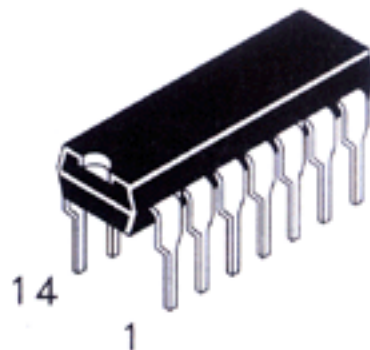


Dual 4-Input NAND Gates

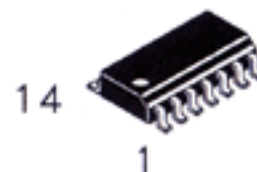
This device contains two independent gates, each of which performs the logic NAND function.

- AVG's LS operates over extended V_{CC} from 4.5 to 5.5 V
- AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and V_{CC} range
- Switching specifications for ALS at 50 pF
- AVG's ALS has the lowest speed power product (4pJ per gate typical) of all logic series

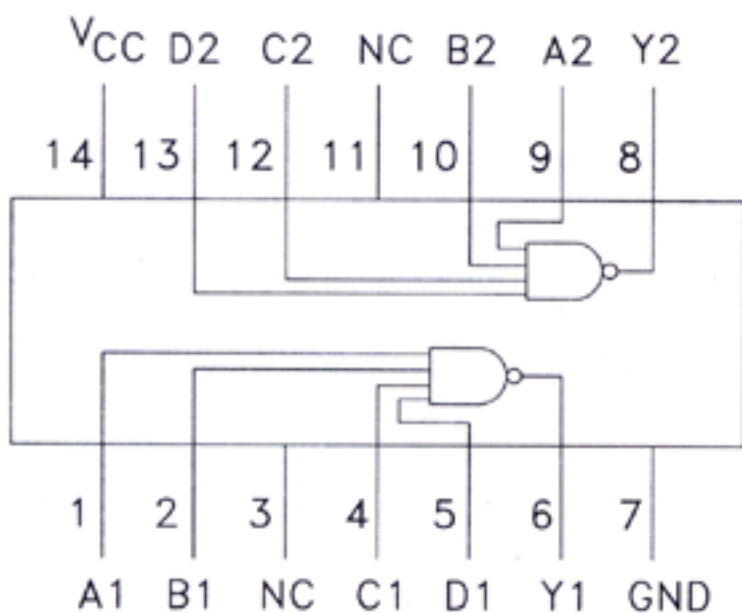
DV74LS20
DV74ALS20A



N Suffix
Plastic DIP
AVG-001 Case



D Suffix
Plastic SOP
AVG-002 Case



NC = No Connection

TRUTH TABLE
 $Y=ABCD$

Inputs				Outputs
A	B	C	D	Y
H	H	H	H	L
L	X	X	X	H
X	L	X	X	H
X	X	L	X	H
X	X	X	L	H

H = High Logic Level
L = Low Logic Level
X = Don't Care

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	LS20	ALS20A	Unit
V_{CC}	Supply Voltage	7.0	7.0	V
V_{IN}	Input Voltage	7.0	7.0	V
T_{STG}	Storage Temperature Range	-65 to +150	-65 to +150	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	LS20		ALS20A		Unit
		Min	Max	Min	Max	
V_{CC}	Supply Voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High Level Input Voltage	2.0		2.0		V
V_{IL}	Low Level Input Voltage		0.8		0.8	V
I_{OH}	High Level Output Current		-0.4		-0.4	mA
I_{OL}	Low Level Output Current		8.0		8.0	mA
T_A	Ambient Temperature Range	-10 to +70		-10 to +70		°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Conditions	LS20			ALS20A			Unit
			Min	Typ	Max	Min	Typ	Max	
V_{IK}	Input Clamp Voltage	$V_{CC} = \text{min}, I_{IN} = -18 \text{ mA}$			-1.5			-1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = \text{min}, I_{OH} = \text{max}$	$V_{CC} - 2$	3.5		$V_{CC} - 2$			V
V_{OL}	Low Level Output Voltage	$V_{CC} = \text{min}; I_{OL} = 4 \text{ mA}$ $V_{CC} = \text{min}; I_{OL} = 8 \text{ mA}$		0.25 0.35	0.4 0.5		0.25 0.35	0.4 0.5	V
I_{IH}	High Level Input Current	$V_{CC} = \text{max}, V_{IN} = 2.7 \text{ V}$ $V_{CC} = \text{max}, V_{IN} = 7 \text{ V}$			20 0.1			20 0.1	μA mA
I_{IL}	Low Level Input Current	$V_{CC} = \text{max}, V_{IN} = 0.4 \text{ V}$			-0.4			-0.1	mA
I_O	Short Circuit Current	$V_{CC} = \text{max}, V_O = 2.25 \text{ V}$	-20		-110	-30		-112	mA
I_{CC}	Supply Current Outputs High Outputs Low	$V_{CC} = \text{max}$			0.8 2.2			0.4 1.5	mA mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	LS20 $C_L = 15 \text{ pF}$		ALS20A $C_L = 50 \text{ pF}$ $R_L = 500 \Omega$		Unit
		Min	Max	Min	Max	
t_{PLH}	Turn Off Delay, Input to Output		15	3	11	ns
t_{PHL}	Turn On Delay, Input to Output		15	3	10	ns

SWITCHING WAVEFORMS

