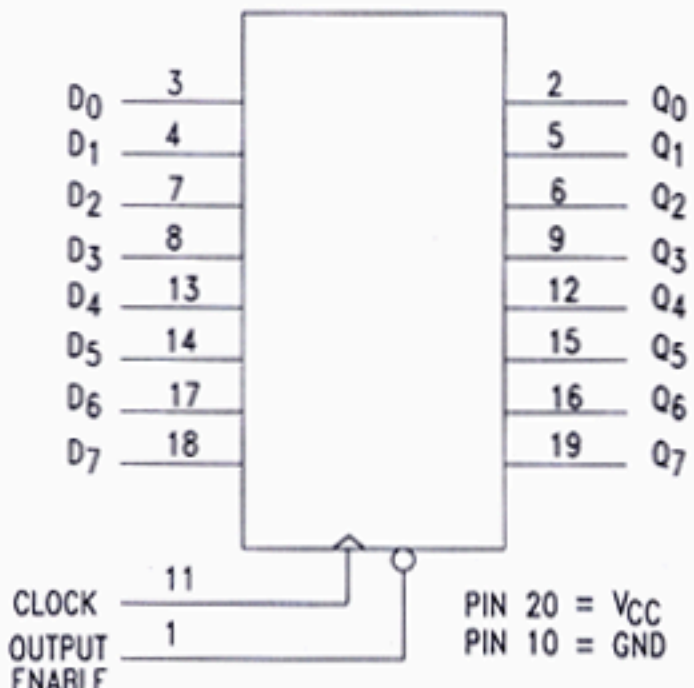


374 Edge Triggered Octal D Flip-Flops with 3-State Outputs

The DV74LS374 and DV74ALS374 circuit is an Octal Flip-Flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A buffered Clock (CP) and Output Enable (OE) is common to 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

DV74LS374
DV74ALS374



Pin Assignments:
 D0-D7 Data Inputs
 CP Clock (Active HIGH) Input
 OE Output Enable (Active LOW) Input
 Q0-Q7 Outputs

TRUTH TABLE			
Inputs			Output
D _N	CP	OE	Q _N
H	↑	L	H
L	↑	L	L
X	L	L	Q ₀
X	X	H	Z

H=HIGH Voltage Level
 L=LOW Voltage Level
 X=Don't Care
 Z=HIGH Impedence (Contents of flip-flops are unaffected by the state of the Output Enable input (OE))
 ↑=Positive Edge Transition
 Q₀=Previous Condition of Q

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	LS374	ALS374	Unit
V _{CC}	Supply Voltage	+7.0	7.0	V
V _{IN}	Input Voltage	-0.5 to +7.0	7.0	V
V _{OUT}	Voltage Applied to Disabled Output	V _{CC}	5.5	V
T _{STG}	Storage Temperature Range	-65 to +150	-65 to +150	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	LS374		ALS374		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		V
V _{IL}	Low Level Input Voltage		0.8		0.8	V
I _{OH}	High Level Output Current		-2.6		-2.6	mA
I _{OL}	Low Level Output Current		24		24	mA
T _A	Operating Free Air Temperature Range	-10 to 70		-10 to +70		°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Condition	LS374			ALS374			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	2.4	3.1		2.4	3.2		V
V _{OL}	Low Level Output Voltage	V _{CC} =min	I _{OL} = 12 mA		0.25	0.4	0.25	0.4	V
			I _{OL} = 24 mA		0.35	0.5	0.35	0.5	V
I _{IH}	High Level Input Current	V _{CC} =max, V _{IN} = 2.7V			20			20	μA
		V _{CC} =max, V _{IN} = 7V			0.1			0.1	mA
I _{IL}	Low Level Input Current	V _{CC} =max, V _{IN} =0.4V			-0.4			-0.2	mA
I _O	Output Short Circuit Current	V _{CC} =max, V _{OUT} =2.25V	-30		-130	-30		-112	mA
I _{OZH}	High Level 3-State Output Current	V _{CC} =5.5V, V _{OUT} = 2.7V			20			20	μA
I _{OZL}	Low Level 3-State Output Current	V _{CC} =5.5V, V _{OUT} = 0.4V			-20			-20	μA
I _{CC}	Supply Current	V _{CC} =max, Outputs Disabled			40		20	31	mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	INPUT	OUTPUT	LS374 C _L =45 pF R _L =667Ω		ALS374 C _L =50pF R ₁ & R ₂ =500Ω		Unit
				Min	Max	Min	Max	
f _{MAX}	Maximum Clock Frequency			35		35		MHz
t _{PLH}	Propagation Delay Time Low-to-High Level Output	Clock or Enable	Any Q		28	3	12	ns
t _{PHL}	Propagation Delay Time High-to-Low Level Output	Clock or Enable	Any Q		28	5	16	ns
t _{PZH}	Output Disable Time to High Level Output	OE	Any Q		28	5	17	ns
t _{PZL}	Output Enable Time to Low Level Output	OE	Any Q		28	7	18	ns
t _{PHZ}	Output Disable Time from High Level Output (LS374-C _L =5.0pF)	OE	Any Q		20	2	10	ns
t _{PLZ}	Output Disable Time from Low Level Output (LS374-C _L =5.0pF)	OE	Any Q		25	3	18	ns

AC SETUP REQUIREMENTS over full operating conditions

Symbol	Parameter	LS374		ALS 374		Unit
		MIN	MAX	MIN	MAX	
t _w	Clock Pulse Width	15		14		ns
t _s	Setup Time	20		10		ns
t _h	Hold Time	0		0		ns

SWITCHING WAVEFORMS

