

QUAD 2-INPUT MULTIPLEXER WITH STORAGE

The SN54/74LS298 is a Quad 2-Port Register. It is the logical equivalent of a quad 2-input multiplexer followed by a quad 4-bit edge-triggered register. A Common Select input selects between two 4-bit input ports (data sources.) The selected data is transferred to the output register synchronous with the HIGH to LOW transition of the Clock input.

The LS298 is fabricated with the Schottky barrier process for high speed and is completely compatible with all Motorola TTL families.

- Select From Two Data Sources
- Fully Edge-Triggered Operation
- Typical Power Dissipation of 65 mW
- Input Clamp Diodes Limit High Speed Termination Effects



NOTE: The Flatpak version has the same pinouts (Connection Diagram) as the Dual In-Line Package.

PIN NAMES	3	LOADING (Note a)		
		HIGH	LOW	
<u>S</u> CP	Common Select Input	0.5 U.L.	0.25 U.L.	
CP	Clock (Active LOW Going Edge) Input	0.5 U.L.	0.25 U.L.	
I _{0a} -I _{0d}	Data Inputs From Source 0	0.5 U.L.	0.25 U.L.	
I _{1a} -I _{1d}	Data Inputs From Source 1	0.5 U.L.	0.25 U.L.	
$Q_a - Q_d$	Register Outputs (Note b)	10 U.L.	5 (2.5) U.L.	

NOTES:

a) 1 TTL Unit Load (U.L.) = 40 μ A HIGH/1.6 mA LOW.

b) The Output LOW drive factor is 2.5 U.L. for Military (54) and 5 U.L. for Commercial (74) Temperature Ranges.



10a 11a 10b 11b 10c 11c 10d 11d

Q_c

13

Qd

12

Qb

14

V_{CC} = PIN 16 GND = PIN 8

S

CP

Qa

15

10

11

LOGIC OR BLOCK DIAGRAM



 $V_{CC} = PIN 16$ GND = PIN 8 \bigcirc = PIN NUMBERS

FUNCTIONAL DESCRIPTION

The LS298 is a high speed Quad 2-Port Register. It selects four bits of data from two sources (ports)under the control of a Common Select Input (S). The selected data is transferred to the 4-bit output register synchronous with the HIGH to LOW

transition of the Clock input (\overline{CP}) . The 4-bit output register is fully edge-triggered. The Data inputs (I) and Select input (S) must be stable only one setup time prior to the HIGH to LOW transition of the clock for predictable operation.

TRUTH TABLE

	INPUTS		OUTPUT
S	I _O	l ₁	Q
l	I	Х	L
I	h	Х	Н
h	Х	I	L
h	Х	h	Н

L = LOW Voltage Level

H = HIGH Voltage Level

X = Don't Care

I = LOW Voltage Level one setup time prior to the HIGH to LOW clock transition.

h = HIGH Voltage Level one setup time prior to the HIGH to LOW clock transition.

GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Тур	Max	Unit
Vcc	Supply Voltage	54 74	4.5 4.75	5.0 5.0	5.5 5.25	V
TA	Operating Ambient Temperature Range	54 74	-55 0	25 25	125 70	°C
ЮН	Output Current — High	54, 74			-0.4	mA
IOL	Output Current — Low	54 74			4.0 8.0	mA

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				Limits				
Symbol	Parameter		Min	Тур	Max	Unit	Tes	t Conditions
VIH	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage for All Inputs	
Ma		54			0.7	v	Guaranteed Input	LOW Voltage for
VIL	Input LOW Voltage	74			0.8	V	All Inputs	
VIK	Input Clamp Diode Voltage			-0.65	-1.5	V	$V_{CC} = MIN, I_{IN} = -18 \text{ mA}$	
Maria		54	2.5	3.5		V	$V_{CC} = MIN, I_{OH} = MAX, V_{IN} = V_{IH}$	
VOH	Output HIGH Voltage	74	2.7	3.5		V	or V _{IL} per Truth T	āble
		54, 74		0.25	0.4	V	I _{OL} = 4.0 mA V _{CC} = V _{CC} MIN, I _{OL} = 8.0 mA V _{IN} = V _{IL} or V _{IH} per Truth Table V _{IN}	
VOL	Output LOW Voltage	74		0.35	0.5	V		
		•			20	μA	V _{CC} = MAX, V _{IN}	= 2.7 V
lн	Input HIGH Current	it 🗖			0.1	mA	V _{CC} = MAX, V _{IN}	= 7.0 V
۱ _{IL}	Input LOW Current				-0.4	mA	V _{CC} = MAX, V _{IN} = 0.4 V	
IOS	Short Circuit Current (Note	1)	-20		-100	mA	V _{CC} = MAX	
ICC	Power Supply Current				21	mA	V _{CC} = MAX	

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

AC CHARACTERISTICS (T_A = 25° C, V_{CC} = 5.0 V)

		Limits				
Symbol	Parameter	Min	Тур	Max	Unit	Test Conditions
^t PLH	Propagation Delay,		18	27	ns	V _{CC} = 5.0 V,
^t PHL	Clock to Output		21	32	ns	C _L = 15 pF

AC SET-UP REQUIREMENTS (T_A = 25° C, V_{CC} = 5.0 V)

		Limits				
Symbol	Parameter	Min	Тур	Max	Unit	Test Conditions
tW	Clock Pulse Width	20			ns	
t _s	Data Setup Time	15			ns	
t _s	Select Setup Time	25			ns	V _{CC} = 5.0 V
t _h	Data Hold Time	5.0			ns	
t _h	Select Hold Time	0				

DEFINITIONS OF TERMS

SETUP TIME (t_S) — is defined as the minimum time required for the correct logic level to be present at the logic input prior to the clock transition from LOW to HIGH in order to be recognized and transferred to the outputs.

HOLD TIME (t_h) — is defined as the minimum time following

the clock transition from LOW to HIGH that the logic level must be maintained at the input in order to ensure continued recognition. A negative HOLD TIME indicates that the correct logic level may be released prior to the clock transition from LOW to HIGH and still be recognized.

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AC WAVEFORMS





*The shaded areas indicate when the input is permitted to change for predictable output performance.

Figure 1

Figure 2

Case 751B-03 D Suffix **16-Pin Plastic** SO-16



Case 648-08 N Suffix **16-Pin Plastic**





- NOTES: 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER. DIMENSION A AND B DO NOT INCLUDE MOLD 2 3.
- PROTRUSION. MAXIMUM MOLD PROTRUSION 0.15 (0.006) 4.
- PER SIDE. 751B-01 IS OBSOLETE, NEW STANDARD 751B-03. 5.

	MILLIM	ETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
Α	9.80	10.00	0.386	0.393	
В	3.80	4.00	0.150	0.157	
С	1.35	1.75	0.054	0.068	
D	0.35	0.49	0.014	0.019	
F	0.40	1.25	0.016	0.049	
G	1.27	BSC	0.050 BSC		
J	0.19	0.25	0.008	0.009	
K	0.10	0.25	0.004	0.009	
М	0°	7 °	0°	7°	
Р	5.80	6.20	0.229	0.244	
R	0.25	0.50	0.010	0.019	

NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2.
- CONTROLLING DIMENSION: INCH. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL. 3.
- DIMENSION "B" DOES NOT INCLUDE MOLD 4. FLASH.
- 5.
- ROUNDED CORNERS OPTIONAL. 648-01 THRU -07 OBSOLETE, NEW STANDARD 6. 648-08.

	MILLIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
Α	18.80	19.55	0.740	0.770	
В	6.35	6.85	0.250	0.270	
С	3.69	4.44	0.145	0.175	
D	0.39	0.53	0.015	0.021	
F	1.02	1.77	0.040	0.070	
G	2.54	BSC	0.100 BSC		
н	1.27	BSC	0.050 BSC		
J	0.21	0.38	0.008	0.015	
K	2.80	3.30	0.110	0.130	
L	7.50	7.74	0.295	0.305	
М	0°	10°	0°	10°	
S	0.51	1.01	0.020	0.040	

- NOTES: 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: INCH. 3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL 4. DIM F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY. 5. 620-01 THRU -08 OBSOLETE, NEW STANDARD 620-09.

- 620-09.

	MILLIM	ETERS	INC	HES	
DIM	MIN	MIN MAX		MAX	
Α	19.05	19.55	0.750	0.770	
В	6.10	7.36	0.240	0.290	
С	_	4.19	-	0.165	
D	0.39	0.53	0.015	0.021	
E	1.27	BSC	0.050 BSC		
F	1.40	1.77	0.055	0.070	
G	2.54	BSC	0.100 BSC		
J	0.23	0.27	0.009	0.011	
K	_	5.08	_	0.200	
L	7.62	7.62 BSC		BSC	
М	0°	15°	0°	15°	
N	0.39	0.88	0.015	0.035	

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