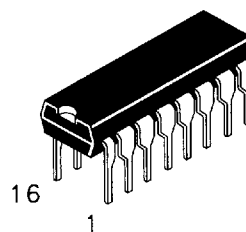


4x4 Register File with 3-State Outputs

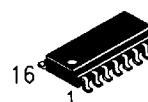
This device is a high speed, low-power 4 x 4 Register File organized as four words by four bits. Separate read and write inputs, both address and enable, allow simultaneous read and write operation. The 3-state outputs make it possible to connect up to 128 outputs to increase capacity up to 512 words.

- 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

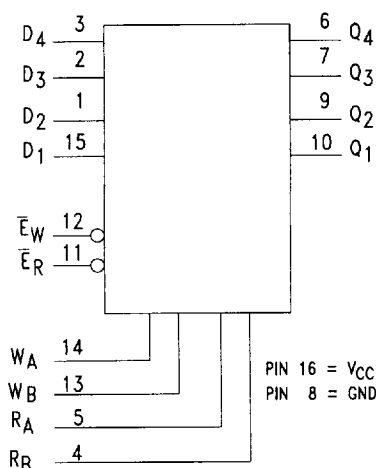
DV74LS670 DVALS670



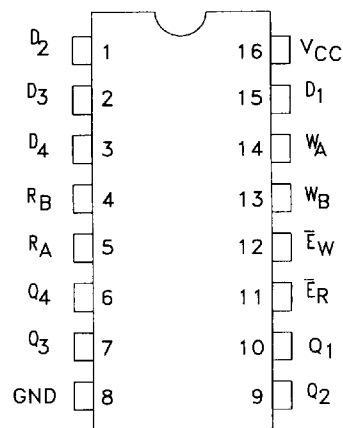
N Suffix
Plastic DIP
AVG-003 Case



D Suffix
Plastic SOP
AVG-004 Case



PIN ASSIGNMENT



WRITE FUNCTION TABLE

WRITE INPUTS			WORD			
WB	WA	EW	0	1	2	3
L	L	L	Q=D	Q ₀	Q ₀	Q ₀
L	H	L	Q ₀	Q=D	Q ₀	Q ₀
H	L	L	Q ₀	Q ₀	Q=D	Q ₀
H	H	L	Q ₀	Q ₀	Q ₀	Q=D
X	X	H	Q ₀	Q ₀	Q ₀	Q ₀

H=High Logic Level

L=Low Logic Level

X=Don't Care

Q₀=The level of Q before the input conditions were established

READ FUNCTION TABLE

READ INPUTS			OUTPUTS			
RB	RA	ER	Q1	Q2	Q3	Q4
L	L	L	W0B1	W0B2	W0B3	W0B4
L	H	L	W1B1	W1B2	W1B3	W1B4
H	L	L	W2B1	W2B2	W2B3	W2B4
H	H	L	W3B1	W3B2	W3B3	W3B4
X	X	H	3S	3S	3S	3S

W0B1=The first bit of word 0 etc.

H=High Logic Level

L=Low Logic Level

X=Don't Care

3S=High Impedance

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	LS670	ALS670	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	LS670		ALS670		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 _{OH}	High Level Output Current		-0.4		-0.4	mA
I _{OL}	Low Level Output Current		8.0		8.0	mA
T _A	Ambient Temperature Range	-10 to +70		-10 to +70		°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Conditions	LS670			ALS670			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		V _{CC} -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 ER, EW V _{CC} =max, V _{IN} = 7V ER, EW			20 60 0.1 0.3			20 60 0.1 0.3	μA μA mA mA
I _{IL}	Low Level Input Current	V _{CC} =max, V _{IN} =0.4V ER, EW			-0.4 -1.2			-0.1 -0.3	mA mA
I _O	Short Circuit Current	V _{CC} =max, V _O =2.25V	-30		-130	-30		-112	mA
I _{OZH}	High Level 3-State Output Current	V _{CC} =5.5V, V _{OUT} =2.4V			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, V _{IN} = 2.7V			50			45	mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	C _L =15pF R _L =667Ω		C _L =50pF R _L =500Ω		Unit
		Min	Max	Min	Max	
t _{PLH}	Propagation Delay, R _A or R _B to Q Outputs		40		25	ns
t _{PHL}			45		30	
t _{PLH}	Propagation Delay, EW to Output		45		30	ns
t _{PHL}			50		35	
t _{PLH}	Propagation Delay, Data to Output		45		30	ns
t _{PHL}			40		25	
t _{PLH}	Output Enable Time		35		22	ns
t _{PHL}			40		25	
t _{PLH}	Output Disable Time		35		22	ns
t _{PHL}			50		35	

AC SETUP REQUIREMENTS over full operating conditions

Symbol	Parameter	LS670		ALS670		Unit
		Min	Max	Min	Max	
t_w	Pulse Width, $\bar{E}_R$, $\bar{E}_W$	25		6		ns
t_s	Setup Time, Data to $\bar{E}_W$	10		10		ns
t_s	Setup Time, W_A , W_B , to $\bar{E}_W$	15		15		ns
t_h	Hold Time, Data to $\bar{E}_W$	15		15		ns
t_h	Hold Time, W_A , W_B , $\bar{E}_W$	5.0		0		ns
t_{LATCH}	Latch Time	25		6		ns

SWITCHING WAVEFORMS

