

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

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Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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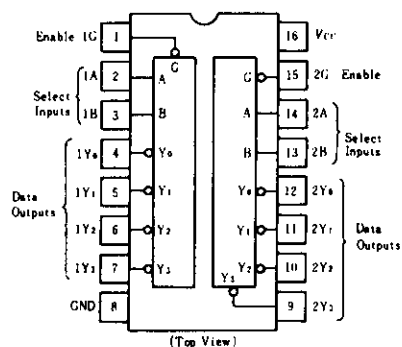
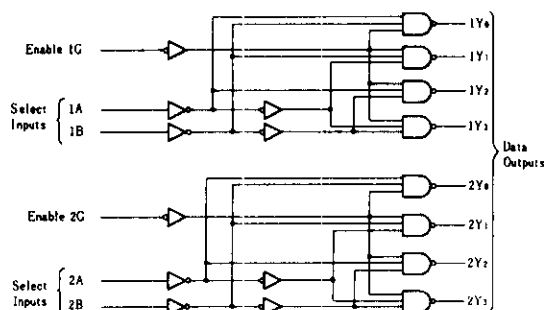
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HD74LS139 • Dual 2-line-to-4-line Decoders/Demultiplexers

The HD74LS139 comprises two individual two-line-to-four-line decoder in a single package. The active-low enable input can be used as a data line in demultiplexing applications.

PIN ARRANGEMENT

BLOCK DIAGRAM



FUNCTION TABLE

Inputs			Outputs			
Enable	Select		Y ₀	Y ₁	Y ₂	Y ₃
G	B	A	Y ₀	Y ₁	Y ₂	Y ₃
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H; high level, L; low level, X; irrelevant

ELECTRICAL CHARACTERISTICS (T_a = -20 ~ +75°C)

Item	Symbol	Test Conditions	min	typ*	max	Unit
Input voltage	V _{IH}		2.0	—	—	V
	V _{IL}		—	—	0.8	V
Output voltage	V _{OH}	V _{CC} =4.75V, V _{IH} =2V, V _{IL} =0.8V, I _{OH} =-400μA	2.7	—	—	V
	V _{OL}	V _{CC} =4.75V, V _{IH} =2V, V _{IL} =0.8V, I _{OL} =4mA	—	—	0.4	V
		I _{OL} =8mA	—	—	0.5	
Input current	I _I	V _{CC} =5.25V, V _I =7V	—	—	0.1	mA
	I _{IH}	V _{CC} =5.25V, V _I =2.7V	—	—	20	μA
	I _{IL}	V _{CC} =5.25V, V _I =0.4V	—	—	-0.4	mA
Short-circuit output current	I _{OS}	V _{CC} =5.25V	-5	—	-42	mA
Supply current	I _{CC}	V _{CC} =5.25V, Outputs enabled and open	—	6.8	11	mA
Input clamp voltage	V _{IK}	V _{CC} =4.75V, I _{IN} =-18mA	—	—	-1.5	V

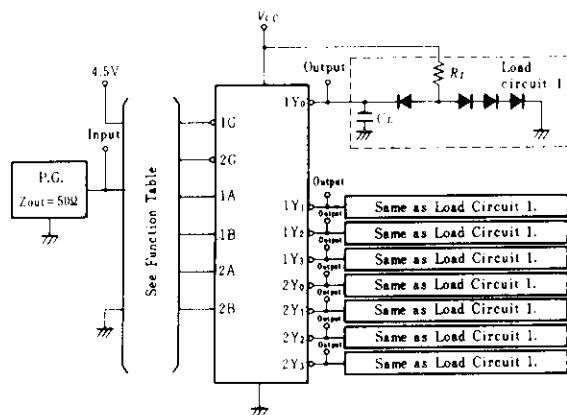
* V_{CC}=5V, T_a=25°C

SWITCHING CHARACTERISTICS (V_{CC}=5V, T_a=25°C)

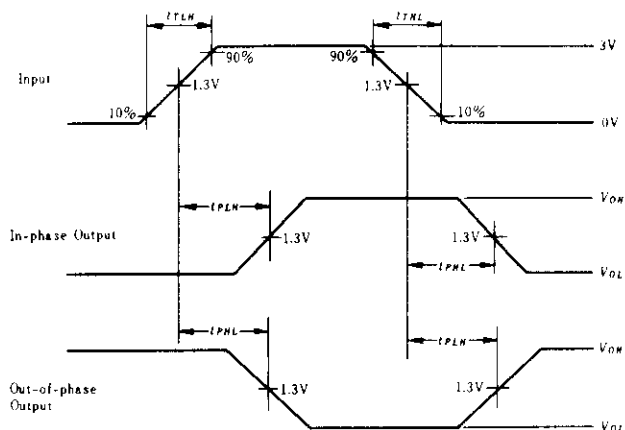
Item	Symbol	Inputs	Outputs	Levels of delay	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	Binary	$1Y_0 \sim 1Y_3$	2	$C_L = 15\text{pF}$ $R_L = 2\text{k}\Omega$	—	13	20	ns
	t_{PHL}	Select				—	22	33	ns
	t_{PLH}	1A, 1B	$2Y_0 \sim 2Y_3$	3		—	18	29	ns
	t_{PHL}	2A, 2B				—	25	38	ns
	t_{PLH}	Enable	$1Y_0 \sim 1Y_3$	2		—	16	24	ns
	t_{PHL}	1G, 2G	$2Y_0 \sim 2Y_3$			—	21	32	ns

■ TESTING METHOD

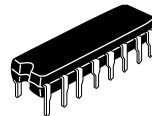
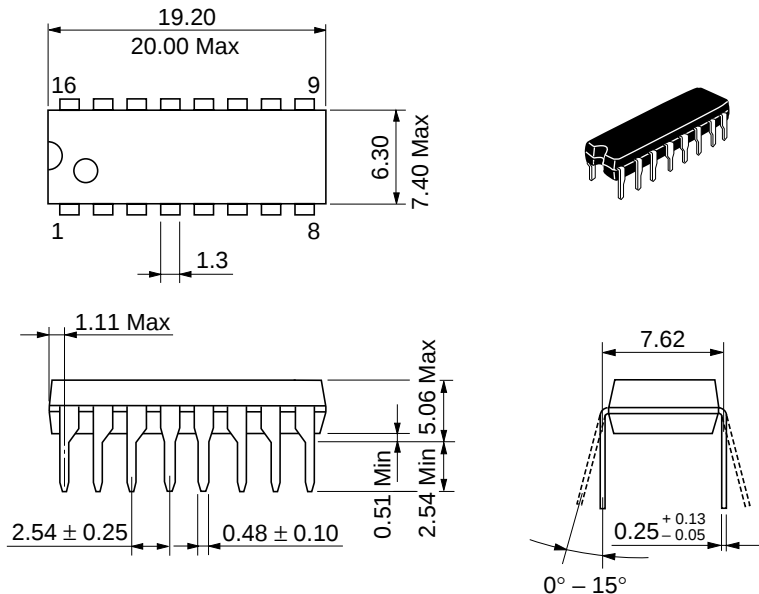
1) Test Circuit



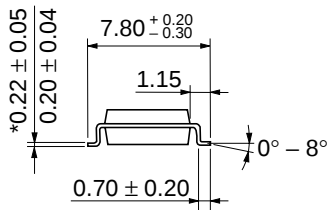
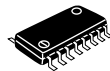
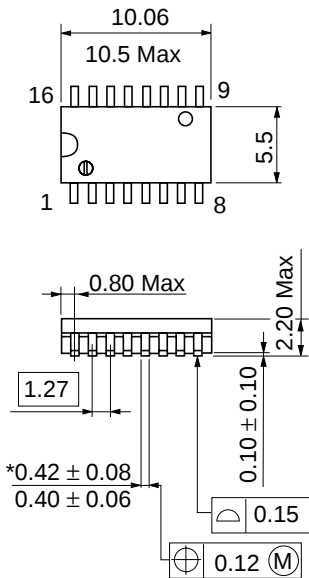
Waveform



- Notes)
1. Input pulse; $t_{TLH} \leq 15\text{ns}$, $t_{THL} \leq 6\text{ns}$, $PRR = 1\text{MHz}$, duty cycle = 50%
 2. C_L includes probe and jig capacitance.
 3. All diodes are 1S2074 (H).

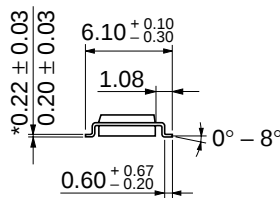
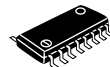
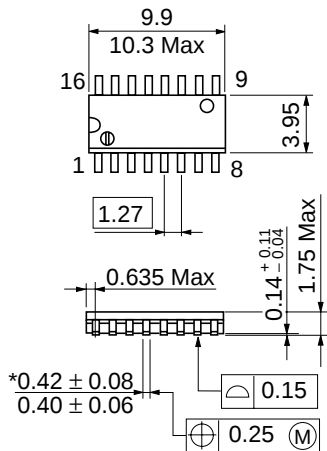


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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