

Hex Schmitt-Triggered Buffer

General Description

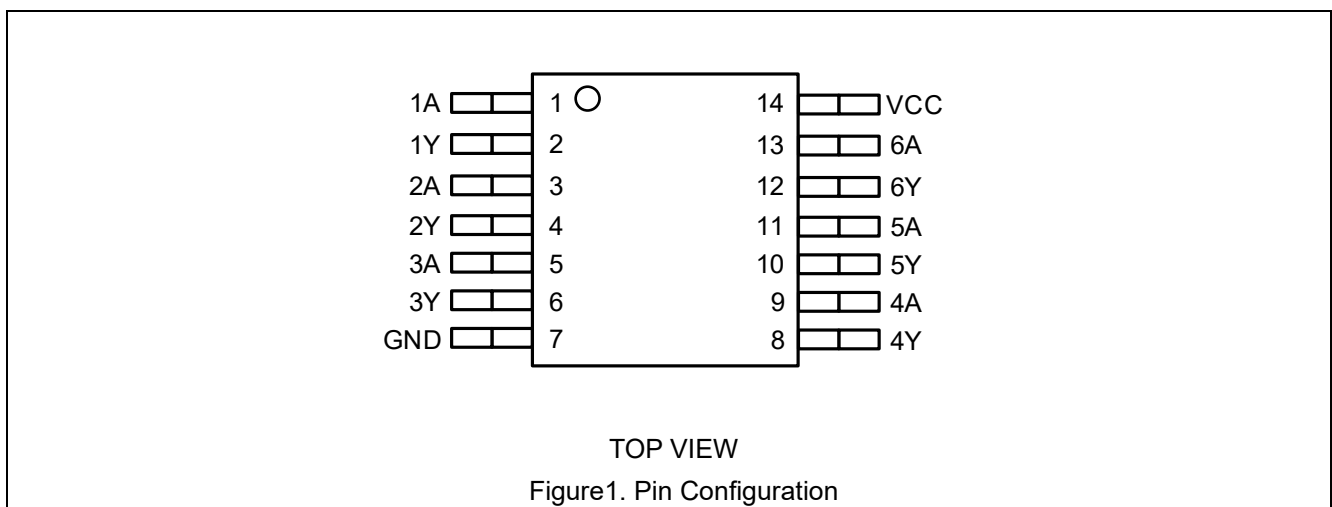
The ET74LVC17A is a high-performance, low-power, low-voltage, Si-gate CMOS device and provides six non-inverting buffers with Schmitt trigger action. It is capable for transforming slowly changing input signals into sharply defined, jitter-free output signals.

Features

- Wide Operating Voltage Range: 1.65V to 5.5V
- 5V Tolerant Input/Output for Interfacing With 5V Logic
- $\pm 32\text{mA}$ Output Drive ($V_{CC} = 4.5\text{V}$)
- CMOS Low-Power Consumption and High Noise Immunity
- I_{OFF} Supports Partial-Power-Down Mode Operation
- Latch-up Performance Exceeds $\pm 100\text{mA}$
- ESD Protection Complies with JESD22 Standard
 - HBM: $\pm 4000\text{V}$ Pass (JEDEC JS-001)
 - CDM: $\pm 1000\text{V}$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 100\text{mA}$ Per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	MSL
ET74LVC17AM14	SOP14 (8.65mm × 3.9mm)	Level 3
ET74LVC17AV	TSSOP14 (4.96mm × 4.4mm)	Level 3

Pin Configuration



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Pin Function

SOP14 / TSSOP14

Pin No.	Pin Name	Function
1	1A	Channel 1, Input A
2	1Y	Channel 1, Output Y
3	2A	Channel 2, Input A
4	2Y	Channel 2, Output Y
5	3A	Channel 3, Input A
6	3Y	Channel 3, Output Y
7	GND	Ground
8	4Y	Channel 4, Output Y
9	4A	Channel 4, Input A
10	5Y	Channel 5, Output Y
11	5A	Channel 5, Input A
12	6Y	Channel 6, Output Y
13	6A	Channel 1, Input A
14	VCC	Supply Voltage

Block Diagram

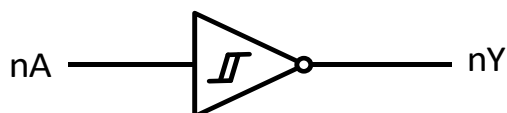


Figure2. Logic Symbol

Functional Description

Function Table

Input	Output
nA	nY
L	L
H	H

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Absolute Maximum Ratings

Symbol	Parameter	Value	Unit	
V_{CC}	DC Supply Voltage (VCC Pin)	-0.5 to 6.5	V	
V_I	DC Input Voltage ⁽¹⁾	$-0.5 \leq V_I \leq 6.5$	V	
V_O	Output Voltage ^{(1) (2)}	High-Impedance	-0.5 to 6.5	V
		Power-Off State		
		High State	-0.5 to $V_{CC} + 0.5$	V
		Low State		
I_{IK}	DC Input Diode Current $V_I < GND$	-50	mA	
I_{OK}	DC Output Diode Current $V_O < GND, V_O > V_{CC}$	-50	mA	
I_O	DC Output Sink Current	± 50	mA	
I_{CC}	DC Supply Current Per Supply Pin	+100	mA	
I_{GND}	DC Ground Current Per Supply Pin	-100	mA	
T_{LEAD}	Lead Temperature (Soldering 10s)	300	°C	
T_{STG}	Storage Temperature Range	-65 to 150	°C	
V_{ESD}	ESD Classification	Human Body Model ⁽³⁾	± 4000	V
		Charged Device Model ⁽⁴⁾	± 2000	V
I_{LU}	Max Latch Up Current Above V_{CC} and GND at 125°C ⁽⁵⁾	± 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: The input negative-voltage and output voltage ratings may be exceeded if the input and output current Ratings are observed.

Note2: The value of V_{CC} is provided in the recommended operating conditions table.

Note3: HBM tested per JEDEC JS-001;

Note4: CDM tested per JEDEC JS-002;

Note5: 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_{IN}	DC Input Voltage	0	V_{CC}	V
V_{OUT}	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)	Operating Free-air Temperature (T _A)					Unit
				T _A = 25°C			-40°C ≤ T _A ≤ 125°C		
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		1.65	1.40			1.40		
			2.3	1.70			1.70		
			3	2.20			2.20		
			4.5	3.10			3.10		
			5.5	3.70			3.70		
V _{IL}	Low-Level Input Voltage		1.65			0.30		0.30	
			2.3			0.40		0.40	
			3			0.60		0.60	
			4.5			1.10		1.10	
			5.5			1.40		1.40	
V _{OH}	High-Level Output Voltage	I _{OH} = -100μA	1.65~5.5	V _{CC} - 0.1			V _{CC} - 0.1		V
		I _{OH} = -4mA	1.65	1.20			1.44		
		I _{OH} = -8mA	2.3	1.90			2.05		
		I _{OH} = -16mA	3	2.40			2.65		
		I _{OH} = -24mA		2.30			2.40		
		I _{OH} = -32mA	4.5	3.80			4.00		
V _{OL}	Low-Level Output Voltage	I _{OL} = 100μA	1.65~5.5			0.10		0.10	V
		I _{OL} = 4mA	1.65			0.45		0.45	
		I _{OL} = 8mA	2.3			0.30		0.30	
		I _{OL} = 16mA	3			0.40		0.40	
		I _{OL} = 24mA				0.55		0.55	
		I _{OL} = 32mA	4.5			0.55		0.55	
I _I	Input Leakage Current	V _I = V _{CC} or GND I _O = 0mA	1.65~5.5			±5		±5	μA
I _{CC}	Supply Current	V _I = V _{CC} or GND, I _O = 0mA	5.5			10		10	μA

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ΔI_{CC}	Additional Quiescent Supply Current	One Input at $V_{CC} - 0.6V$, Other Inputs at V_{CC} or GND	3~5.5			500		500	μA
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AC Electrical Characteristics

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

Symbol	Parameter	Condition	$T_A = 25^\circ C$			$-40^\circ C \leq T_A \leq 125^\circ C$		Unit
			Min	Typ	Max	Min	Max	
t_{PLH}/t_{PHL}	Propagation Delay nA to nY See Table1	$V_{CC} = 1.8V \pm 0.15V$	3.9		9.3	1	11	ns
		$V_{CC} = 2.5V \pm 0.2V$	1.9		5.7	1	7	ns
		$V_{CC} = 3.3V \pm 0.3V$	2.2		5.4	1	5.5	ns
		$V_{CC} = 5V \pm 0.5V$	1.5		4.3	1	4.3	ns

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Capacitance Characteristics

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

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{PD}	Power Dissipation Capacitance per Buffer and Driver ⁽⁶⁾	10MHz, $V_{CC} = 1.8\text{V}$		17		pF
		10MHz, $V_{CC} = 2.5\text{V}$		18		pF
		10MHz, $V_{CC} = 3.3\text{V}$		19		pF
		10MHz, $V_{CC} = 5.0\text{V}$		21		pF

Note6: 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.

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AC Test Circuit

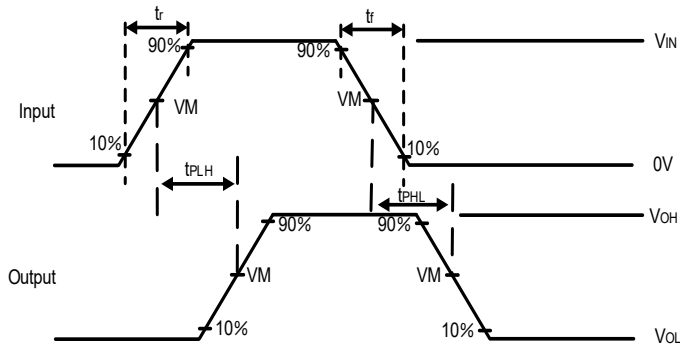


Figure3. Switching Waveform

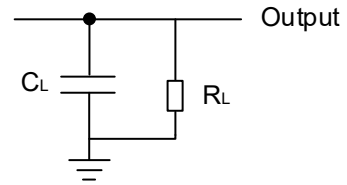


Figure4. Test Circuit

Notes:

1. V_{OL} and V_{OH} are typical output drop that occur with the output load
2. t_{PLH} and t_{PHL} are same as t_{pd}

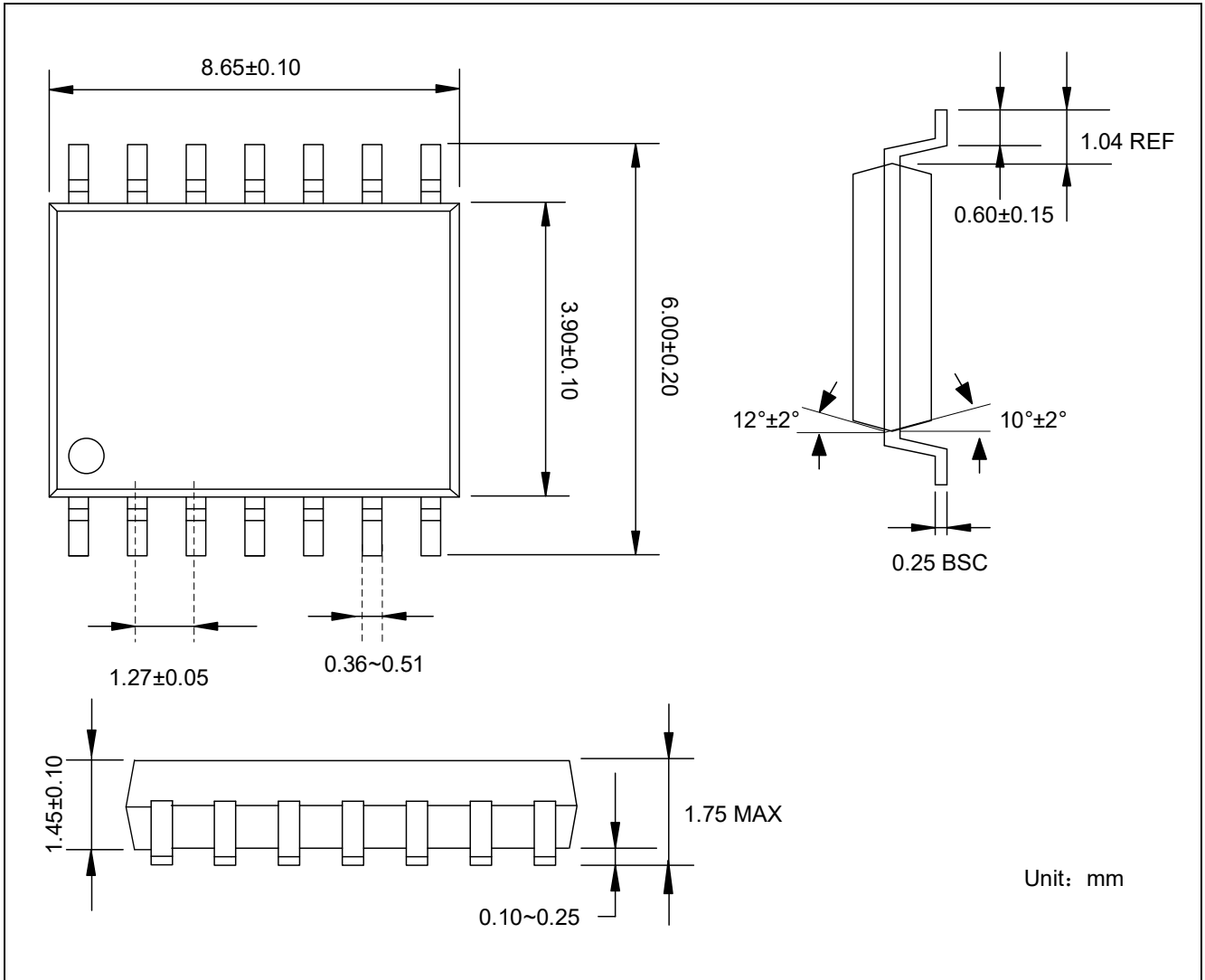
Table1. Measurement Points and Test Data

V_{CC}	V_I	t_r/t_f	V_M	C_L	R_L
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	1k Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	500 Ω
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	50pF	500 Ω

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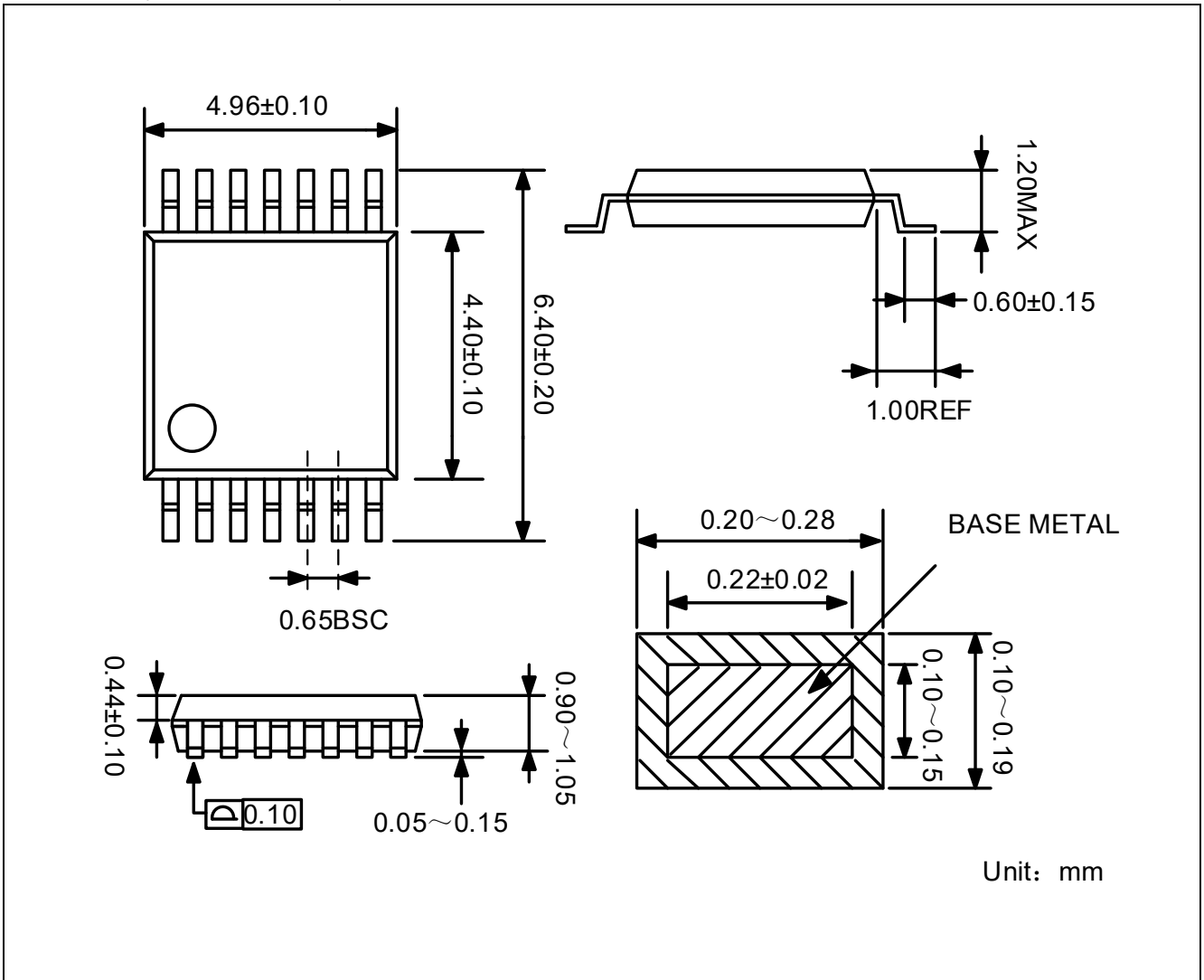
Package Dimension

SOP14 (8.65mm × 3.9mm)



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TSSOP14 (4.96mm × 4.4mm)



Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2025-07-11	Preliminary Version	Zhang zixuan	Yang xiaoxu	Liu jiaying
1.0	2025-09-15	Official Version	Zhang zixuan	Yang xiaoxu	Liu jiaying