AVG *Semiconductors* **DDi™**

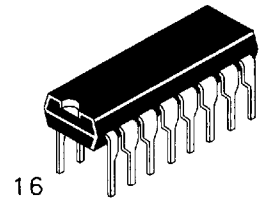
Technical Data

DV74LS174
DV74ALS174

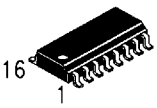
Hex D-Type Flip-Flop

This device is a high speed Hex D Flip-Flop. The device is used primarily as a 6-bit edge-triggered storage register. The information on the D inputs is transferred to storage during LOW to HIGH clock transition. The device has a Reset to aysnchronously clear all flip-flops.

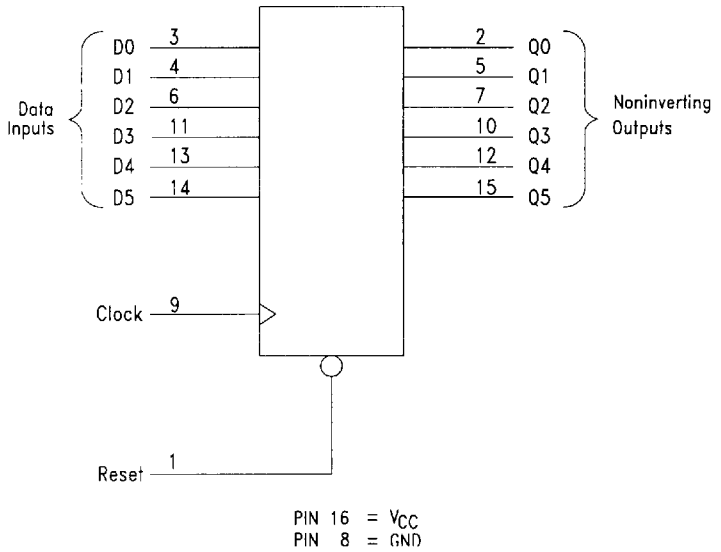
- **AVG's LS operates over extended Vcc from 4.5 to 5.5 V**
- **AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and Vcc range**
- **Switching specifications for ALS at 50 pF**
- **AVG's ALS has the lowest speed power product (4pJ per gate typical) of all logic series**



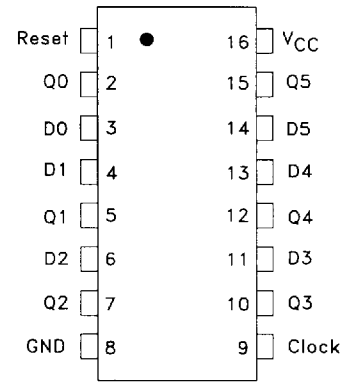
N Suffix
Plastic DIP
AVG-003 Case



D Suffix
Plastic SOP
AVG-004 Case



PIN ASSIGNMENT



TRUTH TABLE

Inputs	Outputs conditions after clock ↑
D	Q
H	H
L	L

H=High Logic Level
L=Low Logic Level
Low at Reset resets all Q's.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	LS174	ALS174	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	LS174		ALS174		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_{OL}	Low Level Output Current		8.0		8.0	mA
I_{OH}	High Level Output Current		–0.4		–0.4	mA

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Conditions	LS174			ALS174			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}=max	V_{CC}–2	3.5		VCC–2			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_{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_{OS}	Short Circuit Current	V_{CC}=max, V_O=2.25V	–20		–110	–30		–112	mA
I_{IL}	Low Level Input Current	V_{CC}=max, V_{IN}=0.4V			–0.4			–0.1	mA
I_{CC}	Supply Current	V_{CC}=Max			26		11	19	mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	LS174 C_L=15pF		ALS174 C_L= 50 pF R_L= 500Ω		Unit
		Min	Max	Min	Max	
f_{MAX}	Maximum Clock Frequency	30		50		MHz
t_{PHL}	Propagation Delay, Reset to Output		35	8	23	ns
t_{PLH}	Propagation Delay, Clock to Output		30	3	15	ns
t_{PHL}			30	5	17	

AC SETUP REQUIREMENTS over full operating conditions

Symbol	Parameter	LS174		ALS174		Unit
		Min	Max	Min	Max	
t_w	Pulse Width, Clock, Reset	20		10		ns
t_s	Data Setup Time	20		10		ns
t_h	Data Hold Time	5.0		0		ns
t_{rec}	Recovery Time	25		6		ns

SWITCHING WAVEFORMS