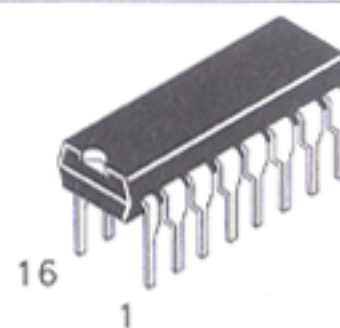


Quad D Flip-Flop with Master Reset

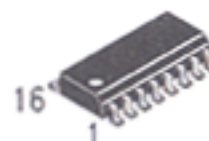
This device is useful for general flip-flop requirements featuring common clock and clear inputs, and both complementary and true outputs. The information on the D inputs is stored during the LOW to HIGH clock transition. A Reset input resets all flip-flops, independent of the Clock or D inputs, when LOW.

- 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

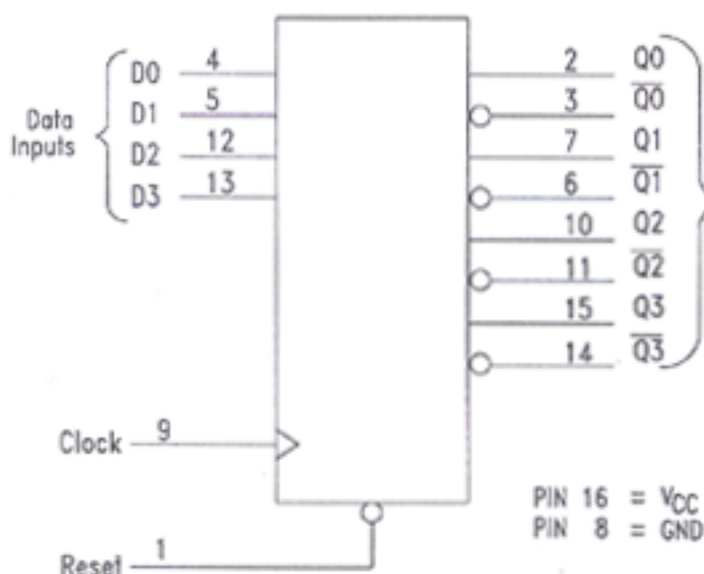
DV74LS175 DV74ALS175



N Suffix
Plastic DIP
AVG-003Case



D Suffix
Plastic SOP
AVG-004 Case



PIN ASSIGNMENT

Reset	1	16	V _{CC}
Q0	2	15	Q3
Q0-bar	3	14	Q3-bar
D0	4	13	D3
D1	5	12	D2
Q1	6	11	Q2
Q1-bar	7	10	Q2-bar
GND	8	9	Clock

TRUTH TABLE

Inputs			Output	
Reset	Clock CP	Data D _N	Q	Q-bar
L	X	X	L	H
H	↑	H	H	L
H	↑	L	L	H
H	L	X	Q	Q-bar

H = High Logic Level

L = Low Logic Level

X = Don't Care

↑ = Transition from LOW to HIGH Level

Q = the level of Q before the indicated steady-state input conditions were established

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	LS175	ALS175	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	LS175		ALS175		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
I _{OH}	High Level Output Current		-0.4		-0.4	mA
T _A	Ambient Temperature Range	-10 to +70		-10 to +70		°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Conditions	LS175			ALS175			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	$V_{CC} = \min; I_{OL} = 4 \text{ mA}$ $V_{CC} = \min; I_{OL} = 8 \text{ mA}$		0.25 0.35	0.4 0.5		0.25 0.35	0.4 0.5	V
I_{IH}	High Level Input Current	$V_{CC} = \max, V_{IN} = 2.7 \text{ V}$ $V_{CC} = \max, V_{IN} = 7 \text{ V}$			20 0.1			20 0.1	μA 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	$V_{CC} = \max, V_{IN} = 2.25 \text{ V}$	-20		-110	-30		-112	mA
I_{CC}	Supply Current	$V_{CC} = \max$			18		9	14	mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	LS175 CL=15pF		ALS175 CL=50 pF RL=500 Ω		Unit
		Min	Max	Min	Max	
f_{MAX}	Maximum Clock Frequency	30		50		MHz
t_{PLH}	Turn Off Delay, MR to Output, Low to High Level Output		30	5	18	ns
t_{PHL}	Turn On Delay, MR to Output, High to Low Level Output		30	.8	23	ns
t_{PLH}	Turn Off Delay, Clock to Output, Low to High Level Output		25	3	15	ns
t_{PHL}	Turn On Delay, Clock to Output, High to Low Level Output		25	5	17	ns

AC SETUP REQUIREMENTS over full operating conditions

Symbol	Parameter	LS175		ALS175		Unit
		Min	Max	Min	Max	
t_w	Clock or MR Pulse Width	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 CHARACTERISTICS

