AVG *Semiconductors*

DDi™

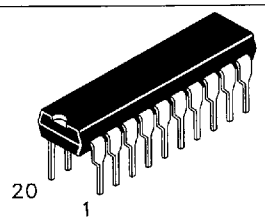
Technical Data

3-State Octal Buffers/Inverters Line Drivers

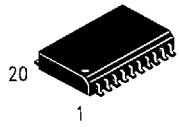
DV74LS240
DV74ALS240A
DV74LS241
DV74ALS241A
DV74LS244
DV74ALS244A

The DV74LS240, DVALS240A, DV74LS241, DV74ALS241A, DV74LS244 and DV74ALS244A are Octal Buffers and Line Drivers designed to be used as memory address drivers, clock drivers and bus-oriented transmitters/receivers which provide improved PC board density.

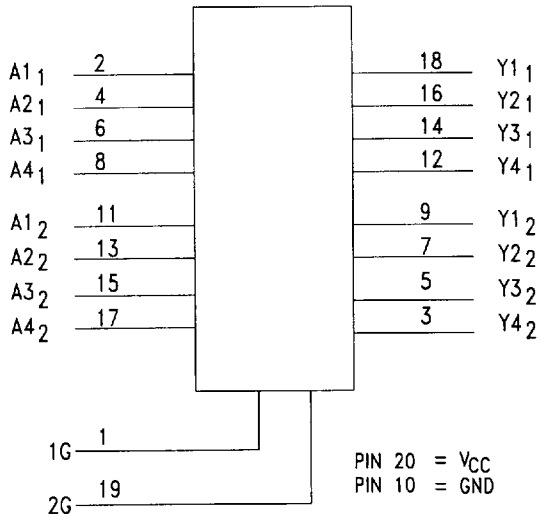
- **AVG's LS operates over extended Vcc from 4.5 to 5.5 V**
- **AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and Vcc range**
- **Switching specifications for ALS at 50 pF**
- **AVG's ALS has the lowest speed power product (4pJ per gate typical) of all logic series**



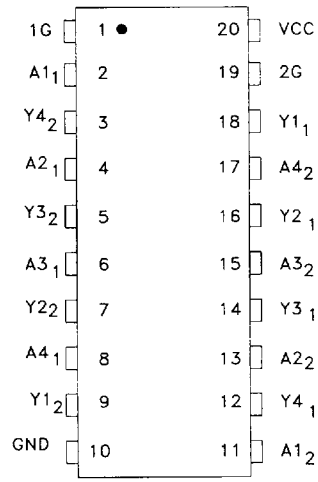
N Suffix
Plastic DIP
AVG-005 Case



D Suffix
Plastic SOP
AVG-006 Case



PIN ASSIGNMENT



Note: Refer to appropriate Truth Tables for signal phases.

'240 TRUTH TABLE

INPUTS		OUTPUT
1G, 2G	An	Y
L	L	H
L	H	L
H	X	Z

'244 TRUTH TABLE

INPUTS		OUTPUT
1G, 2G	An	Y
L	L	L
L	H	H
H	X	Z

'241 TRUTH TABLE

INPUTS		OUTPUT	INPUTS		OUTPUT
1G	D		2G	An	Y
L	L	L	H	L	L
L	H	H	H	H	H
H	X	Z	L	X	Z

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	LS240, 241, 244	ALS240A, 241A, 244A	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	LS240, 241, 244		ALS240A, 241A, 244A		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		–15		–15	mA
I_{OL}	Low Level Output Current		24		24	mA
T_A	Ambient Temperature Range	–10 to +70		–10 to +70		°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Conditions		LS240, 241, 244			ALS240A,241A, 244A			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_{OH}	High Level Output Voltage	V_{CC}=min, I_{OH}= –0.4mA		2.5			2.5			V
		V_{CC}=min, I_{OH}=–3.0mA		2.4	3.4		2.4	3.2		
		V_{CC}=min, I_{OH}=–15mA		2.0			2.0			
V_{OL}	Low Level Output Voltage (V_{IN}=V_{IL} or V_{IH} per truth table)	V_{CC}=min; I_{OL} =12mA			0.25	0.4		0.25	0.4	V
		V_{CC}=min; I_{OL} =24mA			0.35	0.5		0.35	0.5	V
I_{OZH}	Output Off Current HIGH	V_{CC}=max, V_{OUT}=2.7V				20			20	µA
I_{OZL}	Output Off Current LOW	V_{CC}=max, V_{OUT}=0.4V				–20			–20	µA
I_{IH}	High Level Input Current	V_{CC}=max, V_{IN}=2.7V				20			20	µA
		V_{CC}=max, V_{IN}=7.0V				0.1			0.1	mA
I_{IL}	Low Level Input Current	V_{CC}=max, V_{IN}=0.4V				–0.2			–0.2	mA
I_O	Short Circuit Current	VCC=max, V_O=2.25 V		–30		–110	–30		–112	mA
I_{CC}	Supply Current V_{CC}=max	Output HIGH				27		4	11	mA
		Output LOW	240			44		13	23	
		At High Impedence				50		14	25	
		Output HIGH				27		9	15	
		Output LOW	241,			46		15	26	
		At High Impedence	244			54		17	30	

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	LS240, 241, 244 C_L=45pF RL=667Ω		ALS240A, 241A, 244A C_L= 50 pF R_1=R_2= 500Ω		Unit
		Min	Max	Min	Max	
t_{PLH}	Propagation Delay, Data to Output LS240. ALS240A		14	2	10	ns
t_{PHL}			18	2	10	
t_{PLH}	Propagation Delay, Data to Output LS241, 244, ALS241A, 244A		18	3	11	ns
t_{PHL}			18	3	10	

Symbol	Parameter	LS240, 241, 244 C_L=45pF RL=667Ω		ALS240A, 241A, 244A C_L= 50 pF R_1=R_2= 500Ω		Unit
		Min	Max	Min	Max	
t_{PZH}	Output Enable Time LS240, ALS240A		23	5	13	ns
t_{PZL}			30	5	18	
t_{PZH}	Output Enable Time LS241, 244; ALS241A, 244A		23	7	21	ns
t_{PZL}			30	7	21	
t_{PLZ}	Output Disable Time LS240, ALS240A		25	3	12	ns
t_{PHZ}			18	2	10	
		C_L=5.0pF RL=667Ω		C_L= 50 pF R_1=R_2= 500Ω		
t_{PLZ}	Output Disable Time LS240, 241, 244; ALS240A, 241A, 244A		25	3	15	ns
t_{PHZ}			18	2	10	

SWITCHING WAVEFORMS