

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

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

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# RD74HV8T06

## High-Voltage 8-bit Inverter Buffer (with Open Drain Outputs)

REJ03D0900-0200  
Rev.2.00  
Mar 23, 2009

### Description

The RD74HV8T06 has eight Inverter (with open drain outputs) in a 20 pin package. The voltage of maximum 30 V can be impressed to the drain-source voltage. Supports the wide power supply voltage and can use it for the other use as a general-purpose driver.

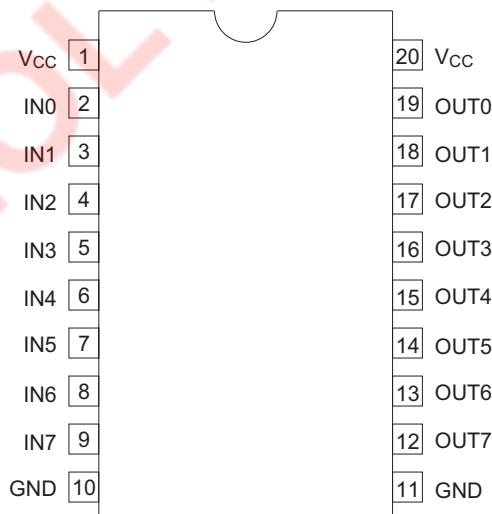
### Features

- Wide supply voltage range : 4.5 to 30 V
- Output voltage :  $V_{DS}$  (Max.) = 30 V
- Operating temperature range : -40 to +85°C
- All inputs  $V_{IH}$  (Min.) = 2.4 V,  $V_{IL}$  (Max.) = 0.8 V (@ $V_{CC}$  = 10 V to 30 V)
- Output current :  $I_O$  short (Typ.) = 70 mA (@ $V_{CC}$  = 15 V)
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Packing Abbreviation (Quantity)	Surface Treatment
RD74HV8T06FPH0	SOP-20 pin (JEITA)	PRSP0020DD-B (FP-20DAV)	FP	H (2,000 pcs/reel)	0 (Ni/Pd/Au)
RD74HV8T06TH0	TSSOP-20 pin	PTSP0020JB-A (TTP-20DAV)	T	H (2,000 pcs/reel)	0 (Ni/Pd/Au)

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

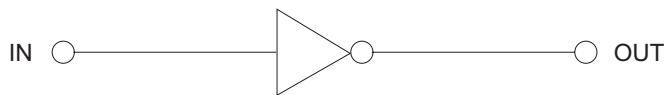
### Pin Arrangement



(Top view)

These products designed for general and industrial use.  
It is not supported for special quality or reliability demanded use such as automotive or life support or something like that.

## Logic Diagram



## Function Table

Input	Output
H	L
L	H

H : High level

L : Low level

## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	$V_{CC}$	0 to 30	V	
Input voltage range <sup>*1</sup>	$V_I$	-0.5 to $V_{CC} + 0.5$	V	
Output voltage range <sup>*1, 2</sup>	$V_O$	-0.5 to 30	V	
Input clamp current	$I_{IK}$	$\pm 50$	mA	$V_I < 0$ or $V_I > V_{CC}$
Output clamp current	$I_{OK}$	-75	mA	$V_O < 0$
Continuous output current	$I_O$	100	mA	Output : L
Continuous current through $V_{CC}$ or GND	$I_{CC}$ or $I_{GND}$	$\pm 100$	mA	
Maximum power dissipation at $T_a = 25^\circ C$ (in still air) <sup>*3</sup>	$P_T$	835	mW	SOP
		757		TSSOP
Storage temperature	$T_{STG}$	-65 to 150	°C	

Notes: The absolute maximum ratings are values which must not individually be exceeded, and furthermore no two of which may be realized at the same time.

1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. This value is limited to 30 V maximum.
3. The maximum package power dissipation was calculated using a junction temperature of 150°C.

## Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Conditions
Supply voltage range	$V_{CC}$	4.5	30	V	
Input voltage range	$V_I$	0	$V_{CC}$	V	
Output voltage range	$V_O$	0	30	V	
Output current	$I_{OL}$	—	2.5	mA	$V_{CC} = 10 V$
		—	5		$V_{CC} = 15 V$
		—	10		$V_{CC} = 25 V$
		—	15		$V_{CC} = 30 V$
Input transition rise or fall rate	$\Delta t / \Delta v$	0	100	ns / V	$V_{CC} < 5 V$
		0	20		$15 V > V_{CC} \geq 5 V$
		0	10		$30 V \geq V_{CC} \geq 15 V$
Operating free-air temperature	$T_a$	-40	85	°C	

Note: Unused or floating inputs must be held high or low.

## Electrical Characteristics

(Ta = -40 to 85°C)

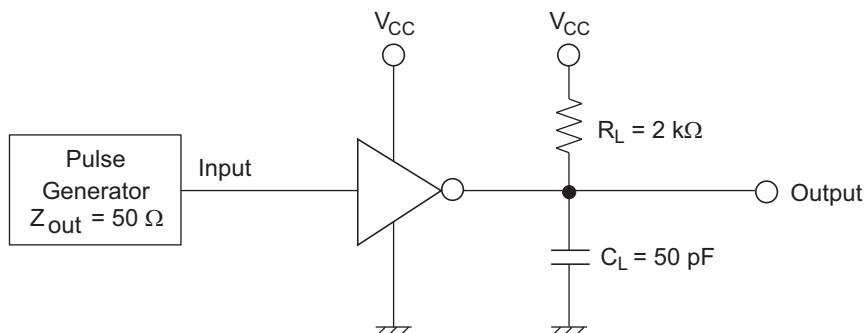
Item	Symbol	V <sub>cc</sub> (V) *	Min	Typ	Max	Unit	Test condition
Input voltage	V <sub>IH</sub>	10	2.4	—	—	V	
		15	2.4	—	—		
		25	2.4	—	—		
		30	2.4	—	—		
	V <sub>IL</sub>	10	—	—	0.8		
		15	—	—	0.8		
		25	—	—	0.8		
		30	—	—	0.8		
Output voltage	V <sub>OL</sub>	10	—	—	1.0	V	I <sub>OL</sub> = 2.5 mA
		15	—	—	1.0		I <sub>OL</sub> = 5 mA
		25	—	—	1.5		I <sub>OL</sub> = 10 mA
		30	—	—	2.0		I <sub>OL</sub> = 15 mA
Output current	I <sub>OL</sub> short	15	46	70	95	mA	V <sub>O</sub> = V <sub>cc</sub>
Input current	I <sub>IN</sub>	V <sub>cc</sub>	—	—	±1	μA	V <sub>IN</sub> = V <sub>cc</sub> or GND
Output off state leak current	I <sub>DS</sub>	30	—	—	2.0	μA	V <sub>DS</sub> = 30 V
Quiescent supply current	I <sub>CC</sub>	10	—	—	0.5	μA	V <sub>IN</sub> = V <sub>cc</sub> or GND
		15	—	—	1.0		
		25	—	—	2.0		
		30	—	—	2.0		
Supply current	I <sub>SUPP</sub>	10	—	—	1	mA	V <sub>CC</sub> = 10 V , V <sub>IN</sub> = 3.0 V
		30	—	—	2.0		V <sub>CC</sub> = 30 V , V <sub>IN</sub> = 3.0 V
Input capacitance	C <sub>IN</sub>	V <sub>cc</sub>	—	2.5	—	pF	V <sub>IN</sub> = V <sub>cc</sub> or GND

Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

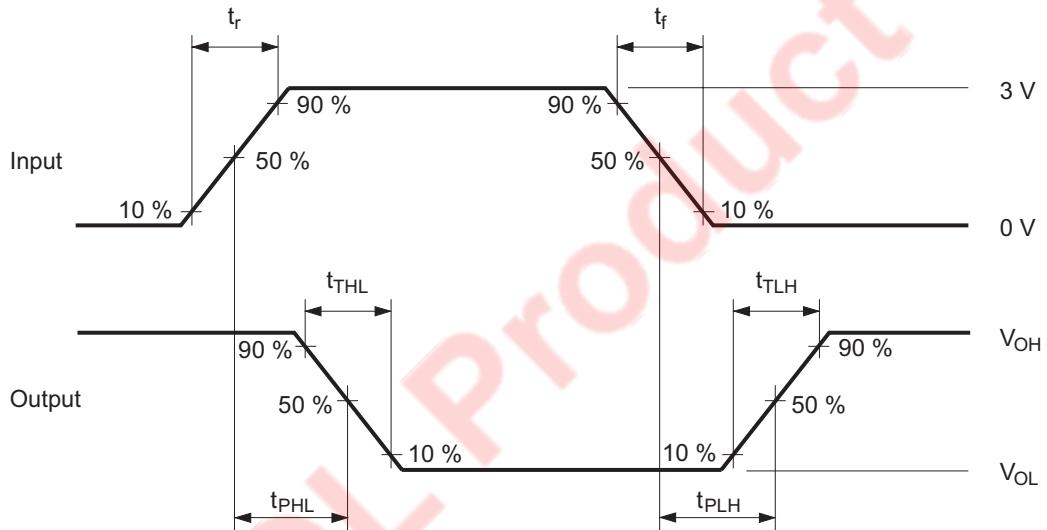
## Switching Characteristics

(C<sub>L</sub> = 50 pF, t<sub>r</sub> = t<sub>f</sub> = 5 ns)

Item	Symbol	V <sub>cc</sub> (V)	Ta = -40 to 85°C			Unit	FROM (Input)	TO (Output)
			Min	Typ	Max			
Propagation delay time	t <sub>PLH</sub>	10	15	—	200	ns	IN	OUT
		15	15	—	200			
		20	10	—	160			
		25	10	—	160			
		30	10	—	160			
	t <sub>PHL</sub>	10	10	—	60	ns	IN	OUT
		15	10	—	60			
		20	10	—	60			
		25	10	—	60			
		30	10	—	60			
Output rise / fall time	t <sub>TLH</sub>	10	—	—	300	ns	IN	OUT
		15	—	—	300			
		20	—	—	300			
		25	—	—	300			
		30	—	—	300			
	t <sub>THL</sub>	10	2	—	30	ns	IN	OUT
		15	2	—	30			
		20	2	—	30			
		25	2	—	30			
		30	2	—	30			

**Test Circuit**

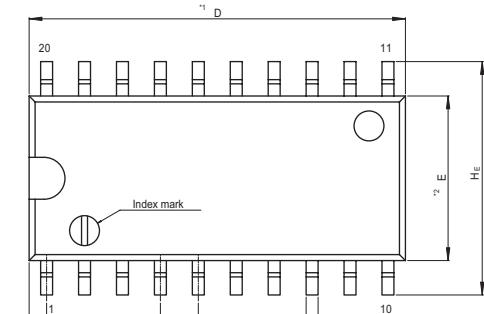
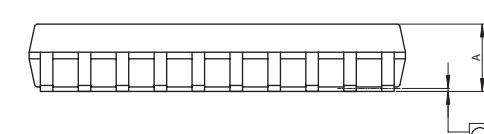
Note:  $C_L$  includes probe and jig capacitance.

**Waveforms**

Note: Input waveform : PRR = 1 MHz, duty cycle 50 %,  $t_r \leq 5 \text{ ns}$ ,  $t_f \leq 5 \text{ ns}$

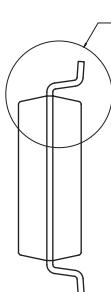
## Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-5.5x12.6-1.27	PRSP0020DD-B	FP-20DAV	0.31g

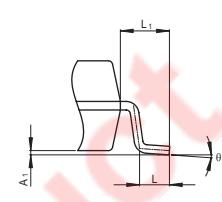



**NOTE)**  
1. DIMENSIONS\*\*1 (Nom)"AND"\*\*2  
DO NOT INCLUDE MOLD FLASH.  
2. DIMENSION\*\*3 DOES NOT  
INCLUDE TRIM OFFSET.

Terminal cross section  
( Ni/Pd/Au plating )

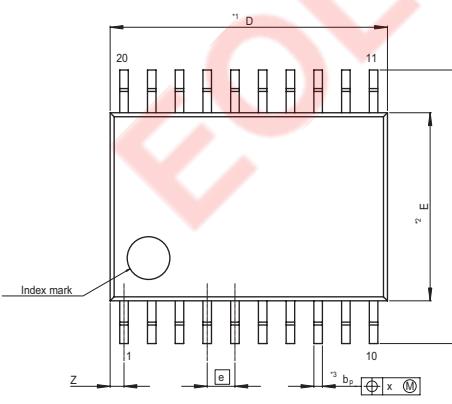


Detail F



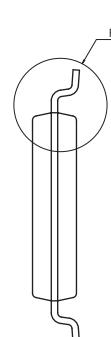
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	12.60	13.0
E	—	5.50	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.00	0.10	0.20
A	—	—	2.20
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
C <sub>1</sub>	—	—	—
θ	0°	—	8°
H <sub>E</sub>	7.50	7.80	8.00
[E]	—	1.27	—
x	—	—	0.12
y	—	—	0.15
z	—	—	0.80
L	0.50	0.70	0.90
L <sub>1</sub>	—	1.15	—

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TSSOP20-4.4x6.5-0.65	PTSP0020JB-A	TTP-20DAV	0.07g

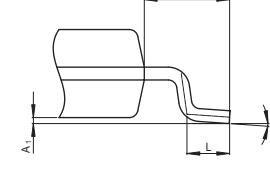



**NOTE)**  
1. DIMENSIONS\*\*1 (Nom)"AND"\*\*2  
DO NOT INCLUDE MOLD FLASH.  
2. DIMENSION\*\*3 DOES NOT  
INCLUDE TRIM OFFSET.

Terminal cross section  
( Ni/Pd/Au plating )



Detail F



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	6.50	6.80
E	—	4.40	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.03	0.07	0.10
A	—	—	1.10
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>	6.20	6.40	6.60
[E]	—	0.65	—
x	—	—	0.13
y	—	—	0.10
z	—	—	0.65
L	0.4	0.5	0.6
L <sub>1</sub>	—	1.0	—

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