



MOTOROLA

SEMICONDUCTORS

P.O. BOX 20912 • PHOENIX, ARIZONA 85036

SN54ALS/74ALS28 SN54ALS/74ALS37 SN54ALS/74ALS40

Advance Information

BUFFERS

DESCRIPTION — These devices perform the same function as ALS gates but with increased output drive capability. Their principal use is in bus systems, clock driver circuits, and interface applications.

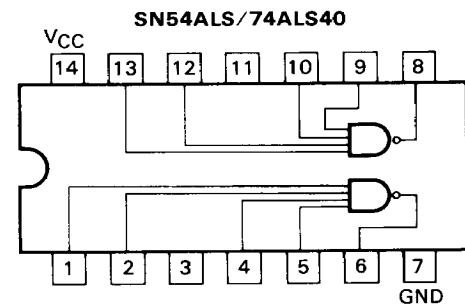
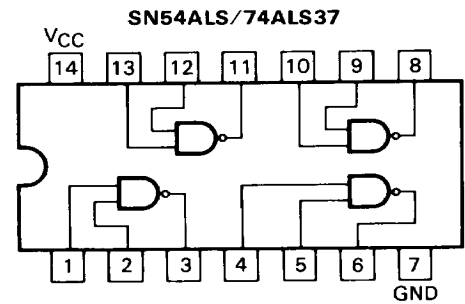
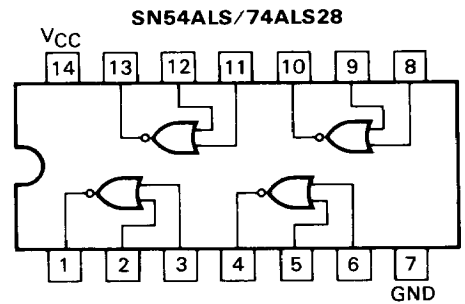
- PNP INPUTS REDUCE DC LOADING
- POWER CONSUMPTION IS EQUAL TO 1/2 OF LS
- PIN AND FUNCTIONALLY COMPATIBLE WITH LS

DEVICE	GATE TYPE
ALS28	Quad 2-Input NOR
ALS37	Quad 2-Input NAND
ALS40	Dual 4-Input NAND

BUFFERS

ADVANCED LOW POWER SCHOTTKY

CONNECTION DIAGRAM DIP



J Suffix — Case 632-07 (Ceramic)
N Suffix — Case 646-05 (Plastic)

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GUARANTEED OPERATING RANGES

SYMBOL	PARAMETER		MIN	TYP	MAX	UNIT
V _{CC}	Supply Voltage*	54	4.5	5.0	5.5	V
		74	4.75	5.0	5.25	
T _A	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I _{OH}	Output Current — High	54			-1.0	mA
		74			-2.6	
I _{OL}	Output Current — Low	54			12	mA
		74			24	

*74ALS devices may be operated over the 4.5 to 5.5 V supply range where they will meet the specifications of 54ALS devices over the 0° to 70°C temperature range.

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER		LIMITS			UNITS	TEST CONDITIONS
			MIN	TYP	MAX		
V _{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V _{IL}	Input LOW Voltage	54			0.8	V	Guaranteed Input LOW Voltage for All Inputs
		74			0.8		
V _{IK}	Input Clamp Diode Voltage				-1.5	V	V _{CC} = MIN, I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54	2.4			V	I _{OL} = -1.0 mA
		74	2.4			V	I _{OL} = -2.6 mA
V _{OL}	Output LOW Voltage	54, 74			0.4	V	I _{OL} = 12 mA
		74			0.5	V	I _{OL} = 24 mA
I _{IH}	Input HIGH Current				20	μA	V _{CC} = MAX, V _{IN} = 2.7 V
					0.1	mA	V _{CC} = MAX, V _{IN} = 7.0 V
I _{IL}	Input LOW Current				-0.2	mA	V _{CC} = MAX, V _{IN} = 0.4 V
I _{OS}	Short Circuit Current (Note 1)		-60		-150	mA	V _{CC} = MAX, V _O = 0 V
I _{CC}	Power Supply Current Total, Output HIGH	ALS28			1.8	mA	V _{CC} = MAX
		ALS37			1.0		
		ALS40			0.5		
	Total, Output LOW	ALS28			6.9		
		ALS37			6.0		
		ALS40			3.0		

AC CHARACTERISTICS: T_A = 25°C

SYMBOL	PARAMETER	MAXIMUM			UNITS	TEST CONDITIONS
		ALS28	ALS37	ALS40		
t _{PLH}	Propagation Delay, Input to Output	24	20	24	ns	V _{CC} = 5.0 V C _L = 50 pF
t _{PHL}	Propagation Delay, Input to Output	24	20	24	ns	

Note 1 — Not more than one output should be shorted at a time.



PROPAGATION DELAY MEASUREMENTS

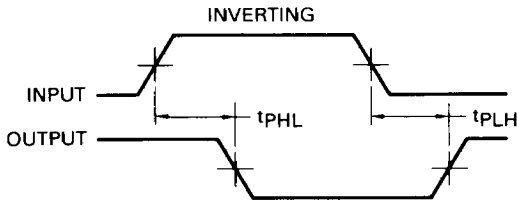
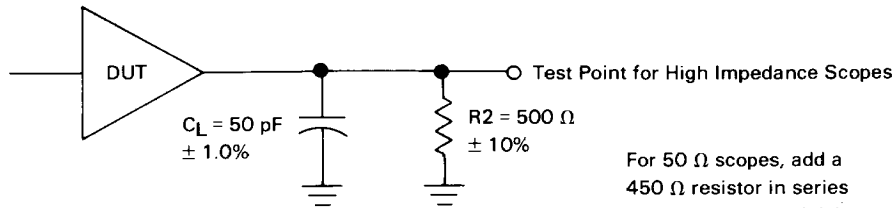


Fig. 1

NOTES:

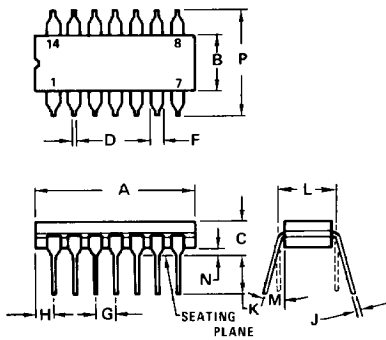
1. All input waveforms have the following characteristics:
 Low Level = 0 V
 High Level = 3.0 V
 Rise and Fall Times (10% to 90%) = 6.0 ns
2. All timing is measured at 1.3 V

AC TEST CIRCUIT



For 50 Ω scopes, add a 450 Ω resistor in series with the scope and delete R2

OUTLINE DIMENSIONS

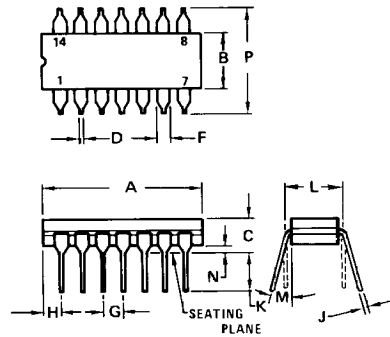


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	19.05	19.94	0.750	0.785
B	6.10	7.49	0.240	0.295
C	—	5.08	—	0.200
D	0.38	0.58	0.015	0.023
F	1.40	1.77	0.055	0.070
G	2.54 BSC		0.100 BSC	
H	1.91	2.29	0.075	0.090
J	0.20	0.38	0.008	0.015
K	3.18	4.32	0.125	0.170
L	7.62 BSC		0.300 BSC	
M	—	15°	—	15°
N	0.51	1.02	0.020	0.040

NOTES:

1. ALL RULES AND NOTES ASSOCIATED WITH MO-001 AA OUTLINE SHALL APPLY.
2. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. DIMENSION "A" AND "B" (632-07) DO NOT INCLUDE GLASS RUN-OUT.
4. LEADS WITHIN 0.25 mm (0.010) DIA OF TRUE POSITION AT SEATING PLANE AND MAXIMUM MATERIAL CONDITION.

CASE 632-07
CERAMIC PACKAGE



NOTE:
1. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	19.05	19.94	0.750	0.785
B	6.22	7.11	0.245	0.280
C	3.94	5.08	0.155	0.200
D	0.38	0.51	0.015	0.020
F	0.89	1.65	0.035	0.065
G	2.54 BSC		0.100 BSC	
H	1.65	2.29	0.065	0.090
J	0.20	0.30	0.008	0.012
K	3.18	4.06	0.125	0.160
L	7.37	8.13	0.290	0.320
M	—	15°	—	15°
N	0.51	1.27	0.020	0.050

CASE 646-05
PLASTIC PACKAGE

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