

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# HD74LS153

## Dual 4-Line to 1-Line Data Selectors / Multiplexers

REJ03D0439-0200

Rev.2.00

Feb.18.2005

This data selector / multiplexer contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR-INVERT gates. Separate strobe inputs are provided for each of the two four-line sections.

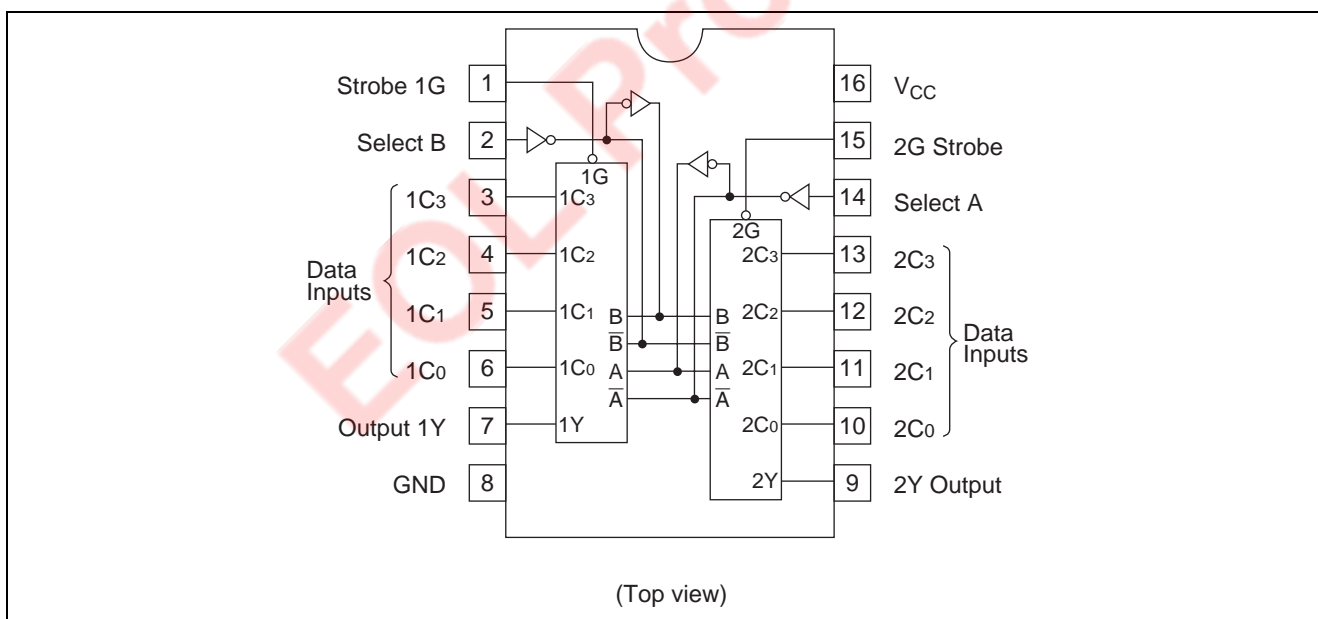
### Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS153P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS153FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)
HD74LS153RPEL	SOP-16 pin (JEDEC)	PRSP0016DG-A (FP-16DNV)	RP	EL (2,500 pcs/reel)

Note: Please consult the sales office for the above package availability.

### Pin Arrangement

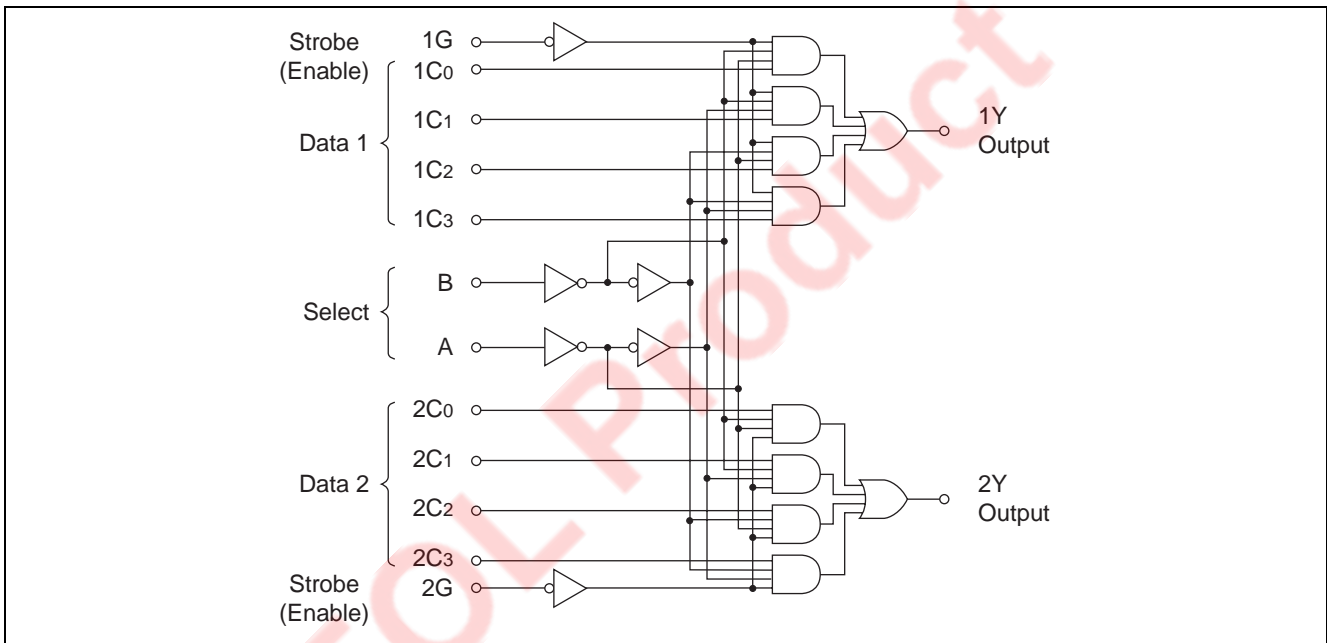


**Function Table**

Select		Inputs				Strobe G	Outputs Y
		Data					
B	A	C0	C1	C2	C3		
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

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

**Block Diagram**



**Absolute Maximum Ratings**

Item	Symbol	Ratings	Unit
Supply voltage	$V_{CC}$	7	V
Input voltage	$V_{IN}$	7	V
Power dissipation	$P_T$	400	mW
Storage temperature	$T_{stg}$	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

**Recommended Operating Conditions**

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.75	5.00	5.25	V
Output current	$I_{OH}$	—	—	-400	μA
	$I_{OL}$	—	—	8	mA
Operating temperature	$T_{opr}$	-20	25	75	°C

## Electrical Characteristics

(Ta = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	V <sub>IH</sub>	2.0	—	—	V	
	V <sub>IL</sub>	—	—	0.8	V	
Output voltage	V <sub>OH</sub>	2.7	—	—	V	V <sub>CC</sub> = 4.75 V, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V, I <sub>OH</sub> = -400 μA
	V <sub>OL</sub>	—	—	0.4	V	V <sub>CC</sub> = 4.75 V, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V
—		—	0.5			
Input current	I <sub>IH</sub>	—	—	20	μA	V <sub>CC</sub> = 5.25 V, V <sub>I</sub> = 2.7 V
	I <sub>IL</sub>	—	—	-0.4	mA	V <sub>CC</sub> = 5.25 V, V <sub>I</sub> = 0.4 V
	I <sub>I</sub>	—	—	0.1	mA	V <sub>CC</sub> = 5.25 V, V <sub>I</sub> = 7 V
Short-circuit output current	I <sub>OS</sub>	-20	—	-100	mA	V <sub>CC</sub> = 5.25 V
Supply current**	I <sub>CC</sub>	—	6.2	10	mA	V <sub>CC</sub> = 5.25 V
Input clamp voltage	V <sub>IK</sub>	—	—	-1.5	V	V <sub>CC</sub> = 4.75 V, I <sub>IN</sub> = -18 mA

Notes: \* V<sub>CC</sub> = 5 V, Ta = 25°C\*\* I<sub>CC</sub> is measured with all outputs open and all inputs grounded.

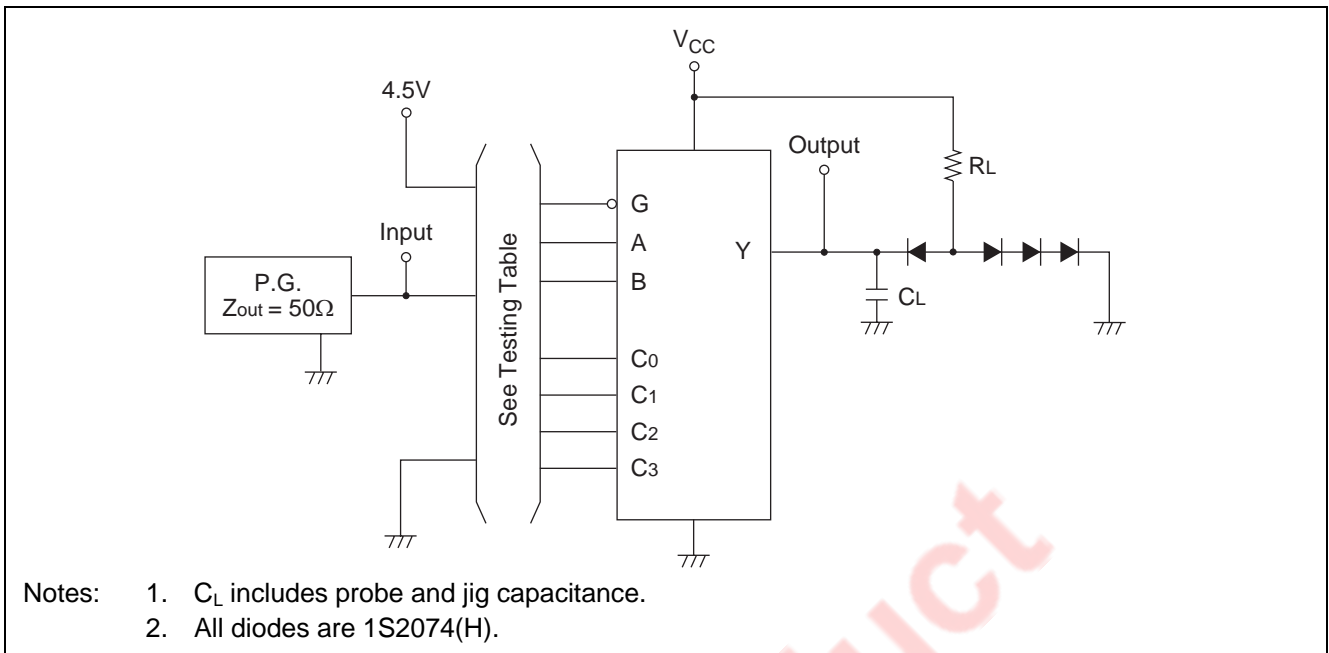
## Switching Characteristics

(V<sub>CC</sub> = 5 V, Ta = 25°C)

Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	t <sub>PLH</sub>	Data	Y	—	10	15	ns	C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2 kΩ
	t <sub>PHL</sub>	Data	Y	—	17	26	ns	
	t <sub>PLH</sub>	Select	Y	—	19	29	ns	
	t <sub>PHL</sub>	Select	Y	—	25	38	ns	
	t <sub>PLH</sub>	Strobe	Y	—	16	24	ns	
	t <sub>PHL</sub>	Strobe	Y	—	21	32	ns	

## Testing Method

### Test Circuit

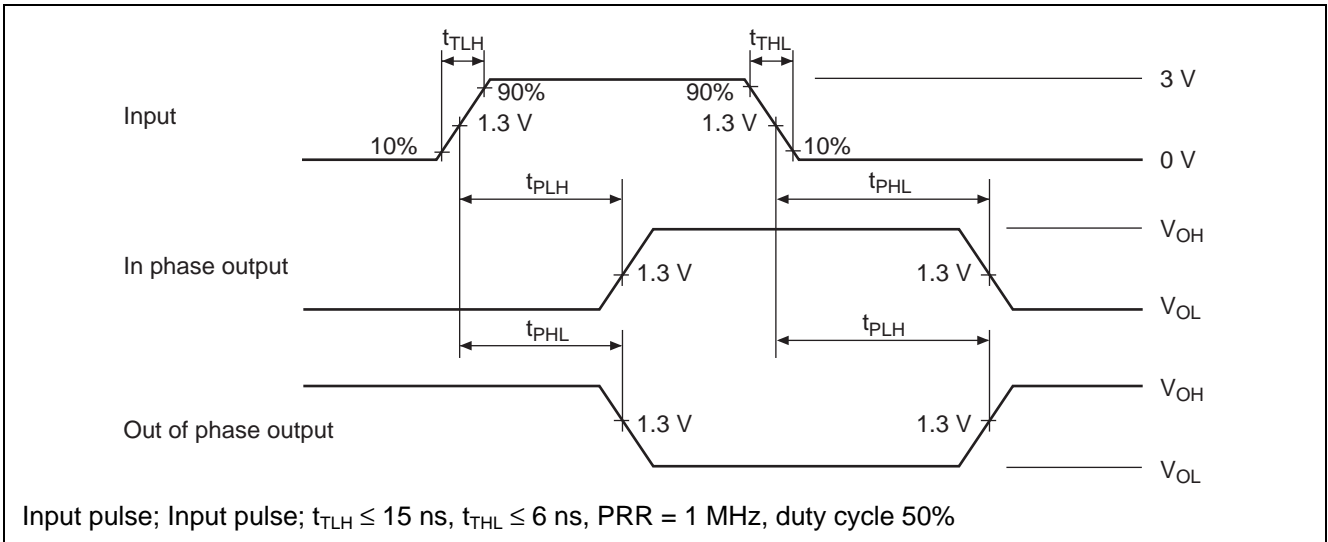


### Testing Table

Item	Inputs							Output Y
	B	A	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	G	
t <sub>PLH</sub> t <sub>PHL</sub>	GND	GND	IN	X	X	X	GND	OUT
	GND	4.5 V	X	IN	X	X	GND	OUT
	4.5 V	GND	X	X	IN	X	GND	OUT
	4.5 V	4.5 V	X	X	X	IN	GND	OUT
	GND	IN	GND	4.5 V	X	X	GND	OUT
			4.5 V	GND				
	IN	GND	GND	X	4.5 V	X	GND	OUT
			4.5 V		GND			
GND	GND	4.5 V	X	X	X	IN	OUT	

X : "4.5 V" or "GND"

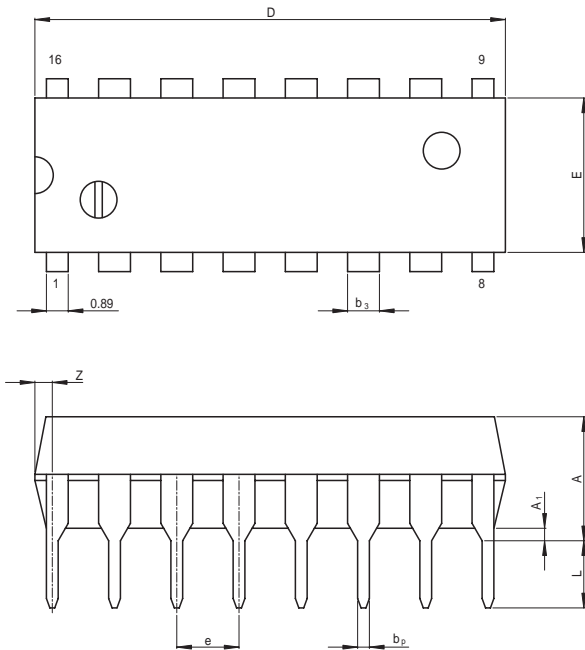
Waveform



EOL Product

Package Dimensions

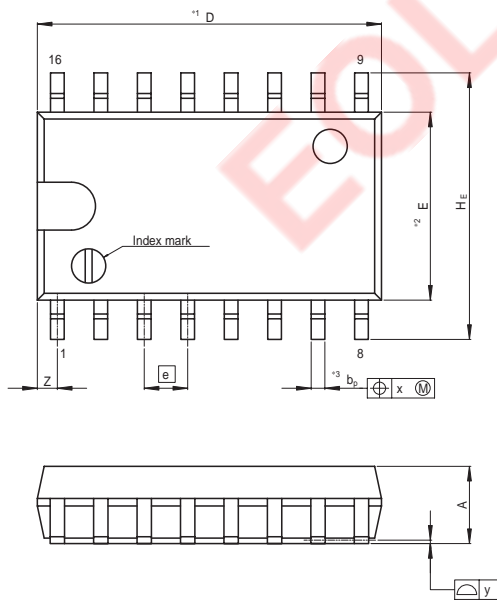
JEITA Package Code P-DIP16-6.3x19.2-2.54	RENESAS Code PRDP0016AE-B	Previous Code DP-16FV	MASS[Typ.] 1.05g
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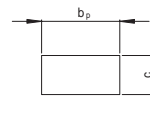
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e <sub>1</sub>	—	7.62	—
D	—	19.2	20.32
E	—	6.3	7.4
A	—	—	5.06
A <sub>1</sub>	0.51	—	—
b <sub>p</sub>	0.40	0.48	0.56
b <sub>3</sub>	—	1.30	—
c	0.19	0.25	0.31
θ	0°	—	15°
e	2.29	2.54	2.79
Z	—	—	1.12
L	2.54	—	—

( Ni/Pd/Au plating )

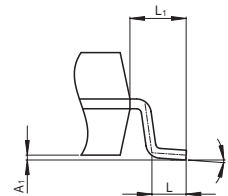
JEITA Package Code P-SOP16-5.5x10.06-1.27	RENESAS Code PRSP0016DH-B	Previous Code FP-16DAV	MASS[Typ.] 0.24g
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NOTE)  
1. DIMENSIONS\*1 (Nom)\*AND\*2\*  
DO NOT INCLUDE MOLD FLASH.  
2. DIMENSION\*3\*DOES NOT  
INCLUDE TRIM OFFSET.



Terminal cross section  
( Ni/Pd/Au plating )



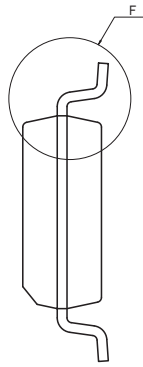
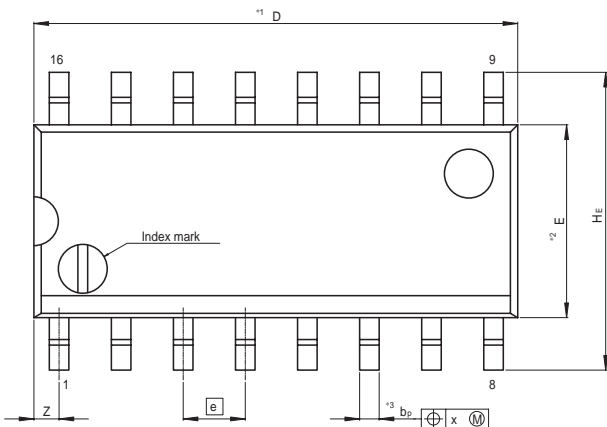
Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	10.06	10.5
E	—	5.50	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.00	0.10	0.20
A	—	—	2.20
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
θ	0°	—	8°
H <sub>E</sub>	7.50	7.80	8.00
e	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	0.80
L	0.50	0.70	0.90
L <sub>1</sub>	—	1.15	—

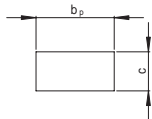


# HD74LS153

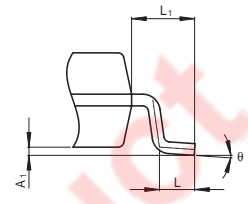
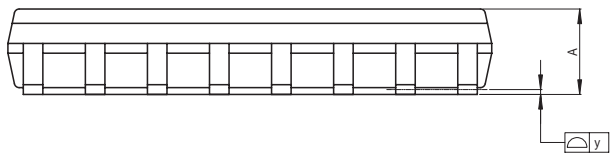
JEITA Package Code P-SOP16-3.95x9.9-1.27	RENESAS Code PRSP0016DG-A	Previous Code FP-16DNV	MASS[Typ.] 0.15g
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NOTE)  
1. DIMENSIONS \*1 (Nom) \*AND\* 2\*  
DO NOT INCLUDE MOLD FLASH.  
2. DIMENSION \*3\* DOES NOT  
INCLUDE TRIM OFFSET.



Terminal cross section  
( Ni/Pd/Au plating )



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	9.90	10.30
E	—	3.95	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.10	0.14	0.25
A	—	—	1.75
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
$\theta$	0°	—	8°
H <sub>E</sub>	5.80	6.10	6.20
e	—	1.27	—
x	—	—	0.25
y	—	—	0.15
Z	—	—	0.635
L	0.40	0.60	1.27
L <sub>1</sub>	—	1.08	—

EOL Product

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