

Hex Inverter Buffer and Driver With Open-Drain Outputs

General Description

The ET74LVC06A device is a hex inverter buffer and driver operating from a 1.65V to 5.5V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

Features

- Designed for 1.65V to 5.5V V_{CC} Operation
- Over-voltage Tolerant Inputs Accept Voltages to 5.5V
- 24mA Output Sink Capability
- ESD Protection Complies with JESD22 Standard
 - HBM: $\pm 4000V$ Pass (JEDEC JS-001)
 - CDM: $\pm 2000V$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 100mA$ per JEDEC JESD78F
- Part No. and Package Information

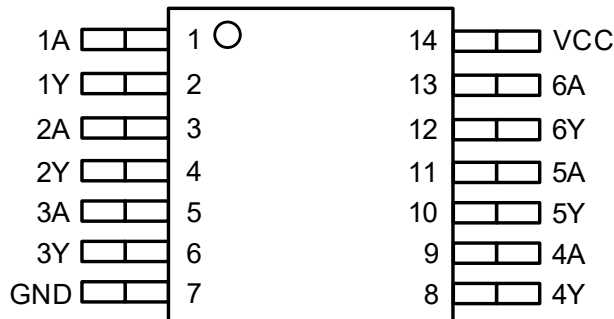
Part No.	Package	Packing Option	MSL
ET74LVC06AM14	SOP14 (3.9mm $\times$ 8.65mm)	Tape and Reel, 4K/Reel	3
ET74LVC06AV	TSSOP14 (4.4mm $\times$ 5.0mm)	Tape and Reel, 4K/Reel	3

Applications

- Mobile Device
- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- MP3 Player or Recorder
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single
- Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- TV: LCD, Digital, and High-definition (HDTV)
- Tablet: Enterprise
- Video Analytics: Server
- Wireless Headset, Keyboard and Mouse

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Pin Configuration



SOP14/TSSOP14

Figure1. Pin Configuration

Pin Function

Pin No.	Pin Name	I/O	Description
1	1A	Input	Channel 1, Input A
2	1Y	Input	Channel 1, Output Y
3	2A	Output	Channel 2, Input A
4	2Y	Input	Channel 2, Output Y
5	3A	Input	Channel 3, Input A
6	3Y	Output	Channel 3, Output Y
7	GND	—	Ground
8	4Y	Output	Channel 4, Output Y
9	4A	Input	Channel 4, Input A
10	5Y	Input	Channel 5, Output Y
11	5A	Output	Channel 5, Input A
12	6Y	Input	Channel 6, Output Y
13	6A	Input	Channel 6, Input A
14	VCC	—	Positive Supply

Block Diagram

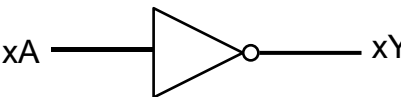


Figure2. Logic Symbol

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Functional Table

Input	Output
xA	xY
L	Z
H	L

Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage(VCC Pin)		-0.5 to 6.5	V
I _{IK}	DC Input Diode Current, V _I < GND		-50	mA
V _I	DC Input Voltage ⁽¹⁾		-0.5 ≤ V _I ≤ 6.5	V
I _{OK}	DC Output Diode Current, V _O < GND		±50	mA
V _O	DC Output Voltage Output in Higher or Low State		-0.5 to V _{CC} + 0.5	V
I _O	DC Output Sink Current, V _O = 0V to V _{CC}		±50	mA
I _{CC}	DC Supply Current per Supply Pin		100	mA
I _{GND}	DC Ground Current per Supply Pin		-100	mA
T _J	Max Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-65 to 150	°C
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±2000	
I _{LU}	Max Latch Up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Note1: I_O absolute maximum rating must be observed.

Note2: HBM tested per JEDEC JS-001;

Note3: CDM tested per JEDEC JS-002;

Note4: Latch up Current Maximum Rating tested per JEDEC JESD78F.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage Operating	1.65	5.5	V
V _I	DC Input Voltage	0	V _{CC}	V
V _O	DC Output Voltage (High or Low State)	0	V _{CC}	V
T _A	Operating Temperature Range	-40	125	°C

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Electrical Characteristics

DC Electrical Characteristics

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		1.65~1.95	0.65V _{CC}			0.65V _{CC}		V
			2.3~2.7	1.7			1.7		V
			2.7~3.6	2			2		V
			4.5~5.5	0.7V _{CC}			0.7V _{CC}		V
V _{IL}	Low-Level Input Voltage		1.65~1.95			0.35V _{CC}		0.35V _{CC}	V
			2.3~2.7			0.7		0.7	V
			2.7~3.6			0.8		0.8	V
			4.5~5.5			0.3V _{CC}		0.3V _{CC}	V
V _{OL}	Low-Level Output Voltage	I _{OL} = 100μA	1.65~5.5			0.1		0.3	V
		I _{OL} = 4mA	1.65			0.24		0.6	
		I _{OL} = 8mA	2.3			0.3		0.75	
		I _{OL} = 12mA	2.7			0.4		0.6	
		I _{OL} = 24mA	3			0.55		0.8	
I _I	Input Leakage Current	V _I = V _{CC} or GND	3.6			±1		±20	μA
I _{CC}	Quiescent Supply Current	V _I = V _{CC} or GND	3.6			1		40	μA
I _{OFF}	Power Off Leakage Current	V _I = 5.5V or V _O = 5.5V	0			±1		±20	uA
ΔI _{CC}	Additional Supply Current	One input at V _{CC} - 0.6V, Other inputs at V _{CC} or GND	2.7~3.6			500		5000	μA

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AC Electrical Characteristics

Over operating free-air temperature range; typical values measured at $T_A = 25^\circ\text{C}$ (unless otherwise noted)

Symbol	Parameter	From	To	$V_{CC}(\text{V})$	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		Unit
					Min	Typ	Max	Min	Max	
t_{PZL} t_{PLZ}	Propagation Delay	A	Y	1.65~1.95	0.5	5	10.5	1	11	ns
				2.3~2.7	0.5	3.8	6	1	6.5	
				2.7	0.5	3.5	6.5	1	7	
				3.0~3.6	0.5	2.6	5	1	5.5	
				4.5~5.5	0.5	2.2	3.8	1	4.3	

Capacitance Characteristics

Over operating free-air temperature range; typical values measured at $T_A = 25^\circ\text{C}$ (unless otherwise noted)

Symbol	Parameter	Test Conditions	Typ	Unit
C_{IN}	Input Capacitance	$V_{CC} = 3.3\text{V}$, $V_I = 0\text{V}$ or V_{CC}	5	pF
C_{PD}	Power Dissipation Capacitance Per Inverter ⁽⁵⁾	10MHz, $V_{CC} = 1.8\text{V}$, $V_I = 0\text{V}$ or V_{CC}	5	pF
		10MHz, $V_{CC} = 2.5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	5.5	
		10MHz, $V_{CC} = 3.3\text{V}$, $V_I = 0\text{V}$ or V_{CC}	6	
		10MHz, $V_{CC} = 5.5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	7.5	

Note5: C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz;

f_o = output frequency in MHz;

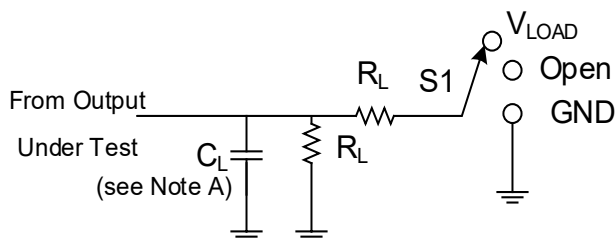
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

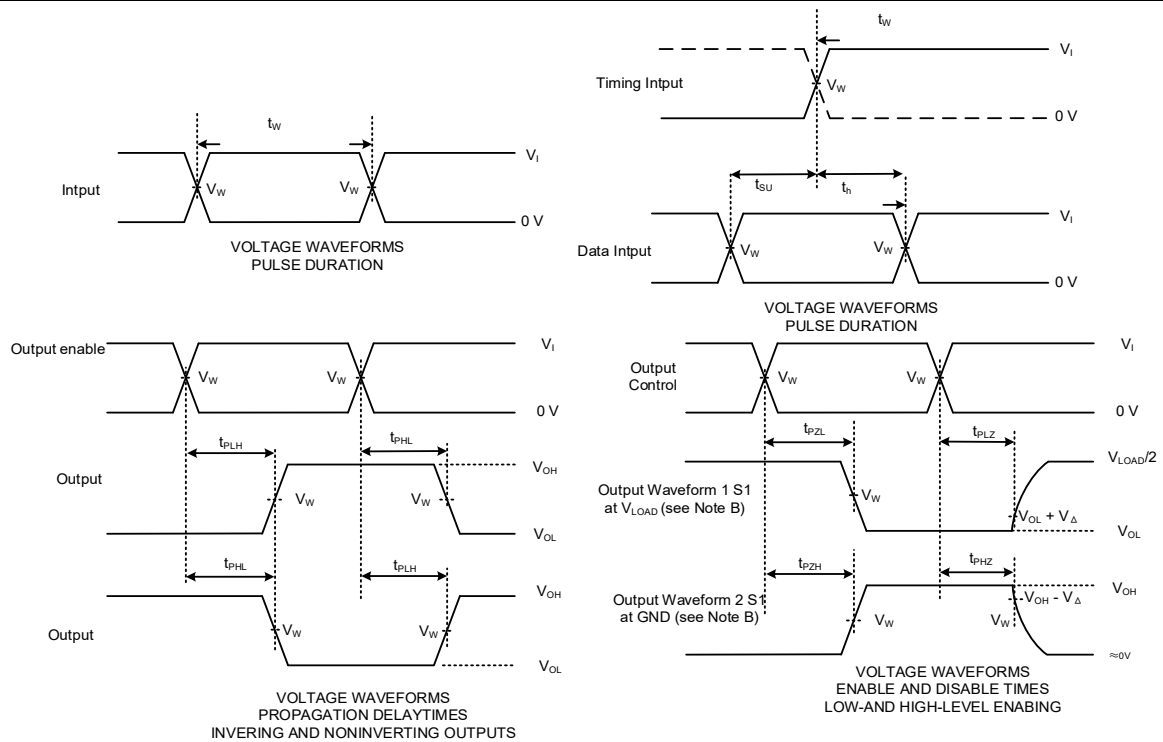
Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	OPEN
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

Figure3. Test circuit for Measuring Switching Times

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Notes:

- C_L includes probe and jig capacitance.
- Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.
- Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
- All input pulses are supplied by generators having the following characteristics:
 $PRR \leq 10\text{MHz}$, $Z_O = 50\Omega$
- The outputs are measured one at a time, with one transition per measurement.
- t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- t_{PZL} and t_{PZH} are the same as t_{en} .
- t_{PLH} and t_{PHL} are the same as t_{pd} .
- All parameters and waveforms are not applicable to all devices.

Figure4. Input to Output Propagation Delay Times

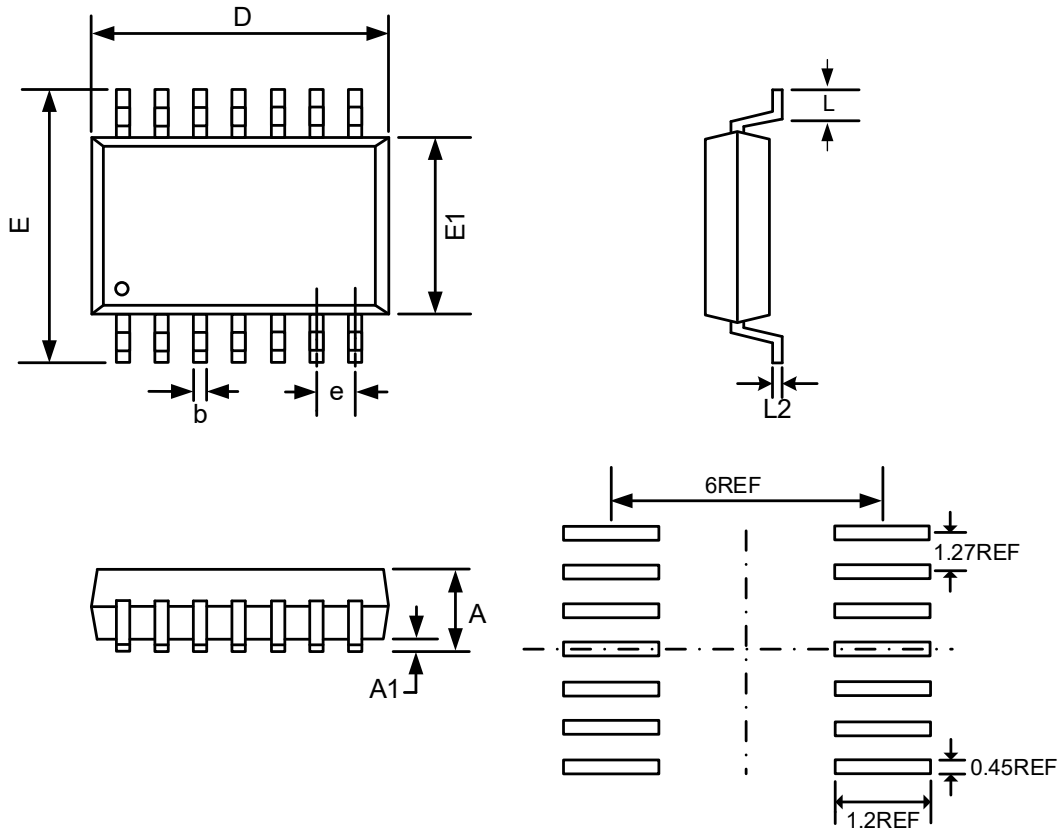
Table1. Measurement Points and Test Data

V_{CC}	Input		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_I	t_r/t_f					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
2.7V	3V	$\leq 2.5\text{ns}$	1.5V	6V	50pF	500 Ω	0.3V
$3.3V \pm 0.3V$	3V	$\leq 2.5\text{ns}$	1.5V	6V	50pF	500 Ω	0.3V
$5.5V \pm 0.5V$	V_{CC}	$\leq 2.5\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V

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Package Dimension

SOP14 (3.9mm × 8.65mm)



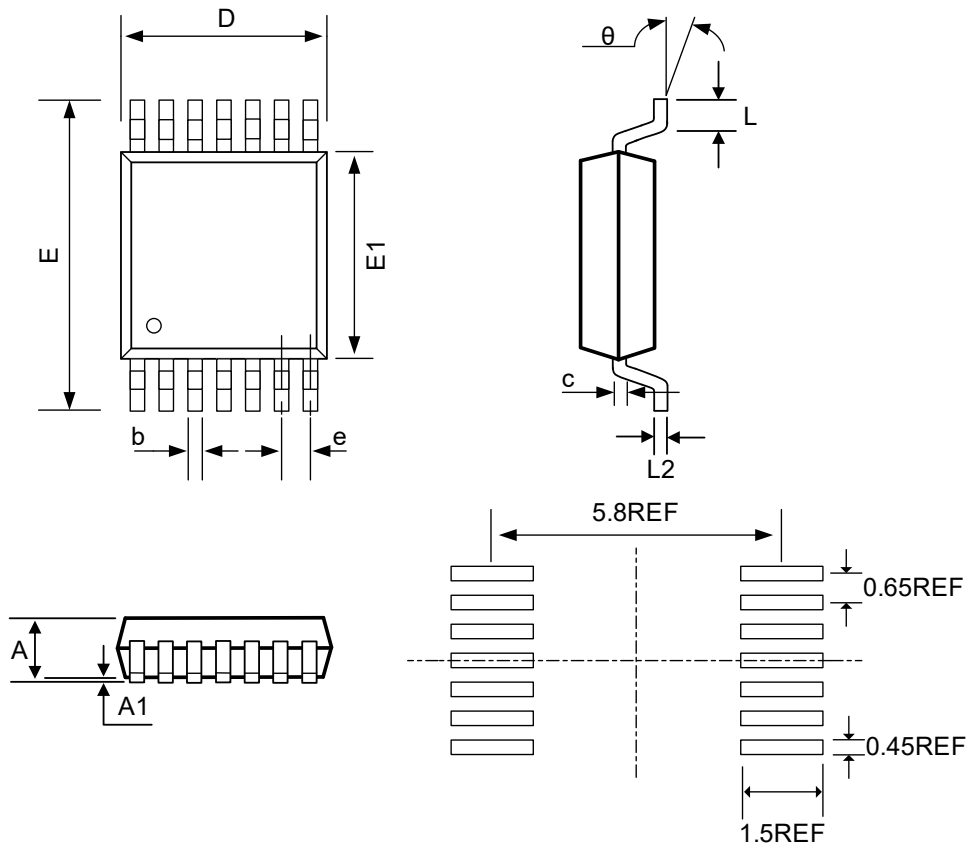
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	MAX
A	--	1.75
A1	0.10	0.25
b	0.36	0.51
D	8.55	8.75
E	5.80	6.20
E1	3.80	4.00
e	1.22	1.32
L	0.45	0.75
L2	0.25 BSC	

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TSSOP14 (4.4mm × 5.0mm)



COMMON DIMENSIONS

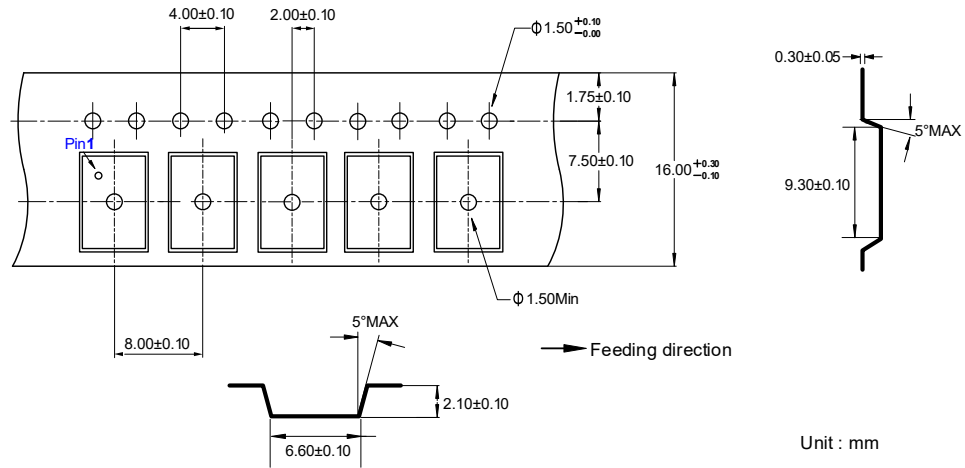
(Unit: mm)

SYMBOL	MIN	MAX
A	--	1.20
A1	0.05	0.15
b	0.19	0.30
c	0.15 REF	
D	4.86	5.10
E	6.20	6.60
E1	4.30	4.50
e	0.65BSC	
L	0.45	0.75
L2	0.25 REF	
θ	0°	8°

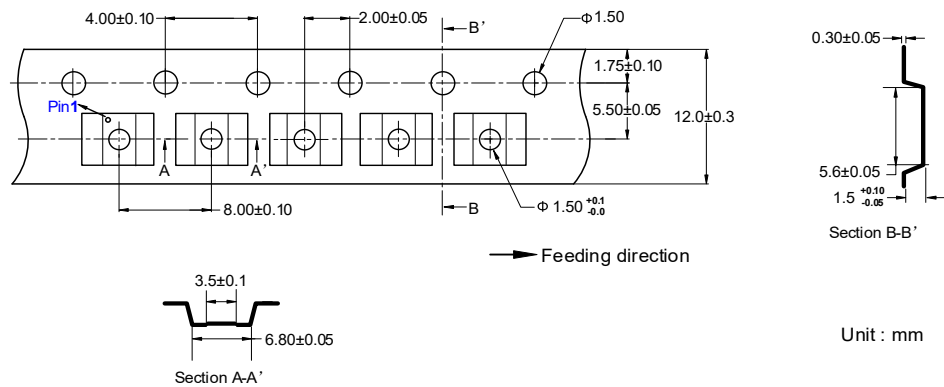
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Tape Information

SOP14 (3.9mm × 8.65mm)



TSSOP14 (4.4mm × 5.0mm)



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Marking Information

C06A
XXXXX
●

ET74LVC06AM14
C06A = Part Number
XXXXX = Tracking Number

C06AV
XXXXX
●

ET74LVC06AV
C06AV = Part Number
XXXXX = Tracking Number

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2026-03-23	Official Version	Xu tao	Yang xiaoxu	Liu jiaying