

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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# HD74SSTV16842

## 11-bit to 22-bit Buffer with SSTL\_2 Inputs and Outputs

REJ03D0829-0200  
 (Previous: ADE-205-602A)  
 Rev.2.00  
 Apr 07, 2006

### Description

The HD74SSTV16842 is a 11-bit to 22-bit buffer designed for 2.3 V to 2.7 V Vcc operation and SSTL\_2 data (A) inputs.

### Features

- Supports SSTL\_2 data inputs
- Flow through architecture optimizes PCB layout
- Ordering Information

Part Name	Package Type	Package Code (Previous code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74SSTV16842TEL	TSSOP-64 pin	PTSP0064KA-A (TTP-64DV)	T	EL (1,000 pcs / Reel)

### Function Table

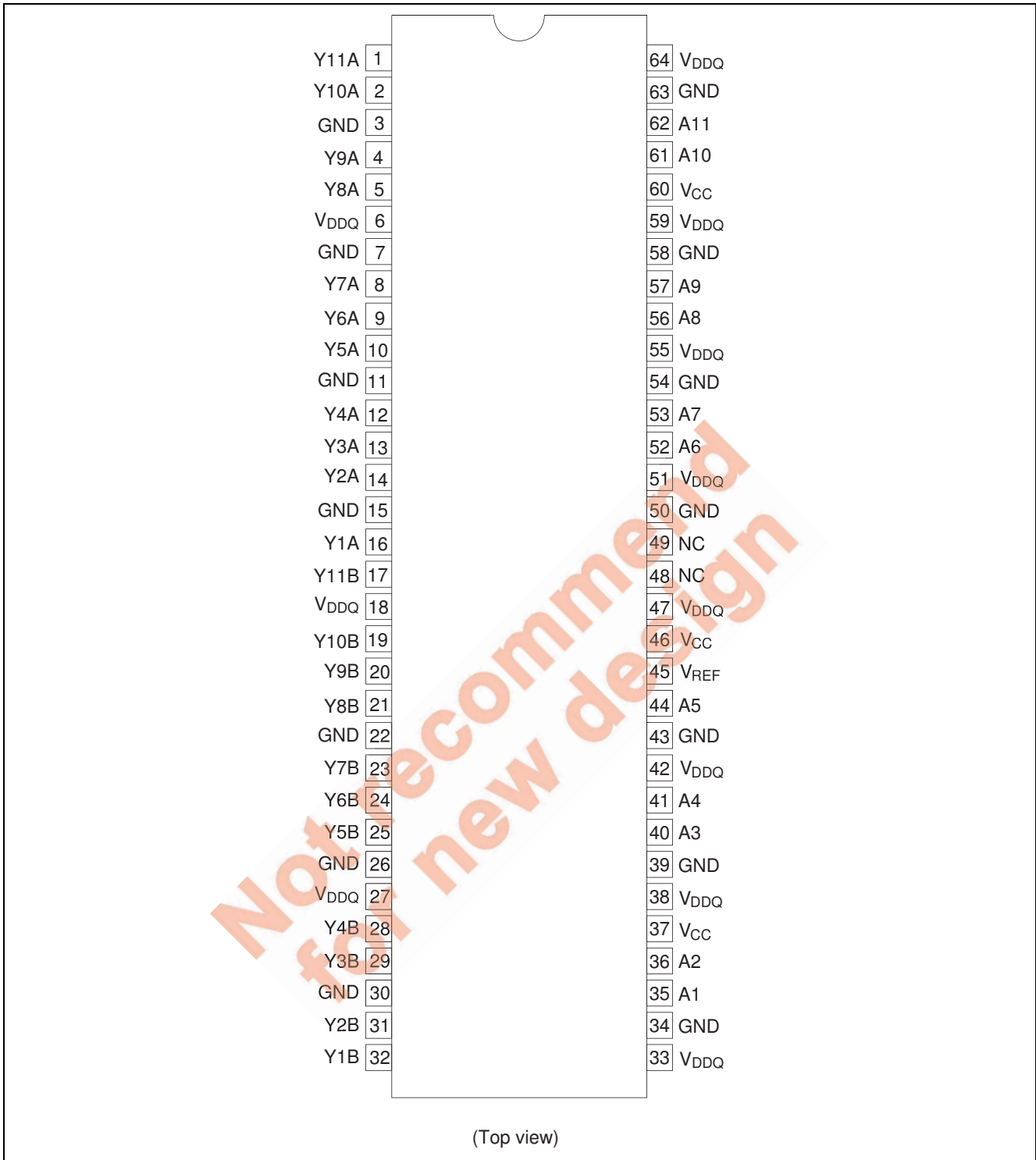
Input A	Output Y
L	L
H	H

H : High level

L : Low level

Not recommended for new design

Pin Arrangement



### Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	$V_{CC}$ or $V_{DDQ}$	-0.5 to 3.6	V	
Input voltage <sup>*1</sup>	$V_I$	-0.5 to $V_{DDQ}+0.5$	V	
Output voltage <sup>*1,2</sup>	$V_O$	-0.5 to $V_{DDQ}+0.5$	V	
Input clamp current	$I_{IK}$	$\pm 50$	mA	$V_I < 0$ or $V_I > V_{CC}$
Output clamp current	$I_{OK}$	$\pm 50$	mA	$V_O < 0$ or $V_O > V_{DDQ}$
Continuous output current	$I_O$	$\pm 50$	mA	$V_O = 0$ to $V_{DDQ}$
$V_{CC}$ , $V_{DDQ}$ or GND current / pin	$I_{CC}$ , $I_{DDQ}$ or $I_{GND}$	$\pm 100$	mA	
Maximum power dissipation at $T_a = 55^\circ\text{C}$ (in still air)	$P_T$	1	W	TSSOP
Storage temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$	

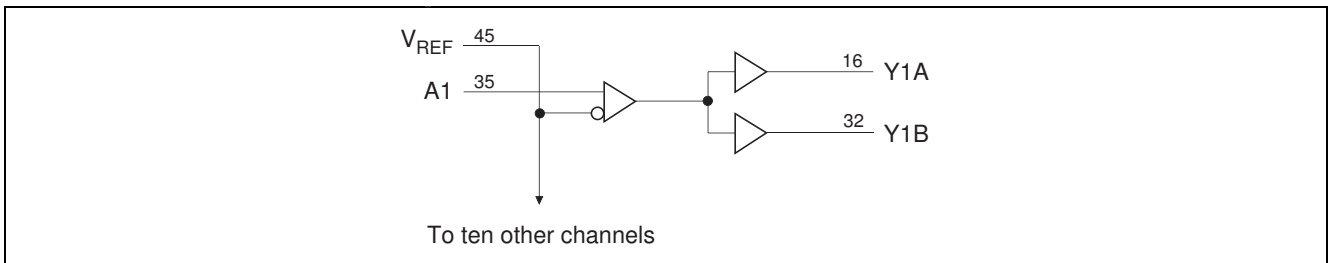
Notes: Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

1. The input and output negative voltage ratings may be exceeded if the input and output clamp current ratings are observed.
2. This current will flow only when the output is in the high state and  $V_O > V_{DDQ}$ .

### Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit	Conditions
Supply voltage	$V_{CC}$	$V_{DDQ}$	2.5	2.7	V	
Output supply voltage	$V_{DDQ}$	2.3	2.5	2.7	V	
Reference voltage	$V_{REF}$	1.15	1.25	1.35	V	$V_{REF} = 0.5 \times V_{DDQ}$
Termination voltage	$V_{TT}$	$V_{REF}-40$ mV	$V_{REF}$	$V_{REF}+40$ mV	V	
Input voltage	$V_I$	0	—	$V_{CC}$	V	
AC high level input voltage	$V_{IH}$	$V_{REF}+310$ mV	—	—	V	A
AC low level input voltage	$V_{IL}$	—	—	$V_{REF}-310$ mV	V	A
DC high level input voltage	$V_{IH}$	$V_{REF}+150$ mV	—	—	V	A
DC low level input voltage	$V_{IL}$	—	—	$V_{REF}-150$ mV	V	A
High level output current	$I_{OH}$	—	—	-20	mA	
Low level output current	$I_{OL}$	—	—	20	mA	
Input transition rise or fall time	$\Delta t / \Delta V$	—	—	10	ns/V	
Operating temperature	$T_a$	0	—	70	$^\circ\text{C}$	

### Logic Diagram



**Electrical Characteristics**

Item	Symbol	V <sub>CC</sub> (V)	Min	Typ	Max	Unit	Test Conditions	
Input diode voltage	V <sub>IK</sub>	2.3	—	—	-1.2	V	I <sub>IN</sub> = -18 mA	
Output voltage	V <sub>OH</sub>	2.3 to 2.7	V <sub>CC</sub> -0.2	—	—	V	I <sub>OH</sub> = -100 μA	
		2.3	1.95	—	V <sub>DDQ</sub>		I <sub>OH</sub> = -16 mA	
	V <sub>OL</sub>	2.3 to 2.7	—	—	0.2		I <sub>OL</sub> = 100 μA	
		2.3	0	—	0.35		I <sub>OL</sub> = 16 mA	
Input current (All inputs)	I <sub>IN</sub>	2.7	—	—	±5	μA	V <sub>IN</sub> = 2.7 V or 0	
Quiescent supply current	I <sub>CC</sub> <sup>*2</sup>	2.7	—	—	45	mA	V <sub>IN</sub> = V <sub>IH(AC)</sub> or V <sub>IL(AC)</sub> , I <sub>O</sub> = 0	
Dynamic operating per each data input	I <sub>CCD</sub> <sup>*2</sup>	2.7	—	—	20	μA/ data input	V <sub>I</sub> = V <sub>IH(AC)</sub> or V <sub>IL(AC)</sub> , One data input switching at 50% duty cycle.	
Output high <sup>*3</sup>	r <sub>OH</sub>	2.3 to 2.7	7	—	20	Ω	I <sub>OH</sub> = -20 mA	
Output low <sup>*3</sup>	r <sub>OL</sub>	2.3 to 2.7	7	—	20	Ω	I <sub>OL</sub> = 20 mA	
r <sub>OH</sub> - r <sub>OL</sub>   each separate bit <sup>*3</sup>	r <sub>O(Δ)</sub>	2.5	—	—	4	Ω	I <sub>O</sub> = 20 mA, Ta = 25°C	
Input capacitance	Data inputs	C <sub>IN</sub>	2.5 <sup>*1</sup>	2.5	—	3.5	pF	V <sub>I</sub> = V <sub>REF</sub> ± 310 mV

Notes: 1. All typical values are at V<sub>CC</sub> = 2.5 V, Ta = 25°C.

2. Total I<sub>CC</sub> (max) = I<sub>CC</sub> + {I<sub>CCD</sub> (Data) × 11}

3. This is effective in the case that it did terminate by resistance.

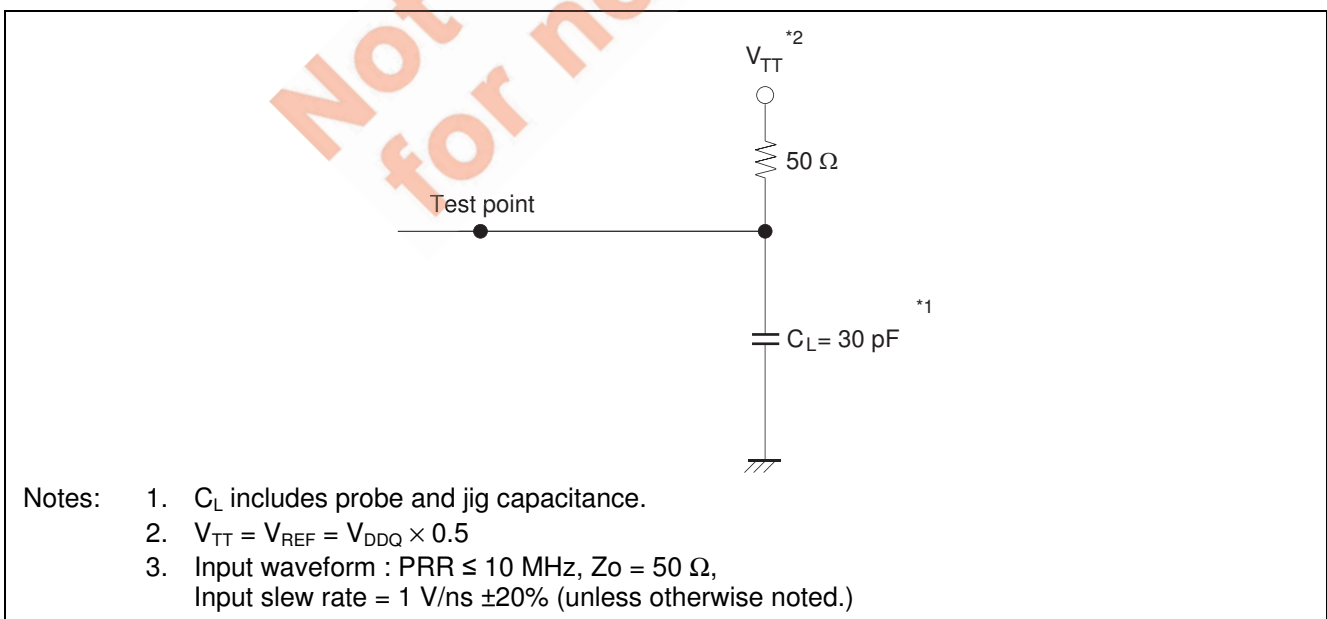
**Switching Characteristics**

V<sub>CC</sub> = 1.8 ± 0.15 V

Item	Symbol	V <sub>CC</sub> = 2.5 ± 0.2 V			Unit	FROM (Input)	TO (Output)
		Min	Typ	Max			
Propagation delay time <sup>*1</sup>	t <sub>PLH</sub> t <sub>PHL</sub>	1.6	—	2.8	ns	A	Y

Note: 1. This timing relationship is specified into test load (see waveforms - 1) with all of the outputs switching.

**Test Circuit**

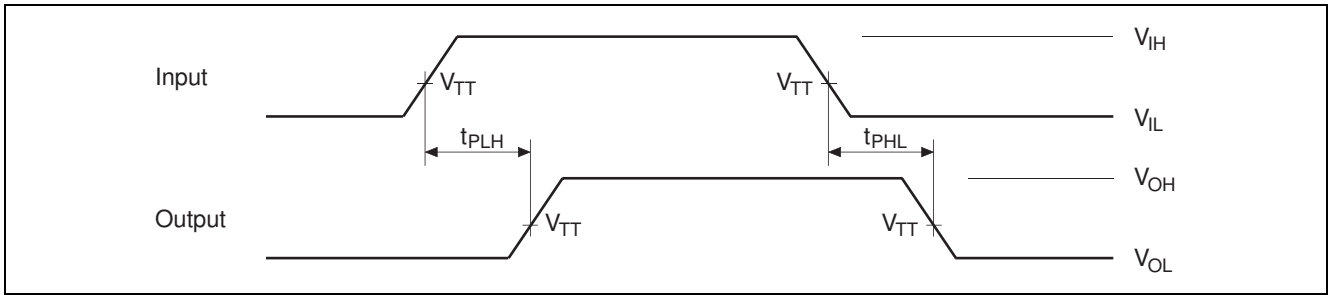


Notes: 1. C<sub>L</sub> includes probe and jig capacitance.

2. V<sub>TT</sub> = V<sub>REF</sub> = V<sub>DDQ</sub> × 0.5

3. Input waveform : PRR ≤ 10 MHz, Z<sub>o</sub> = 50 Ω,  
Input slew rate = 1 V/ns ± 20% (unless otherwise noted.)

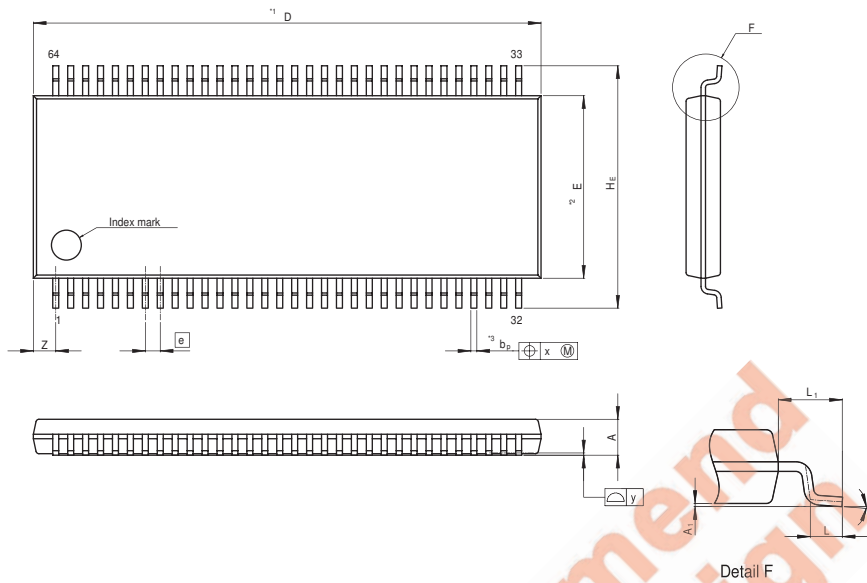
Waveforms



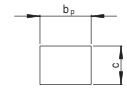
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Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TSSOP64-6.1x17-0.50	PTSP0064KA-A	TTP-64DV	0.47g



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 )

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	17.0	17.2
E	—	6.10	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.00	0.05	0.10
A	—	—	1.20
b <sub>P</sub>	0.15	0.20	0.25
b <sub>1</sub>	—	—	—
c	0.10	0.15	0.20
c <sub>1</sub>	—	—	—
θ	0°	—	8°
H <sub>E</sub>	7.90	8.10	8.30
Ⓢ	—	0.50	—
x	—	—	0.08
y	—	—	0.08
Z	—	—	0.90
L	0.4	0.5	0.6
L <sub>1</sub>	—	1.0	—

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