HD74LVC14

Hex Schmitt-trigger Inverters

REJ03D0345–0300Z
(Previous ADE-205-064B (Z))
Rev.3.00
Jul. 22, 2004

Description

The HD74LVC14 has six schmitt trigger inverters in a 14 pin package. Low voltage and high-speed operation is suitable at the battery drive product (note type personal computer) and low power consumption extends the life of a battery for long time operation.

Features

- V_{CC} = 2.0 V to 5.5 V
- All inputs V_{IH} (Max.) = 5.5 V (@V_{CC} = 0 V to 5.5 V)
- Typical V_{OL} ground bounce < 0.8 V (@V_{CC} = 3.3 V, Ta = 25°C)
- Typical V_{OH} undershoot > 2.0 V (@V_{CC} = 3.3 V, Ta = 25°C)
- High output current ±24 mA (@V_{CC} = 3.0 V to 5.5 V)
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LVC14FPEL	SOP–14 pin (JEITA)	FP–14DAV	FP	EL (2,000 pcs/reel)
HD74LVC14TELL	TSSOP–14 pin	TTP–14DV	T	ELL (2,000 pcs/reel)

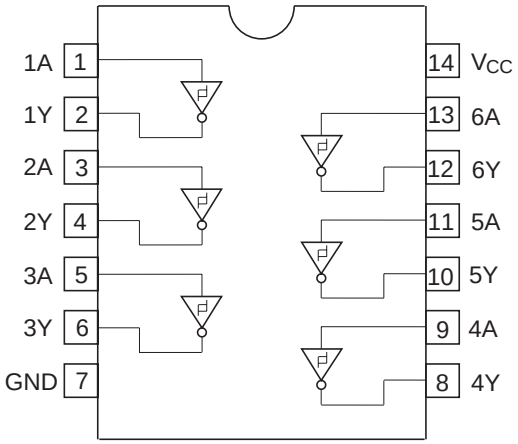
Note: Please consult the sales office for the above package availability.

Function Table

Input A	Output Y
L	H
H	L

H: High level
L: Low level

Pin Arrangement



(Top view)

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Conditions
Supply voltage range	V_{CC}	–0.5 to 6.0	V	
Input diode current	I_{IK}	–50	mA	V_I = –0.5 V
Input voltage	V_I	–0.5 to 6.0	V	
Output diode current	I_{OK}	–50	mA	V_O = –0.5 V
		50		V_O = V_{CC}+0.5 V
Output voltage	V_O	–0.5 to V_{CC}+0.5	V	
Output current	I_O	±50	mA	
V_{CC}, GND current / pin	I_{CC} or I_{GND}	100	mA	
Storage temperature	Tstg	–65 to +150	°C	

Note: 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.

Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	V_{CC}	1.5 to 5.5	V	Data retention
		2.0 to 5.5		At operation
Input / Output voltage	V_I	0 to 5.5	V	A
	V_O	0 to V_{CC}		Y
Operating temperature	Ta	–40 to 85	°C	
Output current	I_{OH}	–12	mA	V_{CC} = 2.7 V
		–24[*2]		V_{CC} = 3.0 V to 5.5 V
	I_{OL}	12	mA	V_{CC} = 2.7 V
		24[*2]		V_{CC} = 3.0 V to 5.5 V
Input rise / fall time[*1]	t_r, t_f	10	ns/V	

Notes: 1. This item guarantees maximum limit when one input switches.
Waveform: Refer to test circuit of switching characteristics.
2. Duty cycle ≤ 50%

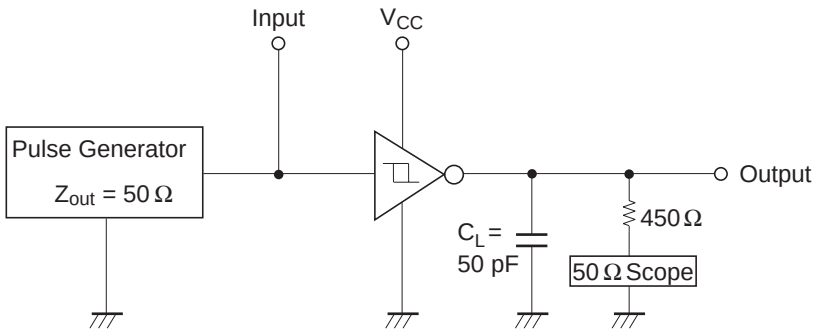
Electrical Characteristics

Item	Symbol	V_{CC} (V)	Ta = –40 to 85°C Min	Max	Unit	Test Conditions
Threshold voltage	V_T^+	2.7	1.0	2.0	V	
		3.0	1.2	2.2		
		3.6	1.5	2.4		
		4.5	1.6	2.6		
		5.5	2.0	3.0		
	V_T^-	2.7	0.4	1.4	V	
		3.0	0.6	1.5		
		3.6	0.8	1.8		
		4.5	1.0	2.0		
		5.5	1.4	2.4		
Hysteresis voltage	V_H	2.7	0.3	1.1	V	$V_T^+ - V_T^-$
		3.0	0.4	1.2		
		3.6	0.4	1.2		
		4.5	0.4	1.2		
		5.5	0.4	1.2		
Input voltage	V_{IH}	2.7 to 3.6	2.4	—	V	
		4.5 to 5.5	3.0	—		
	V_{IL}	2.7 to 3.6	—	0.4		
		4.5 to 5.5	—	1.0		
Output voltage	V_{OH}	2.7 to 5.5	V_{CC}–0.2	—	V	I_{OH} = –100 µA
		2.7	2.2	—		I_{OH} = –12 mA
		3.0	2.4	—		I_{OH} = –12 mA
		3.0	2.0	—		I_{OH} = –24 mA
		4.5	3.8	—		I_{OH} = –24 mA
	V_{OL}	2.7 to 5.5	—	0.2	V	I_{OL} = 100 µA
		2.7	—	0.4		I_{OL} = 12 mA
		3.0	—	0.55		I_{OL} = 24 mA
		4.5	—	0.55		I_{OL} = 24 mA
Input current	I_{IN}	0 to 5.5	—	±5.0	µA	V_{IN} = 5.5 V or GND
Quiescent supply current	I_{CC}	5.5	—	20	µA	V_{IN} = V_{CC} or GND
	ΔI_{CC}	3.0 to 3.6	—	500	µA	V_{IN} = one input at (V_{CC}–0.6)V, other inputs at V_{CC} or GND

Switching Characteristics

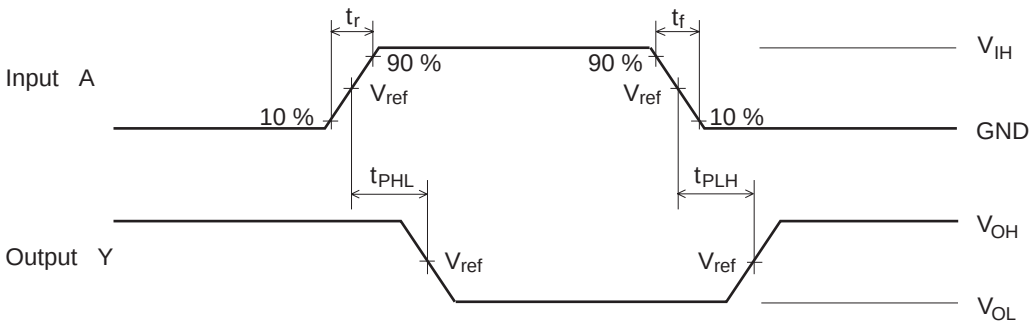
Item	Symbol	V_{CC} (V)	Ta = –40 to 85°C Min	Typ	Max	Unit	From (Input)	To (Output)
Propagation delay time	t_{PLH}	2.7	—	6.0	9.5	ns	A	Y
	t_{PHL}	3.3±0.3	1.5	5.0	8.5			
		5.0±0.5	—	3.5	7.0			
Input capacitance	C_{IN}	2.7	—	3.0	—	pF		
Output capacitance	C_O	2.7	—	15.0	—	pF		

Test Circuit



Note: 1. C_L includes probe and jig capacitance.

Waveforms

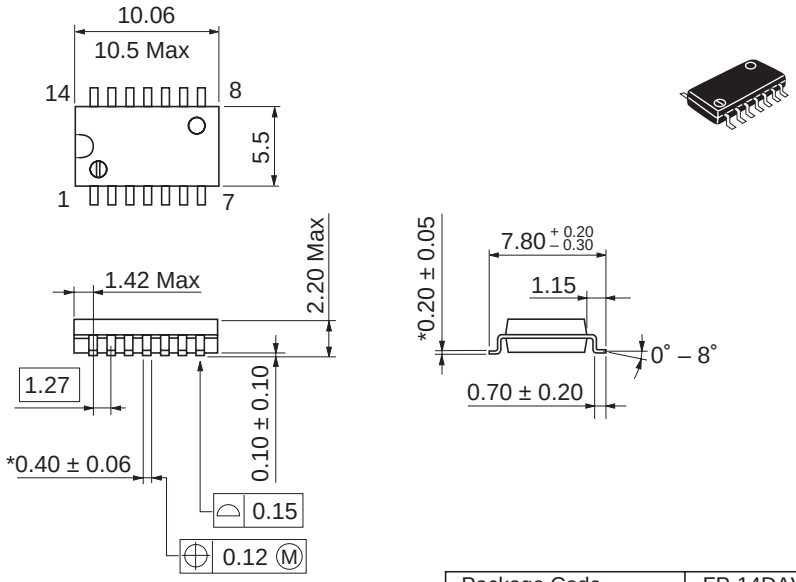


TEST	V_{CC} = 2.7 V, 3.3±0.3 V	V_{CC} = 5.0±0.5 V
V_{IH}	2.7 V	V_{CC}
V_{ref}	1.5 V	50%V_{CC}

Notes: 1. t_r = 2.5 ns, t_f = 2.5 ns
2. Input waveform : PRR = 10 MHz, duty cycle 50%.

Package Dimensions

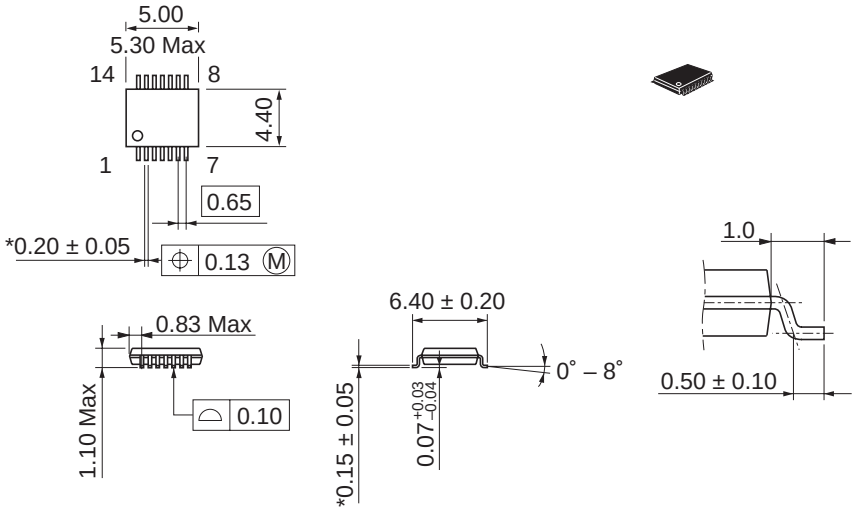
As of January, 2003
Unit: mm



Package Code	FP-14DAV
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.23 g

*Ni/Pd/Au plating

As of January, 2003
Unit: mm



Package Code	TTP-14DV
JEDEC	—
JEITA	—
Mass (reference value)	0.05 g

*Ni/Pd/Au plating

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