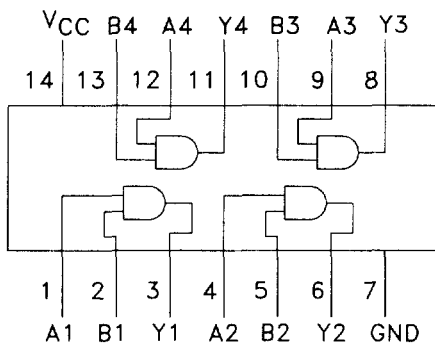
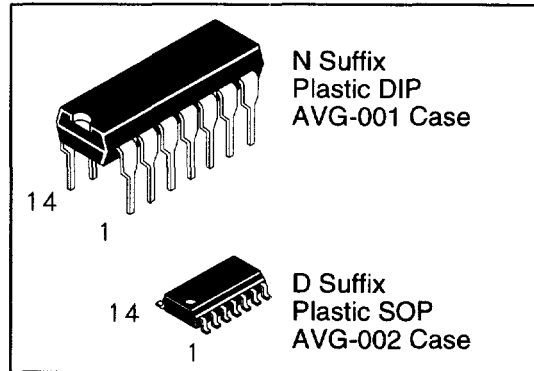


Quad 2-Input AND Gate with Open-Collector Outputs

This device contains four independent 2-input AND buffers, each of which performs the logic AND function in positive logic. The open-collector outputs require pull-up resistors to perform proper logical operation.

- AVG's LS operates over extended Vcc from 4.5 to 5.5 V
- AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and Vcc 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

DV74LS09
DV74ALS09



TRUTH TABLE

$Y = AB$

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

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	LS09	ALS09	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	LS09		ALS09		Unit
		Min	Max	Min	Max	
V _{CC}	Supply Voltage	4.5	5.5	4.5	5.5	V
V _{OH}	High Level Output Voltage		5.5		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 _{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	LS09			ALS09			Unit
			Min	Typ	Max	Min	Typ	Max	
V _{IK}	Input Clamp Voltage	V _{CC} = min, I _{IN} = -18 mA			-1.5			-1.5	V
V _{OL}	Low Level Output Voltage	V _{CC} =min; I _{OL} =4 mA V _{CC} =min; I _{OL} =8 mA		0.25 0.35	0.4 0.5		0.25 0.35	0.4 0.5	V
I _{OH}	High Level Output Current	V _{CC} =min, V _{OH} =max			100			100	µA
I _{IH}	High Level Input Current	V _{CC} =max, V _{IN} = 2.7V V _{CC} =max, V _{IN} = 7V			20 0.1			20 0.1	µA mA
					0.1		0.1	mA	
I _{IL}	Low Level Input Current	V _{CC} =max, V _{IN} =0.4V			-0.4			-0.1	mA
I _{CC}	Supply Current Outputs High Outputs Low	V _{CC} =max			4.8 8.8		1.3 2.2	2.4 4.0	mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	From	To	LS09 CL=15 pF, RL=2 kΩ		ALS09 CL=50pF RL = 2 kΩ		Unit
				Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time, Low to High Level Output	Input	Output		35	23	54	ns
t _{PHL}	Propagation Delay Time, High to Low Level Output	Input	Output		35	5	15	ns

SWITCHING WAVEFORMS

