

Quadruple 2-Input NAND Gates

General Description

The ET74LVC00A contains four independent 2-input NAND gates operating from a 1.65 to 5.5 V supply.

Features

- Wide Operating Voltage Range: 1.65 V to 5.5 V
- 24 mA Balanced Output Sink and Source Capability
- ESD Protection:
 - HBM JESD22-A114-A Exceeds 2000 V
 - CDM JESD22-C101-A Exceeds 1500 V
- Latch-up Performance Exceeds 200 mA

Device Information

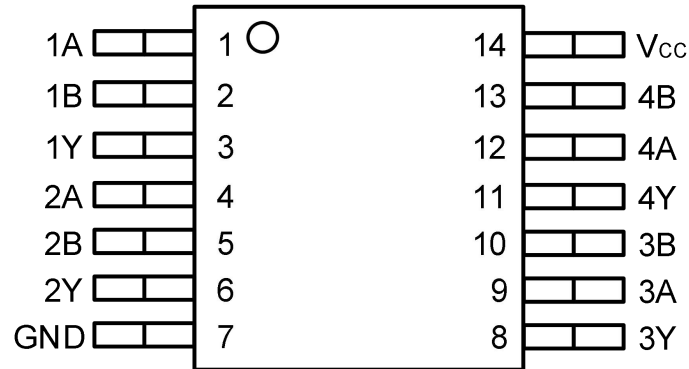
Part No.	Package	Packing Option	MSL
ET74LVC00AM14	SOP14 (8.65 mm × 6 mm)	Tape and Reel, 4K	3
ET74LVC00AV	TSSOP14 (4.96 mm × 6.4 mm)	Tape and Reel, 4K	3

Applications

- Mobile Device

ET74LVC00A

Pin Configuration



ET74LVC00AM14

ET74LVC00AV

Figure1. Top View

Pin Function

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

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Block Diagram

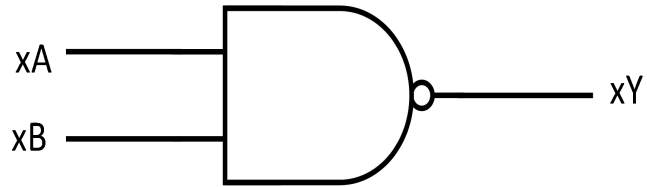


Figure2. Logic Symbol

Functional Description

Function Table

Input		Output
xA	xB	xY
L	L	H
L	H	H
H	L	H
H	H	L

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Absolute Maximum Ratings

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

Symbol	Parameter	Conditions	Value	Unit
V_{CC}	Supply Voltage		-0.5 to 6.5	V
V_I	Input Voltage		-0.5 to 6.5	V
V_O	Output Voltage		-0.5 to $V_{CC}+0.5$	V
I_{IK}	Input Clamp Current ⁽¹⁾	$V_I < -0.5V$	-50	mA
I_{OK}	Output Clamp Current ⁽¹⁾	$V_O < -0.5V$	-50	mA
I_O	Continuous Output Current	$V_O > -0.5V$ or $V_O < V_{CC} + 0.5V$	± 50	mA
I_{CC}	Continuous Current through V_{CC} or GND		± 100	mA
T_J	Max Junction Temperature		150	°C
T_{STG}	Storage Temperature		-65 to 150	°C
V_{ESD}	HBM	Per JESD22-A114-A	± 2000	V
	CDM	Per JESD22-C101-A	± 1500	V
I_{LU}	Max Latch up Current	Per EIA/JESD78E	± 200	mA

Note1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

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Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V _{CC}	Supply Voltage	Operating	1.65	5.5	V
		Data retention only	1.5		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} = 3.6V to 5.5V	2		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} = 3.6V to 5.5V		0.8	V
I _{OH}	High-level Output Current	V _{CC} = 1.65V	-4		mA
		V _{CC} = 2.3V	-8		mA
		V _{CC} = 2.7V	-12		mA
		V _{CC} = 3V	-24		mA
		V _{CC} = 5.5V	-24		mA
I _{OL}	Low-level Output Current	V _{CC} = 1.65V		4	mA
		V _{CC} = 2.3V		8	mA
		V _{CC} = 2.7V		12	mA
		V _{CC} = 3V		24	mA
		V _{CC} = 5.5V		24	mA
T _A	Ambient Temperature	Operating in Free Air	-40	125	°C

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Electrical Characteristics

DC Electrical Characteristics

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

Symbol	Parameter	Condition		V _{CC}	Operating Free-air Temperature (T _A)						Unit
					T _A =25°C		-40°C≤T _A ≤85°C		-40°C≤T _A ≤125°C		
					Min	Max	Min	Max	Min	Max	
V _{OH}	High-level Output Voltage	V _I = V _{IH} or V _{IL}	I _{OH} = -100μA	1.65V to 5.5V	V _{CC} - 0.2		V _{CC} - 0.2		V _{CC} - 0.2		V
			I _{OH} = -4mA	1.65V	1.29		1.2		1.05		
			I _{OH} = -8mA	2.3V	1.9		1.7		1.55		
			I _{OH} = -12mA	2.7V	2.2		2.2		2.05		
				3V	2.4		2.4		2.25		
			I _{OH} = -24mA	3V	2.3		2.2		2		
				5.5V	4.8		4.7		4.5		
V _{OL}	Low-level Output Voltage	V _I = V _{IH} or V _{IL}	I _{OL} = 100μA	1.65V to 5.5V		0.1		0.2		0.3	V
			I _{OL} = 4mA	1.65V		0.24		0.45		0.6	
			I _{OL} = 8mA	2.3V		0.3		0.7		0.85	
			I _{OL} = 12mA	2.7V		0.4		0.4		0.6	
			I _{OL} = 24mA	3V		0.55		0.55		0.8	
				5.5V		0.55		0.55		0.8	
			I _I	Input Leakage Current	V _I = V _{CC} or 0		5.5V		±1		
I _{CC}	Supply Current	V _I = V _{CC} or 0	I _O = 0	5.5V		1		10		40	μA
ΔI _{CC}		One Input at V _{CC} - 0.6V, Other Inputs at V _{CC} or GND		1.65V to 5.5V		500		500		5000	μA
C _I	Input Capacitance	V _I = V _{CC} or 0		5.5V		5					pF

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Electrical Characteristics(Continued)

Switching Characteristics

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

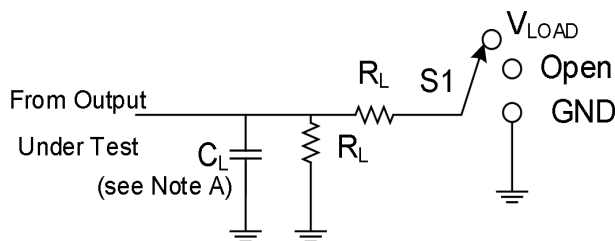
Symbol	Parameter	From	To	V _{CC}	Operating Free-air Temperature (T _A)							Unit
					T _A =25°C			-40°C≤T _A ≤85°C		-40°C≤T _A ≤125°C		
					Min	Typ	Max	Min	Max	Min	Max	
t _{PD}	Propagation Delay	A or B	Y	1.8V ± 0.15V	1	11.5	15	1	17	1	19.5	ns
				2.5V ± 0.2V	1	5.5	7	1	8.5	1	10	
				2.7V	1	6	7.5	1	9	1	10.5	
				3.3V ± 0.3V	1	5	6.5	1	8.5	1	10	
				5.5V		3.5	4.5		6.5		8	
T _{sk(o)}				3.3V ± 0.3V					1		1	ns

Operating Characteristics

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

Symbol	Parameter	Condition	V_{CC}	Min	Typ	Max	Unit
C_{PD}	Power Dissipation Capacitance Gate	No Load	1.8V		18		pF
			2.5V		18		pF
			3.3V		19		pF
			5.5V		19		pF

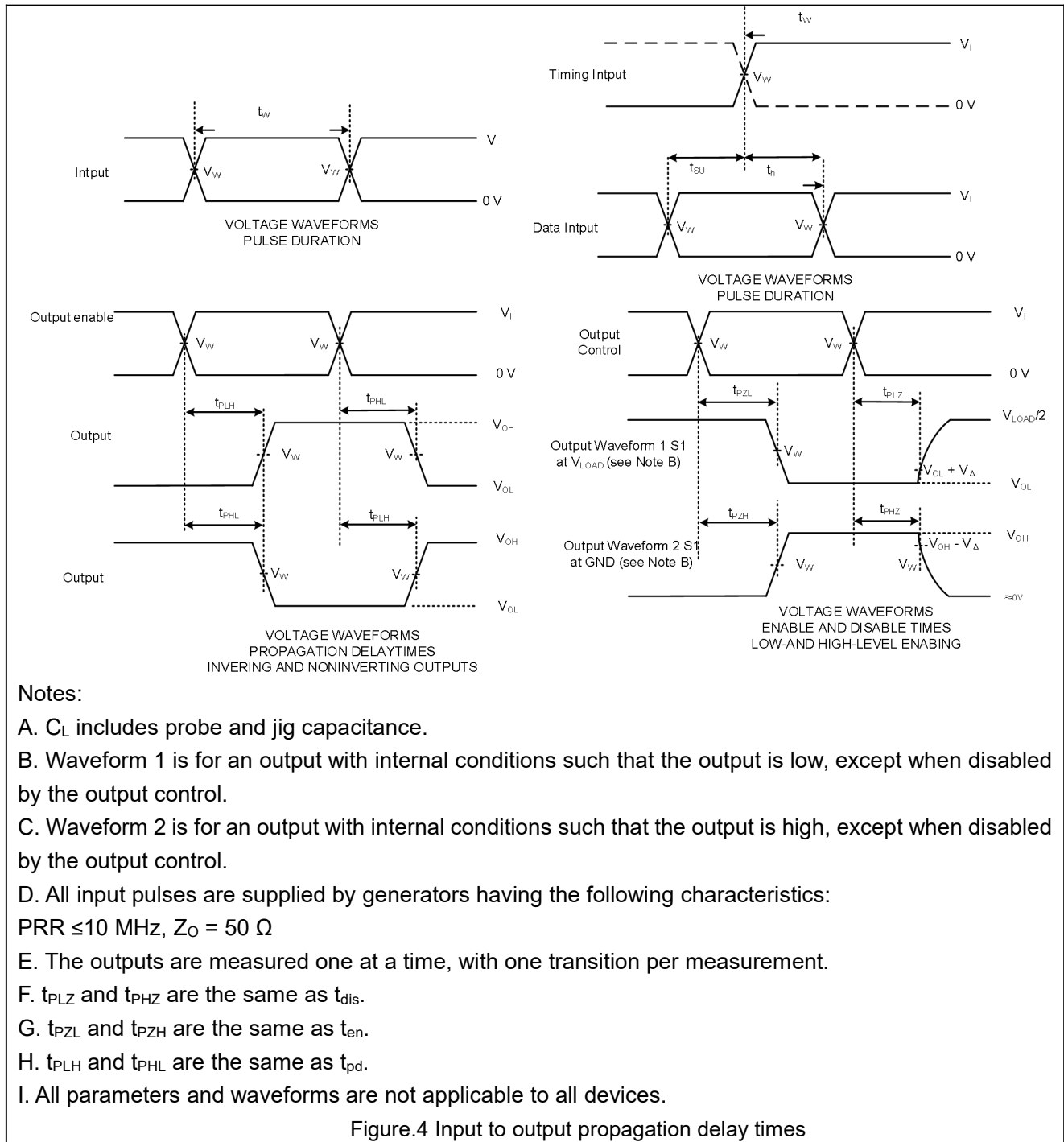
Parameter measurement information



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

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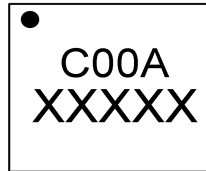


V_{CC}	Input		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_I	t_r/t_f					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
2.7V	2.7V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V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

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Marking

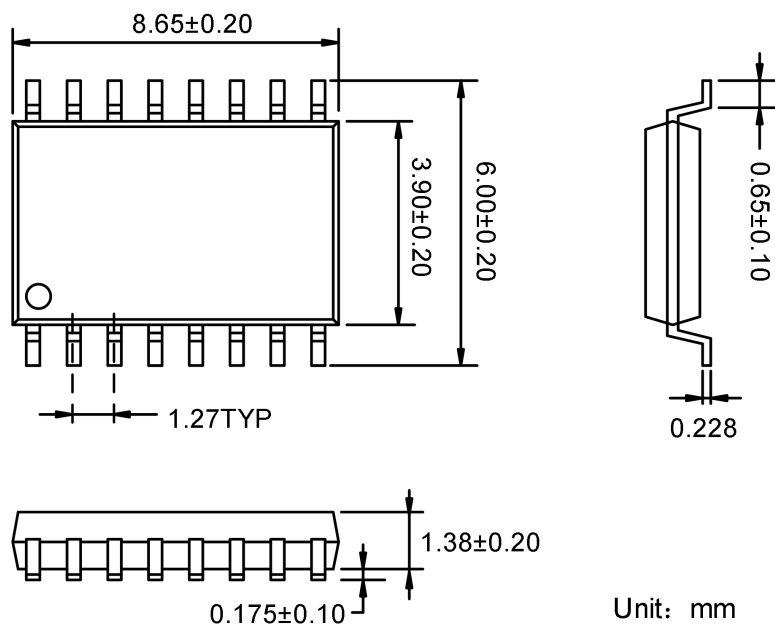
SOP14



C00A - Part Number
XXXXX - Tracking Number

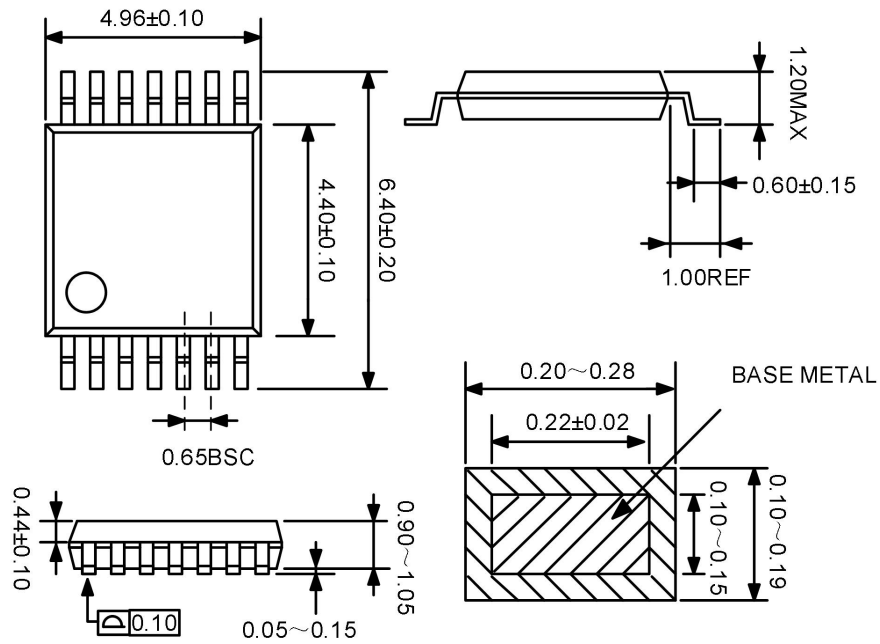
Package Dimension

SOP14



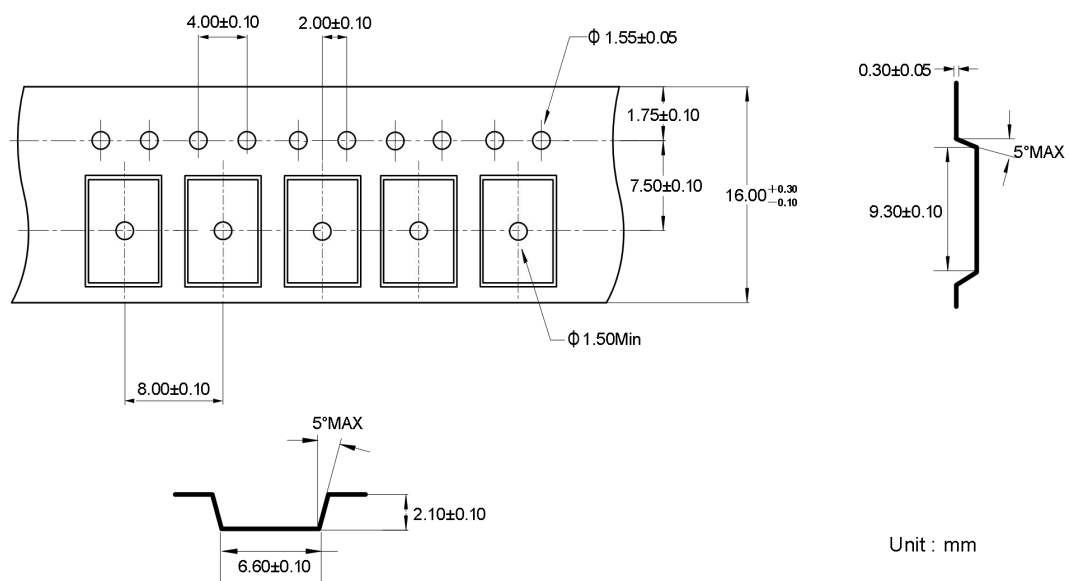
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TSSOP14



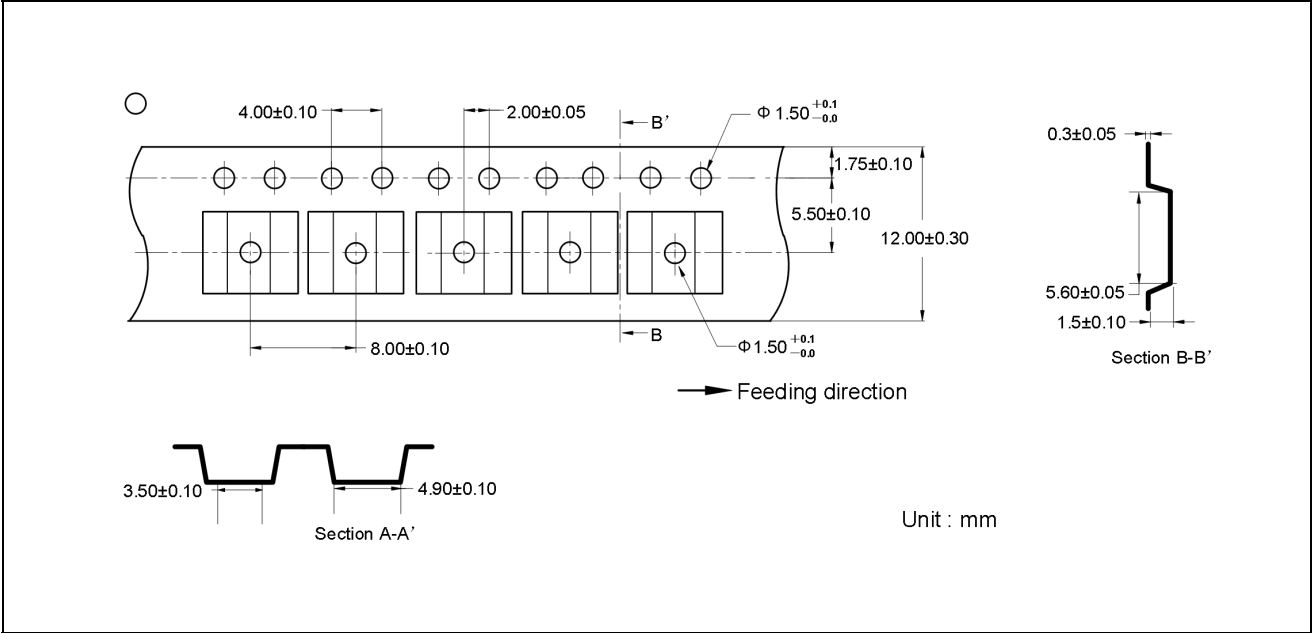
Tape Information

SOP14



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TSSOP14



Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2025-02-13	Preliminary Version	Wangar	Tugz	Liuji
0.1	2025-05-27	Update EC Table	Wangar	Yangxx	Liuji
1.0	2025-06-20	Official Version	Xut	Yangxx	Liuji