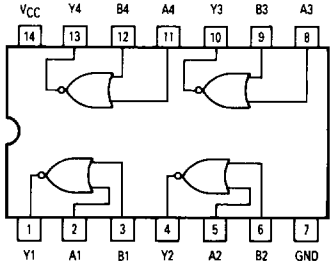
MOTOROLA

Military 54LS28

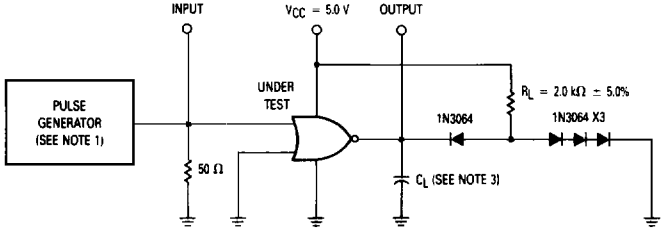
Quad 2-Input Positive NOR Buffer

ELECTRICALLY TESTED PER:
MIL-M-38510/30204

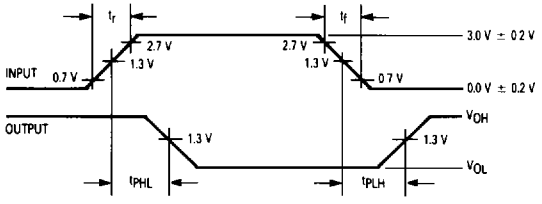
LOGIC DIAGRAM



AC TEST CIRCUIT



WAVEFORMS



NOTES:
1. Pulse generator has the following characteristics: $t_r \leq 15$ ns, $t_f \leq 6.0$ ns, PRR ≤ 1.0 MHz, $t_D = 200 \pm 20$ ns and $Z_{OUT} \approx 50\ \Omega$.
2. All diodes are 1N3064 or equivalent.
3. $C_L = 125$ pF ± 10%, including scope probe, wiring and stray capacitance, without package in test fixture
4. $R_L = 667\ k\Omega \pm 5.0\%$.
5. Voltage measurements are to be made with respect to network ground terminal.
6. Terminal conditions (pins not designated may be high ≥ 2.0 V, low ≤ 0.7 V, or open).

AVAILABLE AS:

1) JAN: JM38510/30204BXA
2) SMD: *
3) 883C: 54LS28/BXAJC

X = CASE OUTLINE AS FOLLOWS:
PACKAGE: CERDIP: C
CERFLAT: D
LCC: 2
***Call Factory for latest update**

PIN ASSIGNMENTS

FUNCTION	DIL	FLATS	LCC	BURN-IN (CONDITION A)
Y1	1	1	2	V_{CC}
A1	2	2	3	GND
B1	3	3	4	GND
Y2	4	4	6	V_{CC}
A2	5	5	8	GND
B2	6	6	9	GND
GND	7	7	10	GND
A3	8	8	12	GND
B3	9	9	13	GND
Y3	10	10	14	V_{CC}
A4	11	11	16	GND
B4	12	12	18	GND
Y4	13	13	19	V_{CC}
V_{CC}	14	14	20	V_{CC}

BURN-IN CONDITIONS:
V_{CC} = 5.0 V MIN/6.0 V MAX

TRUTH TABLE

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

6

Symbol	Parameter	Limits						Units	Test Condition (Unless Otherwise Specified)
	Static Parameters:	+25°C		+125°C		−55°C			
		Subgroup 1		Subgroup 2		Subgroup 3			
		Min	Max	Min	Max	Min	Max		
V_{OH}	Logical "1" Output Voltage	2.5		2.5		2.5		V	V_{CC} = 4.5 V, I_{OH} = −1.2 mA, V_{IL} = 0.7 V, other input = 0.7 V.
V_{OL}	Logical "0" Output Voltage		0.4		0.4		0.4	V	V_{CC} = 4.5 V, I_{OL} = 12 mA, V_{IH} = 2.0 V, other input = 0 V.
V_{IC}	Input Clamping Voltage		−1.5					V	V_{CC} = 4.5 V, I_{IN} = −18 mA, other input is open.
I_{IH1}	Logical "1" Input Current		20		20		20	μA	V_{CC} = 5.5 V, V_{IN} = 2.7 V, other input = 0 V.
I_{IH2}	Logical "1" Input Current		100		100		100	μA	V_{CC} = 5.5 V, V_{IN} = 5.5 V, other input = 0 V.
I_{IL}	Logical "0" Input Current	−160	−400	−160	−400	−160	−400	μA	V_{CC} = 5.5 V, V_{IN} = 0.4 V, other input = 5.5 V.
I_{OS}	Output Short Circuit Current	−30	−130	−30	−130	−30	−130	mA	V_{CC} = 5.5 V, V_{IN} = 0 V (all inputs), V_{OUT} = 0 V.
I_{CCH}	Power Supply Current		3.6		3.6		3.6	mA	V_{CC} = 5.5 V, V_{IN} = 0 V (all inputs).
I_{CCL}	Power Supply Current		13.8		13.8		13.8	mA	V_{CC} = 5.5 V, V_{IN} = 5.5 V (all inputs).
V_{IH}	Logical "1" Input Voltage	2.0		2.0		2.0		V	V_{CC} = 4.5 V.
V_{IL}	Logical "0" Input Voltage		0.7		0.7		0.7	V	V_{CC} = 4.5 V.
		Subgroup 7		Subgroup 8A		Subgroup 8B			
	Functional Tests								per Truth Table with V_{CC} = 5.0 V, V_{INL} = 0.5 V, and V_{INH} = 2.5 V.

Symbol	Parameter	Limits						Units	Test Condition (Unless Otherwise Specified)
	Switching Parameters	+25°C		+125°C		−55°C			
		Subgroup 9		Subgroup 10		Subgroup 11			
		Min	Max	Min	Max	Min	Max		
t_{PHL} t_{PHL}	Propagation Delay /Data-Output Output High-Low	2.0	25 24	2.0	30 30	2.0	30 30	ns ns	V_{CC} = 5.0 V, C_L = 125 pF, R_L = 667 Ω. V_{CC} = 5.0 V, C_L = 45 pF, R_L = 667 Ω.
t_{PLH} t_{PLH}	Propagation Delay /Data-Output Output Low-High	2.0	25 24	2.0	30 30	2.0	30 30	ns ns	V_{CC} = 5.0 V, C_L = 125 pF, R_L = 667 Ω. V_{CC} = 5.0 V, C_L = 45 pF, R_L = 667 Ω.

NOTE:
1. *The limits specified for C_L = 45 pF are guaranteed but not tested.*