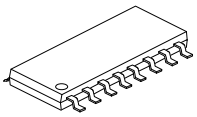
U74HC148

CMOS IC

8-LINE TO 3-LINE PRIORITY ENCODERS



SOP-16

■ DESCRIPTION

The UTC **U74HC148** devices encode eight data lines to 3-line binary (octal). It feature priority decoding of the inputs to ensure that only the highest-order data line is encoded. (enable input EI and enable output EO) have been provided to allow octal expansion without the need for external circuitry. Data inputs and outputs are active at the low logic level.

■ FEATURES

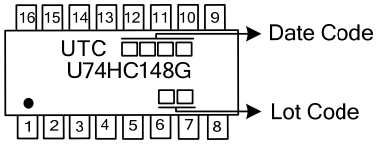
* Wide supply voltage range from 2.0V to 6.0V
* Low static power consumption; I_{CC}=8μA (Max.)
* Encode Eight Data Lines to 3-Line Binary (Octal)
* High Noise Immunity

■ ORDERING INFORMATION

Ordering Number	Package	Packing
U74HC148G-P16-R	TSSOP-16	Tape Reel

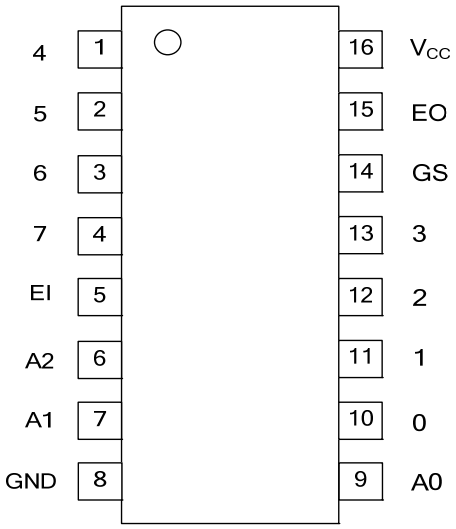
U74HC148G-P16-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) P16: TSSOP-16 (3) G: Halogen Free and Lead Free

■ MARKING



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■ PIN CONFIGURATION

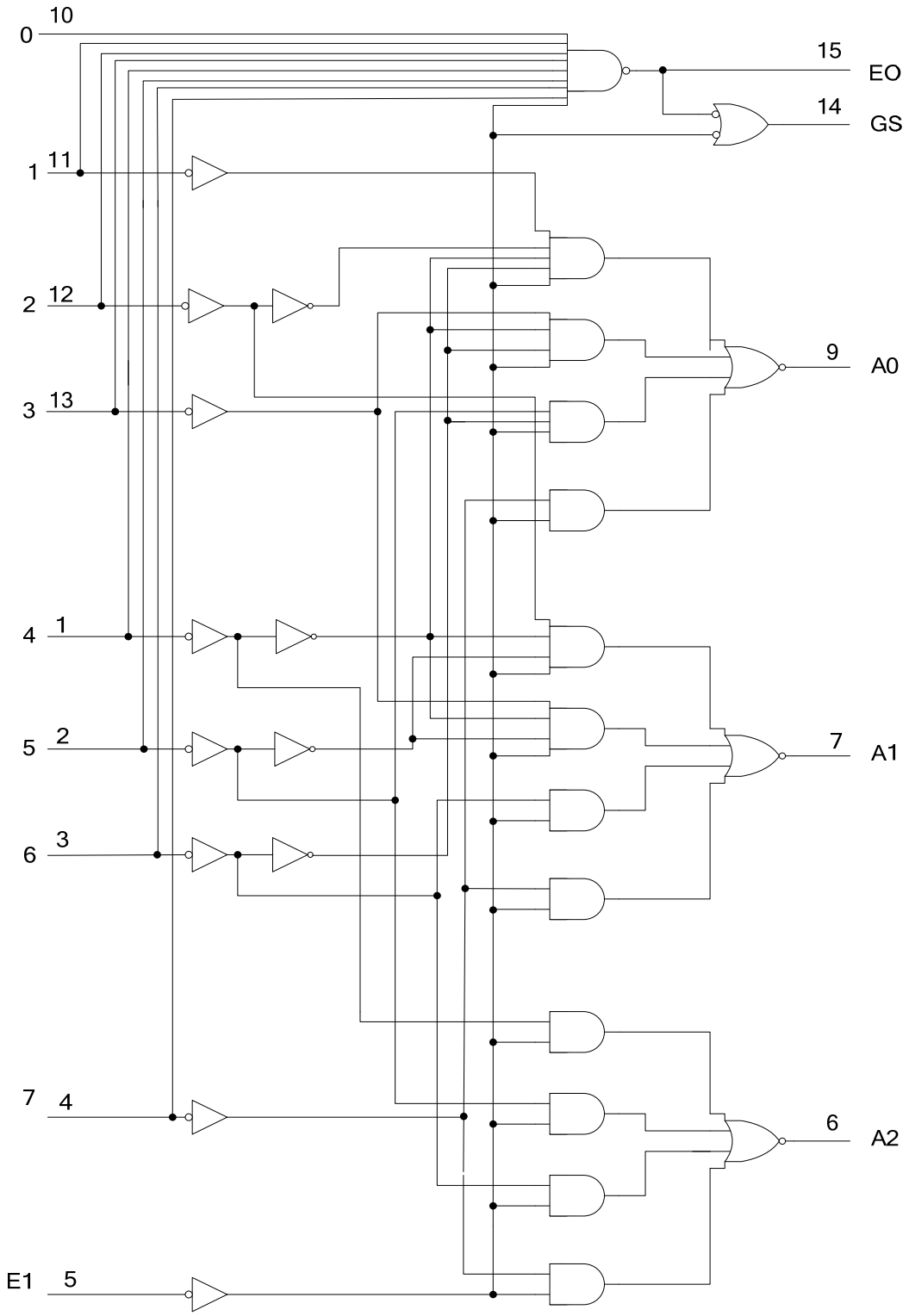


■ FUNCTION TABLE

INPUTS									OUTPUTS				
EI	0	1	2	3	4	5	6	7	A2	A1	A0	GS	EO
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	L	H	L	H
L	X	X	X	X	X	L	H	H	L	H	L	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	H	L	L	L	H
L	X	X	L	H	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	H	H	H	L	H

Note: H: High voltage level; L: Low voltage level; X: Don't care

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +7.0	V
Input Voltage	V_{IN}		-0.5 ~ V_{CC}+0.5	V
Output Voltage	V_{OUT}	Active Mode	-0.5 ~ V_{CC}+0.5	V
Continuous V_{CC} or GND Current	I_{CC}		±50	mA
Continuous Output Current	I_{OUT}	V_{OUT}=0V ~ V_{CC}	±25	mA
Input Clamp Current (Note 2)	I_{IK}	V_{IN}<0V or V_{IN}>V_{CC}	±20	mA
Output Clamp Current (Note 2)	I_{OK}	V_{OUT}>V_{CC} or V_{OUT}<0V	±20	mA
Storage Temperature Range	T_{STG}		-65 ~ +150	°C

Notes: 1. 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.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0	5.0	6.0	V
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Operating Temperature	T_A		-40		85	°C
Input Transition Rise or Fall Rate	Δt/Δv	V_{CC}=2.0V			1000	ns
		V_{CC}=4.5V			500	ns
		V_{CC}=6.0V			400	ns

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

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	V_{CC}=2.0V		1.5			V
		V_{CC}=4.5V		3.15			V
		V_{CC}=6.0V		4.2			V
Low-level Input Voltage	V_{IL}	V_{CC}=2.0V				0.5	V
		V_{CC}=4.5V				1.35	V
		V_{CC}=6.0V				1.8	V
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V	V_{IN}=V_{IH} or V_{IL}, I_{OH}=-20μA	1.9	1.998		V
		V_{CC}=4.5V		4.4	4.498		V
		V_{CC}=6.0V		5.9	5.998		V
		V_{CC}=4.5V, V_{IN}=V_{IH} or V_{IL}, I_{OH}=-4mA		3.98			V
		V_{CC}=6.0V, V_{IN}=V_{IH} or V_{IL}, I_{OH}=-5.2mA		5.48			V
Low-Level Output Voltage	V_{OL}	V_{CC}=2.0V	V_{IN}=V_{IH} or V_{IL}, I_{OH}=20μA		0.002	0.1	V
		V_{CC}=4.5V			0.001	0.1	V
		V_{CC}=6.0V			0.001	0.1	V
		V_{CC}=4.5V, V_{IN}=V_{IH} or V_{IL}, I_{OH}=4mA				0.26	V
		V_{CC}=6.0V, V_{IN}=V_{IH} or V_{IL}, I_{OH}=5.2mA				0.26	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=6.0V, V_{IN}= V_{CC} or GND				±0.1	μA
Quiescent Supply Current	I_{CC}	V_{CC}=6.0V, V_{IN}=V_{CC} or GND, I_{OUT}=0A				8	μA
Input Capacitance	C_I	V_{CC}=2.0~6.0V, V_{IN}=V_{CC} or GND			3	10	pF

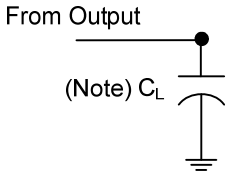
■ SWITCHING CHARACTERISTICS (C_L=50pF, T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (1-7) to output(A0~A2)	t_{PD}	V_{CC}=2.0V		69	180	ns
		V_{CC}=4.5V		23	36	ns
		V_{CC}=6.0V		21	31	ns
Propagation delay from input (0-7) to output(EO)		V_{CC}=2.0V		60	150	ns
		V_{CC}=4.5V		20	30	ns
		V_{CC}=6.0V		17	26	ns
Propagation delay from input (0-7) to output(GS)		V_{CC}=2.0V		75	190	ns
		V_{CC}=4.5V		25	38	ns
		V_{CC}=6.0V		21	32	ns
Propagation delay from input (EI) to output(A0~A2)		V_{CC}=2.0V		78	195	ns
		V_{CC}=4.5V		26	39	ns
		V_{CC}=6.0V		22	33	ns
Propagation delay from input (EI) to output(GS)		V_{CC}=2.0V		57	145	ns
		V_{CC}=4.5V		19	29	ns
		V_{CC}=6.0V		16	25	ns
Propagation delay from input (EI) to output(EO)		V_{CC}=2.0V		66	166	ns
		V_{CC}=4.5V		22	33	ns
		V_{CC}=6.0V		19	28	ns
Propagation delay to output(Any)	t_t	V_{CC}=2.0V		28	75	ns
		V_{CC}=4.5V		8	15	ns
		V_{CC}=6.0V		6	13	ns

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load.		35		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

Note: C_L includes probe and jig capacitance. C_L=50pF

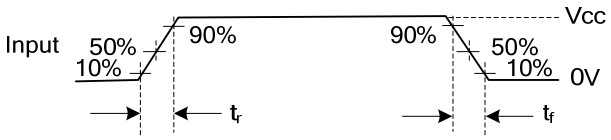


Fig. 1 Input Rise and Fall Times

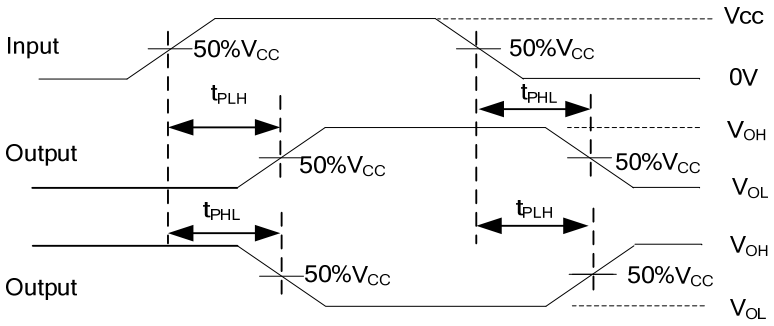


Fig. 2 Load circuitry for switching times.

Notes: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_O = 50Ω.

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