ET74LVC07A - Hex Buffer and Driver

With Open-Drain Outputs

General Description

The ET74LVC07A device is a hex buffer and driver that is designed for 1.65V to 5.5V V_{CC} operation.

Features

- Wide Operating Voltage Range: 1.65V to 5.5V
- Inputs and Open-drain Outputs Accept Voltages Up to 5.5V
- Max t_{pd} of 2.6ns at 5V
- 24mA Balanced Output Sink Capability
- I_{off} Supports Live Insertion, Partial-power-down Mode, and Back-drive Protection
- Latch-up Performance Exceeds 200mA per JESD78, Class II
- ESD Protection Exceeds JESD22
  - 4000V Human-Body Model (A114-A)
  - 2000V Charged-Device Model (C101)

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

Device Information

Part No.	Package	MSL
ET74LVC07AM	SOP14(8.65mm*6mm)	3
ET74LVC07AV	TSSOP14(4.96mm*6.4mm)	3

Pin Configuration

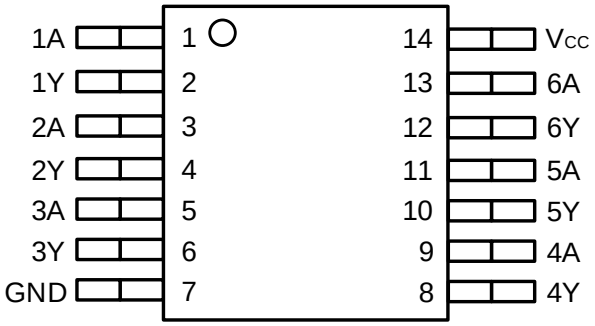


Figure1. Top View

Pin Function

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

Block Diagram

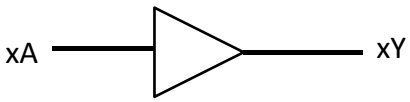


Figure2. Logic Symbol

Functional Description

Function Table

Input	Output
xA	**xY**
L	L
H	Z

Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Rating	Unit
V_{CC}	Supply Voltage		-0.5~+6.5	V
I_{IK}	Input Clamping Current	V_I < 0V	-50	mA
V_I	Input Voltage (1)		-0.5~+6.5	V
I_{OK}	Output Clamping Current	V_O < 0V	-50	mA
V_O	Output Voltage	Active Mode (1)	-0.5~V_{CC}+0.5	V
		Power-down Mode V_{CC}=0V (1)	-0.5~+6.5	V
I_O	Output Current	V_O = 0V to V_{CC}	±50	mA
I_{CC}	Supply Current		+100	mA
I_{GND}	Ground Current		-100	mA
T_J	Operating Junction Range		-40 to +150	°C
T_{STG}	Storage Temperature		-65 to +150	°C
V_{ESD}	Human Body Mode (2)		±4000	V
	Charged Device Mode (3)		±2000	V
I_{LU}	Latch-up Current (4)		±200	mA

Note1: I_O absolute maximum rating must be observed.

Note2: HBM tested per EIA/JESD22-A114−A;

Note3: CDM tested per EIA/JESD22-C101;

Note4: Latch-up Current Maximum Rating tested per EIA/JESD78E;

Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	Supply Voltage	Operating	1.65	5.5	V
V_{IH}	High-level input voltage	V_{CC} = 1.65V to 1.95V	0.65 × V_{CC}		V
		V_{CC} = 2.3V to 2.7V	1.7		V
		V_{CC} = 2.7V to 3.6V	2		V
		V_{CC} = 4.5V to 5.5V	0.7 × V_{CC}		V
V_{IL}	Low-level input voltage	V_{CC} = 1.65V to 1.95V		0.35 × V_{CC}	V
		V_{CC} = 2.3V to 2.7V		0.7	V
		V_{CC} = 2.7V to 3.6V		0.8	V
		V_{CC} = 4.5V to 5.5V		0.3 × V_{CC}	V
V_I	Input Voltage		0	5.5	V
V_O	Output Voltage		0	5.5	V
I_{OL}	Low-level Output Current	V_{CC} = 1.65V		4	mA
		V_{CC} = 2.3V		12	mA
		V_{CC} = 2.7V		12	mA
		V_{CC} = 3V		24	mA
		V_{CC} = 4.5V		24	mA
T_A	Ambient Temperature	Operating in Free Air	-40	125	°C

Electrical Characteristics

DC Electrical Characteristics

Over operating free-air temperature range; typical values measured at T_A = 25°C (unless otherwise noted)

Symbol	Parameter	Conditions		V_{CC}	-40°C ≤ T_A ≤ 125°C			Unit
					Min	Typ	Max	
V_{OL}	Low−level Output Voltage	V_I = V_{IH} or V_{IL}	I_{OL} = 100μA	1.65V to 5.5V			0.2	V
			I_{OL} = 4mA	1.65V			0.45	
			I_{OL} = 8mA	2.3V			0.7	
			I_{OL} = 12mA	2.7V			0.4	
			I_{OL} = 24mA	3V			0.55	
I_I	Input Leakage Current	V_I = V_{CC} or 0		3.6V			±5	μA
I_{OFF}	Leakage Current	V_I or V_O= 5.5V		0V			±10	μA
I_{CC}	Supply Current	V_I = V_{CC} or 0	I_O = 0	3.6V			10	μA

ΔI_{CC}		One input at V_{CC} - 0.6V, Other inputs at V_{CC} or GND	2.7V to 3.6V			500	μA
C_I	Input Capacitance	$V_I = V_{CC}$ or 0	3.3V		5		pF

Switching Characteristics

Over operating free-air temperature range; typical values measured at T_A = 25°C (unless otherwise noted)

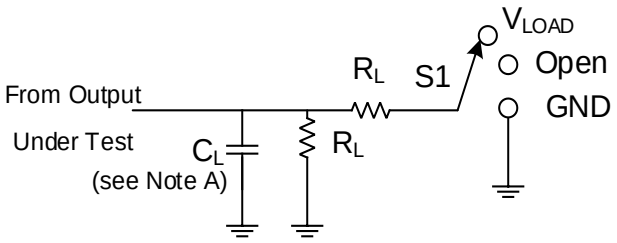
Symbol	Parameter	From	To	V_{CC}	-40°C≤T_A≤85°C		-40°C≤T_A≤125°C		Unit
					Min	Max	Min	Max	
t_{pd}	Propagation Delay	A	Y	1.8V ± 0.15V	1	10.5	1	10.5	ns
				2.5V ± 0.2V	1	6	1	6	
				2.7V	1	6.5	1	6.5	
				3.3V ± 0.3V	1	5	1	5	
				5V ± 0.5V	1	3.8	1	3.8	

Operating Characteristics

Over operating free-air temperature range; typical values measured at T_A = 25°C (unless otherwise noted)

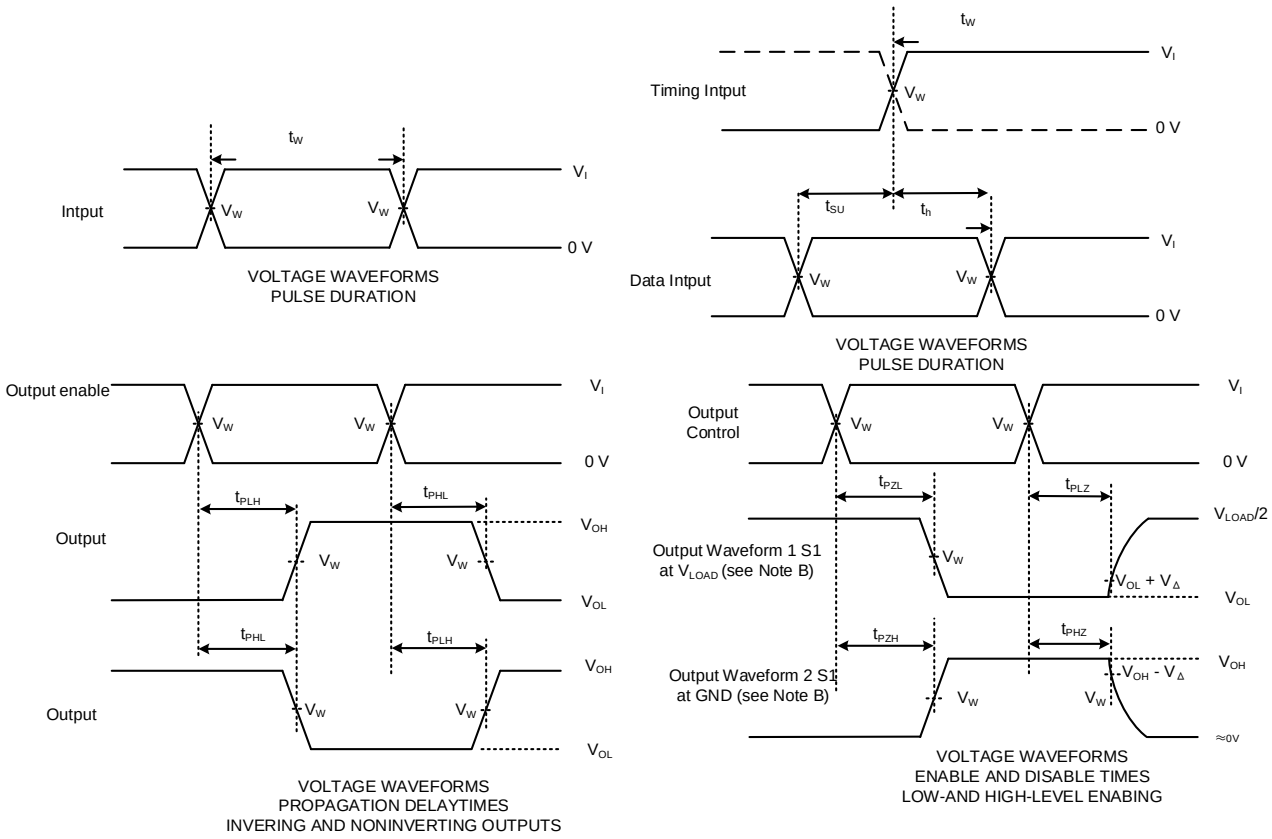
Symbol	Parameter	Conditions	V_{CC}	Min	Typ	Max	Unit
C_{PD}	Power Dissipation Capacitance per Buffer and Driver	f = 10MHz, No Load	1.8V		5		pF
			2.5V		5.5		pF
			3.3V		6		pF
			5.5V		7.5		pF

Parameter measurement information



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

Figure.3 Test circuit for measuring switching times



Notes:

A. C_L includes probe and jig capacitance.

B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.

C. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.

D. All input pulses are supplied by generators having the following characteristics:

PRR ≤ 10MHz, Z_O = 50Ω

E. The outputs are measured one at a time, with one transition per measurement.

F. t_{PLZ} and t_{PHZ} are the same as t_{dis}.

G. t_{PZL} and t_{PZH} are the same as t_{en}.

H. t_{PLH} and t_{PHL} are the same as t_{pd}.

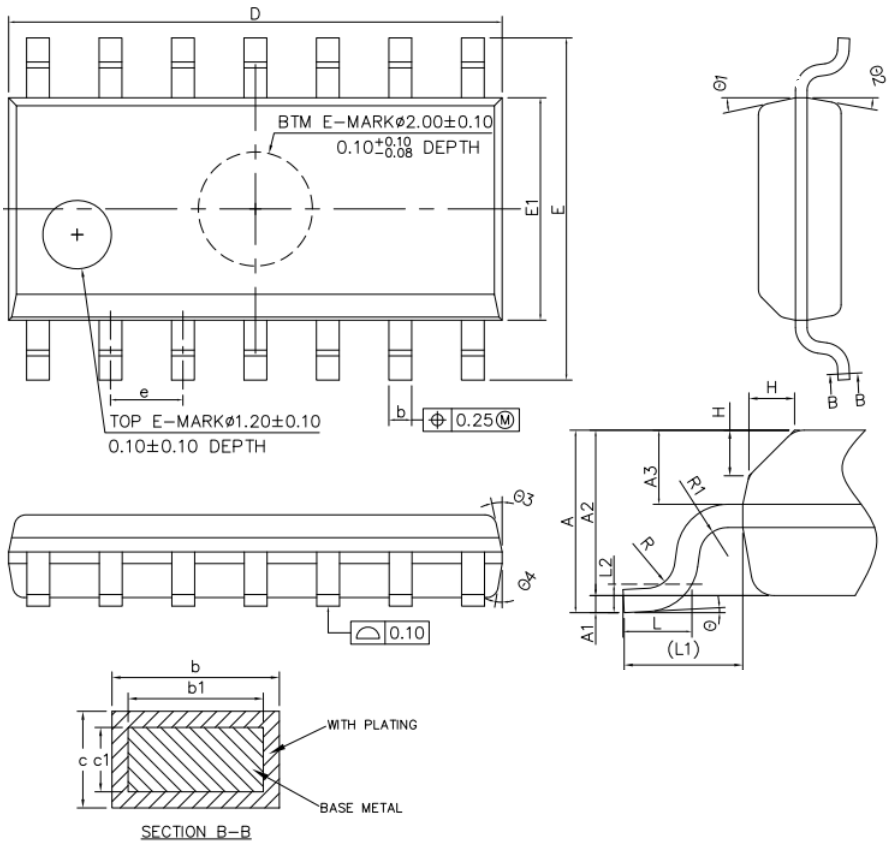
I. All parameters and waveforms are not applicable to all devices.

Figure.4 Input to output propagation delay times

V_{CC}	Input		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	t_r/t_f					
1.8V ± 0.15V	V_{CC}	≤ 2ns	$V_{CC}/2$	2 × V_{CC}	30pF	1kΩ	0.15V
2.5V ± 0.2V	V_{CC}	≤ 2ns	$V_{CC}/2$	2 × V_{CC}	30pF	500Ω	0.15V
2.7V	3V	≤ 2.5ns	1.5V	6V	50pF	500Ω	0.3V
3.3V ± 0.3V	3V	≤ 2.5ns	1.5V	6V	50pF	500Ω	0.3V
5.5V ± 0.5V	V_{CC}	≤ 2.5ns	$V_{CC}/2$	2 × V_{CC}	50pF	500Ω	0.3V

Package Dimension

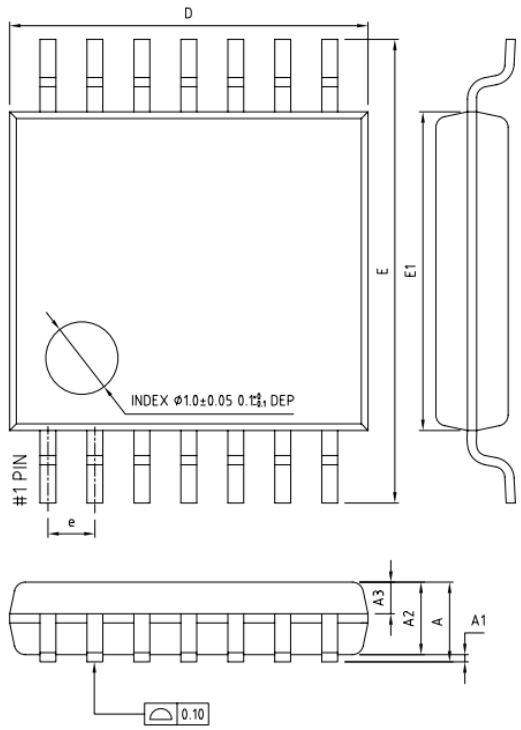
SOP14

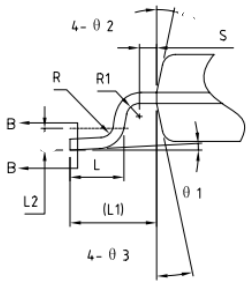


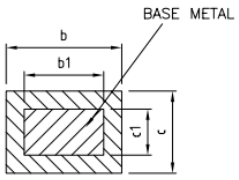
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	–	–	1.75
A1	0.10	0.15	0.25
A2	1.35	1.45	1.55
A3	0.55	0.65	0.75
b	0.36	–	0.51
b1	0.35	0.40	0.45
c	0.18	–	0.25
c1	0.17	0.20	0.23
D	8.55	8.65	8.75
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.22	1.27	1.32
H	0.30	0.40	0.50
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	–	–
R1	0.07	–	–
θ	0°	–	8°
θ1	10°	12°	14°
θ2	8°	10°	12°
θ3	10°	12°	14°
θ4	8°	10°	12°

TSSOP14







SECTION B–B

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	–	–	1.20
A1	0.05	–	0.15
A2	0.90	1.00	1.05
A3	0.34	0.44	0.54
b	0.20	–	0.28
b1	0.20	0.22	0.24
c	0.10	–	0.19
c1	0.10	0.13	0.15
D	4.86	4.96	5.06
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	0.65BSC		
L	0.45	0.60	0.75
L1	1.00REF		
L2	0.25BSC		
R	0.09	–	–
R1	0.09	–	–
S	0.20	–	–
θ 1	0°	–	8°
θ 2	10°	12°	14°
θ 3	10°	12°	14°

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2025-02-07	Preliminary Version	Gehao	Yangxiaoxu	Liujiaying
0.1	2025-04-21	Update Format	Wanganran	Yangxiaoxu	Liujiaying