



U74AHC158

CMOS IC

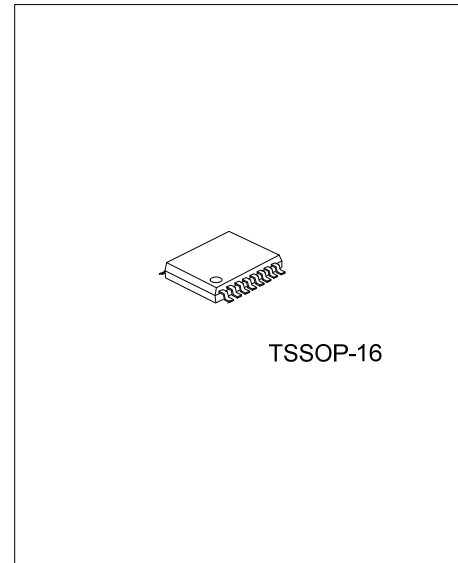
QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

DESCRIPTION

The **U74AHC158** is a quadruple 2-line to 1-line data selector/multiplexer. When \bar{G} is high, all outputs are high. When \bar{G} is low, a 4-bit word is selected from one of with two sources and is routed to the four outputs. The device provides inverted data.

FEATURES

- * Wide supply voltage range from 2V to 5.5V
- * Max t_{pd} of 4.1ns from A or B to Y at 5V, $C_L=15pF$
- * Low power consumption, $I_{CC} = 4 \mu A$ (Max.) at 5.5V
- * ± 8 mA output driver at 5V

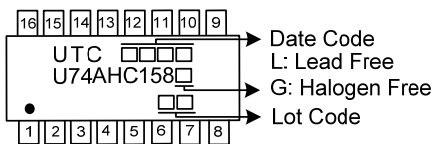


ORDERING INFORMATION

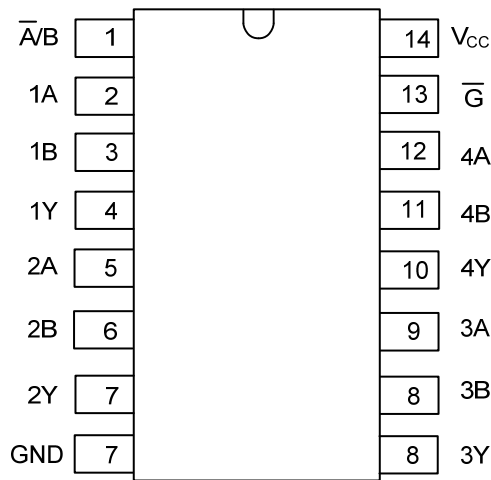
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC158L-P16-R	U74AHC158G-P16-R	TSSOP-16	Tape Reel

<p>U74AHC158G-P16-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) P16: TSSOP-16 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



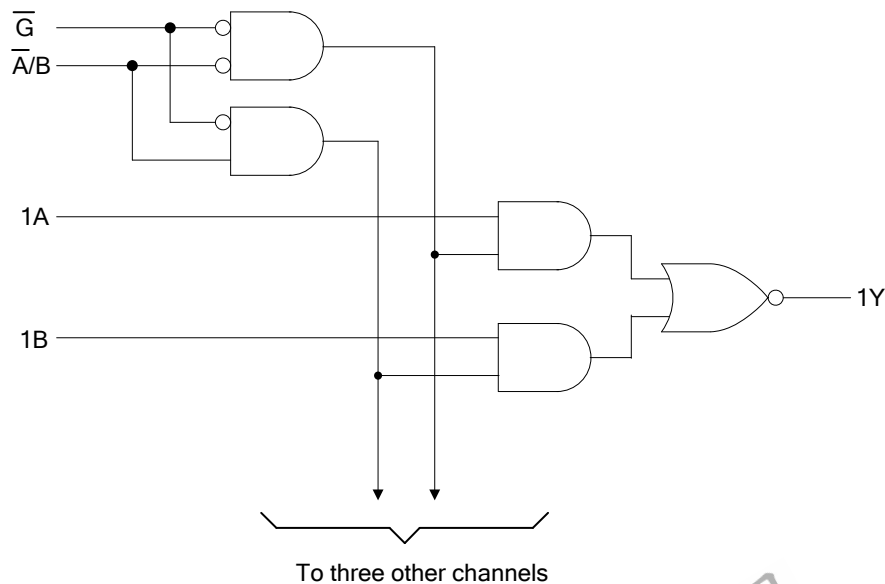
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUTS				OUTPUTS
\bar{G}	\bar{A}/B	A	B	Y
H	X	X	X	H
L	L	L	X	H
L	L	H	X	L
L	H	X	L	H
L	H	X	H	L

■ LOGIC DIAGRAM



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■ ABSOLUTE MAXIMUM RATING($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	V_{CC}	-0.5~7	V
Input Voltage Range	V_{IN}	-0.5~7	V
Output Voltage Range	V_{OUT}	-0.5~ $V_{CC} + 0.5$	V
Input Clamp Current ($V_{IN} < 0$)	I_{IK}	-20	mA
Output Clamp Current ($V_{OUT} < 0$, or $V_{OUT} > V_{CC}$)	I_{OK}	± 20	mA
Output Current	I_{OUT}	± 25	mA
V_{CC} or GND Current	I_{CC}	± 50	mA
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

Note: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 2. Absolute maximum ratings are those values beyond which the device could be permanently damaged.
 Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	108	$^\circ\text{C/W}$

■ RECOMMENDED OPERATING COMDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		5.5	V
High-Level Input Voltage	V_{IH}	$V_{CC} = 2\text{V}$	1.5			V
		$V_{CC} = 3\text{V}$	2.1			
		$V_{CC} = 5.5\text{V}$	3.85			
Low-Level Input Voltage	V_{IL}	$V_{CC} = 2\text{V}$			0.5	V
		$V_{CC} = 3\text{V}$			0.9	
		$V_{CC} = 5.5\text{V}$			1.65	
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
High-level Output Current	I_{OH}	$V_{CC} = 2\text{V}$			-50	μA
		$V_{CC} = 3.3 \pm 0.3\text{V}$			-4	mA
		$V_{CC} = 5 \pm 0.5\text{V}$			-8	
Low-level Output Current	I_{OL}	$V_{CC} = 2\text{V}$			50	μA
		$V_{CC} = 3.3 \pm 0.3\text{V}$			4	mA
		$V_{CC} = 5 \pm 0.5\text{V}$			8	
Input Transition Rise or Fall Rate	$\Delta t / \Delta v$	$V_{CC} = 3.3 \pm 0.3\text{V}$			100	ns/V
		$V_{CC} = 5 \pm 0.5\text{V}$			20	
Operating Temperature	T_A		-40		85	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS (T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V _{OH}	I _{OH} = -50 μA, V _{CC} = 2V	1.9	2		V
		I _{OH} = -50 μA, V _{CC} = 3V	2.9	3		
		I _{OH} = -50 μA, V _{CC} = 4.5V	4.4	4.5		
		I _{OH} = -4 mA, V _{CC} = 3V	2.58			
		I _{OH} = -8 mA, V _{CC} = 4.5V	3.94			
Low-Level Output Voltage	V _{OL}	I _{OL} = 50 μA, V _{CC} = 2V			0.1	V
		I _{OL} = 50 μA, V _{CC} = 3V			0.1	
		I _{OL} = 50 μA, V _{CC} = 4.5V			0.1	
		I _{OL} = 4 mA, V _{CC} = 3V			0.36	
		I _{OL} = 8 mA, V _{CC} = 4.5V			0.36	
Input Leakage Current (A or B inputs)	I _{I(LEAK)}	V _{IN} = 5.5V or GND, V _{CC} = 0 to 5.5V			±0.1	μA
Quiescent Supply Current	I _{CC}	V _{IN} = V _{CC} or GND, I _{OUT} = 0, V _{CC} = 5.5V			4	μA
Input Capacitance	C _{IN}	V _{IN} = V _{CC} or GND, V _{CC} =5V		2	10	pF

■ SWITCHING CHARACTERISTICS

(V_{CC} = 3.3V ± 0.3V, T_A =25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A or B to output Y, t _{pd}	t _{PLH}	C _L =15pF, R _L =1kΩ		6.2	9.7	ns
		C _L =50pF, R _L =1kΩ		8.7	13.2	
	t _{PHL}	C _L =15pF, R _L =1kΩ		6.2	9.7	ns
		C _L =50pF, R _L =1kΩ		8.7	13.2	
Propagation delay from input \bar{A} / B to output Y, t _{pd}	t _{PLH}	C _L =15pF, R _L =1kΩ		8.4	13.2	ns
		C _L =50pF, R _L =1kΩ		10.9	16.7	
	t _{PHL}	C _L =15pF, R _L =1kΩ		8.4	13.2	ns
		C _L =50pF, R _L =1kΩ		10.9	16.7	
Propagation delay from input \bar{G} to output Y, t _{pd}	t _{PLH}	C _L =15pF, R _L =1kΩ		8.7	13.6	ns
		C _L =50pF, R _L =1kΩ		11.2	17.1	
	t _{PHL}	C _L =15pF, R _L =1kΩ		8.7	13.6	ns
		C _L =50pF, R _L =1kΩ		11.2	17.1	

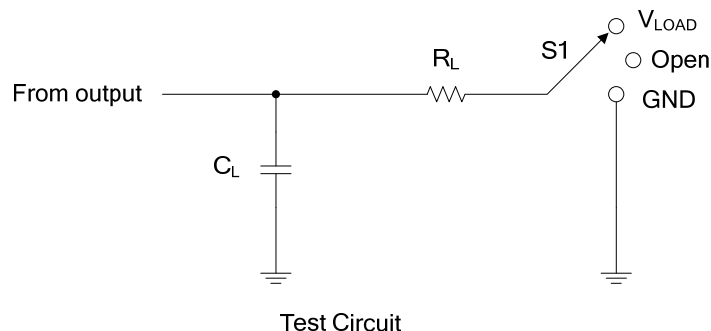
(V_{CC} = 5V ± 0.5V, T_A =25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A or B to output Y, t _{pd}	t _{PLH}	C _L =15pF, R _L =1kΩ		4.1	6.4	ns
		C _L =50pF, R _L =1kΩ		5.6	8.4	
	t _{PHL}	C _L =15pF, R _L =1kΩ		4.1	6.4	ns
		C _L =50pF, R _L =1kΩ		5.6	8.4	
Propagation delay from input \bar{A} / B to output Y, t _{pd}	t _{PLH}	C _L =15pF, R _L =1kΩ		5.3	8.1	ns
		C _L =50pF, R _L =1kΩ		6.8	10.1	
	t _{PHL}	C _L =15pF, R _L =1kΩ		5.3	8.1	ns
		C _L =50pF, R _L =1kΩ		6.8	10.1	
Propagation delay from input \bar{G} to output Y, t _{pd}	t _{PLH}	C _L =15pF, R _L =1kΩ		5.6	8.6	ns
		C _L =50pF, R _L =1kΩ		7.1	10.6	
	t _{PHL}	C _L =15pF, R _L =1kΩ		5.6	8.6	ns
		C _L =50pF, R _L =1kΩ		7.1	10.6	

■ OPERATING CHARACTERISTICS (T_A =25°C)

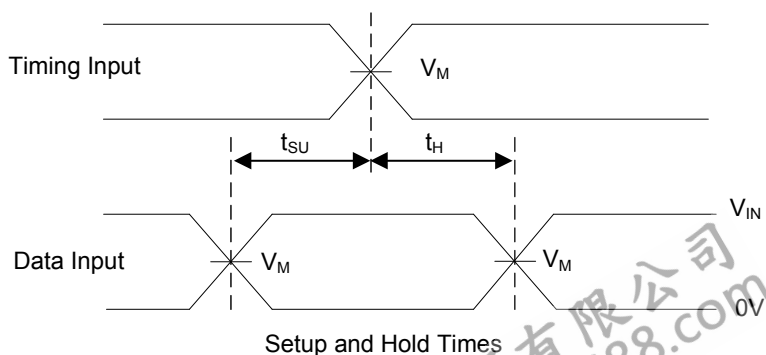
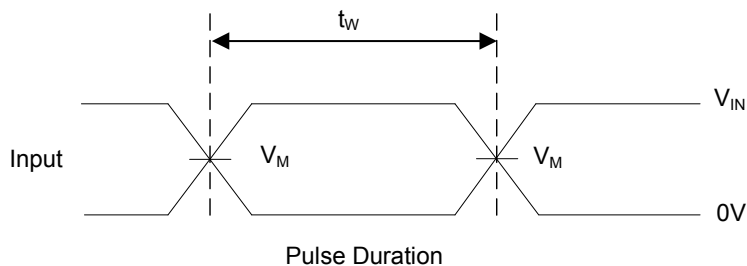
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power dissipation capacitance	C _{PD}	V _{CC} = 5V, f=1MHz, No load		11		pF

TEST CIRCUIT AND WAVEFORMS

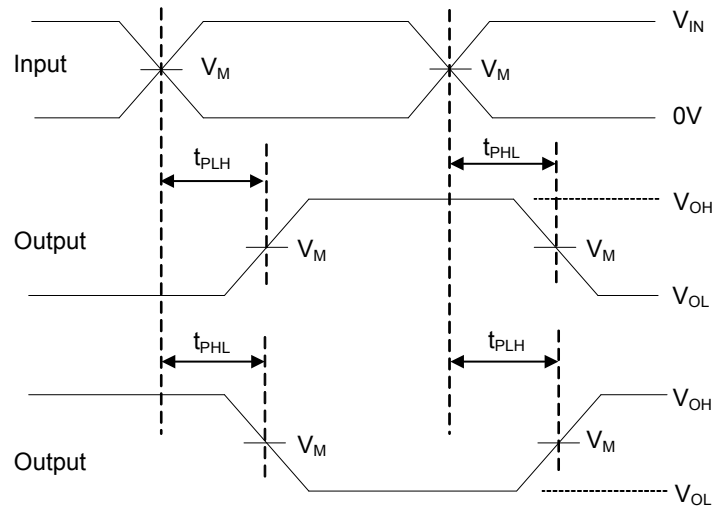


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

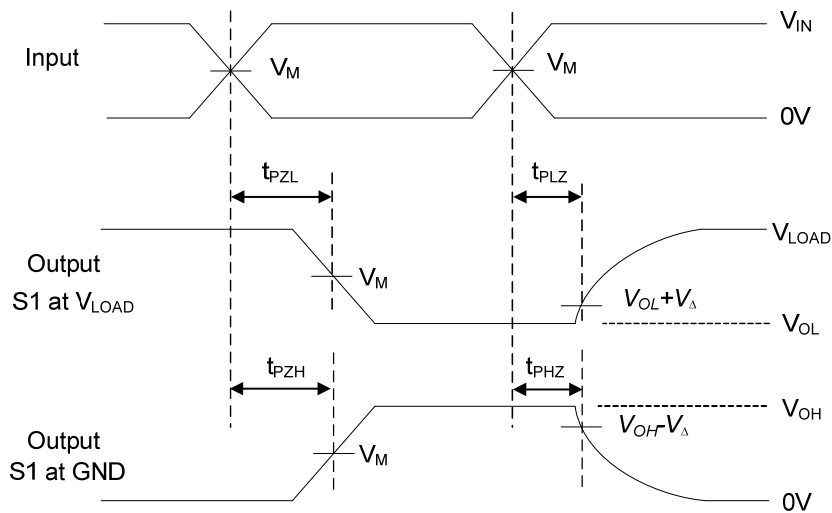
V_{CC}	Input		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_{IN}	t_R, t_F					
$3.3V \pm 0.3V$	V_{CC}	$\leq 3ns$	$V_{CC}/2$	V_{CC}	15pF	1k Ω	0.3V
					50pF		
$5V \pm 0.5V$	V_{CC}	$\leq 3ns$	$V_{CC}/2$	V_{CC}	15pF	1k Ω	0.5V
					50pF		



■ TEST CIRCUIT AND WAVEFORMS(Cont.)



Voltage Waveforms Propagation Delay Times



Voltage Waveforms Enable and Disable Times

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: PRR $\leq 1\text{MHz}$, $Z_O = 50\Omega$, $t_R \leq 3\text{ns}$, $t_F \leq 3\text{ns}$.

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