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.

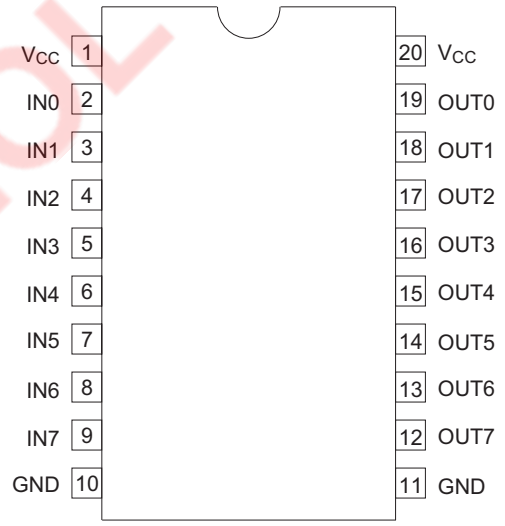
Features

- 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.

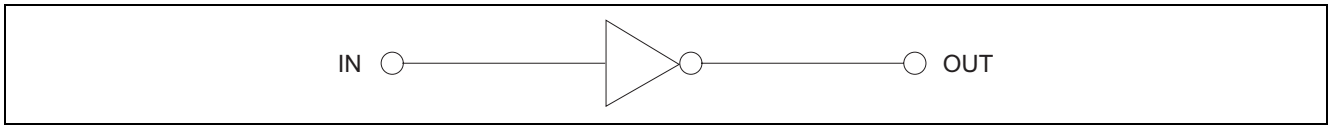
Pin Arrangement



(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 [*1]	V_I	–0.5 to V_{CC} + 0.5	V	
Output voltage range [*1, 2]	V_O	–0.5 to 30	V	
Input clamp current	I_{IK}	±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}	±100	mA	
Maximum power dissipation at Ta = 25°C (in still air) [*3]	P_T	835	mW	SOP
		757		TSSOP
Storage temperature	Tstg	–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	Δt / Δv	0	100	ns / V	V_{CC} < 5 V
		0	20		15 V > V_{CC} ≥ 5 V
		0	10		30 V ≥ V_{CC} ≥ 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_{CC} (V) *	Min	Typ	Max	Unit	Test condition
Input voltage	V_{IH}	10	2.4	—	—	V	
		15	2.4	—	—		
		25	2.4	—	—		
		30	2.4	—	—		
	V_{IL}	10	—	—	0.8		
		15	—	—	0.8		
		25	—	—	0.8		
		30	—	—	0.8		
Output voltage	V_{OL}	10	—	—	1.0	V	I_{OL} = 2.5 mA
		15	—	—	1.0		I_{OL} = 5 mA
		25	—	—	1.5		I_{OL} = 10 mA
		30	—	—	2.0		I_{OL} = 15 mA
Output current	I_{OL} short	15	46	70	95	mA	V_O = V_{CC}
Input current	I_{IN}	V_{CC}	—	—	±1	µA	V_{IN} = V_{CC} or GND
Output off state leak current	I_{DS}	30	—	—	2.0	µA	V_{DS} = 30 V
Quiescent supply current	I_{CC}	10	—	—	0.5	µA	V_{IN} = V_{CC} or GND
		15	—	—	1.0		
		25	—	—	2.0		
		30	—	—	2.0		
Supply current	I_{SUPP}	10	—	—	1	mA	V_{CC} = 10 V , VIN = 3.0 V
		30	—	—	2.0		V_{CC} = 30 V , VIN = 3.0 V
Input capacitance	C_{IN}	V_{CC}	—	2.5	—	pF	V_{IN} = V_{CC} or GND

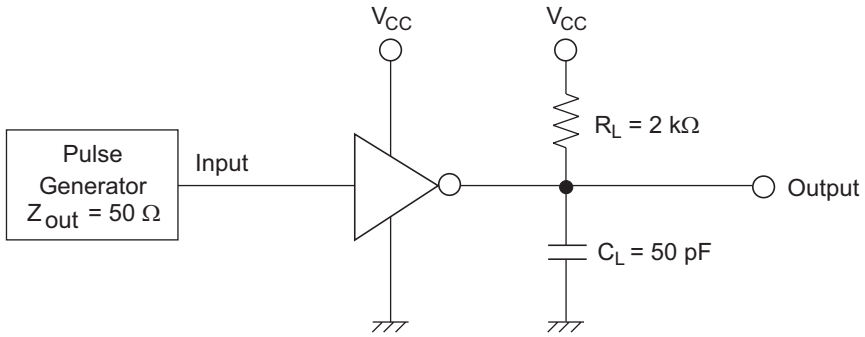
Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

Switching Characteristics

(C_L = 50 pF, t_r = t_f = 5 ns)

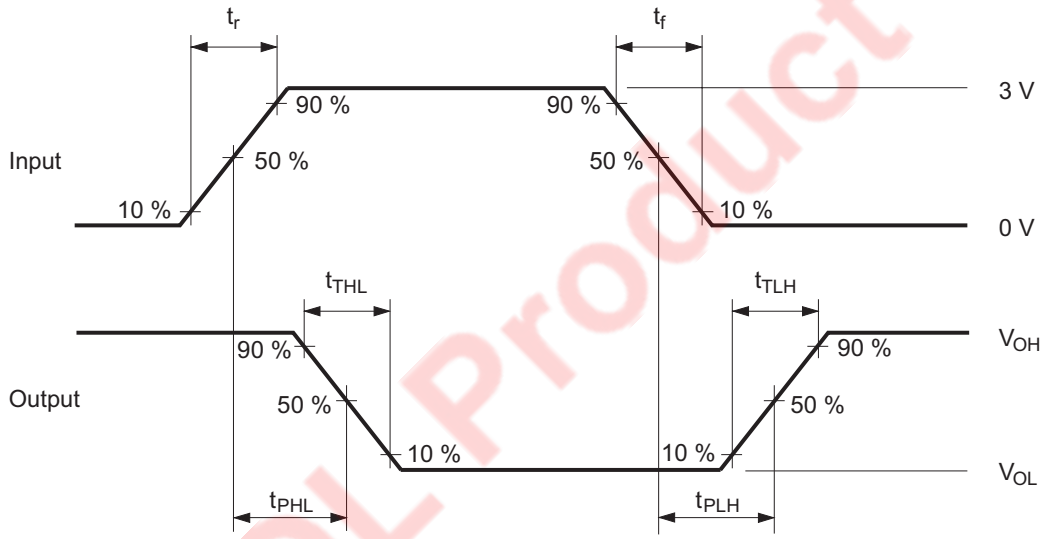
Item	Symbol	Vcc (V)	Ta = –40 to 85°C			Unit	FROM (Input)	TO (Output)
			Min	Typ	Max			
Propagation delay time	t_{PLH}	10	15	—	200	ns	IN	OUT
		15	15	—	200			
		20	10	—	160			
		25	10	—	160			
		30	10	—	160			
	t_{PHL}	10	10	—	60	ns	IN	OUT
		15	10	—	60			
		20	10	—	60			
		25	10	—	60			
		30	10	—	60			
Output rise / fall time	t_{TLH}	10	—	—	300	ns	IN	OUT
		15	—	—	300			
		20	—	—	300			
		25	—	—	300			
		30	—	—	300			
	t_{THL}	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.

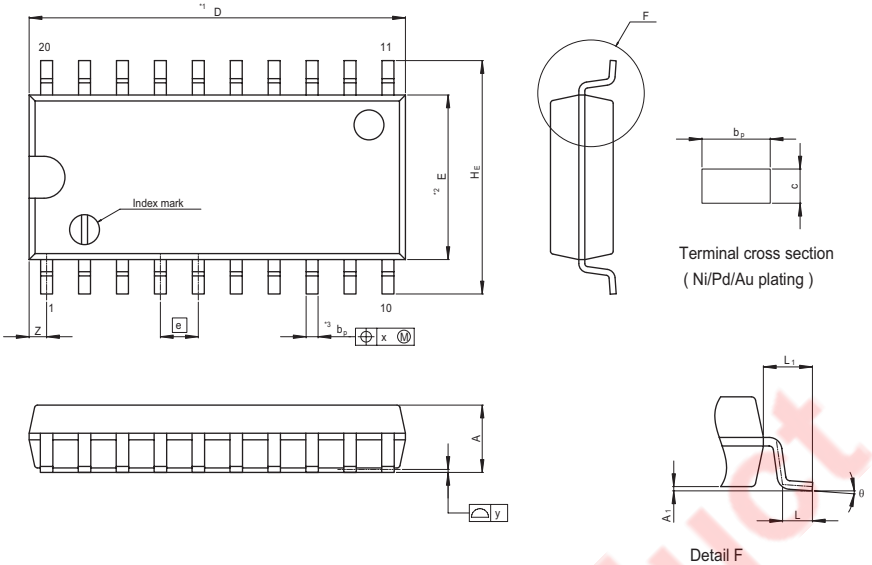
Waveforms



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

Package Dimensions

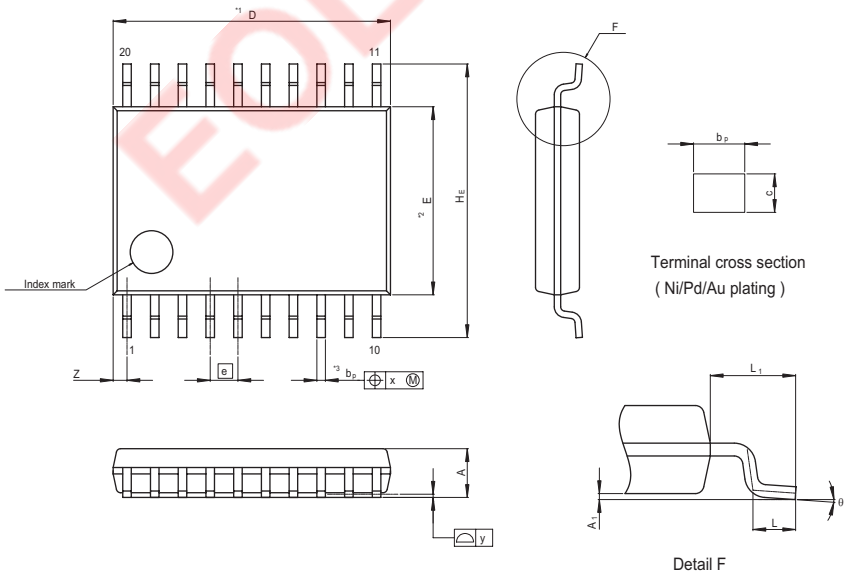
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-5.5x12.6-1.27	PRSP0020DD-B	FP-20DAV	0.31g



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

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	12.60	13.0
E	—	5.50	—
A_2	—	—	—
A_1	0.00	0.10	0.20
A	—	—	2.20
b_p	0.34	0.40	0.46
b_1	—	—	—
c	0.15	0.20	0.25
c_1	—	—	—
θ	0°	—	8°
H_E	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_1	—	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.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	6.50	6.80
E	—	4.40	—
A_2	—	—	—
A_1	0.03	0.07	0.10
A	—	—	1.10
b_p	0.15	0.20	0.25
b_1	—	—	—
c	0.10	0.15	0.20
c_1	—	—	—
θ	0°	—	8°
H_E	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_1	—	1.0	—

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