- **Operation from Very Slow Edges**
- **Improved Line-Receiving Characteristics**
- **High Noise Immunity**

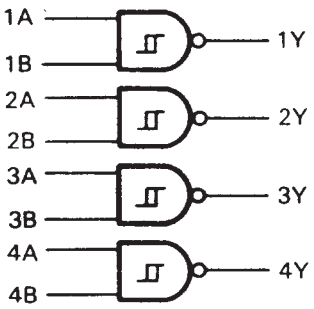
description

Each circuit functions as a 2-input NAND gate, but because of the Schmitt action, it has different input threshold levels for positive (V_{T+}) and for negative going (V_{T-}) signals.

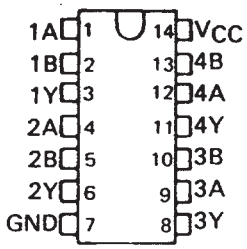
These circuits are temperature-compensated and can be triggered from the slowest of input ramps and still give clear, jitter-free output signals.

The SN54132, SN54LS132, and SN54S132 are characterized for operation over the full military temperature range of −55°C to 125°C. The SN74132, SN74LS132, and SN74S132 are characterized for operation from 0°C to 70°C.

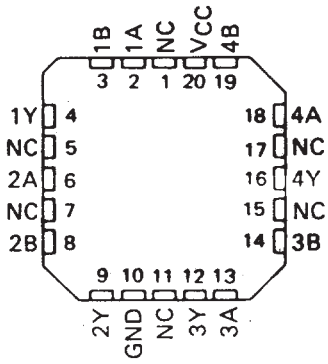
logic diagram (positive logic)



SN54132, SN54LS132, SN54S132 . . . J OR W PACKAGE
SN74132 . . . N PACKAGE
SN74LS132, SN74S132 . . . D OR N PACKAGE
(TOP VIEW)

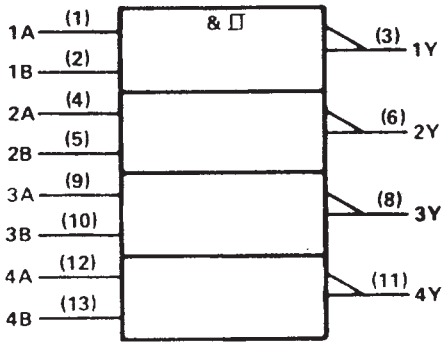


SN54LS132, SN54S132 . . . FK PACKAGE
(TOP VIEW)



NC-No internal connection

logic symbol†

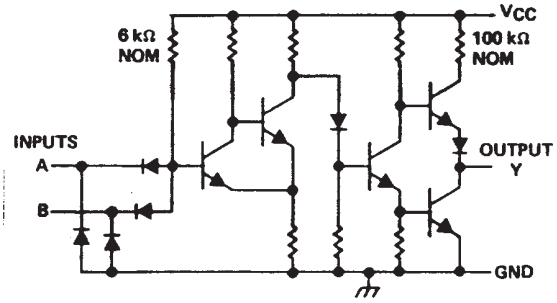


positive logic: $Y = \overline{AB}$ or $Y = \overline{A} + \overline{B}$

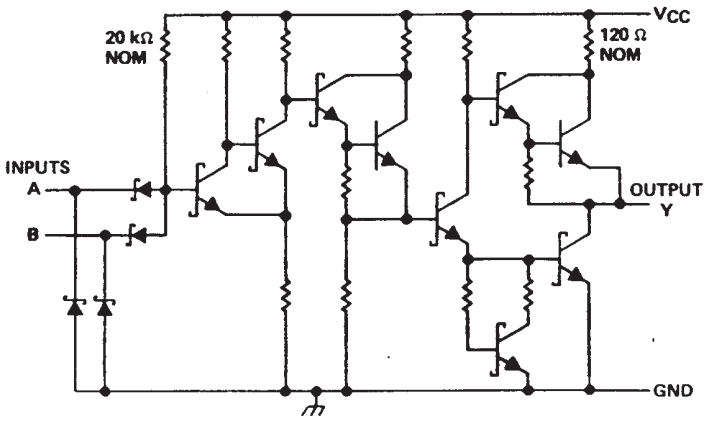
†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

schematics

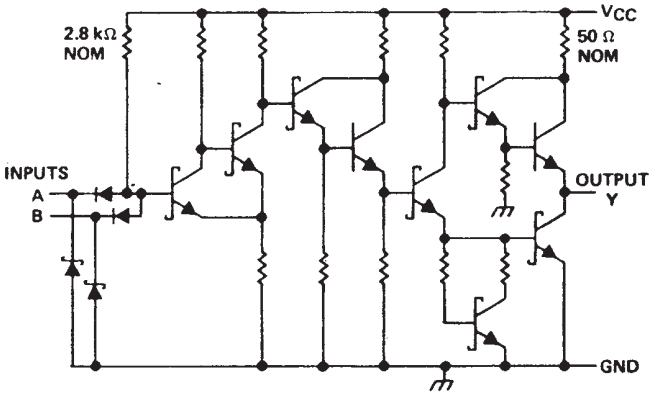
'132 CIRCUITS



'LS132 CIRCUITS



'S132 CIRCUITS



Resistor values shown are nominal.

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

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage: '132, 'S132 . . . . . 5.5 V
'LS132 . . . . . 7 V
Operating free-air temperature: SN54' . . . . . −55°C to 125°C
SN74' . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

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

recommended operating conditions

		SN54132			SN74132			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			– 0.8			– 0.8	mA
I_{OL}	Low-level output current			16			16	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†			MIN	TYP‡	MAX	UNIT
V_{T+}	V_{CC} = 5 V			1.5	1.7	2	V
V_{T-}	V_{CC} = 5 V			0.6	0.9	1.1	V
V_{hys} ($V_{T+} - V_{T-}$)	V_{CC} = 5 V			0.4	0.8		V
V_{IK}	V_{CC} = MIN,	I_I = – 12 mA				– 1.5	V
V_{OH}	V_{CC} = MIN,	V_I = 0.6 V,	I_{OH} = – 0.8 mA	2.4	3.4		V
V_{OL}	V_{CC} = MIN,	V_I = 2 V,	I_{OL} = 16 mA		0.2	0.4	V
I_{T+}	V_{CC} = 5 V,	$V_I = V_{T+}$			– 0.43		mA
I_{T-}	V_{CC} = 5 V,	$V_I = V_{T-}$			– 0.56		mA
I_I	V_{CC} = MAX,	V_I = 5.5 V				1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.4 V				40	μA
I_{IL}	V_{CC} = MAX,	V_{IL} = 0.4 V			– 0.8	– 1.2	mA
I_{OS}§	V_{CC} = MAX			– 18		– 55	mA
I_{CCH}	V_{CC} = MAX				15	24	mA
I_{CCL}	V_{CC} = MAX				26	40	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.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Any	Y	R_L = 400 Ω, C_L = 15 pF		15	22	ns
t_{PHL}					15	22	ns

recommended operating conditions

	SN54LS132			SN74LS132			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			−0.4			−0.4	mA
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†		SN54LS132			SN74LS132			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{T+}	V_{CC} = 5 V		1.4	1.6	1.9	1.4	1.6	1.9	V
V_{T-}	V_{CC} = 5 V		0.5	0.8	1	0.5	0.8	1	V
V_{hys} ($V_{T+} - V_{T-}$)	V_{CC} = 5 V		0.4	0.8		0.4	0.8		V
V_{IK}	V_{CC} = MIN, I_I = −18 mA				−1.5			−1.5	V
V_{OH}	V_{CC} = MIN, V_I = 0.5 V,	I_{OH} = −0.4 mA	2.5	3.4		2.7	3.4		V
V_{OL}	V_{CC} = MIN, V_I = 1.9 V	I_{OL} = 4 mA		0.25	0.4		0.25	0.4	V
		I_{OL} = 8 mA					0.35	0.5	
I_{T+}	V_{CC} = 5 V, V_I = V_{T+}			−0.14			−0.14		mA
I_{T-}	V_{CC} = 5 V, V_I = V_{T-}			−0.18			−0.18		mA
I_I	V_{CC} = MAX, V_I = 7 V				0.1			0.1	mA
I_{IH}	V_{CC} = MAX, V_I = 2.7 V				20			20	μA
I_{IL}	V_{CC} = MAX, V_{IL} = 0.4 V				−0.4			−0.4	mA
I_{OS} §	V_{CC} = MAX		−20		−100	−20		−100	mA
I_{CCH}	V_{CC} = MAX			5.9	11		5.9	11	mA
I_{CCL}	V_{CC} = MAX			8.2	14		8.2	14	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 the short-circuit should not exceed one second

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Any	Y	R_L = 2 kΩ, C_L = 15 pF		15	22	ns
t_{PHL}					15	22	ns

recommended operating conditions

		SN54S132			SN74S132			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			−1			−1	mA
I_{OL}	Low-level output current			20			20	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

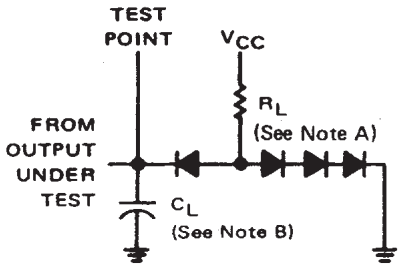
PARAMETER	TEST CONDITIONS†			SN54S132			SN74S132			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{T+}	V_{CC} = 5 V			1.6	1.77	1.9	1.6	1.77	1.9	V
V_{T-}	V_{CC} = 5 V			1.1	1.22	1.4	1.1	1.22	1.4	V
V_{hys} ($V_{T+} - V_{T-}$)	V_{CC} = 5 V			0.2	0.55		0.2	0.55		V
V_{IK}	V_{CC} = MIN,	I_I = −18 mA				−1.2			−1.2	V
V_{OH}	V_{CC} = MIN,	V_I = 1.1 V,	I_{OH} = −1 mA	2.5	3.4		2.7	3.4		V
V_{OL}	V_{CC} = MIN,	V_I = 1.9 V,	I_{OL} = 20 mA			0.5			0.5	V
I_{T+}	V_{CC} = 5 V,	$V_I = V_{T+}$			−0.9			−0.9		mA
I_{T-}	V_{CC} = 5 V,	$V_I = V_{T-}$			−1.1			−1.1		mA
I_I	V_{CC} = MAX,	V_I = 5.5 V				1			1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.7 V				50			50	μA
I_{IL}	V_{CC} = MAX,	V_{IL} = 0.5 V				−2			−2	mA
I_{OS}§	V_{CC} = MAX			−40		−100	−40		−100	mA
I_{CCH}	V_{CC} = MAX				28	44		28	44	mA
I_{CCL}	V_{CC} = MAX				44	68		44	68	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 the short-circuit should not exceed one second.

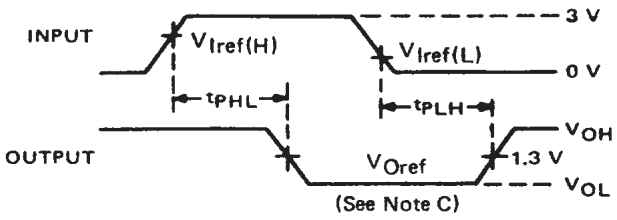
switching characteristics, V_{CC} = 5 V, T_A = 25°C (see figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	A or B	Y	R_L = 280 Ω,	C_L = 15 pF		7	10.5	ns
t_{PHL}						8.5	13	ns

PARAMETER MEASUREMENT INFORMATION



LOAD CIRCUIT



VOLTAGE WAVEFORMS

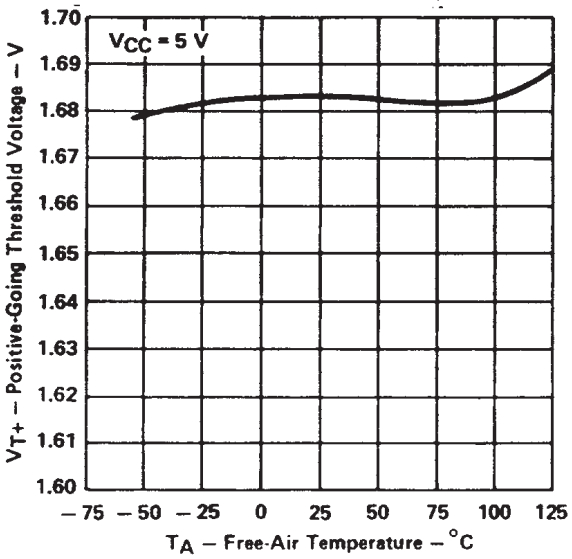
NOTES: A. All diodes are 1N3064 or equivalent.
B. C_L includes probe and jig capacitance.
C. Generator characteristics and reference voltages are:

	Generator Characteristics				Reference Voltages		
	Z_{out}	PRR	t_r	t_f	$V_{I\ ref(H)}$	$V_{I\ ref(L)}$	$V_{O\ ref}$
SN54'/SN74'	50	1 MHz	10 ns	10 ns	1.7 V	0.9 V	1.5 V
SN54LS'/SN74LS'	50	1 MHz	15 ns	6 ns	1.6 V	0.8 V	1.3 V
'S132	50	1 MHz	2.5 ns	2.5 ns	1.8 V	1.2 V	1.5 V

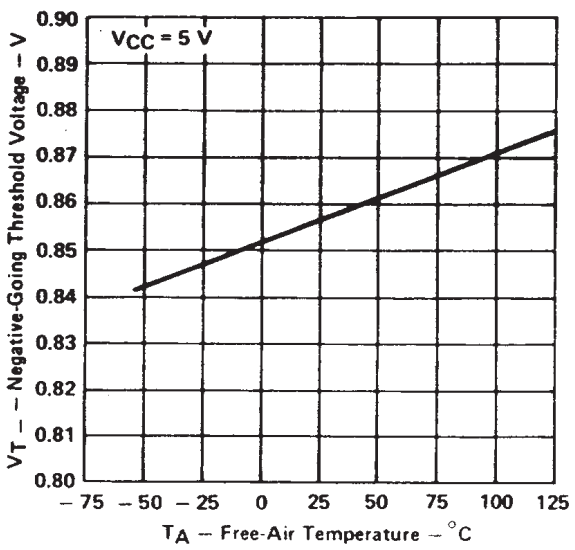
FIGURE 1

TYPICAL CHARACTERISTICS OF '132 CIRCUITS

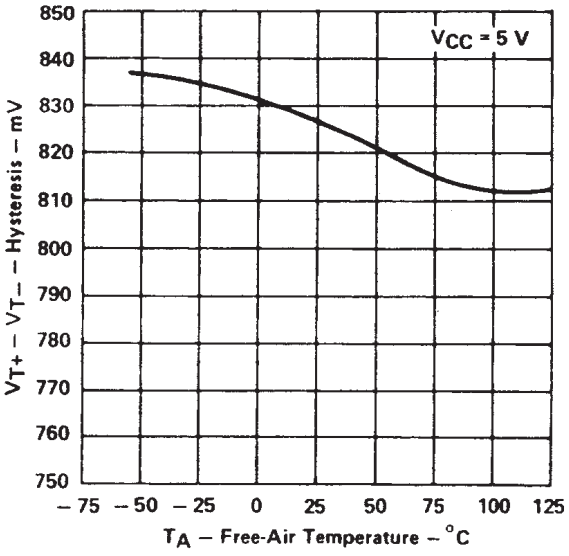
POSITIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



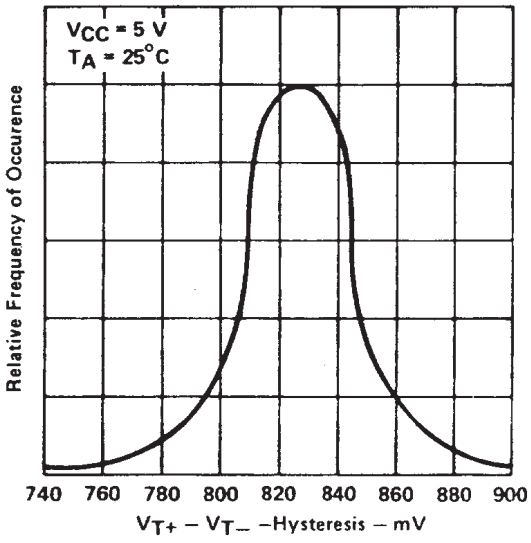
NEGATIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



HYSTERESIS
vs
FREE-AIR TEMPERATURE

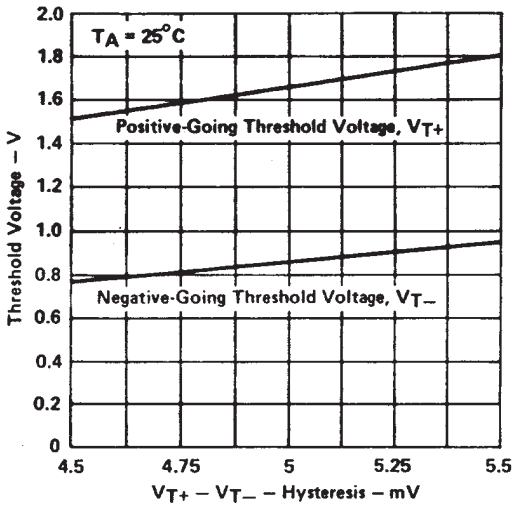


DISTRIBUTION OF UNITS
FOR HYSTERESIS

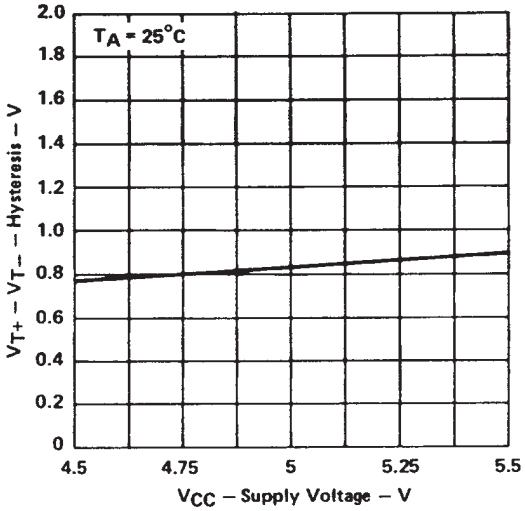


TYPICAL CHARACTERISTICS OF '132 CIRCUITS

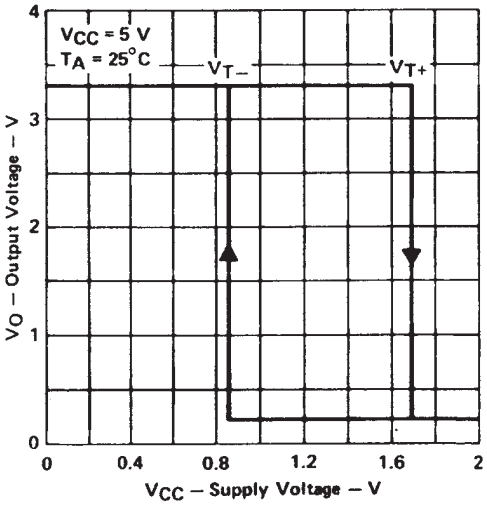
THRESHOLD VOLTAGES
vs
SUPPLY VOLTAGE



HYSTERESIS
vs
SUPPLY VOLTAGE



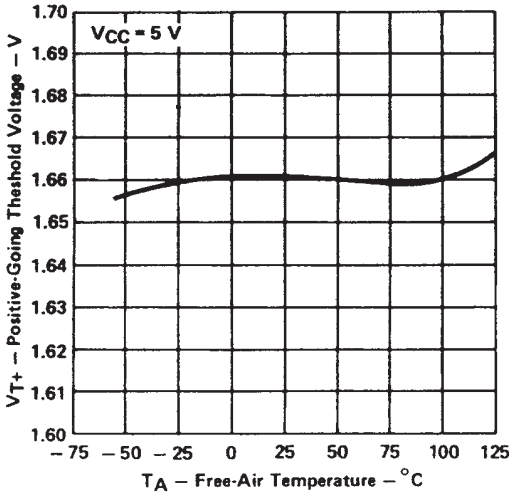
OUTPUT VOLTAGE
vs
INPUT VOLTAGE



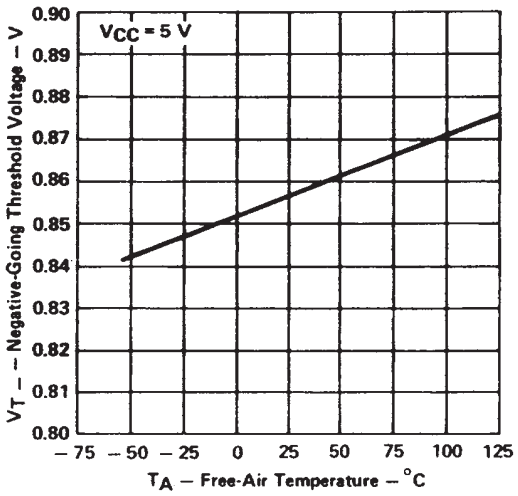
† Data for temperatures below 0°C and 70°C and supply below 4.75 V and above 5.25 V are applicable for SN54132 only.

TYPICAL CHARACTERISTICS OF 'LS132 CIRCUITS

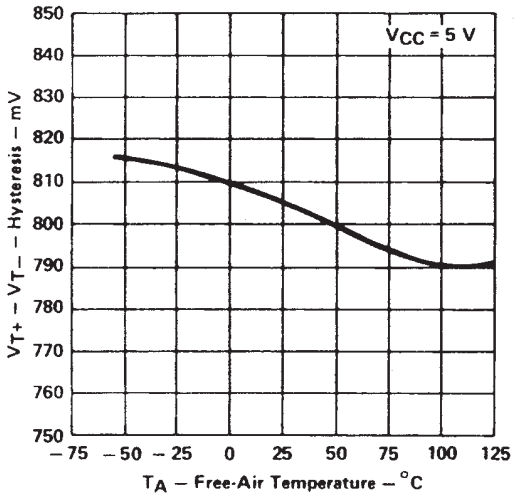
POSITIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



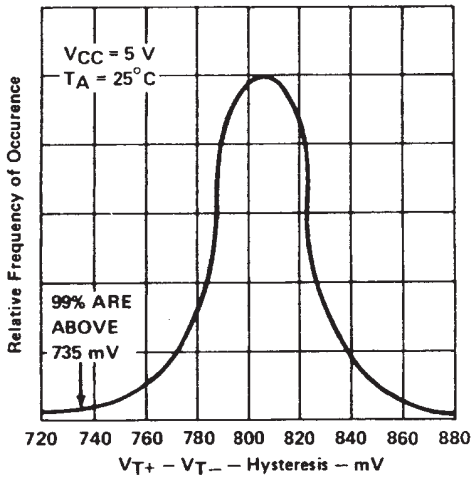
NEGATIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



HYSTERESIS
vs
FREE-AIR TEMPERATURE



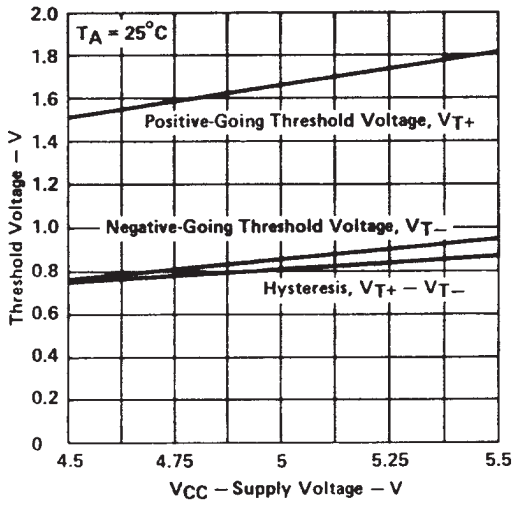
DISTRIBUTION OF UNITS
FOR HYSTERESIS



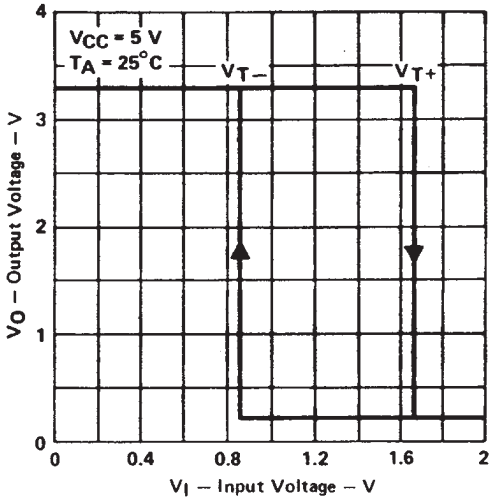
Data for temperatures below 0°C and above 70°C and supply voltages below 4.75 V and above 5.25 V are applicable for SN54LS132 only.

TYPICAL CHARACTERISTICS OF 'LS132 CIRCUITS

THRESHOLD VOLTAGES AND HYSTERESIS
vs
SUPPLY VOLTAGE

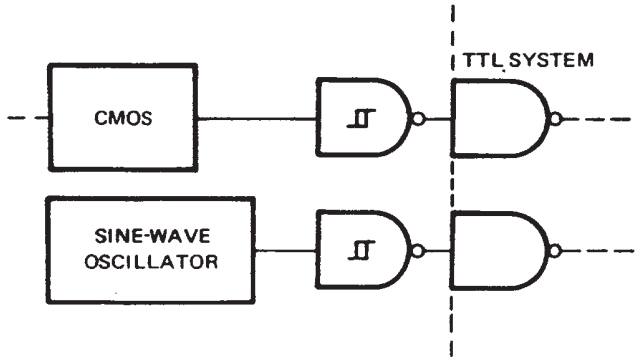


OUTPUT VOLTAGE
vs
INPUT VOLTAGE

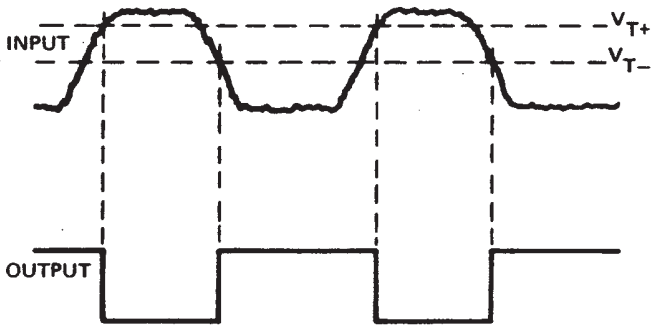


† Data for temperatures below 0°C and above 70°C and supply voltages below 4.75 V and above 5.25 V are applicable for SN54LS132 only.

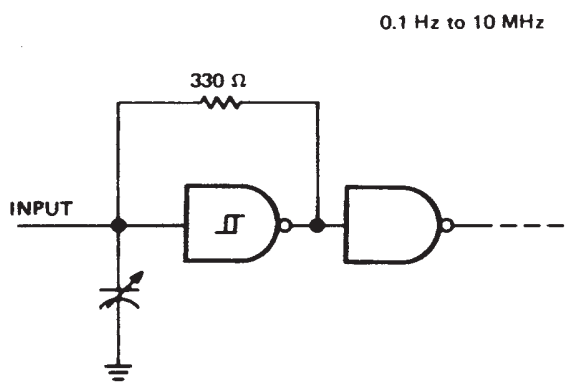
TYPICAL APPLICATION DATA



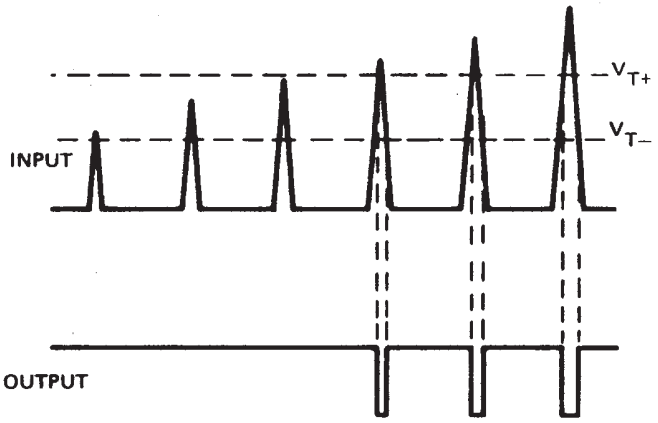
TTL SYSTEM INTERFACE
FOR SLOW INPUT WAVEFORMS



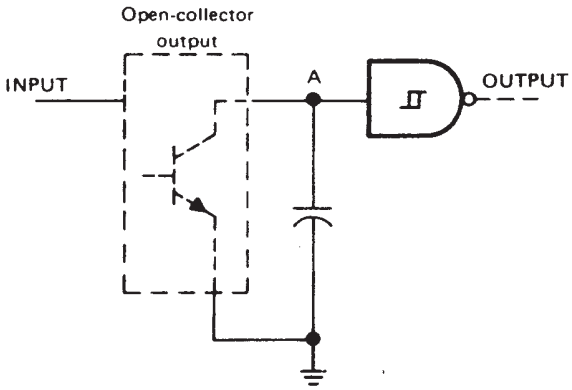
PULSE SHAPER

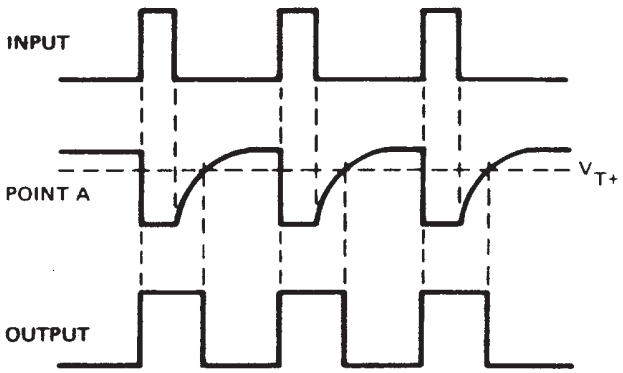


MULTIVIBRATOR



THRESHOLD DETECTOR





PULSE STRETCHER

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)
7600401CA	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401CA SNJ54LS132J
7600401DA	Active	Production	CFP (W) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401DA SNJ54LS132W
7600401DA	Active	Production	CFP (W) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401DA SNJ54LS132W
JM38510/31303BCA	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 31303BCA
JM38510/31303BCA	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 31303BCA
SN54LS132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS132J
SN54LS132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS132J
SN54S132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S132J
SN54S132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S132J
SN74LS132D	Obsolete	Production	SOIC (D) | 14	-	-	Call TI	Call TI	0 to 70	LS132
SN74LS132D	Obsolete	Production	SOIC (D) | 14	-	-	Call TI	Call TI	0 to 70	LS132
SN74LS132DR	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS132
SN74LS132DR	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS132
SN74LS132N	Active	Production	PDIP (N) | 14	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS132N
SN74LS132N	Active	Production	PDIP (N) | 14	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS132N
SN74LS132NSR	Active	Production	SOP (NS) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS132
SN74LS132NSR	Active	Production	SOP (NS) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS132
SNJ54LS132FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 132FK
SNJ54LS132FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 132FK
SNJ54LS132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401CA SNJ54LS132J
SNJ54LS132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401CA SNJ54LS132J
SNJ54LS132W	Active	Production	CFP (W) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401DA SNJ54LS132W

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)
SNJ54LS132W	Active	Production	CFP (W) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7600401DA SNJ54LS132W
SNJ54S132FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S 132FK
SNJ54S132FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S 132FK
SNJ54S132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S132J
SNJ54S132J	Active	Production	CDIP (J) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S132J
SNJ54S132W	Active	Production	CFP (W) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S132W
SNJ54S132W	Active	Production	CFP (W) | 14	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S132W

(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.

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 SN54LS132, SN74LS132 :

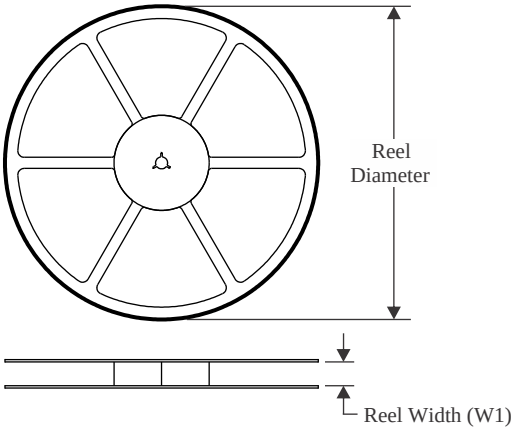
- Catalog : SN74LS132
- Military : SN54LS132

NOTE: Qualified Version Definitions:

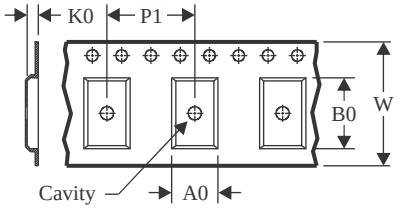
- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION

REEL DIMENSIONS

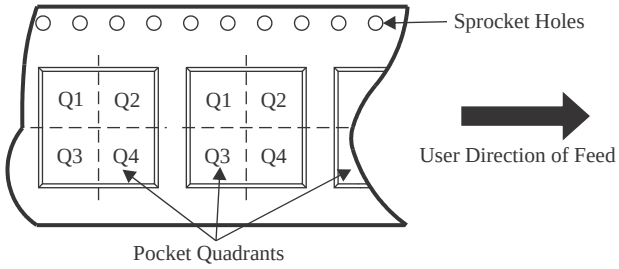


TAPE DIMENSIONS



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

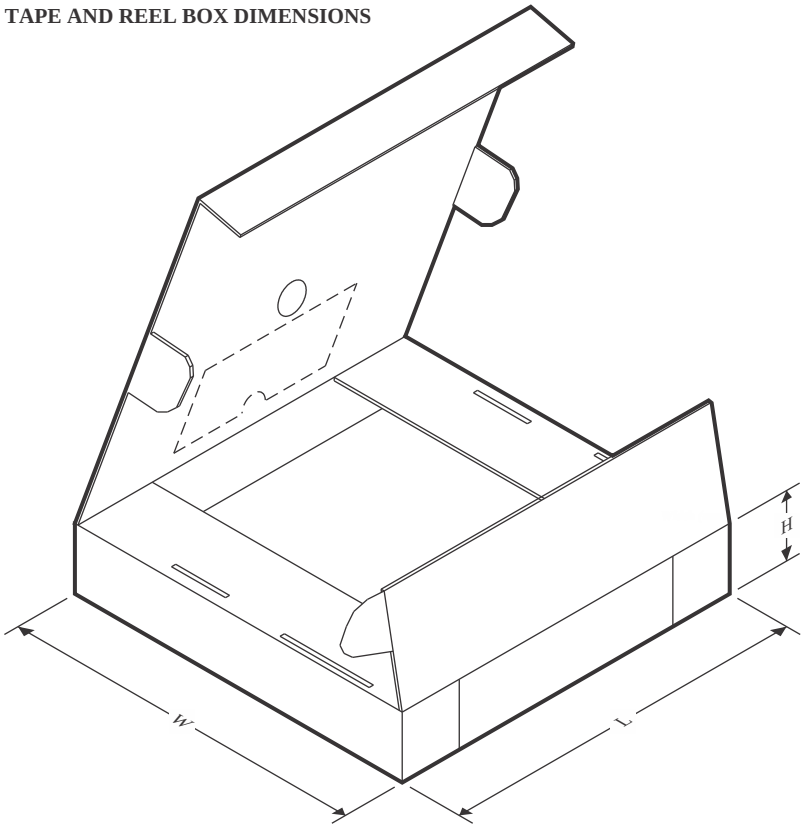
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
SN74LS132DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LS132NSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1

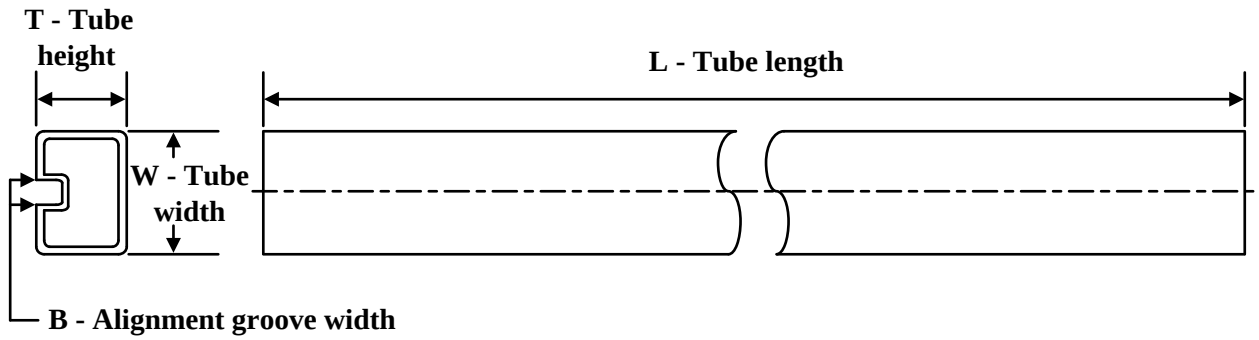
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

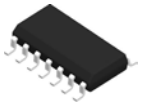
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LS132DR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LS132NSR	SOP	NS	14	2000	356.0	356.0	35.0

TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
7600401DA	W	CFP	14	25	506.98	26.16	6220	NA
SN74LS132N	N	PDIP	14	25	506	13.97	11230	4.32
SN74LS132N	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54LS132FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS132W	W	CFP	14	25	506.98	26.16	6220	NA
SNJ54S132FK	FK	LCCC	20	55	506.98	12.06	2030	NA

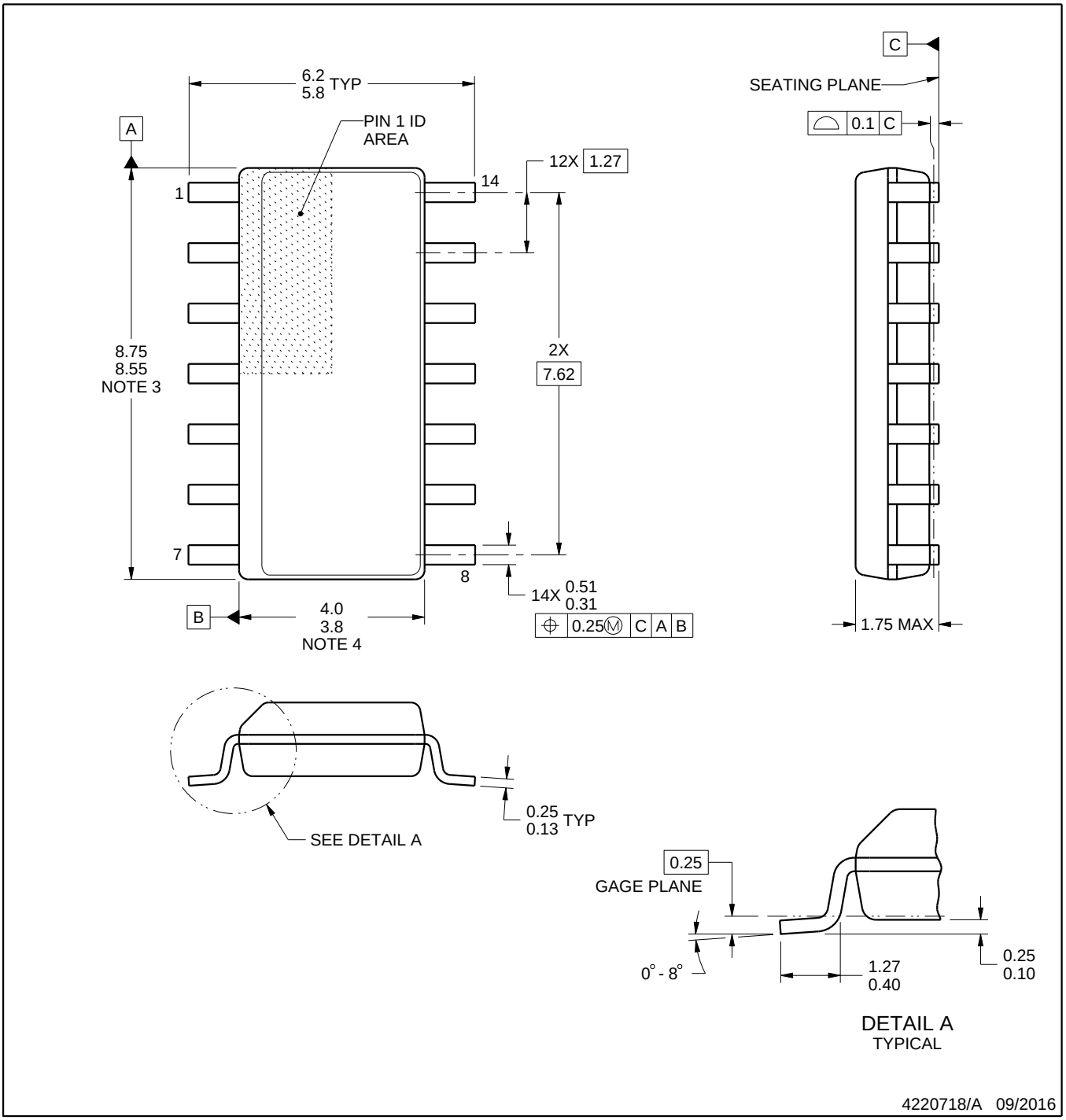


PACKAGE OUTLINE

D0014A

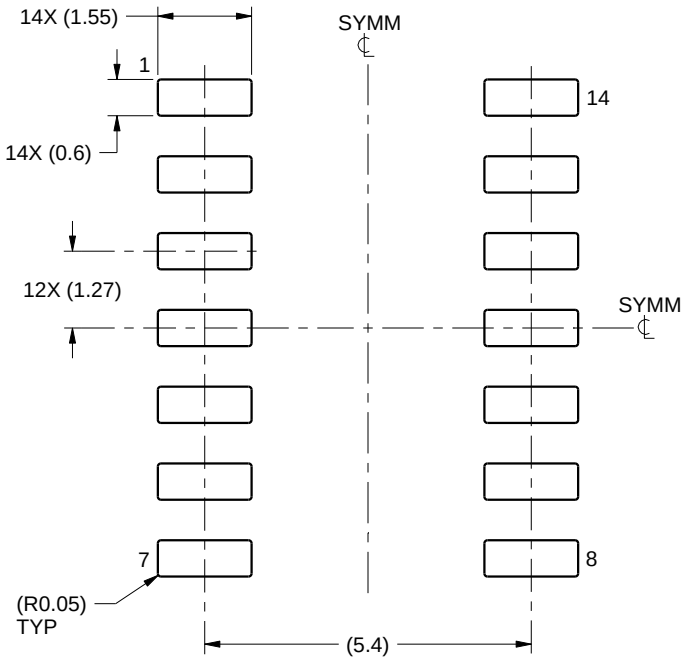
SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT

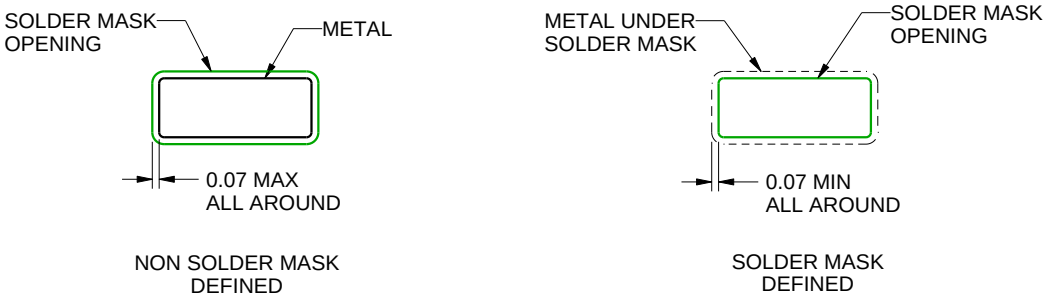


NOTES:

1. All linear dimensions are in millimeters. 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. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

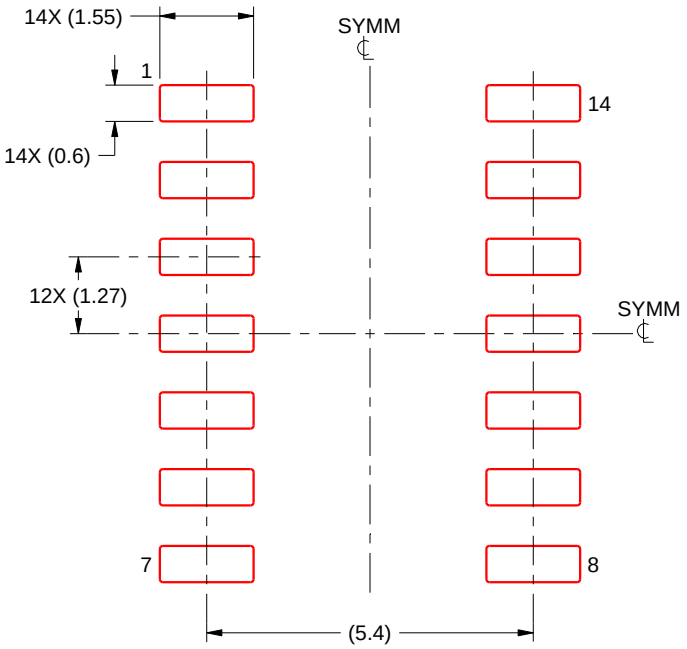
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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

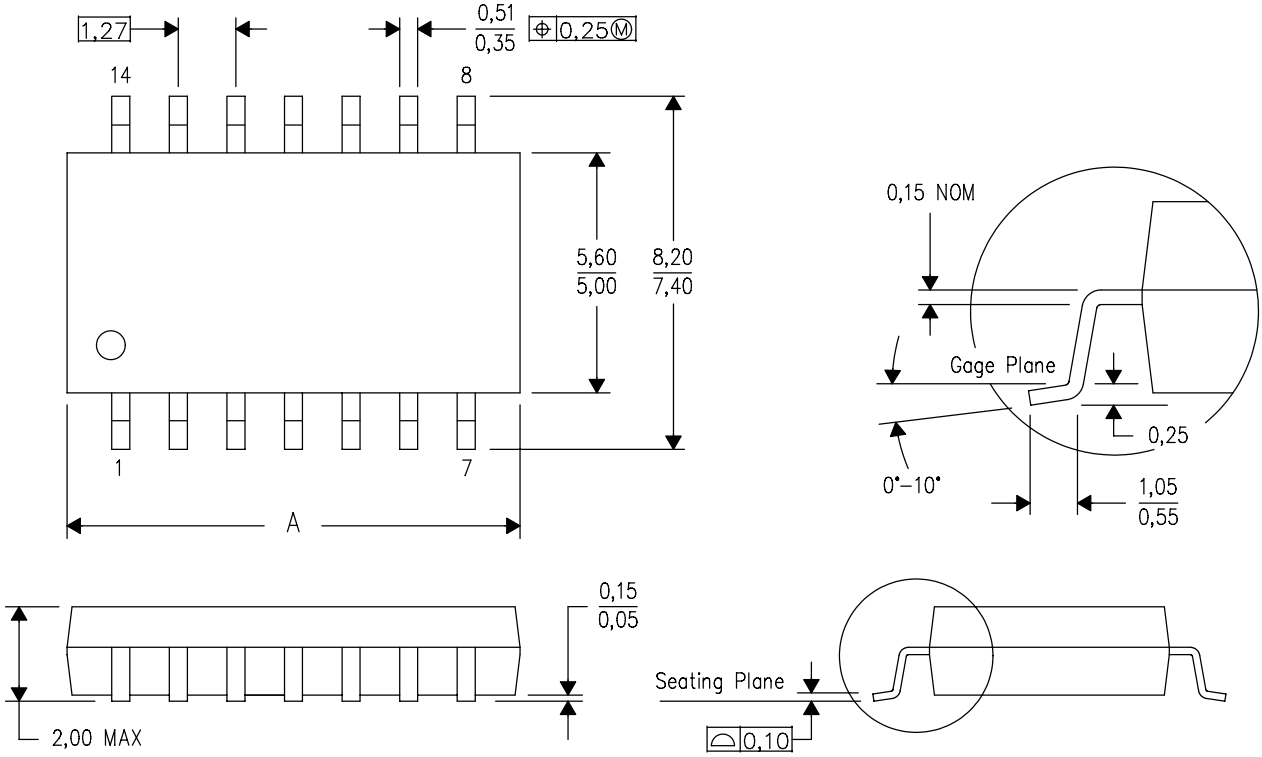
NOTES: (continued)

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)** **PLASTIC SMALL-OUTLINE PACKAGE**

14-PINS SHOWN

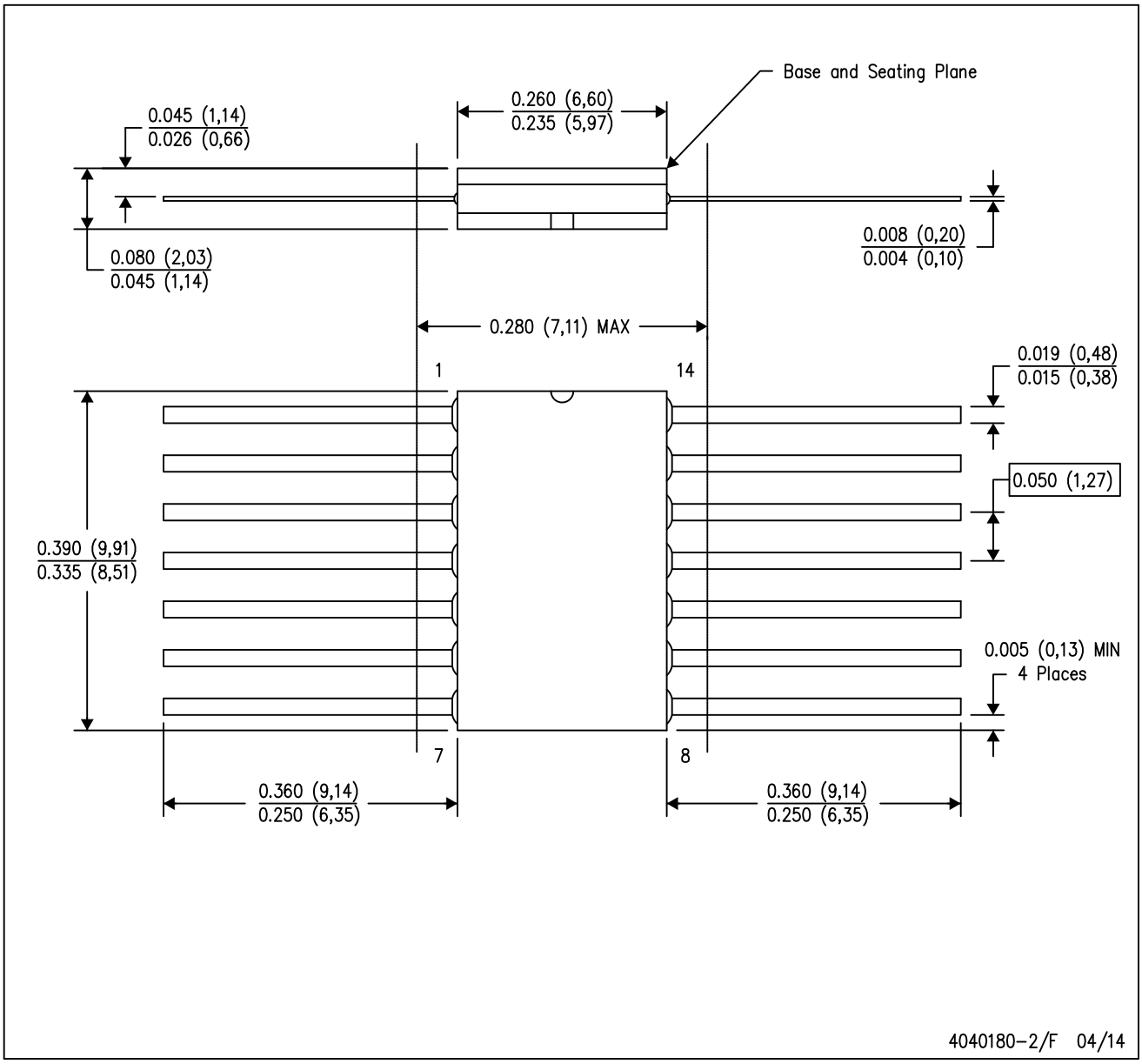


DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

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.

W (R–GDFP–F14) 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–F14

GENERIC PACKAGE VIEW

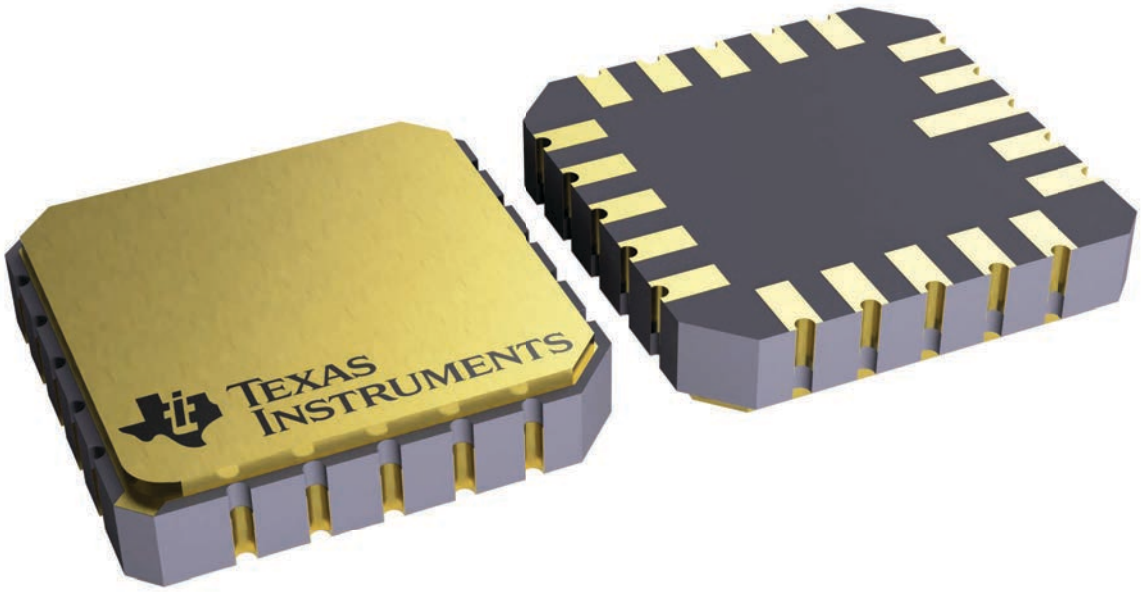
FK 20

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.

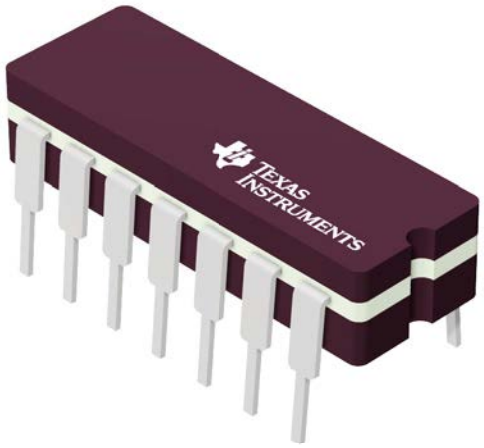


4229370VA\

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.

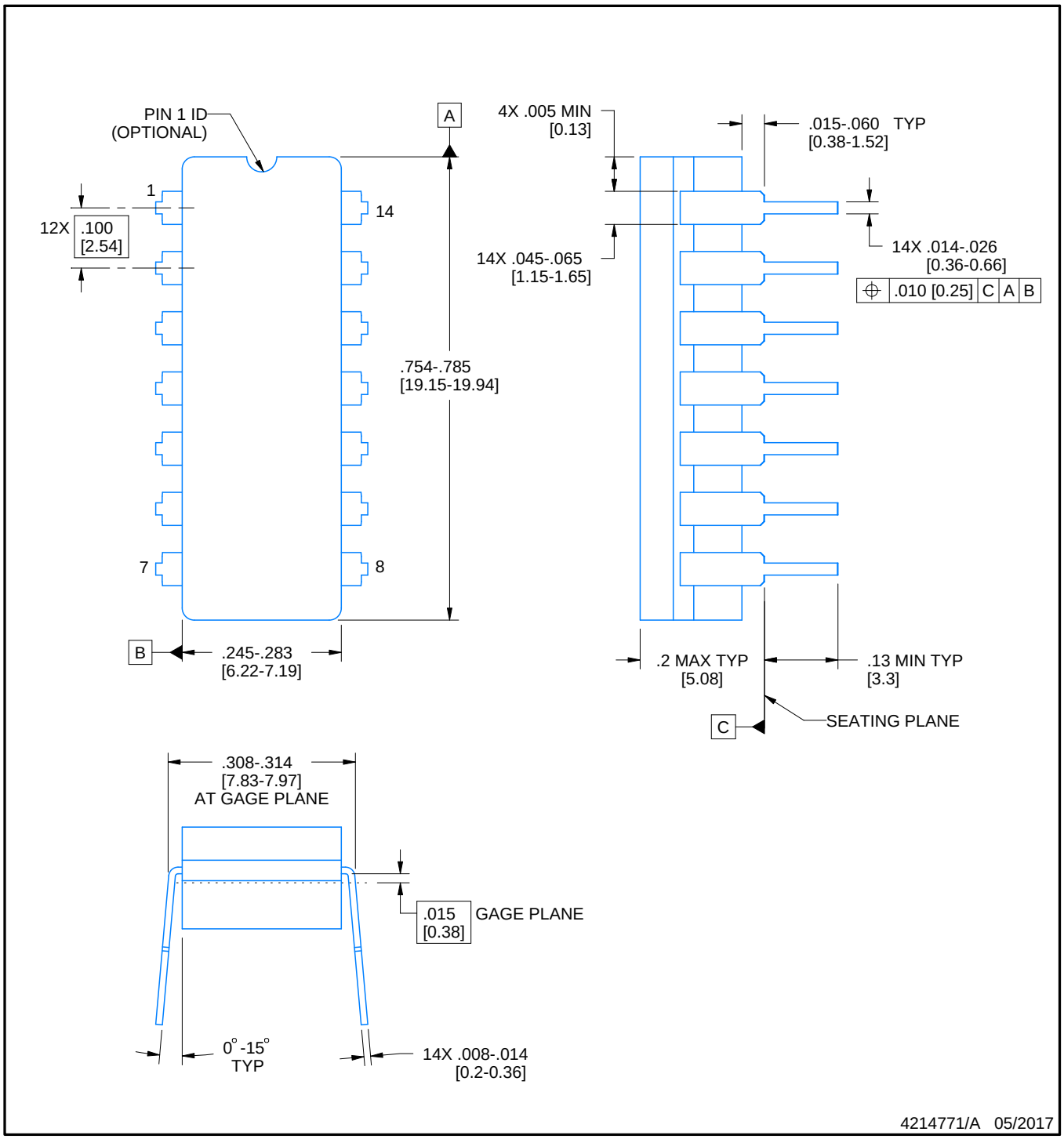
4040083-5/G

PACKAGE OUTLINE

J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



NOTES:

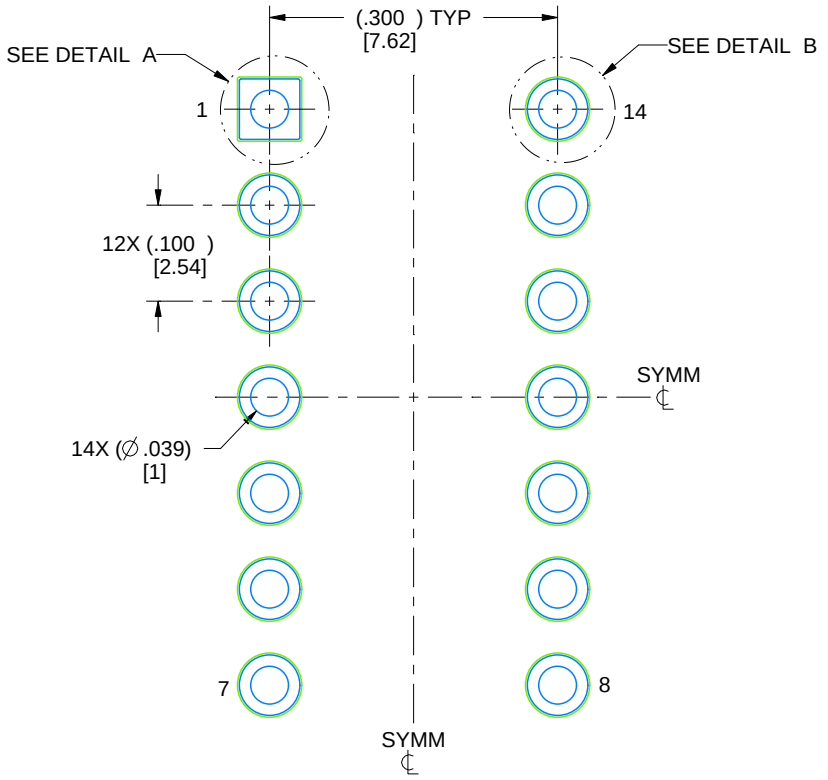
1. All controlling linear dimensions are in inches. Dimensions in brackets are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This package is hermitically sealed with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

EXAMPLE BOARD LAYOUT

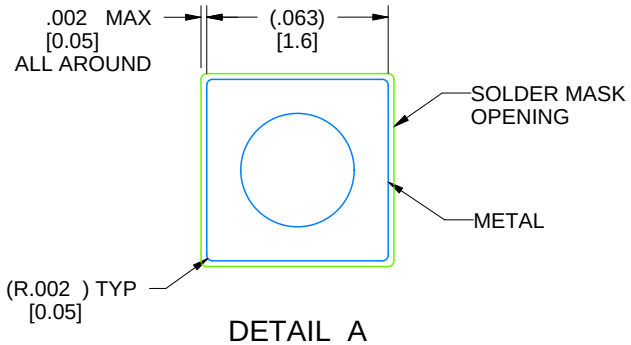
J0014A

CDIP - 5.08 mm max height

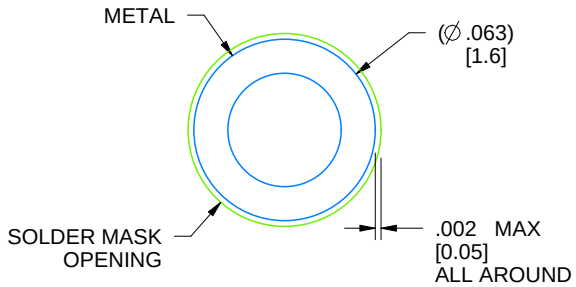
CERAMIC DUAL IN LINE PACKAGE



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



DETAIL A
SCALE: 15X



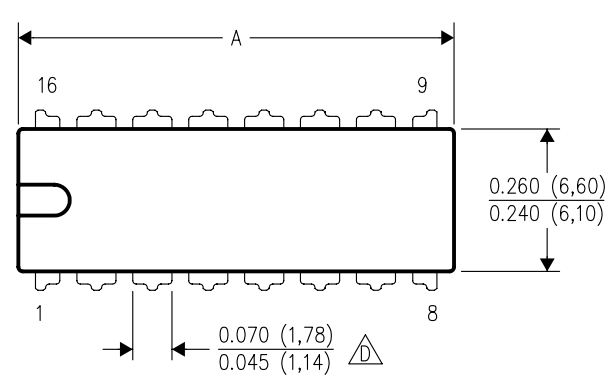
DETAIL B
13X, SCALE: 15X

4214771/A 05/2017

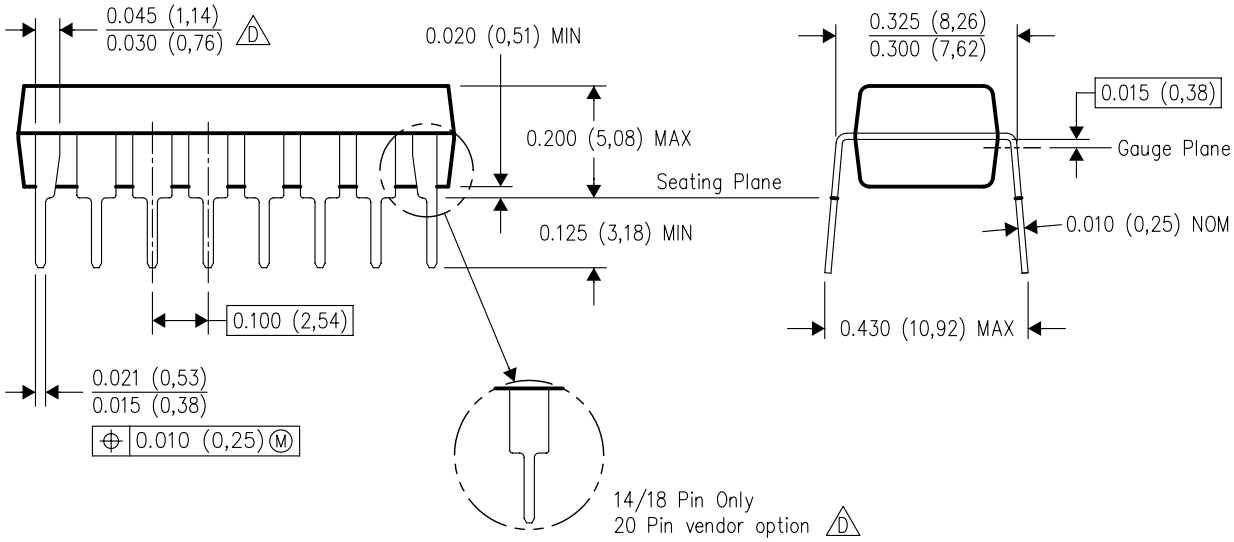
N (R–PDIP–T**)

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.

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