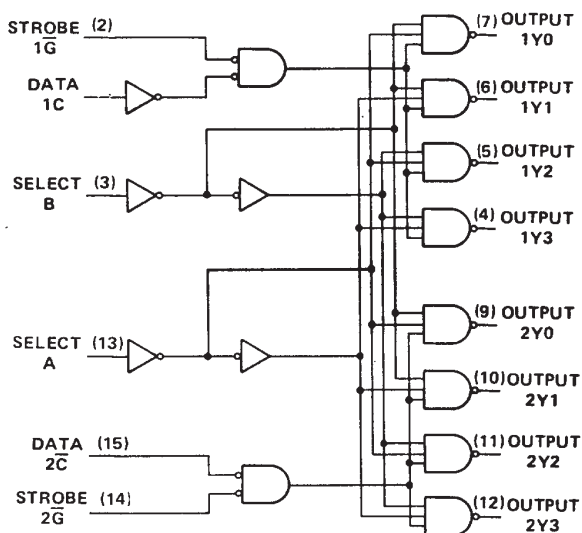
**SN54155, SN54156, SN54LS155A, SN54LS156,
SN74155, SN74156, SN74LS155A, SN74LS156
DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS**

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schematics of inputs and outputs (continued)



logic diagram (positive logic)



FUNCTION TABLES

2-LINE-TO-4-LINE DECODER

OR 1-LINE-TO-4-LINE DEMULTIPLEXER

INPUTS				OUTPUTS			
SELECT B	A	STROBE 1G	DATA 1C	1Y0	1Y1	1Y2	1Y3
X	X	H	X	H	H	H	H
L	L	L	H	L	H	H	H
L	H	L	H	H	L	H	H
H	L	L	H	H	H	L	H
H	H	L	H	H	H	H	L
X	X	X	L	H	H	H	H

INPUTS				OUTPUTS			
SELECT B	A	STROBE 2G	DATA 2C	2Y0	2Y1	2Y2	2Y3
X	X	H	X	H	H	H	H
L	L	L	L	L	H	H	H
L	H	L	L	H	L	H	H
H	L	L	L	H	H	L	H
H	H	L	L	H	H	H	L
X	X	X	H	H	H	H	H

FUNCTION TABLE

3-LINE-TO-8-LINE DECODER

OR 1-LINE-TO-8-LINE DEMULTIPLEXER

INPUTS				OUTPUTS							
SELECT C†	B	A	STROBE OR DATA G‡	(0) 2Y0	(1) 2Y1	(2) 2Y2	(3) 2Y3	(4) 1Y0	(5) 1Y1	(6) 1Y2	(7) 1Y3
X	X	X	H	H	H	H	H	H	H	H	H
L	L	L	L	L	H	H	H	H	H	H	H
L	L	H	L	H	L	H	H	H	H	H	H
L	H	L	L	H	H	L	H	H	H	H	H
L	H	H	L	H	H	H	L	H	H	H	H
H	L	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	L	H	H
H	H	L	L	H	H	H	H	H	H	L	H
H	H	H	L	H	H	H	H	H	H	H	L

†C = inputs 1C and 2C connected together

‡G = inputs 1G and 2G connected together

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



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**SN54155, SN54156, SN54LS155A, SN54LS156,
SN74155, SN74156, SN74LS155A, SN74LS156
DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS**

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage: '155, '156	5.5 V
'LS155A, 'LS156	7 V
Off-state output voltage: '156	5.5 V
'LS156	7 V
Operating free-air temperature range: SN54', SN54LS' Circuits	–55°C to 125°C
SN74', SN74LS' Circuits	0°C to 70°C
Storage temperature range	–65°C to 150°C

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

recommended operating conditions

	SN54155			SN74155			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	μ A
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†	SN54155 SN74155			UNIT
		MIN	TYP‡	MAX	
V_{IH} High-level input voltage		2			V
V_{IL} Low-level input voltage				0.8	V
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -8 \text{ mA}$			–1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OH} = -800 \mu\text{A}$	2.4	3.4		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OL} = 16 \text{ mA}$		0.2	0.4	V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$			1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$			40	μ A
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$			–1.6	mA
I_{OS} Short-circuit output current§	$V_{CC} = \text{MAX}$	SN54155	–20	–55	mA
		SN74155	–18	–57	
I_{CC} Supply current	$V_{CC} = \text{MAX},$ See Note 2	SN54155	25	35	mA
		SN74155	25	40	

†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.

NOTE 2: I_{CC} is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LEVELS OF LOGIC	TEST CONDITIONS	SN54155 SN74155			UNIT
					MIN	TYP	MAX	
t_{PLH}	A, B, 2 $\overline{C}$, 1 $\overline{G}$, or 2 $\overline{G}$	Y	2	$C_L = 15 \text{ pF},$ $R_L = 400 \Omega,$ See Note 3		13	20	ns
t_{PHL}	A, B, 2 $\overline{C}$, 1 $\overline{G}$, or 2 $\overline{G}$	Y	2			18	27	ns
t_{PLH}	A or B	y	3			21	32	ns
t_{PHL}	A or B	Y	3			21	32	ns
t_{PLH}	1C	Y	3			16	24	ns
t_{PHL}	1C	Y	3			20	30	ns

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

SN54155A, SN74155A DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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recommended operating conditions

	SN54156			SN74156			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 voltage, V_{OH}			5.5			5.5	V
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†	SN54156 SN74156		UNIT	
		MIN	TYP‡ MAX		
V _{IH} High-level input voltage		2		V	
V _{IL} Low-level input voltage			0.8	V	
V _{IK} Input clamp voltage	V _{CC} = MIN, I _I = −8 mA		−1.5	V	
I _{OH} High-level output current	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, V _{OH} = 5.5 V		250	μA	
V _{OL} Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 16 mA	0.2	0.4	V	
I _I Input current at maximum input voltage	V _{CC} = MAX, V _I = 5.5 V		1	mA	
I _{IH} High-level input current	V _{CC} = MAX, V _I = 2.4 V		40	μA	
I _{IL} Low-level input current	V _{CC} = MAX, V _I = 0.4 V		−1.6	mA	
I _{CC} Supply current	V _{CC} = MAX,	SN54156	25	35	mA
	See Note 2	SN74156	25	40	

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

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

NOTE 2: I_{CC} is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

PARAMETER§	FROM (INPUT)	TO (OUTPUT)	LEVELS OF LOGIC	TEST CONDITIONS	SN54156 SN74156			UNIT
					MIN	TYP	MAX	
t_{PLH}	A, B, 2C, 1G, or 2G	Y	2	$C_L = 15 \text{ pF},$ $R_L = 400 \Omega,$ See Note 3		15	23	ns
t_{PHL}	A, B, 2C, 1G, or 2G	Y	2			20	30	ns
t_{PLH}	A or B	y	3			23	34	ns
t_{PHL}	A or B	Y	3			23	34	ns
t_{PLH}	1C	Y	3			18	27	ns
t_{PHL}	1C	Y	3			22	33	ns

§ 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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SN54LS155A, SN74LS155A

DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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recommended operating conditions

	SN54LS155A			SN74LS155A			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	μ A
Low-level output current, I_{OL}			4			8	mA
Operating free-air temperature, T_A	-55		125	0		70	$^{\circ}$ C

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

PARAMETER	TEST CONDITIONS†	SN54LS155A			SN74LS155A			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V _{IH} High-level input voltage		2			2			V
V _{IL} Low-level input voltage					0.7			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 _{IH} = 2 V, V _{IL} = V _{IL max} , I _{OH} = −400 μA	2.5	3.4		2.7	3.4		V
V _{OL} Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = V _{IL max}	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			mA
I _{IH} High-level input current	V _{CC} = MAX, V _I = 2.7 V				20			μA
I _{IL} Low-level input current	V _{CC} = MAX, V _I = 0.4 V				−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	6.1			10			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.

NOTE 2: I_{CC} is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

PARAMETER¶	FROM (INPUT)	TO (OUTPUT)	LEVELS OF LOGIC	TEST CONDITIONS	SN54LS155A SN74LS155A			UNIT
					MIN	TYP	MAX	
t_{PLH}	A, B, 2C, 1G, or 2G	Y	2	$C_L = 15 \text{ pF}$, $R_L = 2 \text{ k}\Omega$, See Note 3		10	15	ns
t_{PHL}	A, B, 2C, 1G, or 2G	Y	2			19	30	ns
t_{PLH}	A or B	Y	3			17	26	ns
t_{PHL}	A or B	Y	3			19	30	ns
t_{PLH}	1C	Y	3			18	27	ns
t_{PHL}	1C	Y	3			18	27	ns

¶ 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.

SN54LS156A, SN74LS156A
DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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recommended operating conditions

	SN54LS156			SN74LS156			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 voltage, V_{OH}			5.5			5.5	V
Low-level output current, I_{OL}			4			8	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†		SN54LS156		SN74LS156		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	
I _{OH}	High-level output current	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = V _{IL} max, V _{OH} = 5.5 V				100		100	μA	
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = V _{IL} max	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	μA	
I _{IL}	Low-level input current	V _{CC} = MAX, V _I = 0.4 V				−0.4		−0.4	mA	
I _{CC}	Supply current	V _{CC} = MAX, See Note 2				6.1	10	6.1	10	mA

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

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

NOTE 2: I_{CC} is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

PARAMETER§	FROM (INPUT)	TO (OUTPUT)	LEVELS OF LOGIC	TEST CONDITIONS	SN54LS156 SN74LS156			UNIT
					MIN	TYP	MAX	
t_{PLH}	A, B, $2\bar{C}$ $1\bar{G}$, or $2\bar{G}$	Y	2	$C_L = 15 \text{ pF}, R_L = 2 \text{ k}\Omega$, See Note 3		25	40	ns
t_{PHL}	A, B, $2\bar{C}$, $1\bar{G}$, or $2\bar{G}$	Y	2			34	51	ns
t_{PLH}	A or B	Y	3			31	46	ns
t_{PHL}	A or B	Y	3			34	51	ns
t_{PLH}	1C	Y	3			32	48	ns
t_{PHL}	1C	Y	3			32	48	ns

§ 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.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
5962-9750801QEA	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QE A SNJ54LS155AJ	Samples
5962-9750801QFA	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QF A SNJ54LS155AW	Samples
5962-9750801QFA	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QF A SNJ54LS155AW	Samples
SN54155J	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI	-55 to 125		
SN54155J	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI	-55 to 125		
SN54LS155AJ	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	SN54LS155AJ	Samples
SN54LS155AJ	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	SN54LS155AJ	Samples
SN54LS156J	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	SN54LS156J	Samples
SN54LS156J	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	SN54LS156J	Samples
SN74155N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74155N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74155N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74155N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74156N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74156N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74LS155AD	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155AD	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155ADG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155ADG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155ADR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LS155ADR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155ADRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155ADRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS155A	Samples
SN74LS155AN	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS155AN	Samples
SN74LS155AN	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS155AN	Samples
SN74LS155ANE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS155AN	Samples
SN74LS155ANE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS155AN	Samples
SN74LS155ANSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS155A	Samples
SN74LS155ANSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS155A	Samples
SN74LS156D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LS156DRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156DRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	LS156	Samples
SN74LS156N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS156N	Samples
SN74LS156N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS156N	Samples
SN74LS156N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74LS156N3	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI	0 to 70		
SN74LS156NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS156N	Samples
SN74LS156NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS156N	Samples
SN74LS156NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS156	Samples
SN74LS156NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS156	Samples
SNJ54155J	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI	-55 to 125		
SNJ54155J	OBSOLETE	CDIP	J	16		TBD	Call TI	Call TI	-55 to 125		
SNJ54155W	OBSOLETE	CFP	W	16		TBD	Call TI	Call TI	-55 to 125		
SNJ54155W	OBSOLETE	CFP	W	16		TBD	Call TI	Call TI	-55 to 125		
SNJ54LS155AJ	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QE A SNJ54LS155AJ	Samples
SNJ54LS155AJ	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QE A SNJ54LS155AJ	Samples
SNJ54LS155AW	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QF A SNJ54LS155AW	Samples
SNJ54LS155AW	ACTIVE	CFP	W	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-9750801QF A SNJ54LS155AW	Samples



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PACKAGE OPTION ADDENDUM

www.ti.com

17-Dec-2015

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SNJ54LS156FK	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI	-55 to 125		
SNJ54LS156FK	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI	-55 to 125		
SNJ54LS156J	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	SNJ54LS156J	Samples
SNJ54LS156J	ACTIVE	CDIP	J	16	1	TBD	A42	N / A for Pkg Type	-55 to 125	SNJ54LS156J	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.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), 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.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

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.

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

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PACKAGE OPTION ADDENDUM

17-Dec-2015

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 SN54155, SN54LS155A, SN54LS156, SN74155, SN74LS155A, SN74LS156 :

• Catalog: [SN74155](#), [SN74LS155A](#), [SN74LS156](#)

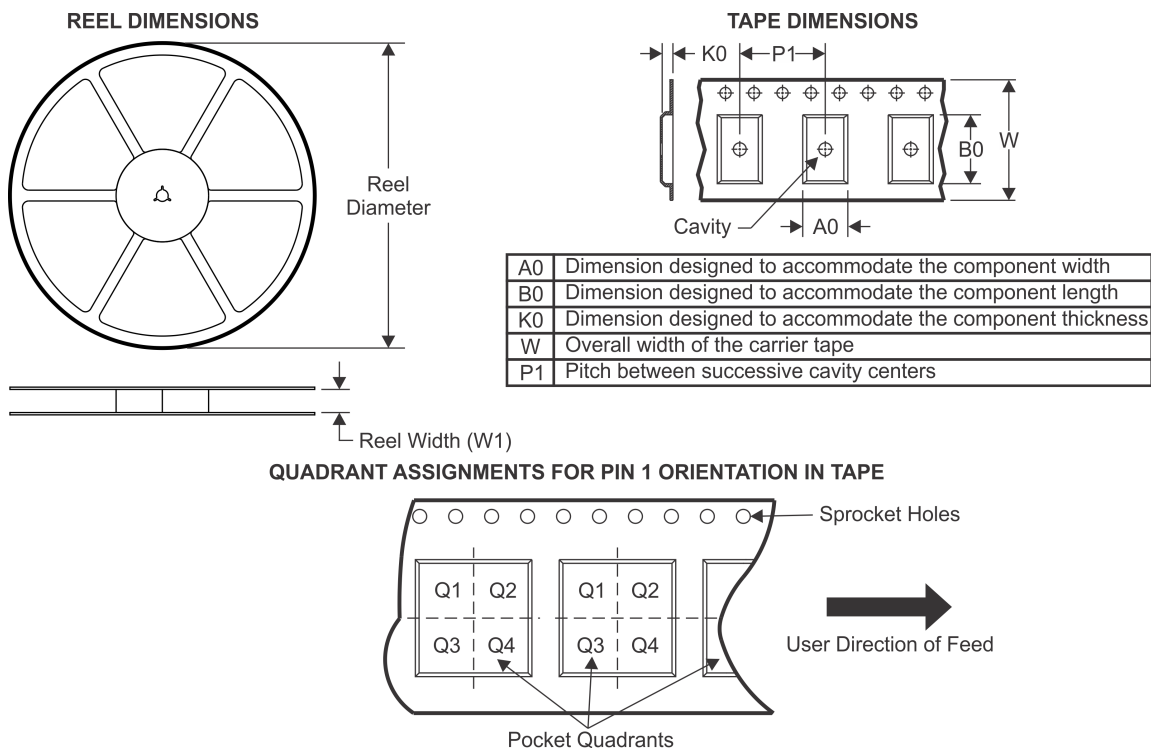
• Military: [SN54155](#), [SN54LS155A](#), [SN54LS156](#)

NOTE: Qualified Version Definitions:

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

PACKAGE MATERIALS INFORMATION

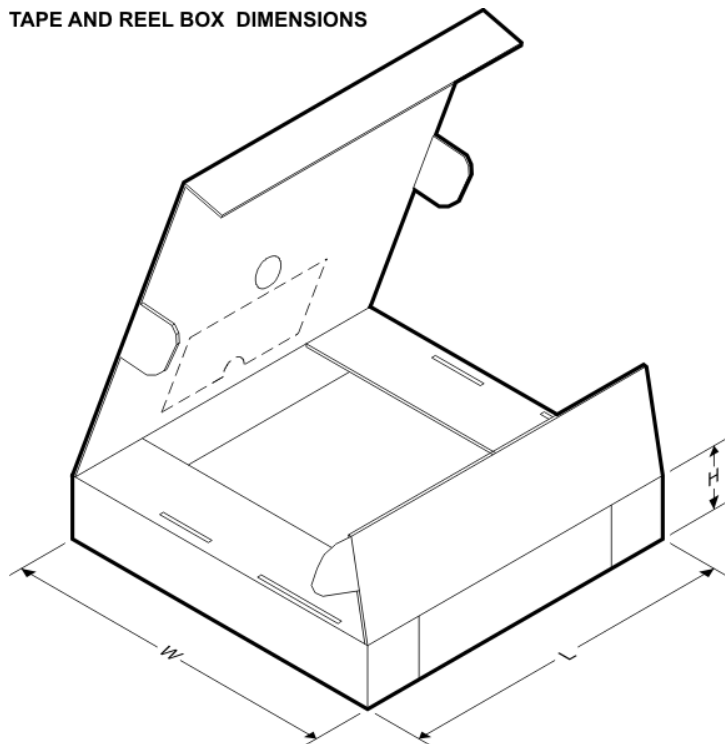
TAPE AND REEL INFORMATION



*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
SN74LS155ADR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS156DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS156NSR	SO	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS



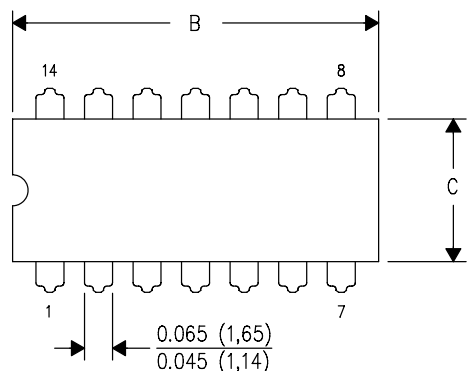
*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LS155ADR	SOIC	D	16	2500	333.2	345.9	28.6
SN74LS156DR	SOIC	D	16	2500	333.2	345.9	28.6
SN74LS156NSR	SO	NS	16	2000	367.0	367.0	38.0

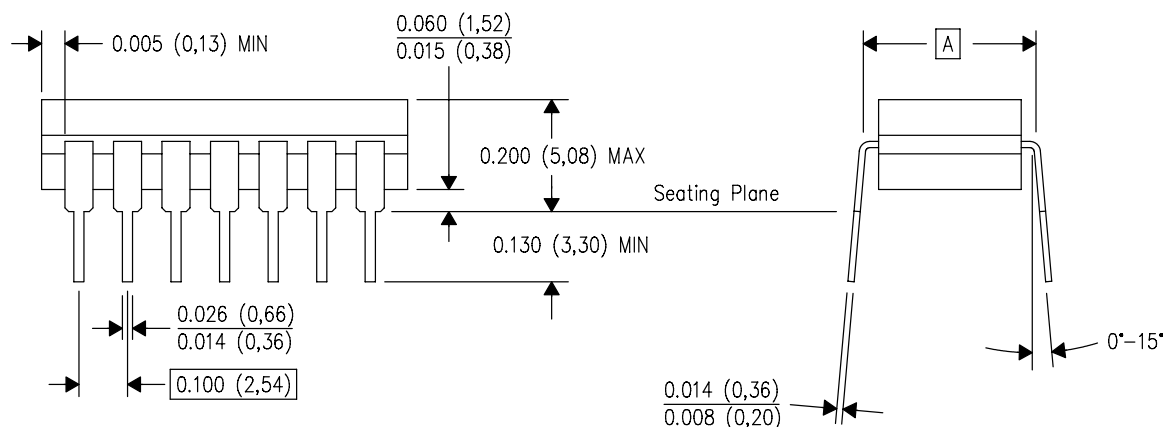
J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



PINS **	14	16	18	20
DIM				
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)



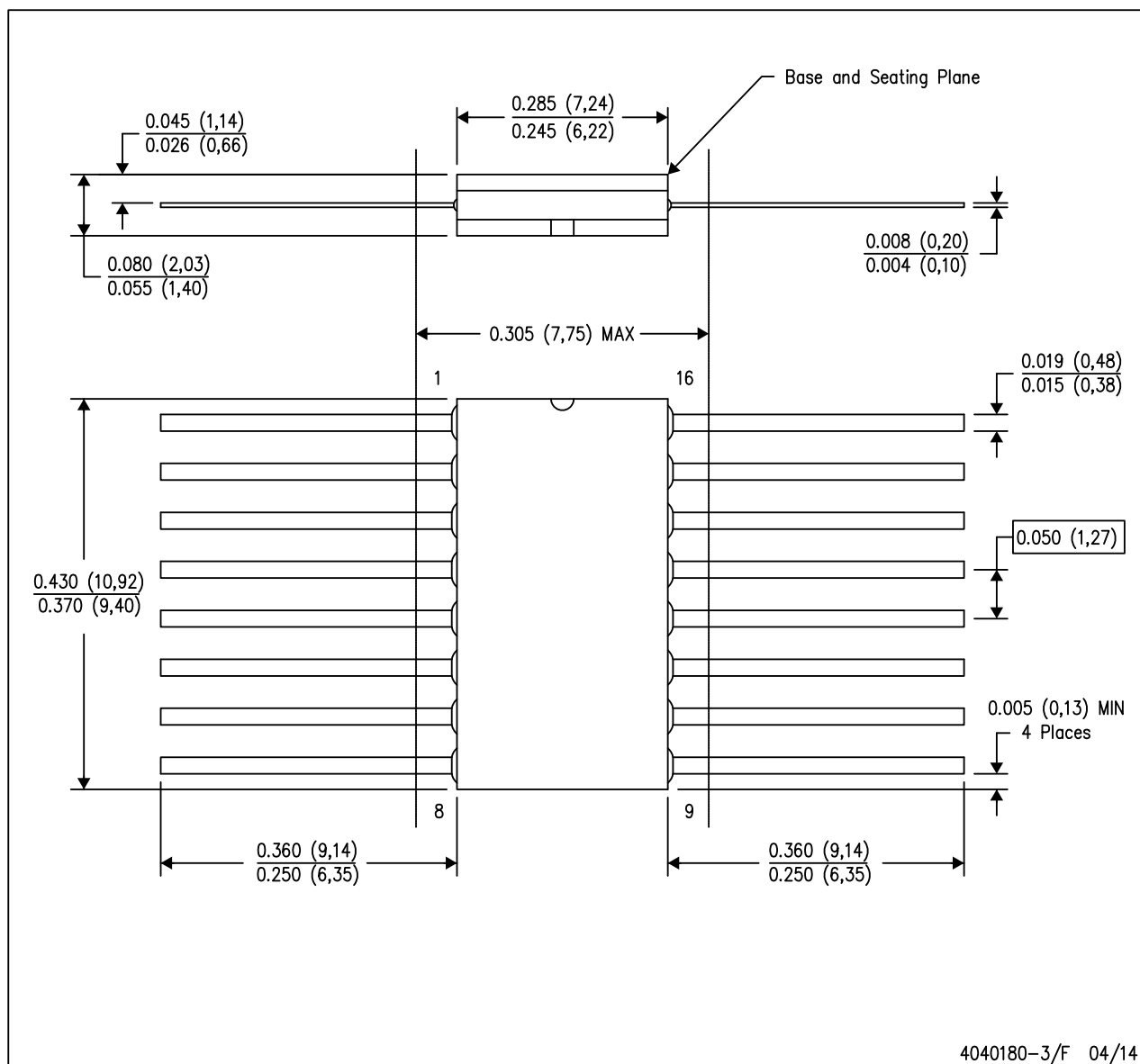
4040083/F 03/03

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

MECHANICAL DATA

W (R-GDFP-F16)

CERAMIC DUAL FLATPACK

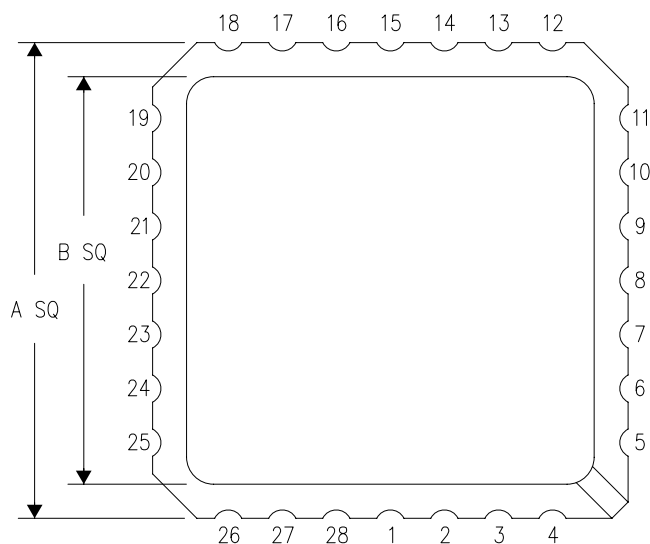


- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. This package can be hermetically sealed with a ceramic lid using glass frit.
 - D. Index point is provided on cap for terminal identification only.
 - E. Falls within MIL STD 1835 GDFP2-F16

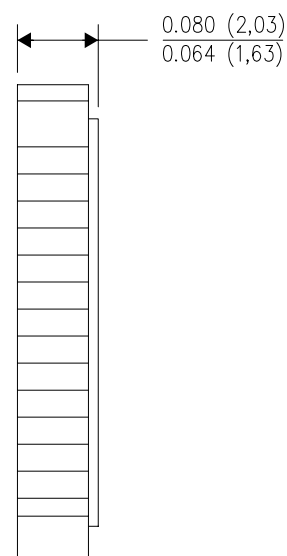
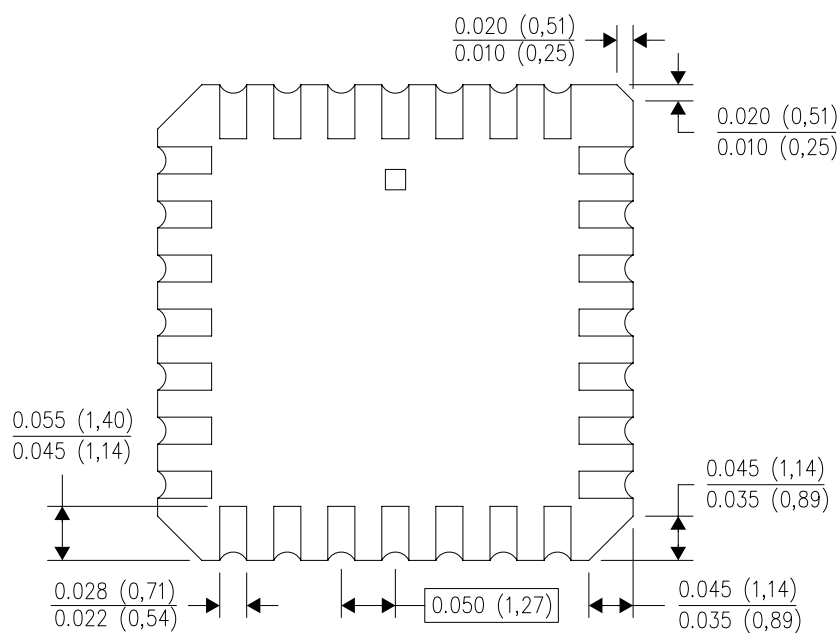
FK (S-CQCC-N**)

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	0.740 (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 01/11

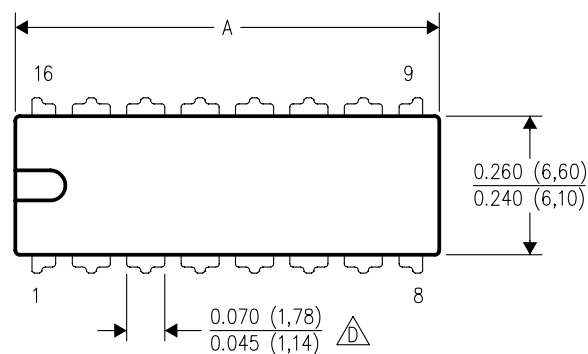
- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package can be hermetically sealed with a metal lid.
 - Falls within JEDEC MS-004

MECHANICAL DATA

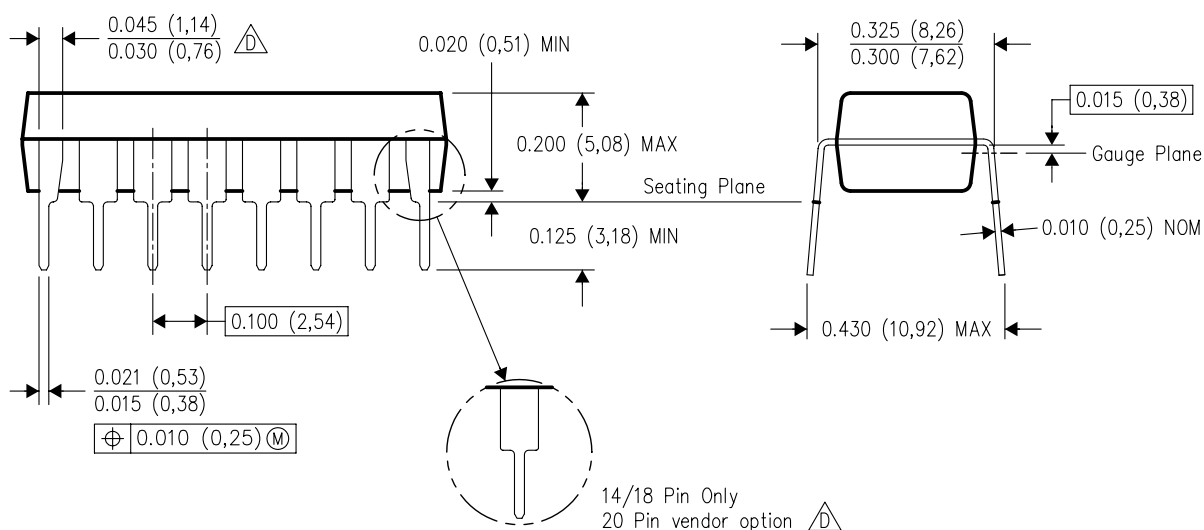
N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



PINS **	14	16	18	20
DIM				
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	AA	BB	AC	AD



4040049/E 12/2002

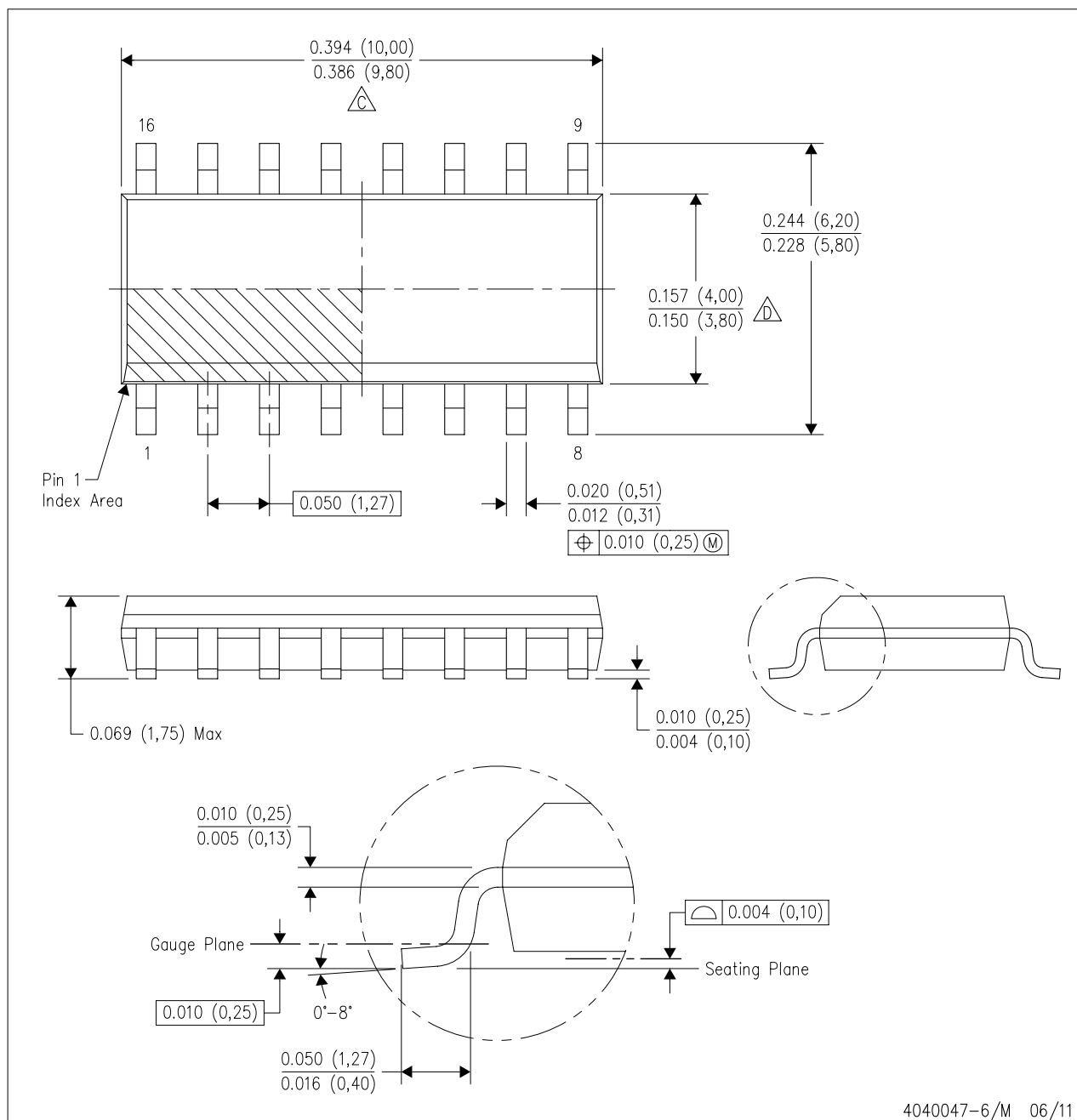
NOTES:

- All linear dimensions are in inches (millimeters).
- 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.

MECHANICAL DATA

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE

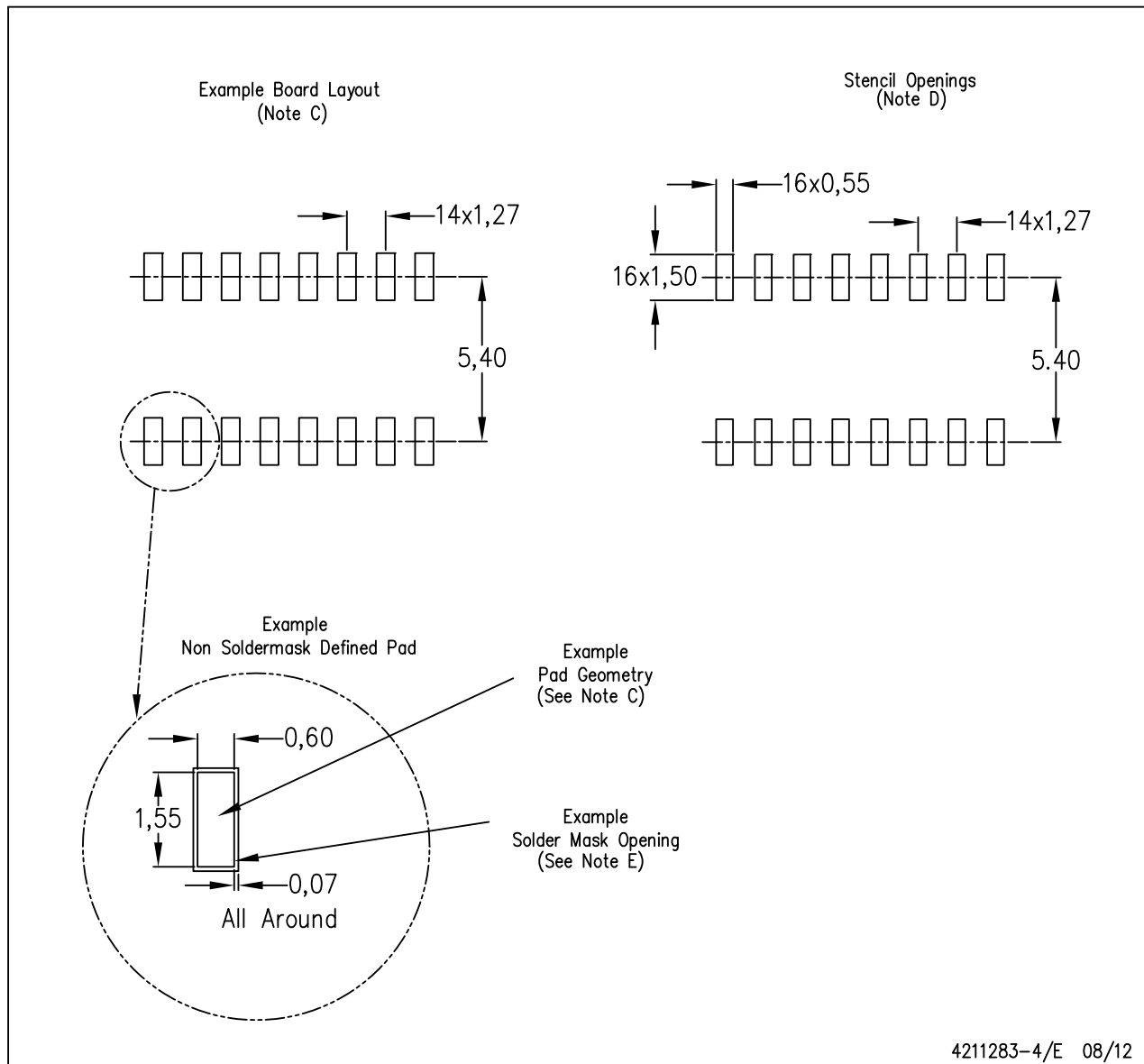


4040047-6/M 06/11

LAND PATTERN DATA

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



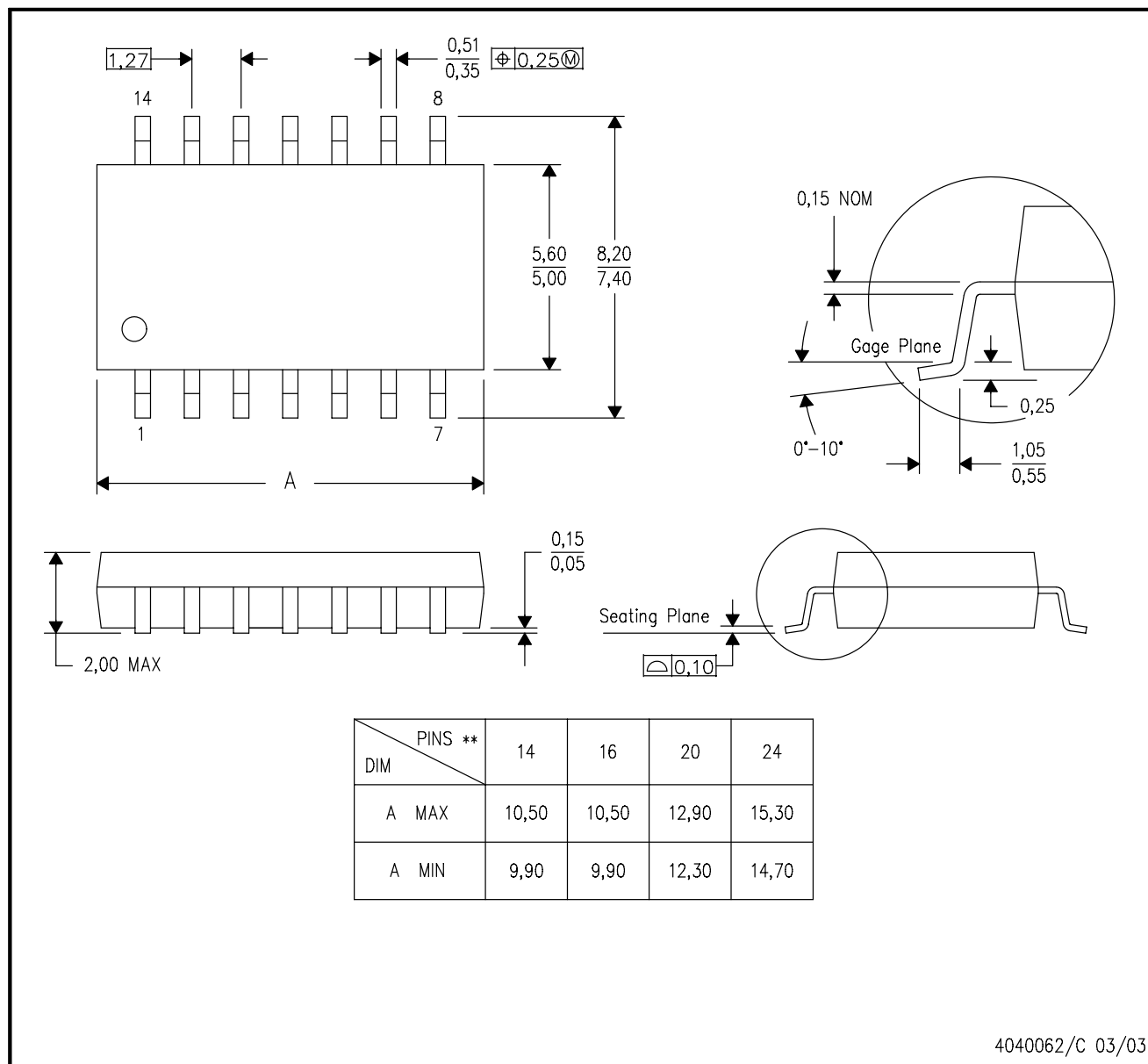
- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 - Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14-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.

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