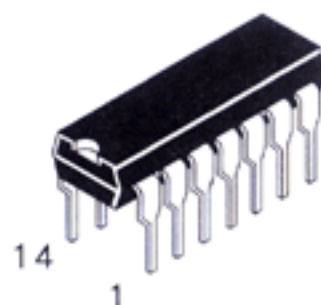


## Hex Inverter

This device contains six independent gates, each of which performs the logic INVERT function.

- 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

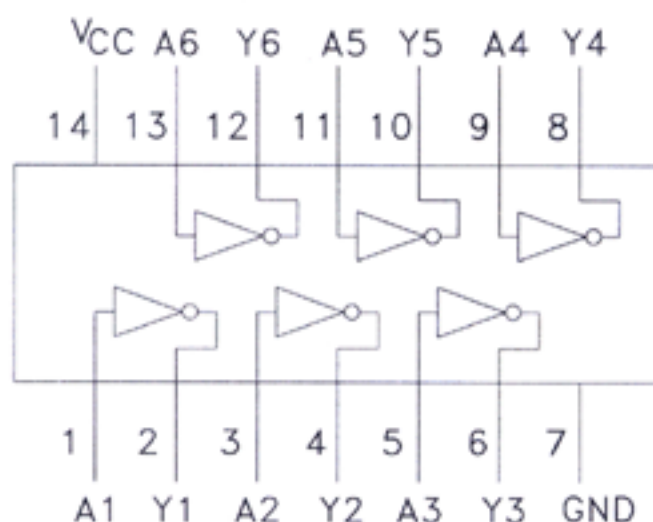
DV74LS04  
DV74ALS04B



N Suffix  
Plastic DIP  
AVG-001 Case



D Suffix  
Plastic SOP  
AVG-002 Case



TRUTH TABLE  
 $Y = \overline{A}$

Inputs	Outputs
A	Y
L	H
H	L

H = High Logic Level  
L = Low Logic Level

### ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	LS04	ALS04B	Unit
V <sub>CC</sub>	Supply Voltage	7.0	7.0	V
V <sub>IN</sub>	Input Voltage	7.0	7.0	V
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	-65 to + 150	°C

### GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	LS04		ALS04B		Unit
		Min	Max	Min	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5.5	4.5	5.5	V
V <sub>IH</sub>	High Level Input Voltage	2.0		2.0		V
V <sub>IL</sub>	Low Level Input Voltage		0.8		0.8	V
I <sub>OH</sub>	High Level Output Current		-0.4		-0.4	mA
I <sub>OL</sub>	Low Level Output Current		8.0		8.0	mA
T <sub>A</sub>	Ambient Temperature Range	-10 to +70		-10 to + 70		°C

**DC ELECTRICAL CHARACTERISTICS** over full operating conditions

Symbol	Parameter	Conditions	LS04			ALS04B			Unit
			Min	Typ	Max	Min	Typ	Max	
$V_{IK}$	Input Clamp Voltage	$V_{CC} = \min, I_{IN} = -18 \text{ mA}$			-1.5			-1.5	V
$V_{OH}$	High Level Output Voltage	$V_{CC} = \min, I_{OH} = \max$	$V_{CC} - 2$	3.5		$V_{CC} - 2$			V
$V_{OL}$	Low Level Output Voltage	$V_{CC} = \min$							V
		$V_{CC} = \min; I_{OL} = 4 \text{ mA}$		0.25	0.4		0.25	0.4	V
		$V_{CC} = \min; I_{OL} = 8 \text{ mA}$		0.35	0.5		0.35	0.5	V
$I_{IH}$	High Level Input Current	$V_{CC} = \max, V_{IN} = 2.7 \text{ V}$			20			20	$\mu\text{A}$
		$V_{CC} = \max, V_{IN} = 7 \text{ V}$			0.1			0.1	mA
$I_{IL}$	Low Level Input Current	$V_{CC} = \max, V_{IN} = 0.4 \text{ V}$			-0.4			-0.1	mA
$I_O$	Output Short Circuit Current	$V_{CC} = \max, V_{OUT} = 2.25 \text{ V}$	-20		-110	-30		-112	mA
$I_{CC}$	Supply Current Outputs High Outputs Low	$V_{CC} = \max$			2.4		0.65	1.1	mA
					6.6		2.9	4.2	mA

**SWITCHING CHARACTERISTICS** over full operating conditions

Symbol	Parameter	From	To	LS04 CL=15 pF		ALS04B CL=50pF RL = 500 $\Omega$		Unit
				Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay Time, Low to High Level Output	Input	Output		15	3	11	ns
$t_{PHL}$	Propagation Delay Time, High to Low Level Output	Input	Output		15	2	8	ns

**SWITCHING WAVEFORMS**