

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

### description

These devices contain two independent D-type positive-edge-triggered flip-flops. A low level at the preset or clear inputs sets or resets the outputs regardless of the levels of the other inputs. When preset and clear are inactive (high), data at the D input meeting the setup time requirements are transferred to the outputs on the positive-going edge of the clock pulse. Clock triggering occurs at a voltage level and is not directly related to the rise time of the clock pulse. Following the hold time interval, data at the D input may be changed without affecting the levels at the outputs.

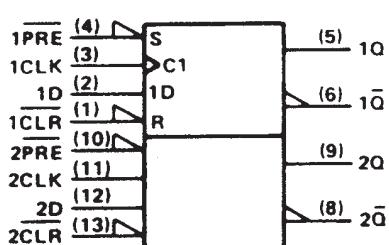
The SN54' family is characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74' family is characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

FUNCTION TABLE

INPUTS				OUTPUTS	
PRE	CLR	CLK	D	Q	$\bar{Q}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H <sup>†</sup>	H <sup>†</sup>
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q <sub>0</sub>	$\bar{Q}_0$

<sup>†</sup> The output levels in this configuration are not guaranteed to meet the minimum levels in  $V_{OH}$  if the lows at preset and clear are near  $V_{IL}$  maximum. Furthermore, this configuration is nonstable; that is, it will not persist when either preset or clear returns to its inactive (high) level.

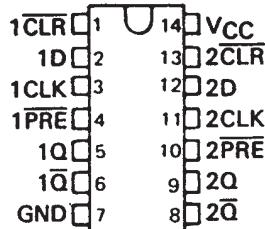
### logic symbol <sup>‡</sup>



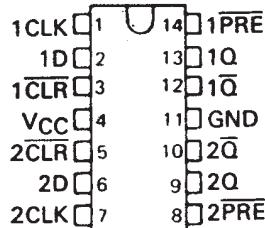
<sup>‡</sup>This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

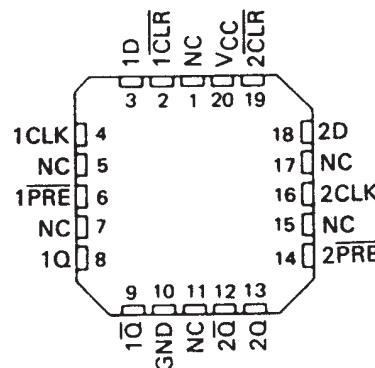
**SN5474 . . . J PACKAGE**  
 SN54LS74A, SN54S74 . . . J OR W PACKAGE  
 SN7474 . . . N PACKAGE  
 SN74LS74A, SN74S74 . . . D OR N PACKAGE  
 (TOP VIEW)



**SN5474 . . . W PACKAGE**  
 (TOP VIEW)

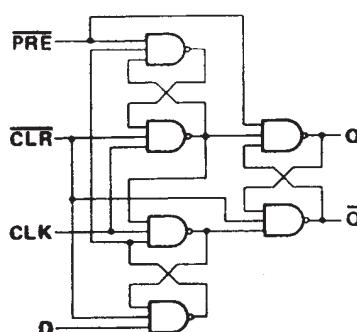


**SN54LS74A, SN54S74 . . . FK PACKAGE**  
 (TOP VIEW)



NC - No internal connection

### logic diagram (positive logic)



**SN5474, SN54LS74A, SN54S74**

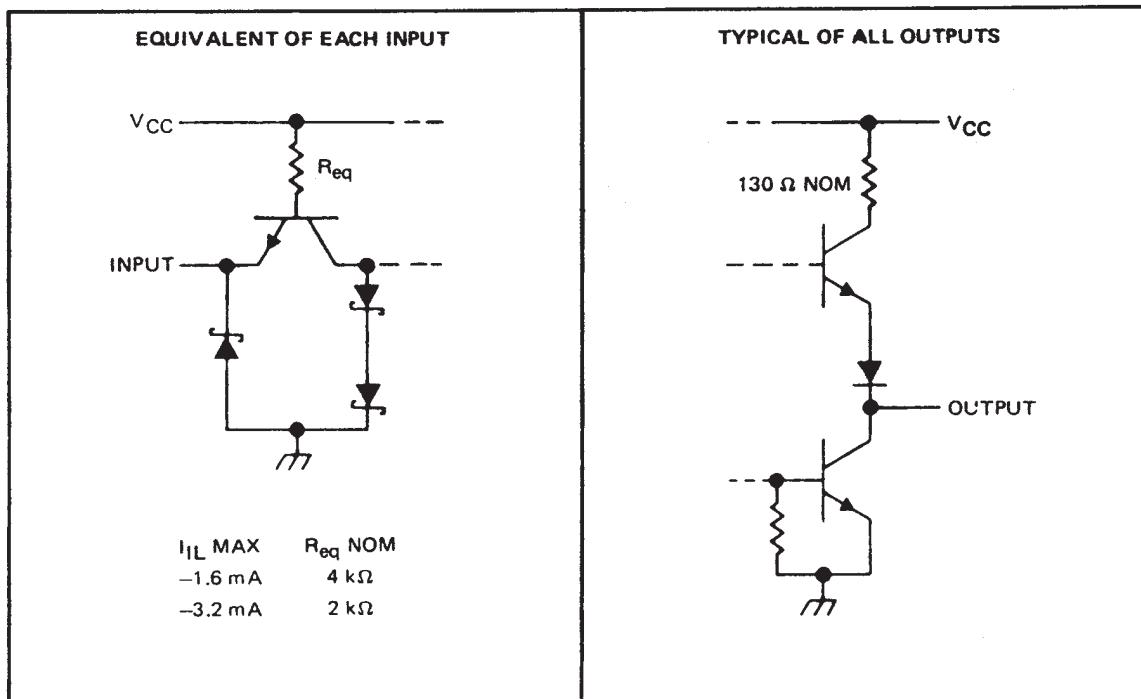
**SN7474, SN74LS74A, SN74S74**

**DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR**

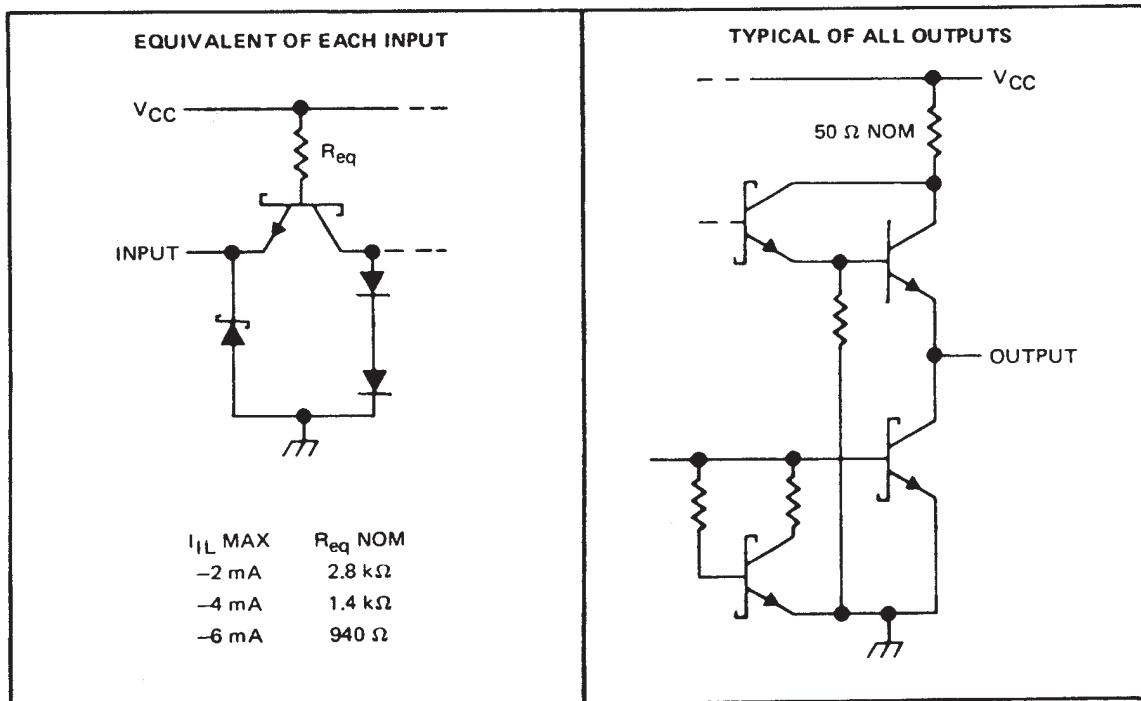
SDLS119 – DECEMBER 1983 – REVISED MARCH 1988

**schematics of inputs and outputs**

**74**



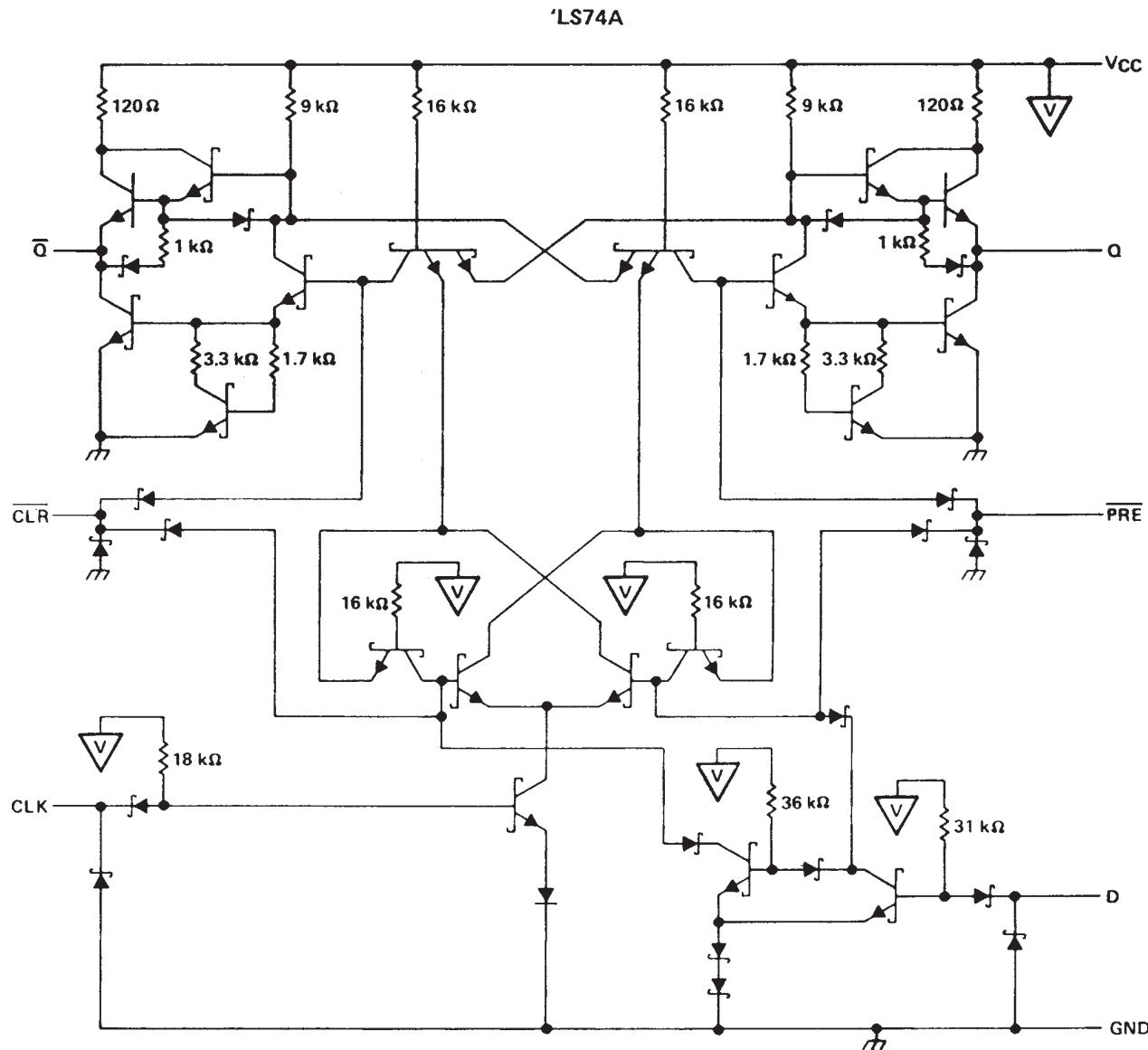
**'S74**



## DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

SDLS119 - DECEMBER 1983 - REVISED MARCH 1988

## schematic



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

Supply voltage, V <sub>CC</sub> (see Note 1) . . . . .	7 V
Input voltage: '74, 'S74 . . . . .	5.5 V
'LS74A . . . . .	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.

**SN5474, SN54LS74A, SN54S74****SN7474, SN74LS74A, SN74S74****DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR**

SDLS119 - DECEMBER 1983 - REVISED MARCH 1988

**recommended operating conditions**

			SN5474			SN7474			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V <sub>CC</sub>	Supply voltage		4.5	5	5.5	4.75	5	5.25	V
V <sub>IH</sub>	High-level input voltage		2			2			V
V <sub>IL</sub>	Low-level input voltage				0.8			0.8	V
I <sub>OH</sub>	High-level output current				-0.4			-0.4	mA
I <sub>OL</sub>	Low-level output current				16			16	mA
t <sub>w</sub>	Pulse duration	CLK high	30			30			ns
		CLK low	37			37			
		PRE or CLR low	30			30			
t <sub>su</sub>	Input setup time before CLK t		20			20			ns
t <sub>h</sub>	Input hold time-data after CLK t		5			5			ns
T <sub>A</sub>	Operating free-air temperature		-55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS <sup>†</sup>			SN5474			SN7474			UNIT
				MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX	
V <sub>IK</sub>	V <sub>CC</sub> = MIN, I <sub>I</sub> = -12 mA				-1.5			-1.5		V
V <sub>OH</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V, I <sub>OH</sub> = -0.4 mA			2.4	3.4		2.4	3.4		V
V <sub>OL</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V, I <sub>OL</sub> = 16 mA			0.2	0.4		0.2	0.4		V
I <sub>I</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V					1			1	mA
I <sub>IH</sub>	D CLR All Other	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4 V			40			40		μA
					120			120		
					80			80		
I <sub>IL</sub>	D PRE <sup>§</sup> CLR <sup>§</sup> CLK	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V			-1.6			-1.6		mA
					-1.6			-1.6		
					-3.2			-3.2		
					-3.2			-3.2		
I <sub>OS</sub> <sup>¶</sup>	V <sub>CC</sub> = MAX			-20	-57	-18	-18	-57		mA
I <sub>CC</sub> <sup>#</sup>	V <sub>CC</sub> = MAX, See Note 2				8.5	15		8.5	15	mA

<sup>†</sup>For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.<sup>‡</sup>All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.<sup>§</sup>Clear is tested with preset high and preset is tested with clear high.<sup>¶</sup>Not more than one output should be shown at a time.

#Average per flip-flop.

NOTE 2: With all outputs open, I<sub>CC</sub> is measured with the Q and  $\bar{Q}$  outputs high in turn. At the time of measurement, the clock input is grounded.**switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 3)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
f <sub>max</sub>			R <sub>L</sub> = 400 Ω, C <sub>L</sub> = 15 pF	15	25		MHz	
t <sub>PLH</sub>	PRE or CLR	Q or $\bar{Q}$			25		ns	
t <sub>PHL</sub>					40		ns	
t <sub>PLH</sub>	CLK	Q or $\bar{Q}$			14	25	ns	
t <sub>PHL</sub>					20	40	ns	

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



POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

## DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

SDS119 – DECEMBER 1983 – REVISED MARCH 1988

## recommended operating conditions

			SN54LS74A			SN74LS74A			UNIT	
	MIN	NOM	MAX	MIN	NOM	MAX				
V <sub>CC</sub>	Supply voltage			4.5	5	5.5	4.75	5	5.25	V
V <sub>IH</sub>	High-level input voltage			2			2			V
V <sub>IL</sub>	Low-level input voltage				0.7			0.8		V
I <sub>OH</sub>	High-level output current					-0.4			-0.4	mA
I <sub>OL</sub>	Low-level output current					4		8		mA
f <sub>clock</sub>	Clock frequency			0	25		0	25		MHz
t <sub>w</sub>	Pulse duration	CLK high		25			25			ns
		PRE or CLR low		25			25			
t <sub>su</sub>	Setup time-before CLK↑	High-level data		20			20			ns
		Low-level data		20			20			
t <sub>h</sub>	Hold time-data after CLK↑			5			5			ns
T <sub>A</sub>	Operating free-air temperature			-55	125		0	70		°C

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

PARAMETER	TEST CONDITIONS <sup>†</sup>			SN54LS74A			SN74LS74A			UNIT
				MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX	
V <sub>IK</sub>	V <sub>CC</sub> = MIN,	I <sub>I</sub> = -18 mA			-1.5			-1.5		V
V <sub>OH</sub>	V <sub>CC</sub> = MIN,	V <sub>IH</sub> = 2 V,	V <sub>IL</sub> = MAX,	2.5	3.4		2.7	3.4		V
V <sub>OL</sub>	V <sub>CC</sub> = MIN,	V <sub>IL</sub> = MAX,	V <sub>IH</sub> = 2 V,		0.25	0.4	0.25	0.4		V
	I <sub>OL</sub> = 4 mA						0.35	0.5		
I <sub>I</sub>	D or CLK	V <sub>CC</sub> = MAX,	V <sub>I</sub> = 7 V		0.1		0.1			mA
	CLR or PRE				0.2		0.2			
I <sub>IH</sub>	D or CLK	V <sub>CC</sub> = MAX,	V <sub>I</sub> = 2.7 V		20		20			μA
	CLR or PRE				40		40			
I <sub>IIL</sub>	D or CLK	V <sub>CC</sub> = MAX,	V <sub>I</sub> = 0.4 V		-0.4		-0.4			mA
	CLR or PRE				-0.8		-0.8			
I <sub>OS\$</sub>	V <sub>CC</sub> = MAX,	See Note 4		-20	-100	-20	-100			mA
I <sub>CC</sub> (Total)	V <sub>CC</sub> = MAX,	See Note 2		4	8		4	8		mA

<sup>†</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.<sup>‡</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.<sup>§</sup> Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.NOTE 2: With all outputs open, I<sub>CC</sub> is measured with the Q and  $\bar{Q}$  outputs high in turn. At the time of measurement, the clock input is grounded.NOTE 4: For certain devices where state commutation can be caused by shorting an output to ground, an equivalent test may be performed with V<sub>O</sub> = 2.25 V and 2.125 V for the 54 family and the 74 family, respectively, with the minimum and maximum limits reduced to one half of their stated values.switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
f <sub>max</sub>			R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 15 pF	25	33		MHz
t <sub>PLH</sub>	CLR, PRE or CLK	Q or $\bar{Q}$		13	25		ns
t <sub>PHL</sub>				25	40		ns

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

**SN5474, SN54LS74A, SN54S74**

**SN7474, SN74LS74A, SN74S74**

**DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR**

SDLS119 – DECEMBER 1983 – REVISED MARCH 1988

**recommended operating conditions**

			SN54S74			SN74S74			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V <sub>CC</sub>	Supply voltage		4.5	5	5.5	4.75	5	6.25	V
V <sub>IH</sub>	High-level input voltage		2			2			V
V <sub>IL</sub>	Low-level input voltage				0.8			0.8	V
I <sub>OH</sub>	High-level output current				-1			-1	mA
I <sub>OL</sub>	Low-level output current				20			20	mA
t <sub>w</sub>	Pulse duration	CLK high		6		6			ns
		CLK low		7.3		7.3			
		CLR or PRE low		7		7			
t <sub>su</sub>	Setup time, before CLK ↑	High-level data		3		3			ns
		Low-level data		3		3			
t <sub>h</sub>	Input hold time - data after CLK ↑			2		2			ns
T <sub>A</sub>	Operating free-air temperature		-55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS <sup>†</sup>			SN54S74			SN74S74			UNIT
	MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX	
V <sub>IK</sub>	V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA,				-1.2			-1.2		V
V <sub>OH</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V, I <sub>OH</sub> = -1 mA			2.5	3.4		2.7	3.4		V
V <sub>OL</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V, I <sub>OL</sub> = 20 mA				0.5			0.5		V
I <sub>I</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V				1			1		mA
I <sub>IH</sub>	D	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V			50		50			μA
	CLR		150		150					
	PRE or CLK		100		100					
I <sub>IL</sub>	D	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.5 V			-2		-2			mA
	CLR <sup>§</sup>		-6		-6					
	PRE <sup>§</sup>		-4		-4					
	CLK		-4		-4					
I <sub>OS</sub> <sup>§</sup>	V <sub>CC</sub> = MAX			-40	-100	-40	-100			mA
I <sub>CC</sub> <sup>#</sup>	V <sub>CC</sub> = MAX, See Note 2				15	25		15	25	mA

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

<sup>‡</sup>All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>§</sup>Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

<sup>¶</sup>Clear is tested with preset high and preset is tested with clear high.

<sup>#</sup>Average per flip-flop.

NOTE 2: With all outputs open, I<sub>CC</sub> is measured with the Q and  $\bar{Q}$  outputs high in turn. At the time of measurement, the clock input is grounded.

**switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 3)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN TYP MAX			UNIT
				75	110	MHz	
f <sub>max</sub>				4	6	ns	
t <sub>PLH</sub>	PRE or CLR	Q or $\bar{Q}$		9	13.5	ns	
t <sub>PHL</sub>	PRE or CLR (CLK high)	$\bar{Q}$ or Q	R <sub>L</sub> = 280 Ω, C <sub>L</sub> = 15 pF	5	8		ns
	PRE or CLR (CLK low)	Q or $\bar{Q}$		6	9	ns	
t <sub>PLH</sub>	CLK	Q or $\bar{Q}$		6	9	ns	
t <sub>PHL</sub>							

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



POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

**PACKAGING INFORMATION**

Orderable part number	Status	Material type	Package   Pins	Package qty   Carrier	RoHS	Lead finish/ Ball material	MSL rating/ Peak reflow	Op temp (°C)	Part marking
(1)	(2)	(3)	(4)	(5)	(6)				
JM38510/07101BCA	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/07101BCA
JM38510/07101BDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/07101BDA
JM38510/07101BDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/07101BDA
JM38510/30102B2A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102B2A
JM38510/30102B2A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102B2A
JM38510/30102BCA	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102BCA
JM38510/30102BCA	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102BCA
JM38510/30102BDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102BDA
JM38510/30102BDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102BDA
JM38510/30102SCA	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102SCA
JM38510/30102SCA	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102SCA
JM38510/30102SDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102SDA
JM38510/30102SDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/30102SDA
SN54LS74AJ	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS74AJ
SN54LS74AJ	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS74AJ
SN54S74J	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S74J
SN54S74J	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S74J
SN74LS74AD	Obsolete	Production	SOIC (D)   14	-	-	Call TI	Call TI	0 to 70	LS74A
SN74LS74AD	Obsolete	Production	SOIC (D)   14	-	-	Call TI	Call TI	0 to 70	LS74A

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)
SN74LS74ADBR	Active	Production	SSOP (DB)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS74A
SN74LS74ADBR	Active	Production	SSOP (DB)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS74A
SN74LS74ADR	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS74A
SN74LS74ADR	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS74A
SN74LS74AN	Active	Production	PDIP (N)   14	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS74AN
SN74LS74AN	Active	Production	PDIP (N)   14	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS74AN
SN74LS74ANSR	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS74A
SN74LS74ANSR	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS74A
SN74LS74ANSRG4	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS74A
SN74LS74ANSRG4	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS74A
SN74S74D	Active	Production	SOIC (D)   14	50   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	S74
SN74S74D	Active	Production	SOIC (D)   14	50   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	S74
SN74S74N	Active	Production	PDIP (N)   14	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74S74N
SN74S74N	Active	Production	PDIP (N)   14	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74S74N
SNJ54LS74AFK	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 74AFK
SNJ54LS74AFK	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 74AFK
SNJ54LS74AJ	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS74AJ
SNJ54LS74AJ	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS74AJ
SNJ54LS74AW	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS74AW
SNJ54LS74AW	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS74AW
SNJ54S74J	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S74J
SNJ54S74J	Active	Production	CDIP (J)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S74J
SNJ54S74W	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S74W
SNJ54S74W	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S74W

(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.

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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 SN54LS74A, SN54LS74A-SP, SN54S74, SN74LS74A, SN74S74 :

• Catalog : [SN74LS74A](#), [SN54LS74A](#), [SN74S74](#)

• Military : [SN54LS74A](#), [SN54S74](#)

• Space : [SN54LS74A-SP](#)

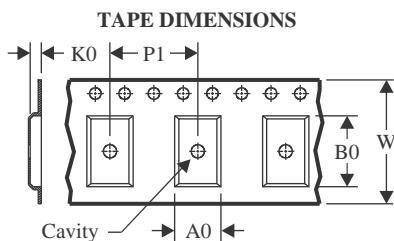
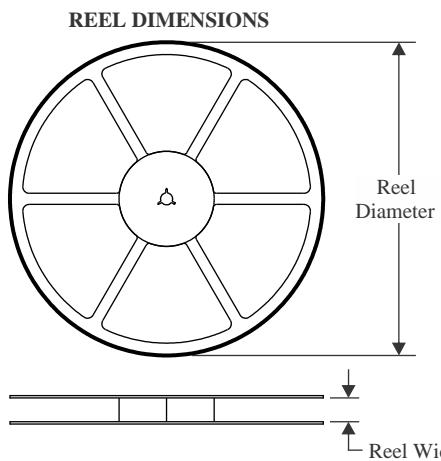
NOTE: Qualified Version Definitions:

• Catalog - TI's standard catalog product

• Military - QML certified for Military and Defense Applications

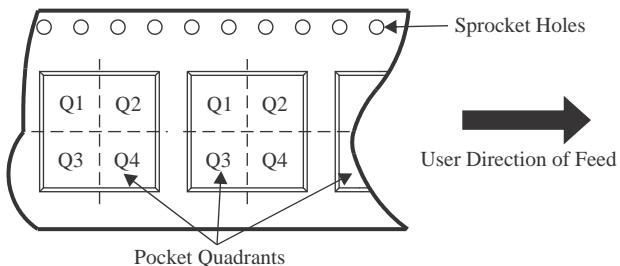
• Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

## TAPE AND REEL INFORMATION



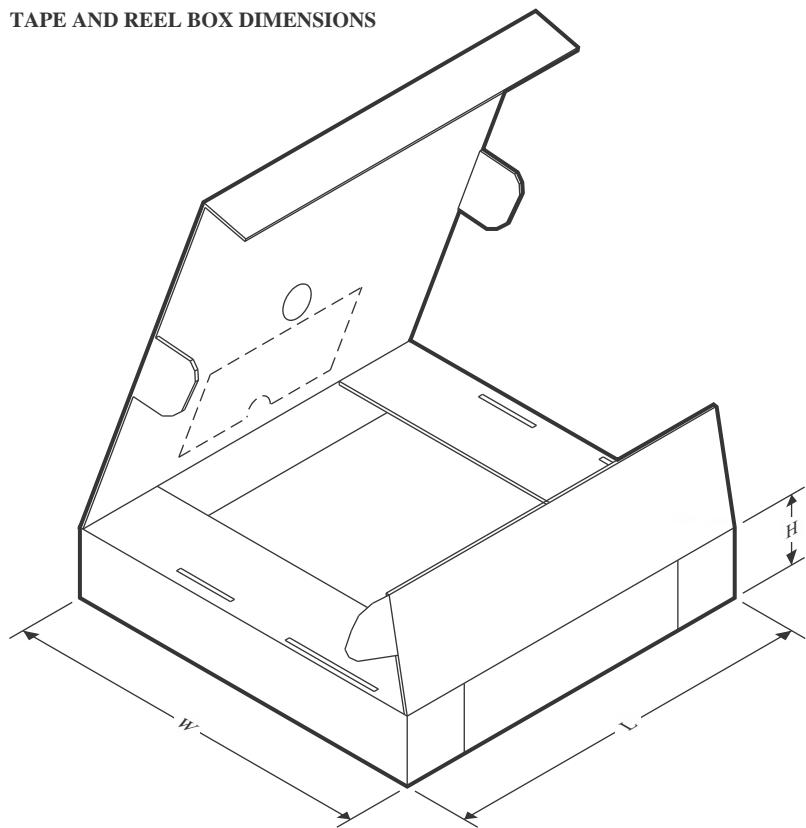
A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

### QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



\*All dimensions are nominal

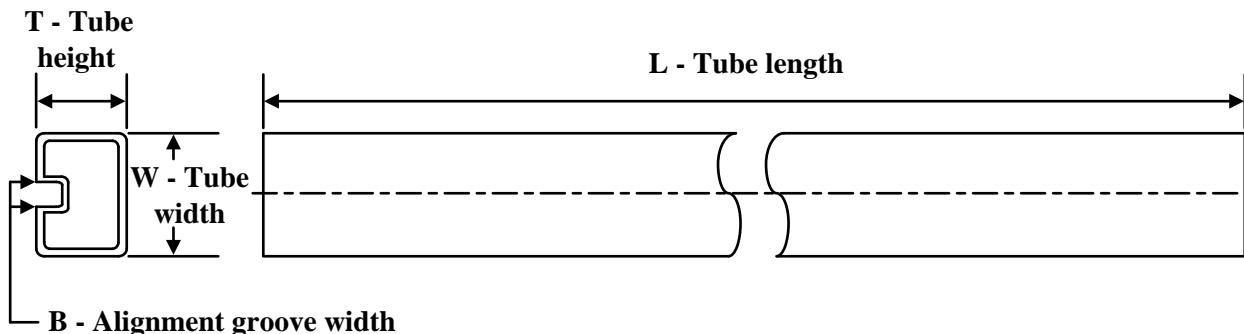
Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LS74ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LS74ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LS74ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LS74ANSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74LS74ANSR	SOP	NS	14	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)
SN74LS74ADBR	SSOP	DB	14	2000	356.0	356.0	35.0
SN74LS74ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LS74ADR	SOIC	D	14	2500	353.0	353.0	32.0
SN74LS74ANSR	SOP	NS	14	2000	367.0	367.0	38.0
SN74LS74ANSR	SOP	NS	14	2000	353.0	353.0	32.0

## TUBE



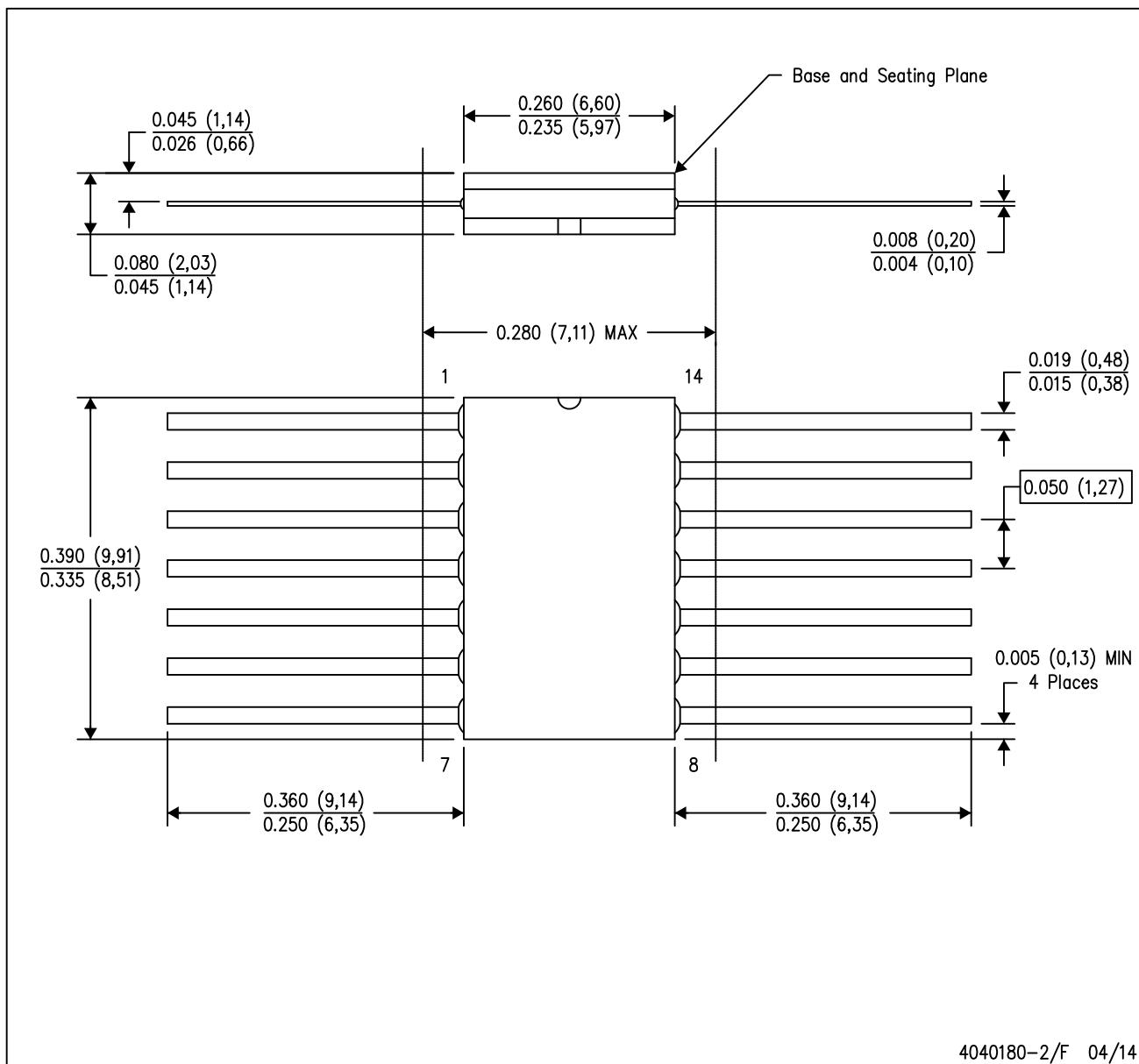
\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T ( $\mu$ m)	B (mm)
JM38510/07101BDA	W	CFP	14	25	506.98	26.16	6220	NA
JM38510/30102B2A	FK	LCCC	20	55	506.98	12.06	2030	NA
JM38510/30102BDA	W	CFP	14	25	506.98	26.16	6220	NA
JM38510/30102SDA	W	CFP	14	25	506.98	26.16	6220	NA
M38510/07101BDA	W	CFP	14	25	506.98	26.16	6220	NA
M38510/30102B2A	FK	LCCC	20	55	506.98	12.06	2030	NA
M38510/30102BDA	W	CFP	14	25	506.98	26.16	6220	NA
M38510/30102SDA	W	CFP	14	25	506.98	26.16	6220	NA
SN74LS74AN	N	PDIP	14	25	506	13.97	11230	4.32
SN74LS74AN	N	PDIP	14	25	506	13.97	11230	4.32
SN74LS74ANE4	N	PDIP	14	25	506	13.97	11230	4.32
SN74LS74ANE4	N	PDIP	14	25	506	13.97	11230	4.32
SN74S74D	D	SOIC	14	50	506.6	8	3940	4.32
SN74S74N	N	PDIP	14	25	506	13.97	11230	4.32
SN74S74N	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54LS74AFK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS74AW	W	CFP	14	25	506.98	26.16	6220	NA
SNJ54S74W	W	CFP	14	25	506.98	26.16	6220	NA

## MECHANICAL DATA

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



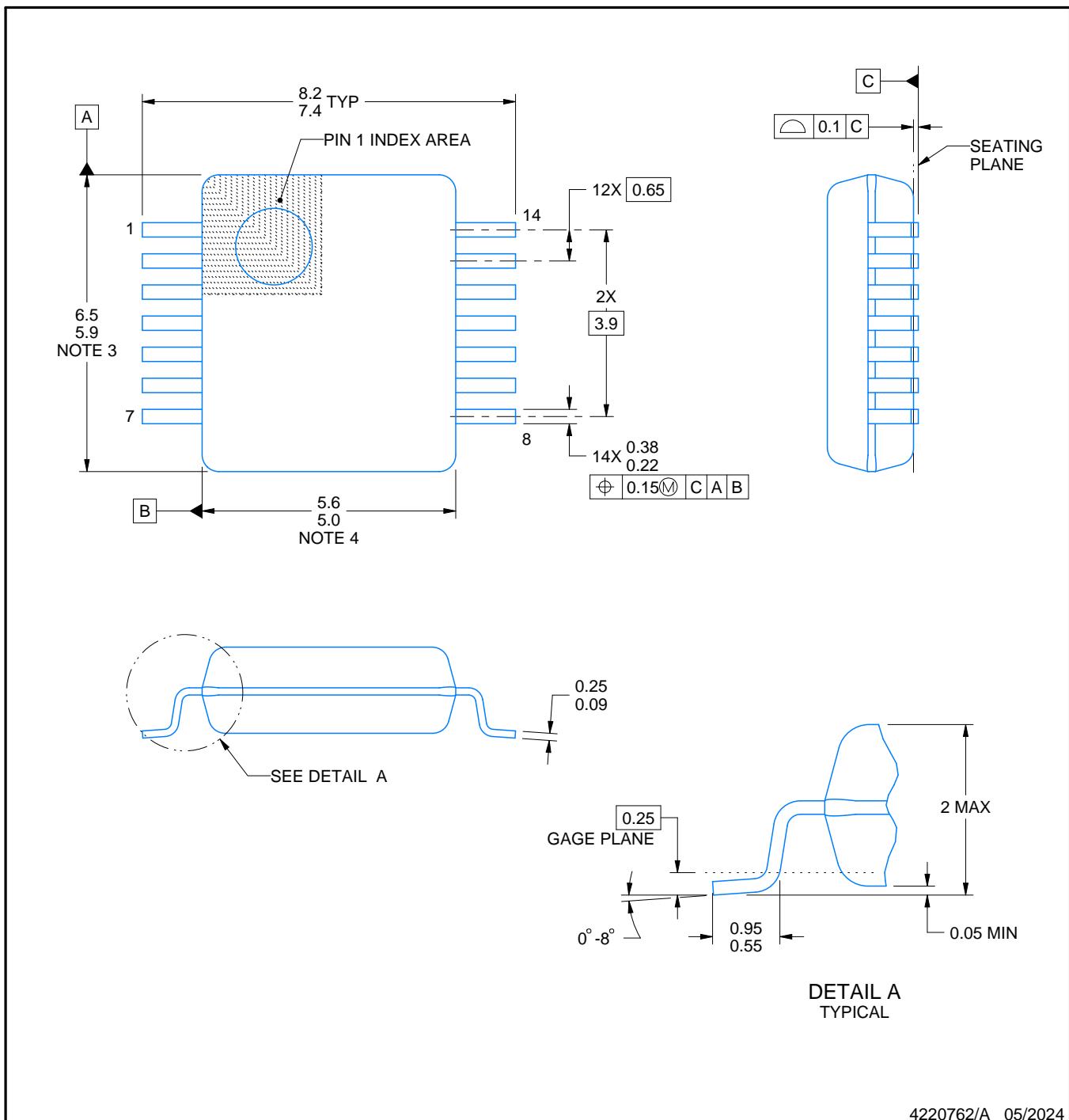
4040180-2/F 04/14

- 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-F14

# PACKAGE OUTLINE

## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



### NOTES:

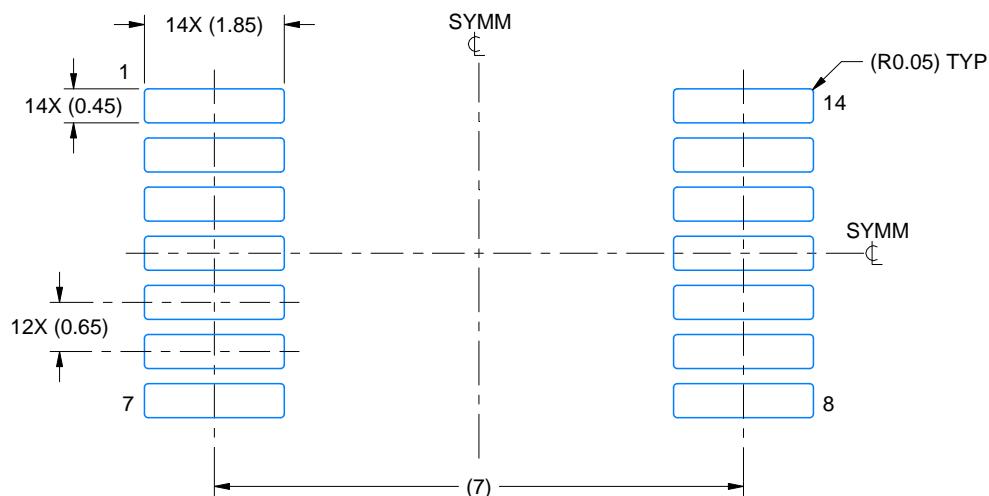
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. Reference JEDEC registration MO-150.

# EXAMPLE BOARD LAYOUT

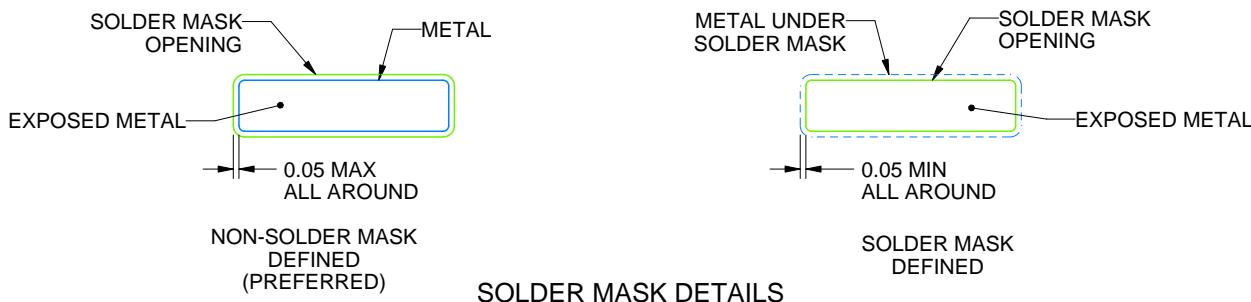
DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

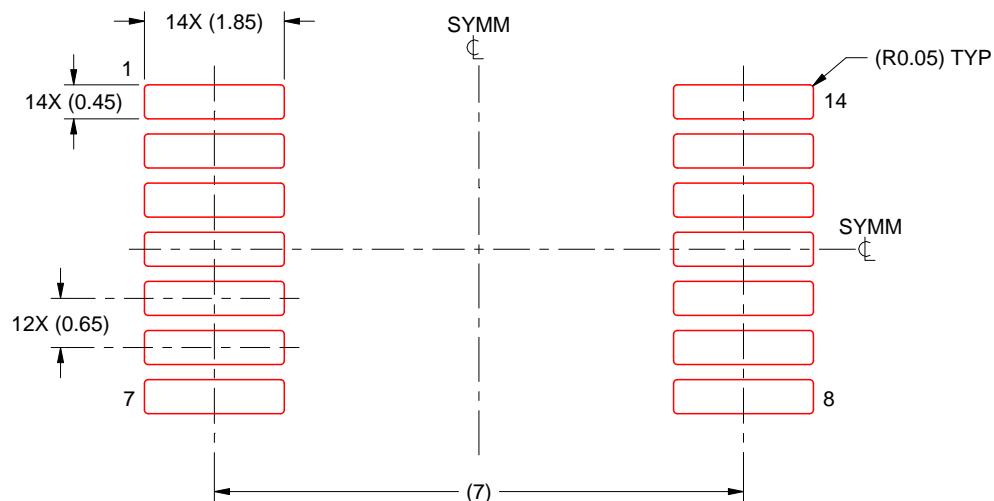
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220762/A 05/2024

NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

# GENERIC PACKAGE VIEW

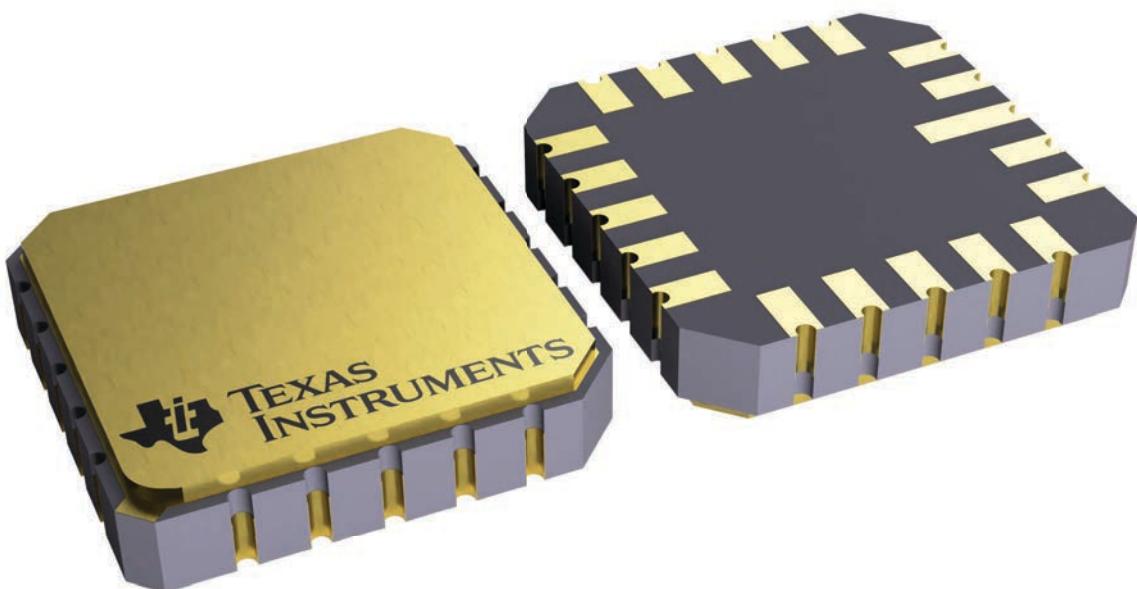
**FK 20**

**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.



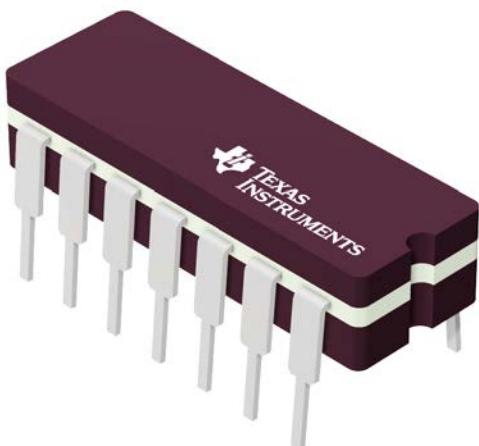
4229370VA\

# GENERIC PACKAGE VIEW

J 14

**CDIP - 5.08 mm max height**

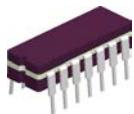
CERAMIC DUAL IN LINE PACKAGE



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

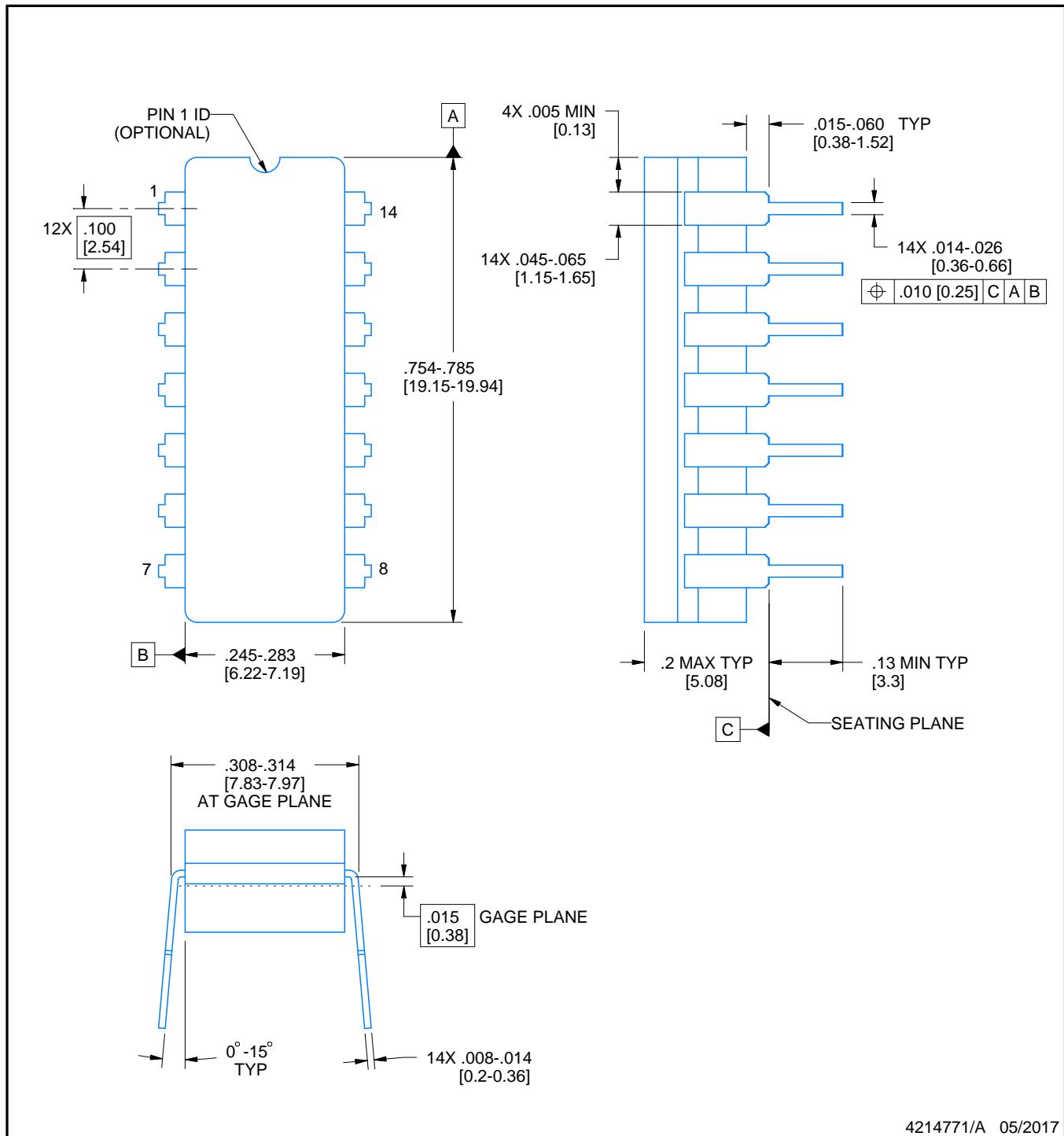
J0014A



# PACKAGE OUTLINE

## CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



4214771/A 05/2017

### NOTES:

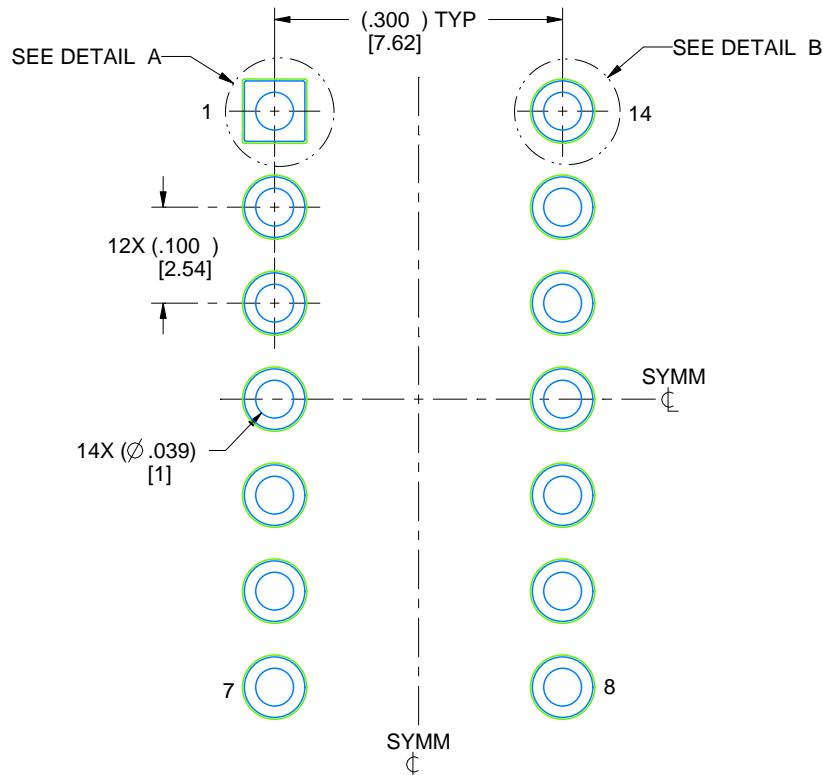
- All controlling linear dimensions are in inches. Dimensions in brackets are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- This package is hermetically sealed with a ceramic lid using glass frit.
- Index point is provided on cap for terminal identification only and on press ceramic glass frit seal only.
- Falls within MIL-STD-1835 and GDIP1-T14.

# EXAMPLE BOARD LAYOUT

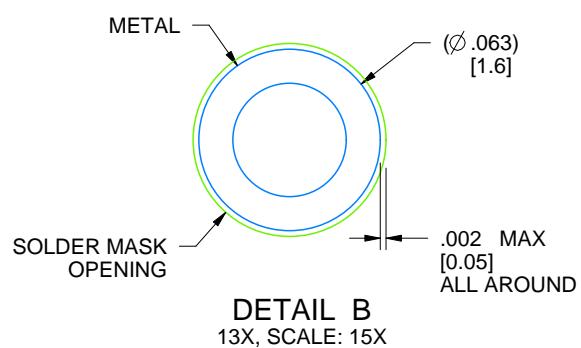
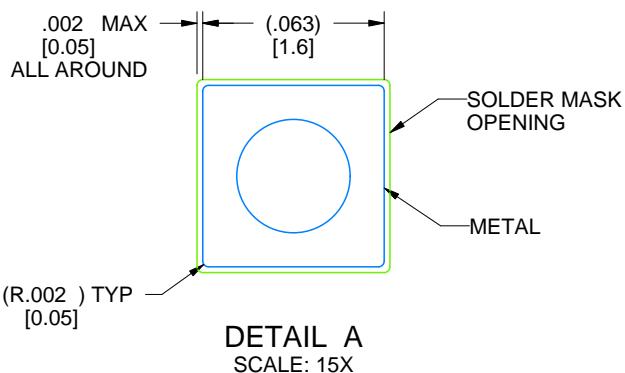
J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



LAND PATTERN EXAMPLE  
NON-SOLDER MASK DEFINED  
SCALE: 5X

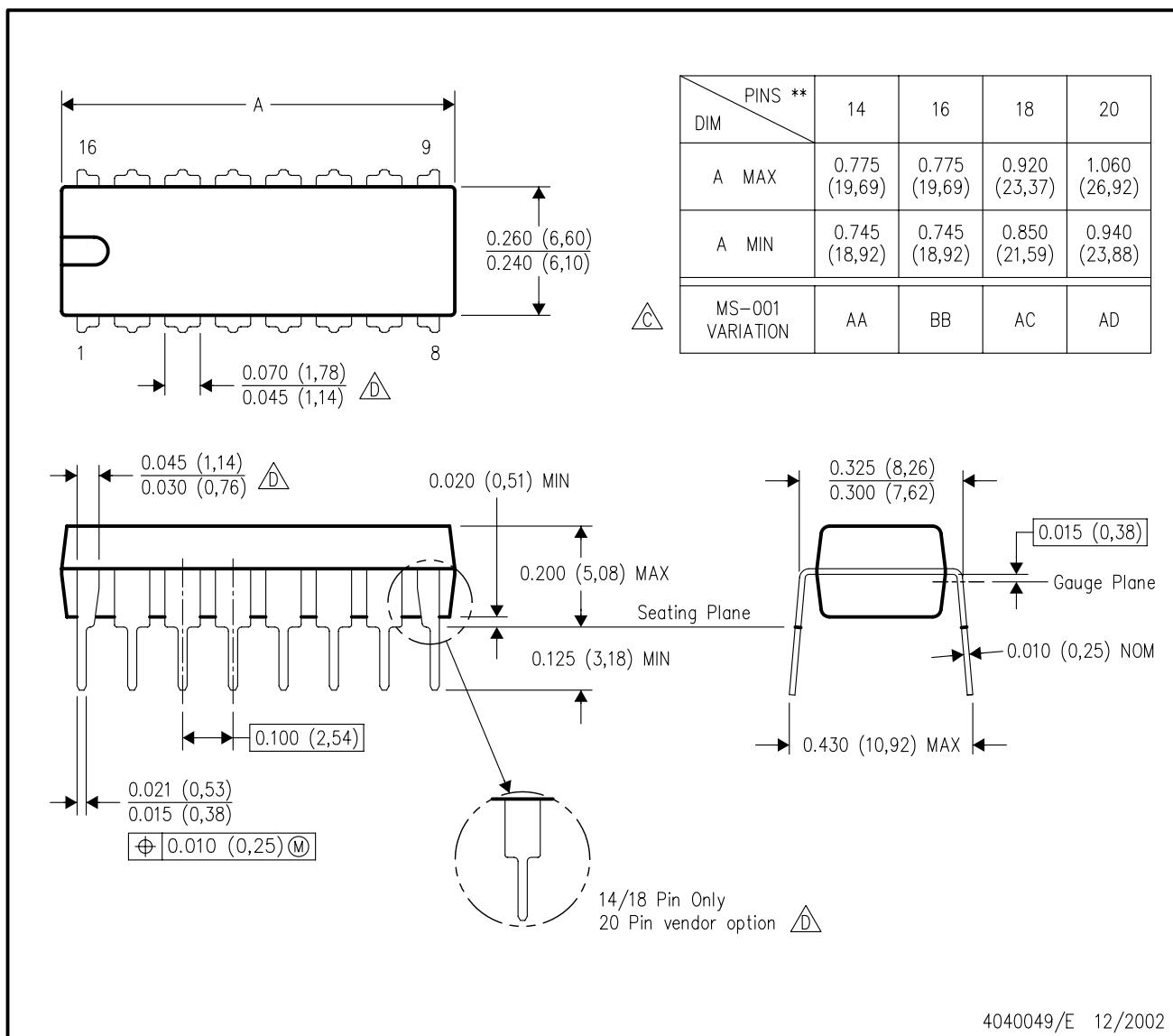


4214771/A 05/2017

## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



4040049/E 12/2002

NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.

Symbol C: Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).

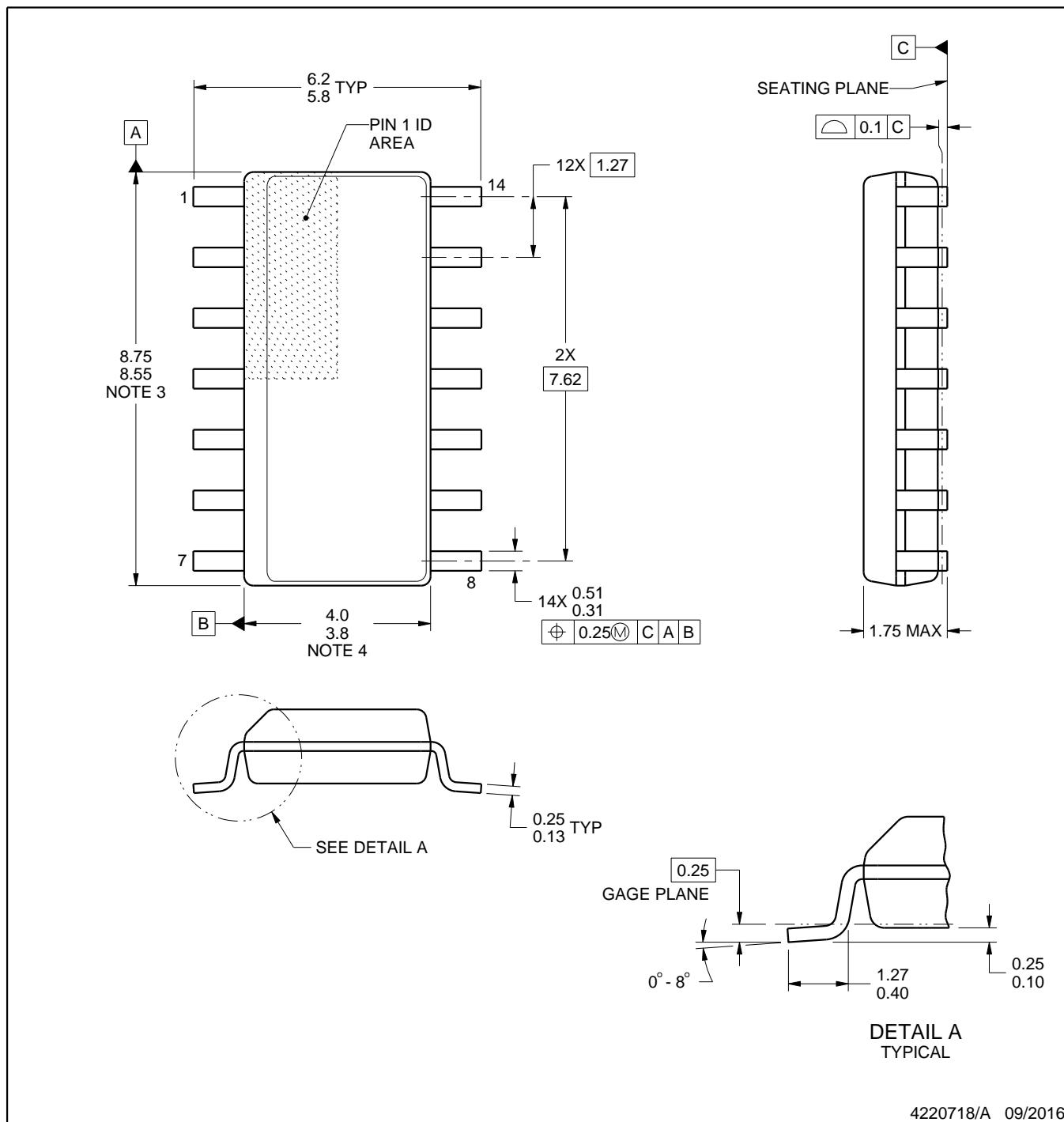
Symbol D: The 20 pin end lead shoulder width is a vendor option, either half or full width.

# PACKAGE OUTLINE

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



NOTES:

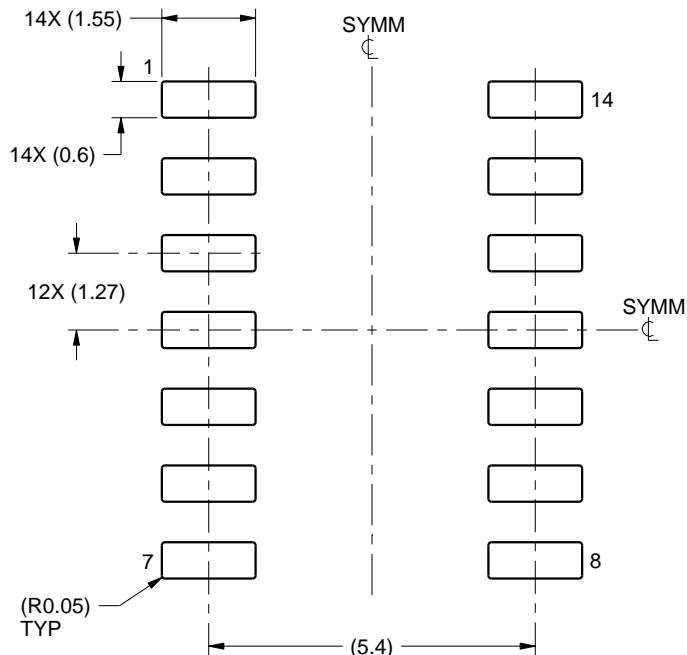
- All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
- This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
- Reference JEDEC registration MS-012, variation AB.

# EXAMPLE BOARD LAYOUT

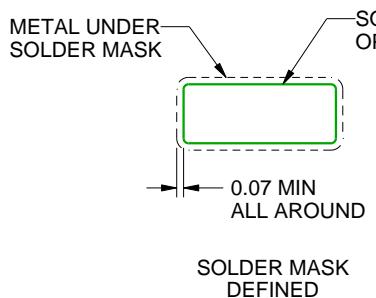
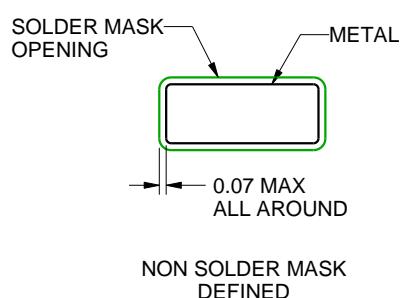
D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE  
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

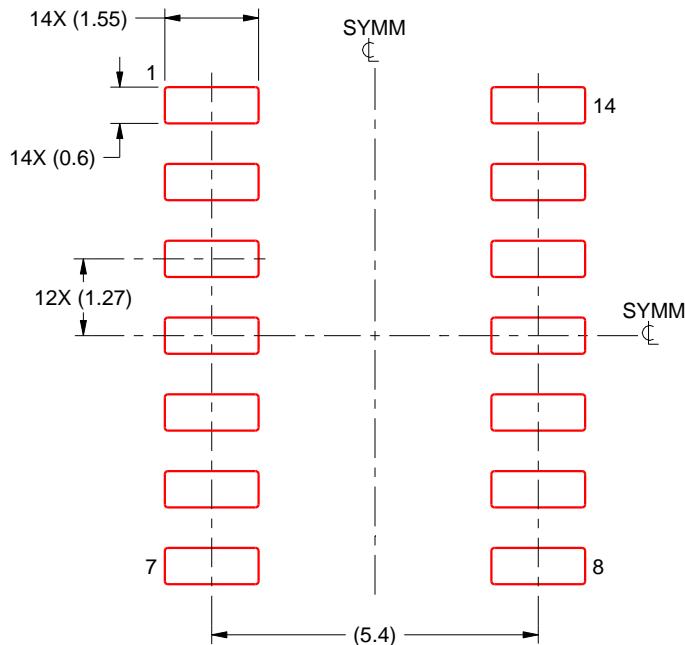
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:8X

4220718/A 09/2016

NOTES: (continued)

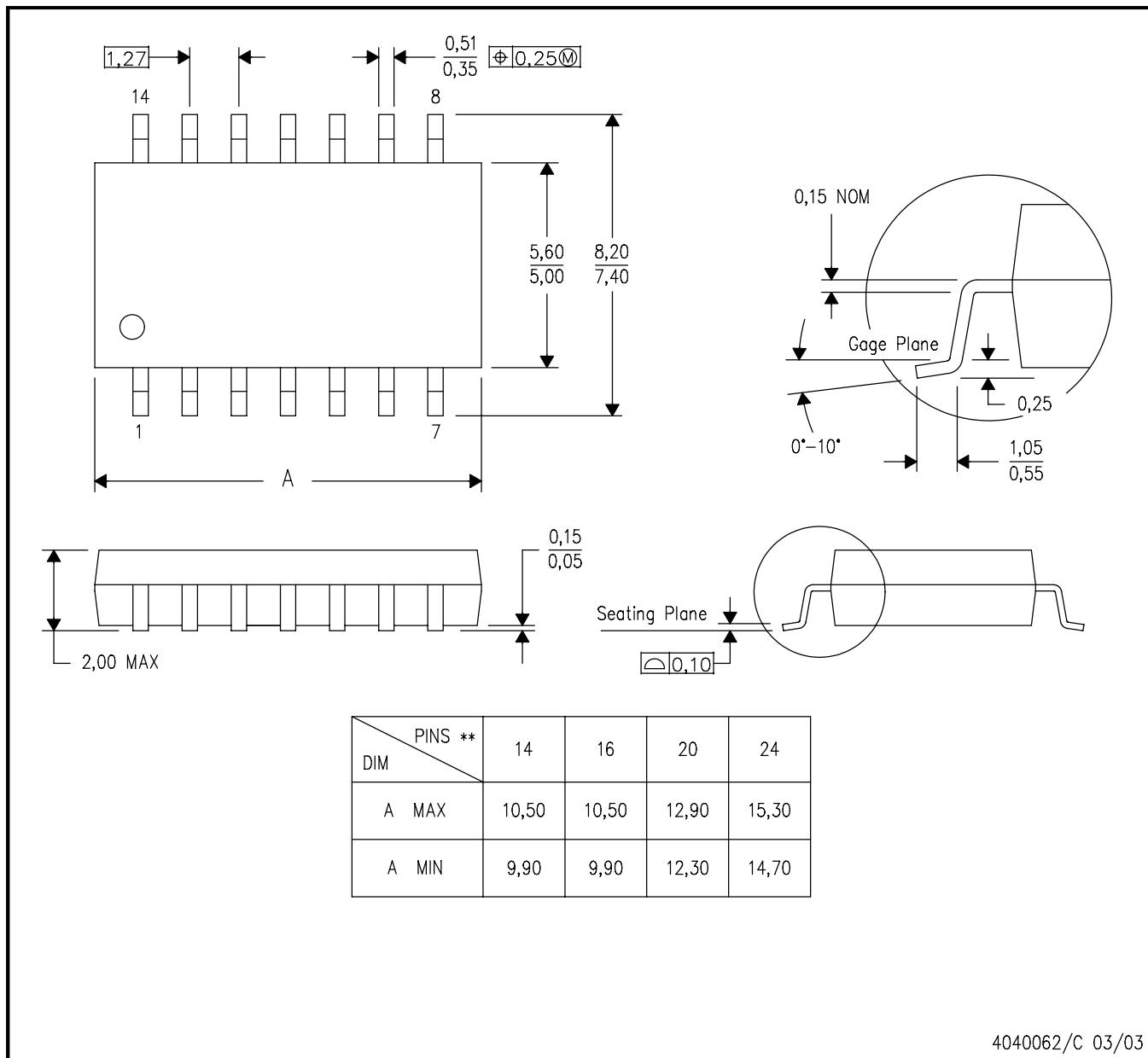
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

## MECHANICAL DATA

**NS (R-PDSO-G\*\*)**

**14-PINS SHOWN**

**PLASTIC SMALL-OUTLINE PACKAGE**



- NOTES: 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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