

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

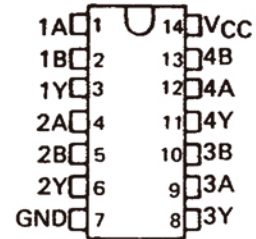
description

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.

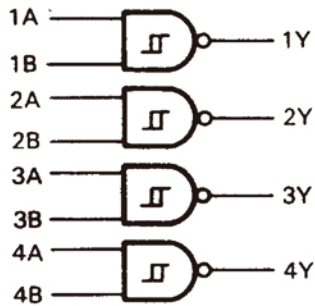
These circuits are temperature-compensated and can be triggered from the slowest of input ramps and still give clear, jitter-free output signals.

XD74LS132 are characterized for operation from 0°C to 70°C.

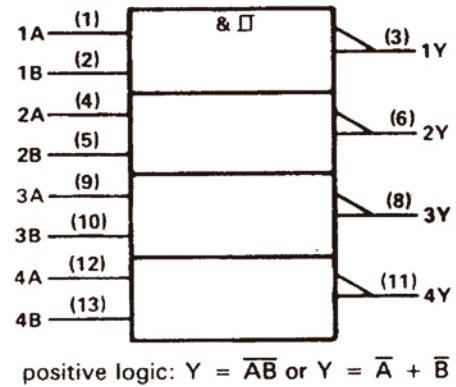
XD74LS132



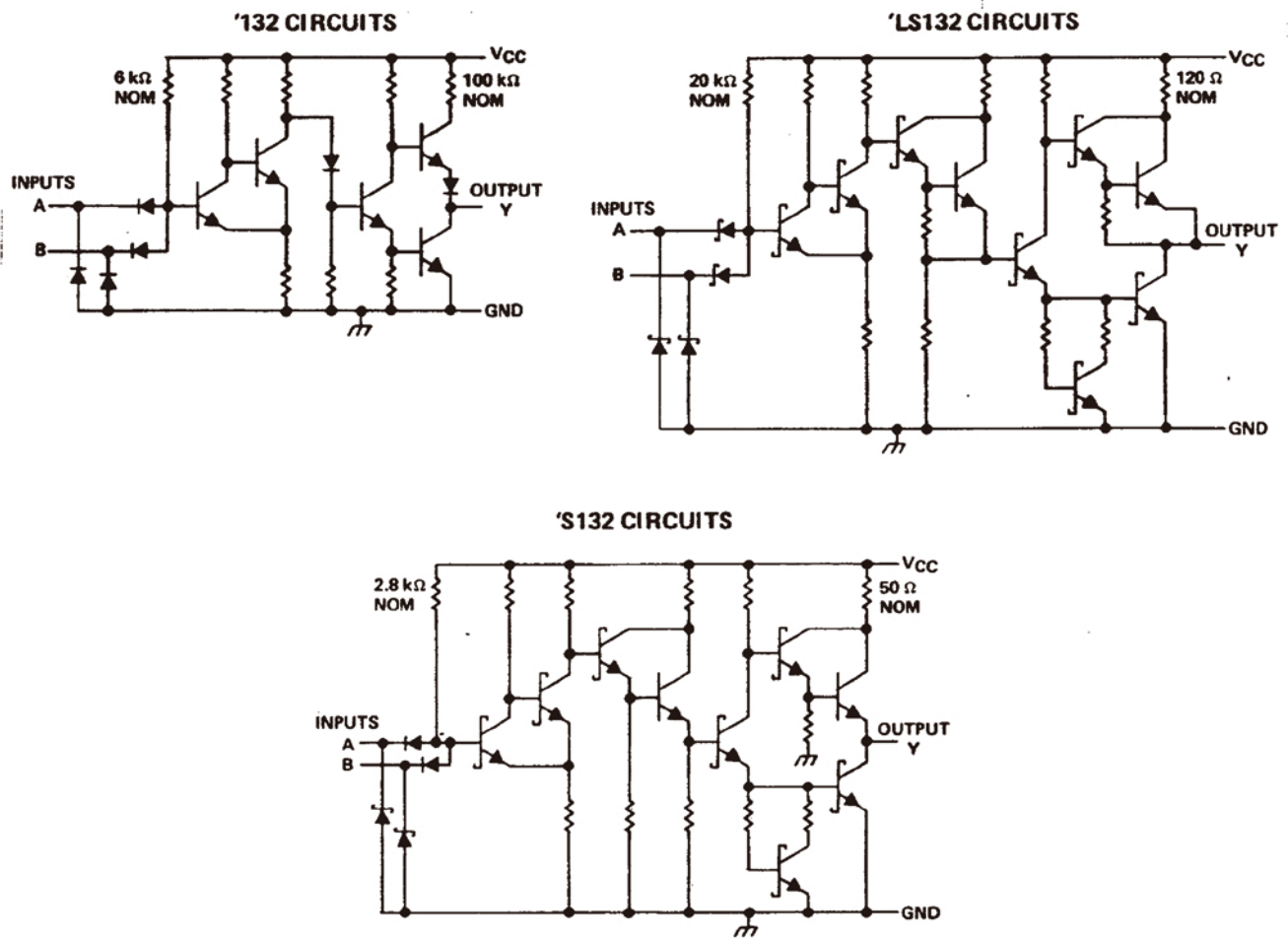
logic diagram (positive logic)



logic symbol†



schematics



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
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

	XD74LS132			UNIT
	MIN	NOM	MAX	
V _{CC} Supply voltage	4.75	5	5.25	V
I _{OH} High-level output current			-0.8	mA
I _{OL} Low-level output current			16	mA
T _A Operating free-air temperature	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

	XD74LS132			UNIT
	MIN	NOM	MAX	
V _{CC} Supply voltage	4.75	5	5.25	V
I _{OH} High-level output current			-0.4	mA
I _{OL} Low-level output current			8	mA
T _A Operating free-air temperature	0		70	°C

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

PARAMETER	TEST CONDITIONS†	XD74LS132			UNIT
		MIN	TYP‡	MAX	
V _{T+}	V _{CC} = 5 V	1.4	1.6	1.9	V
V _{T-}	V _{CC} = 5 V	0.5	0.8	1	V
V _{hys} (V _{T+} - V _{T-})	V _{CC} = 5 V	0.4	0.8		V
V _{IK}	V _{CC} = MIN, I _I = -18 mA			-1.5	V
V _{OH}	V _{CC} = MIN, V _I = 0.5 V, I _{OH} = -0.4 mA	2.7	3.4		V
V _{OL}	V _{CC} = MIN, V _I = 1.9 V	I _{OL} = 4 mA	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			mA
I _{T-}	V _{CC} = 5 V, V _I = V _{T-}	-0.18			mA
I _I	V _{CC} = MAX, V _I = 7 V			0.1	mA
I _{IH}	V _{CC} = MAX, V _I = 2.7 V			20	μA
I _{IL}	V _{CC} = MAX, V _{IL} = 0.4 V			-0.4	mA
I _{OS} §	V _{CC} = MAX	-20		-100	mA
I _{CCH}	V _{CC} = MAX		5.9	11	mA
I _{CCL}	V _{CC} = MAX		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

	XD74LS132			UNIT
	MIN	NOM	MAX	
V _{CC} Supply voltage	4.75	5	5.25	V
I _{OH} High-level output current			-1	mA
I _{OL} Low-level output current			20	mA
T _A Operating free-air temperature	0		70	°C

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

PARAMETER	TEST CONDITIONS†	XD74LS132			UNIT
		MIN	TYP‡	MAX	
V _{T+}	V _{CC} = 5 V	1.6	1.77	1.9	V
V _{T-}	V _{CC} = 5 V	1.1	1.22	1.4	V
V _{hys} (V _{T+} - V _{T-})	V _{CC} = 5 V	0.2	0.55		V
V _{IK}	V _{CC} = MIN, I _I = -18 mA			-1.2	V
V _{OH}	V _{CC} = MIN, V _I = 1.1 V, I _{OH} = -1 mA	2.7	3.4		V
V _{OL}	V _{CC} = MIN, V _I = 1.9 V, I _{OL} = 20 mA			0.5	V
I _{T+}	V _{CC} = 5 V, V _I = V _{T+}		-0.9		mA
I _{T-}	V _{CC} = 5 V, V _I = V _{T-}		-1.1		mA
I _I	V _{CC} = MAX, V _I = 5.5 V			1	mA
I _{IH}	V _{CC} = MAX, V _I = 2.7 V			50	μA
I _{IL}	V _{CC} = MAX, V _{IL} = 0.5 V			-2	mA
I _{OS} §	V _{CC} = MAX	-40		-100	mA
I _{CCH}	V _{CC} = MAX		28	44	mA
I _{CCL}	V _{CC} = MAX		44	68	mA

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

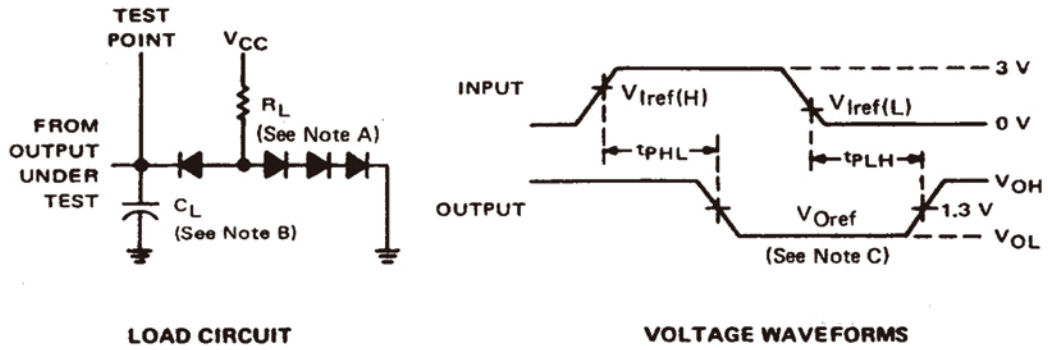
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ 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



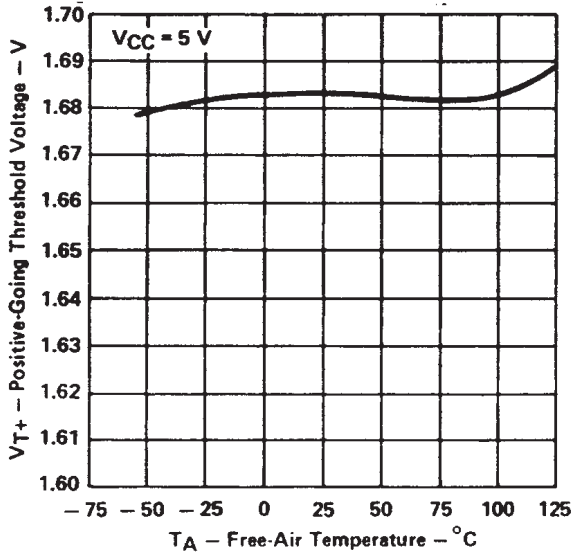
- NOTES: A. All diodes are 1N3064 or equivalent.
 B. C_L includes probe and jig capacitance.
 C. Generator characteristics and reference voltages are:

	Generator Characteristics				Reference Voltages		
	Z_{out}	PRR	t_r	t_f	$V_{I\ ref(H)}$	$V_{I\ ref(L)}$	$V_{O\ ref}$
XD74LS132	50	1 MHz	10 ns	10 ns	1.7 V	0.9 V	1.5 V
XD74LS132	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

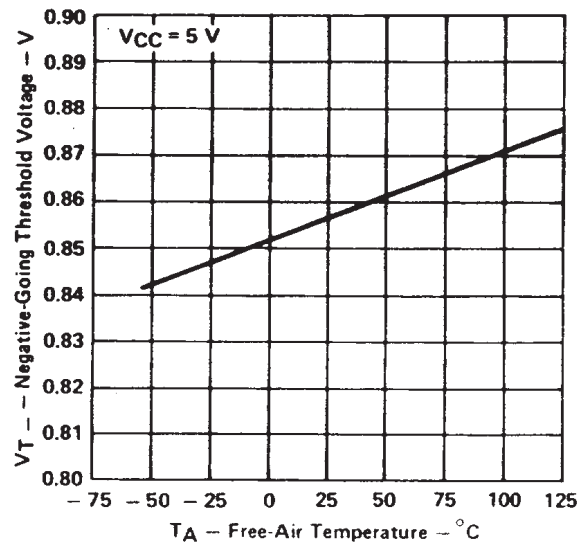
FIGURE 1

TYPICAL CHARACTERISTICS OF '132 CIRCUITS

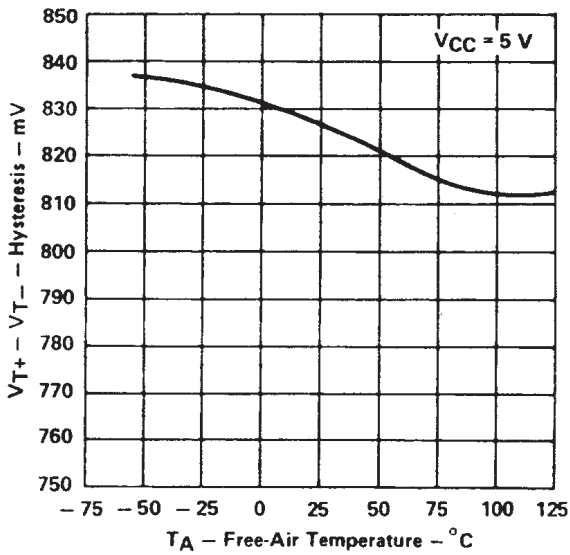
POSITIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



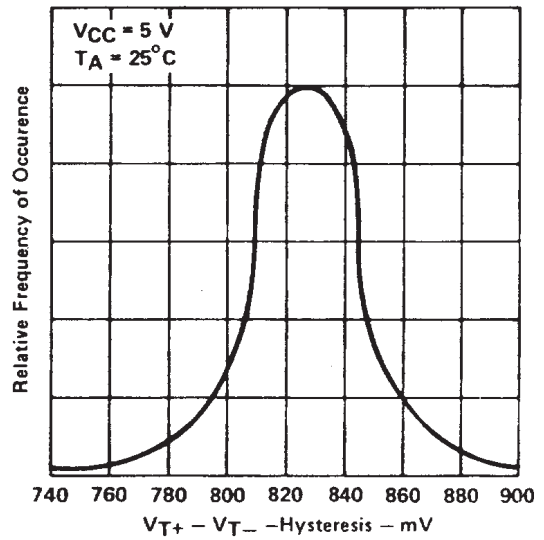
NEGATIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



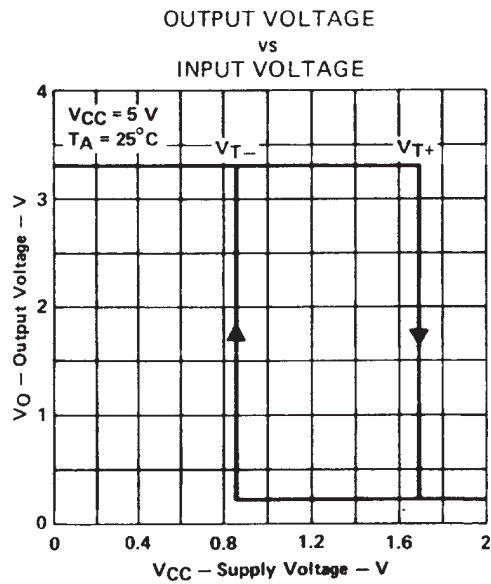
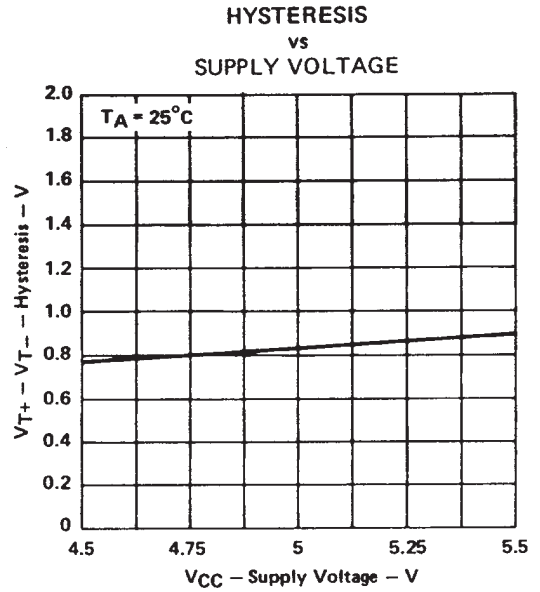
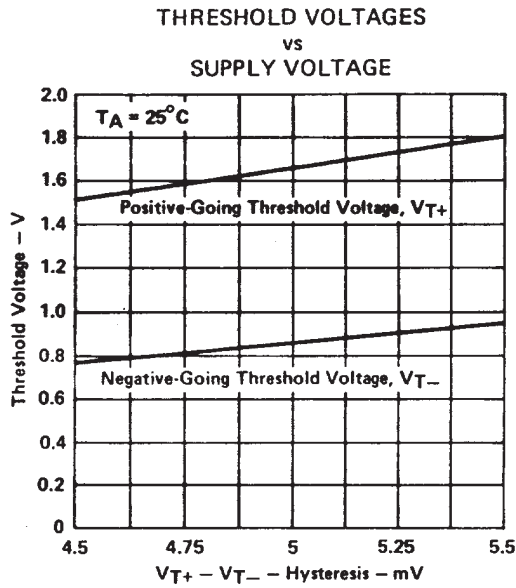
HYSTERESIS
vs
FREE-AIR TEMPERATURE



DISTRIBUTION OF UNITS
FOR HYSTERESIS



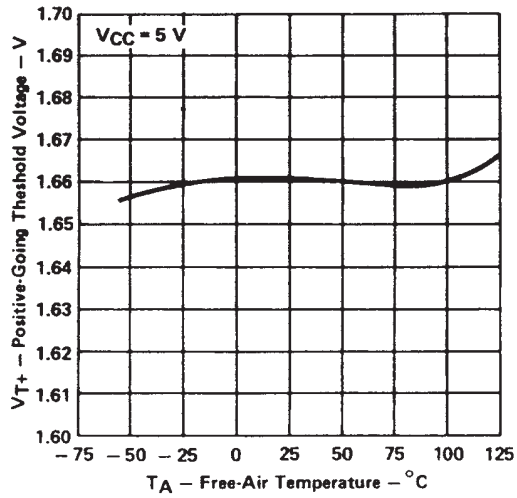
TYPICAL CHARACTERISTICS OF '132 CIRCUITS



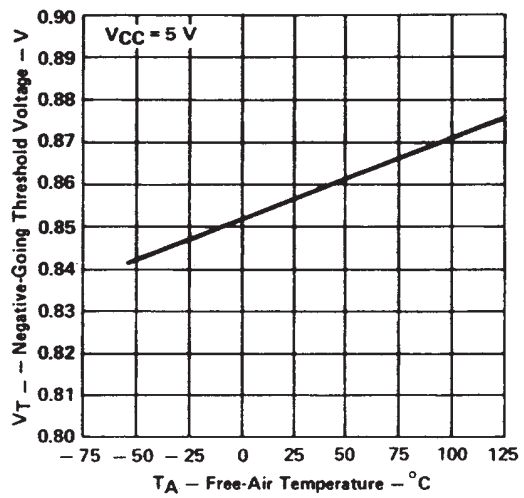
† Data for temperatures below 0°C and 70°C and supply below 4.75 V and above 5.25 V are applicable for SN54132 only.

TYPICAL CHARACTERISTICS OF 'LS132 CIRCUITS

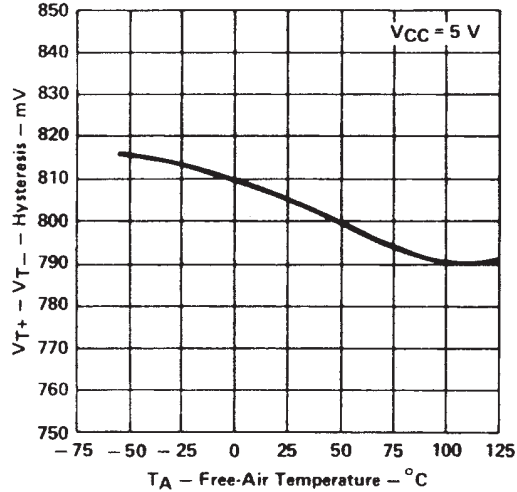
POSITIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



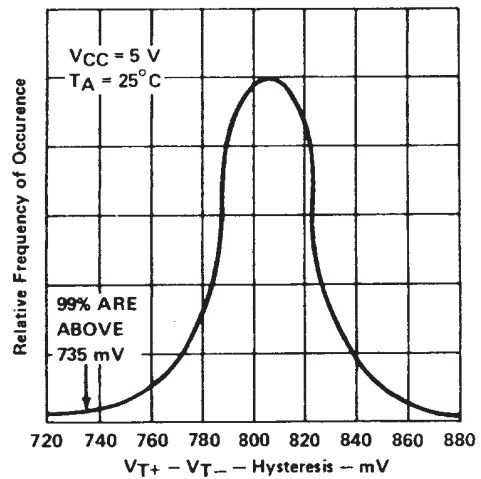
NEGATIVE-GOING THRESHOLD VOLTAGE
vs
FREE-AIR TEMPERATURE



HYSTERESIS
vs
FREE-AIR TEMPERATURE



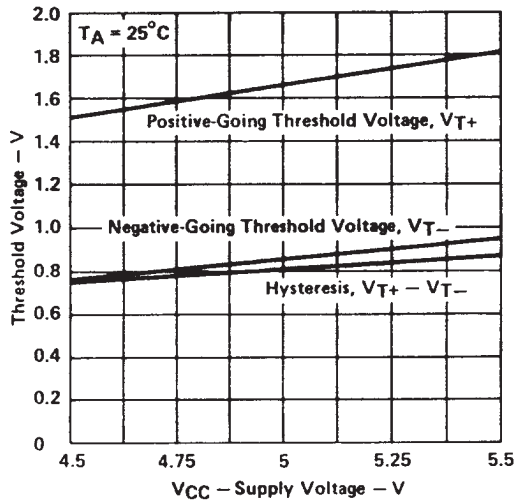
DISTRIBUTION OF UNITS
FOR HYSTERESIS



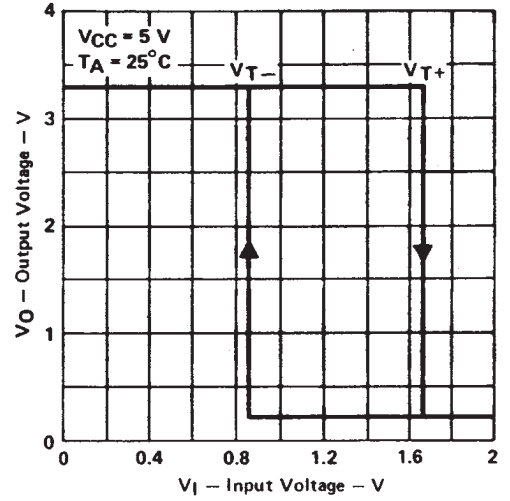
Data for temperatures below 0°C and above 70°C and supply voltages below 4.75 V and above 5.25 V are applicable for SN54LS132 only.

TYPICAL CHARACTERISTICS OF 'LS132 CIRCUITS

THRESHOLD VOLTAGES AND HYSTERESIS
VS
SUPPLY VOLTAGE

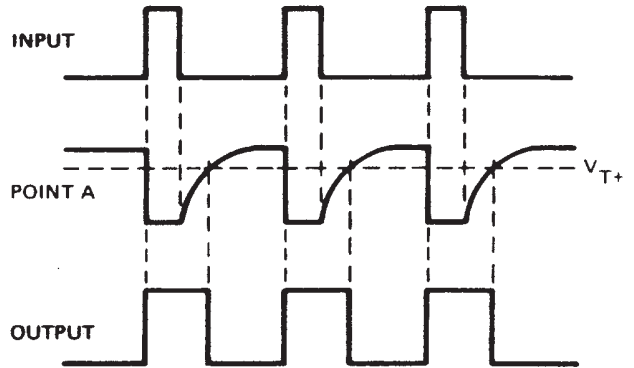
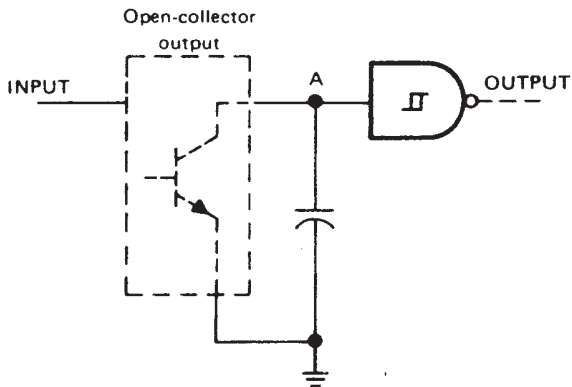
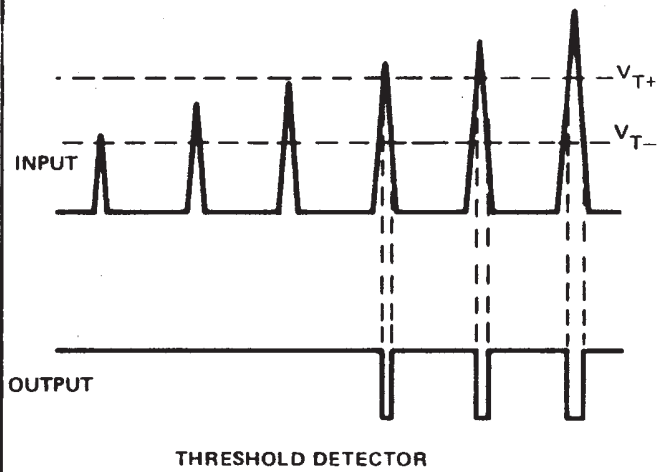
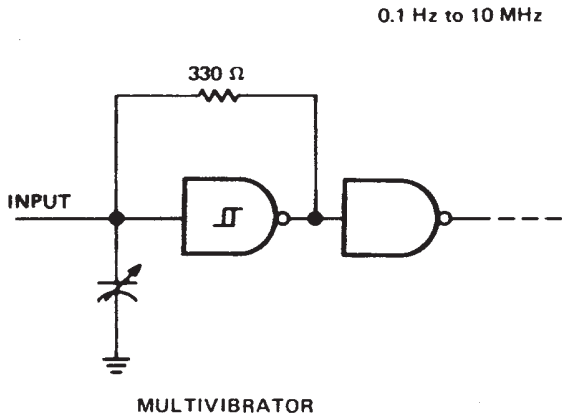
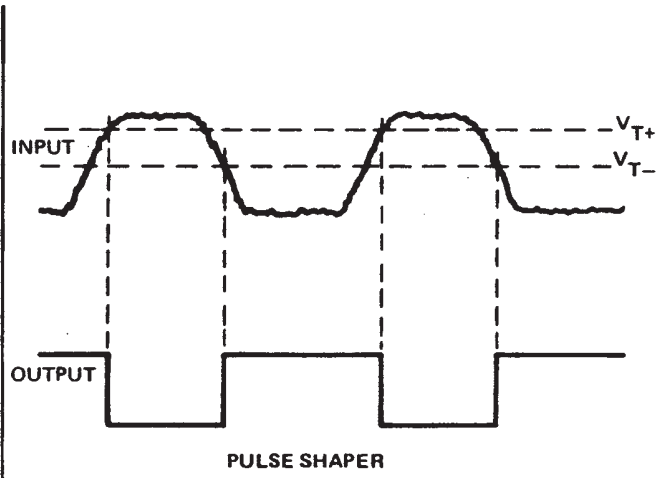
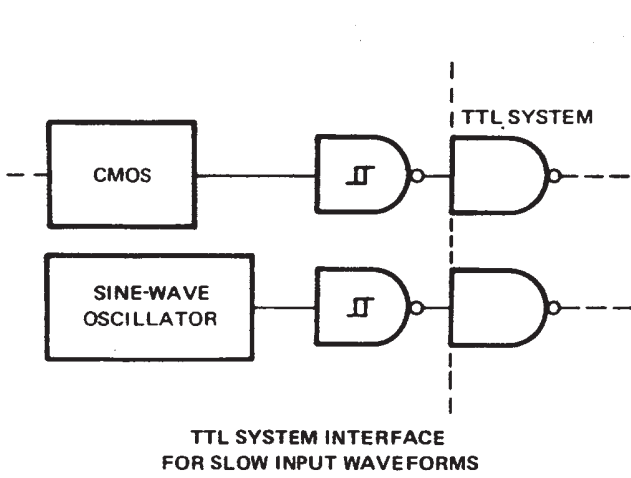


OUTPUT VOLTAGE
VS
INPUT VOLTAGE

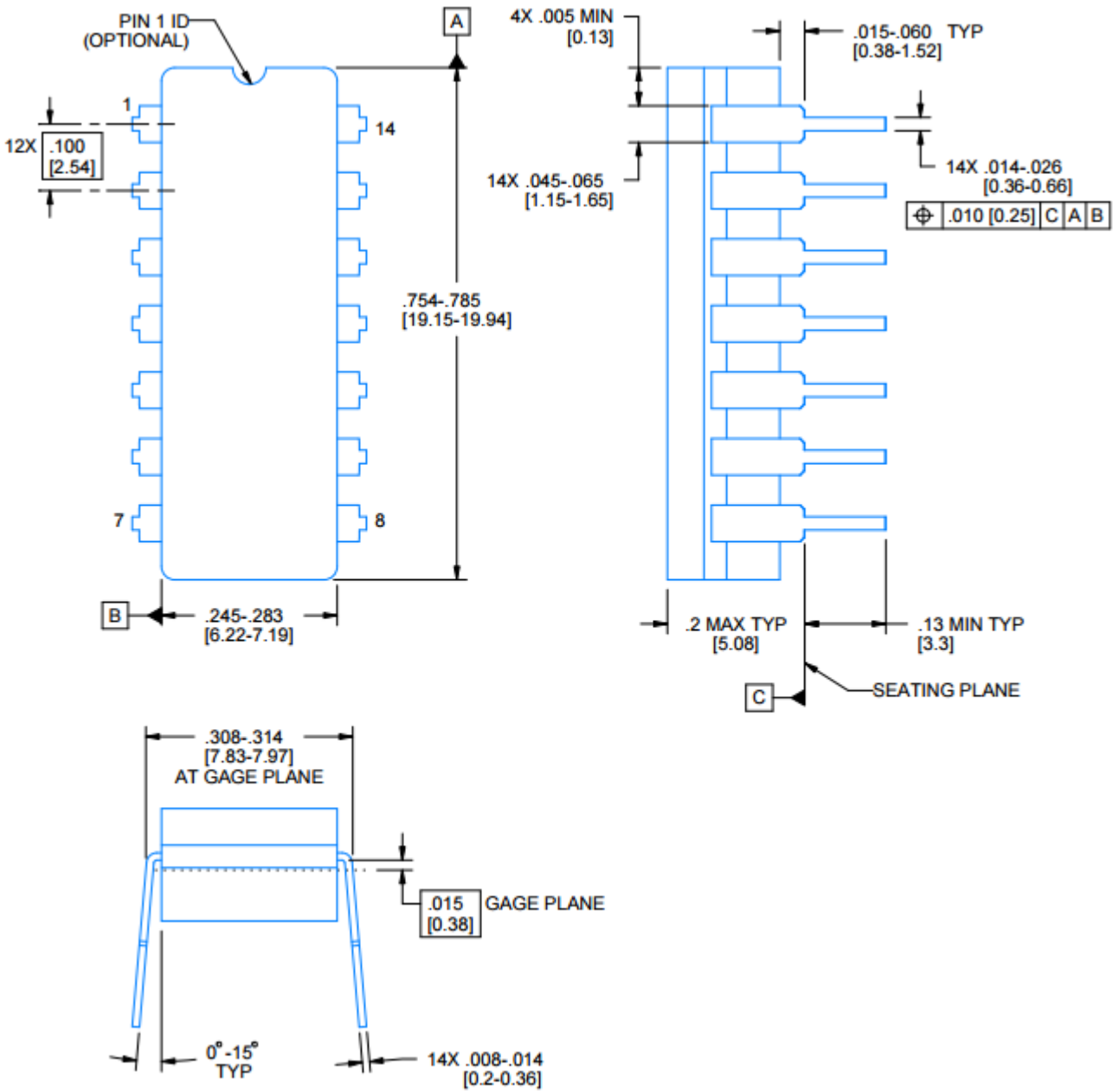


† Data for temperatures below 0°C and above 70°C and supply voltages below 4.75 V and above 5.25 V are applicable for SN54LS132 only.

TYPICAL APPLICATION DATA



PULSE STRETCHER



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