

Quadruple Bus Buffer Gate With 3-State Outputs

General Description

The ET74HCT125 is a quad buffer/line driver with 3-state outputs controlled by the output enable inputs ($\overline{nOE}$). A HIGH on $\overline{nOE}$ causes the outputs to assume a high impedance OFF-state.

Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.

Features

- Wide Operating Voltage Range: 4.5V to 5.5V
- Over-voltage Tolerant Inputs Accept Voltages to 5.5V
- $\pm 8\text{mA}$ Balanced Output Sink and Source Capability
- Near-zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free and RoHS Compliant
- 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 $\pm 200\text{mA}$ per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	MSL
ET74HCT125M	SOP14 (8.65mm $\times$ 3.9mm)	3
ET74HCT125V	TSSOP14 (5.0mm $\times$ 4.4mm)	3
ET74HCT125Y	QFN14 (3.0mm $\times$ 2.5mm)	3

Applications

- Mobile Device
- Telecom Equipment
- Industrial Equipment

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Pin Configuration

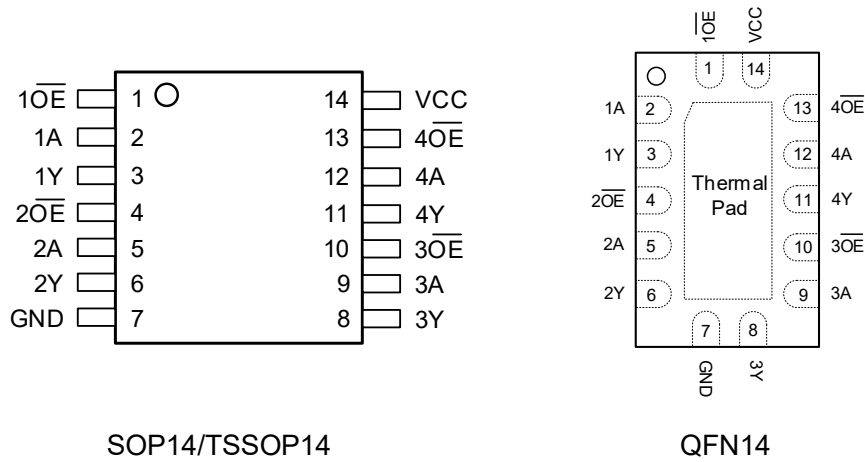


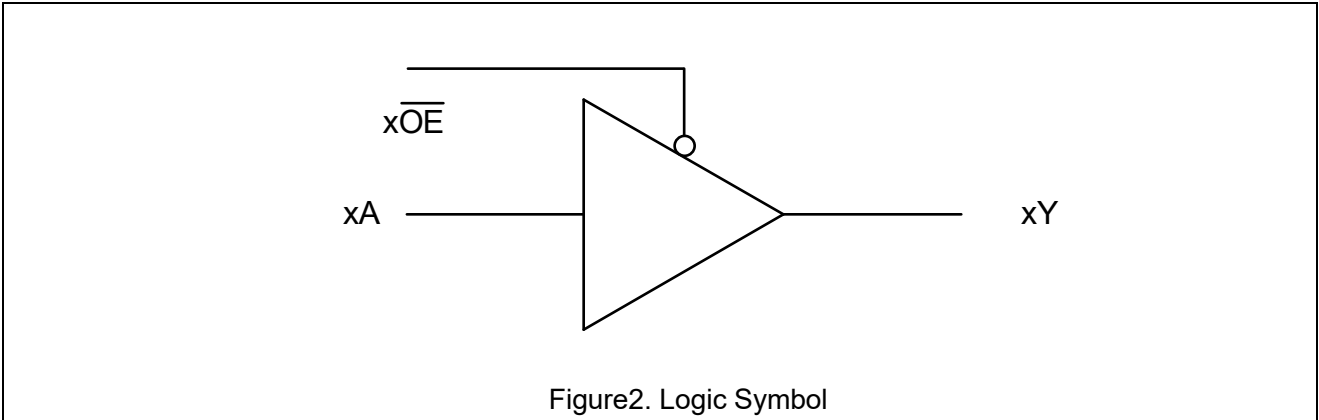
Figure1. Pin Configuration

Pin Function

Pin		I/O	Description
Name	No.		
$\overline{1OE}$	1	Input	Channel 1, Output Enable
1A	2	Input	Channel 1, Input A
1Y	3	Output	Channel 1, Output Y
$\overline{2OE}$	4	Input	Channel 2, Output Enable
2A	5	Input	Channel 2, Input A
2Y	6	Output	Channel 2, Output Y
GND	7	--	Ground
3Y	8	Output	Channel 3, Output Y
3A	9	Input	Channel 3, Input A
$\overline{3OE}$	10	Input	Channel 3, Output Enable
4Y	11	Output	Channel 4, Output Y
4A	12	Input	Channel 4, Input A
$\overline{4OE}$	13	Input	Channel 4, Output Enable
VCC	14	--	Positive Supply

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Block Diagram



Function Table

Input		Output
$\overline{xOE}$	xA	xY
L	L	L
L	H	H
H	X	Z

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Absolute Maximum Ratings

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

Symbol	Parameter		Value	Unit
V _{CC}	Supply Voltage (VCC Pin)		-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 _{LEAD}	Lead Temperature (Soldering 10s)		300	°C
T _{STG}	Storage Temperature		-65 to 150	°C
V _{ESD}	Human Body Model ⁽²⁾		±4000	V
	Charged Device Model ⁽³⁾		±1000	
I _{LU}	Max Latch Up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±200	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}	Supply Voltage	4.5	5.5	V
V _I	Input Voltage	0	V _{CC}	V
V _O	Output Voltage	0	V _{CC}	V
T _A	Operating Free-air Temperature	-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} (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	
V_{IH}	High-Level Input Voltage		4.5	2			2		V
			5.5	2			2		
V_{IL}	Low-Level Input Voltage		4.5			0.8		0.8	V
			5.5			0.8		0.8	
V_{OH}	High-Level Output Voltage	$I_{OH} = -50\mu\text{A}$	4.5	4.4	4.5		4.4		V
		$I_{OH} = -8\text{mA}$	4.5	3.94			3.8		
V_{OL}	Low-Level Output Voltage	$I_{OL} = 50\mu\text{A}$	4.5			0.1		0.1	V
		$I_{OL} = 8\text{mA}$	4.5			0.36		0.44	
I_I	Input Current	$V_I = 5.5\text{V}$ or GND	0~5.5			± 0.1		± 1	μA
I_{OZ}	OFF-state Output Current	$V_O = V_{CC}$ or GND	5.5			± 0.2 5		± 2.5	μA
I_{CC}	Supply Current	$V_I = V_{CC}$ or GND, $I_O = 0\text{mA}$	5.5			1.0		10	μA
$\Delta I_{CC}^{(5)}$	Change in Supply Current	One Input at 3.4V, Other Inputs at V_{CC} or GND	5.5			1.35		1.5	mA

Note5: This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0V or V_{CC} .

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AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$, (see Figure3)

Symbol	Parameter	Condition	$V_{CC}(\text{V})$	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay	$C_L = 50\text{pF}$	4.5		14	25		29	ns
		$C_L = 15\text{pF}$	5.0		12				
t_{PZL} t_{PZH}	Output Enable Time	$C_L = 50\text{pF}$	4.5		12	30		34	ns
t_{PLZ} t_{PHZ}	Output Disable Time	$C_L = 50\text{pF}$	4.5		13	26		30	ns

Capacitance Characteristics

$V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$

Symbol	Parameter	Condition	Typ	Unit
C_I	Input Capacitance	$V_I = V_{CC}$ or GND	4	pF
$C_{PD}^{(6)}$	Power Dissipation Capacitance	No Load, $f = 1\text{MHz}$	9	pF

Note6: C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

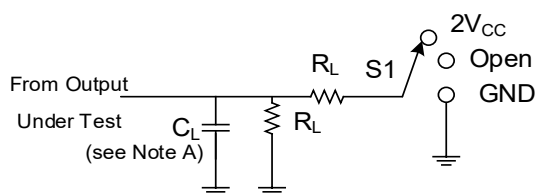
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

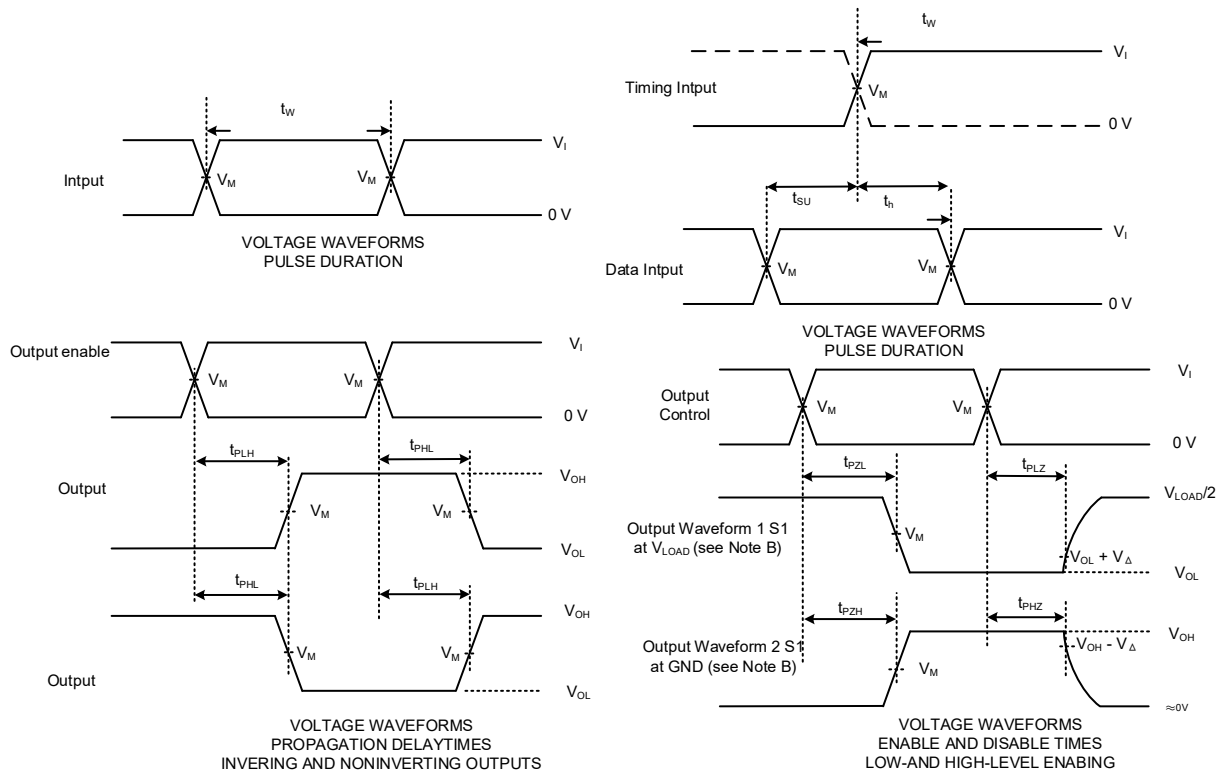
Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	$2V_{CC}$
t_{PHZ}/t_{PZH}	GND

Figure3. Test circuit for measuring switching times

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Notes:

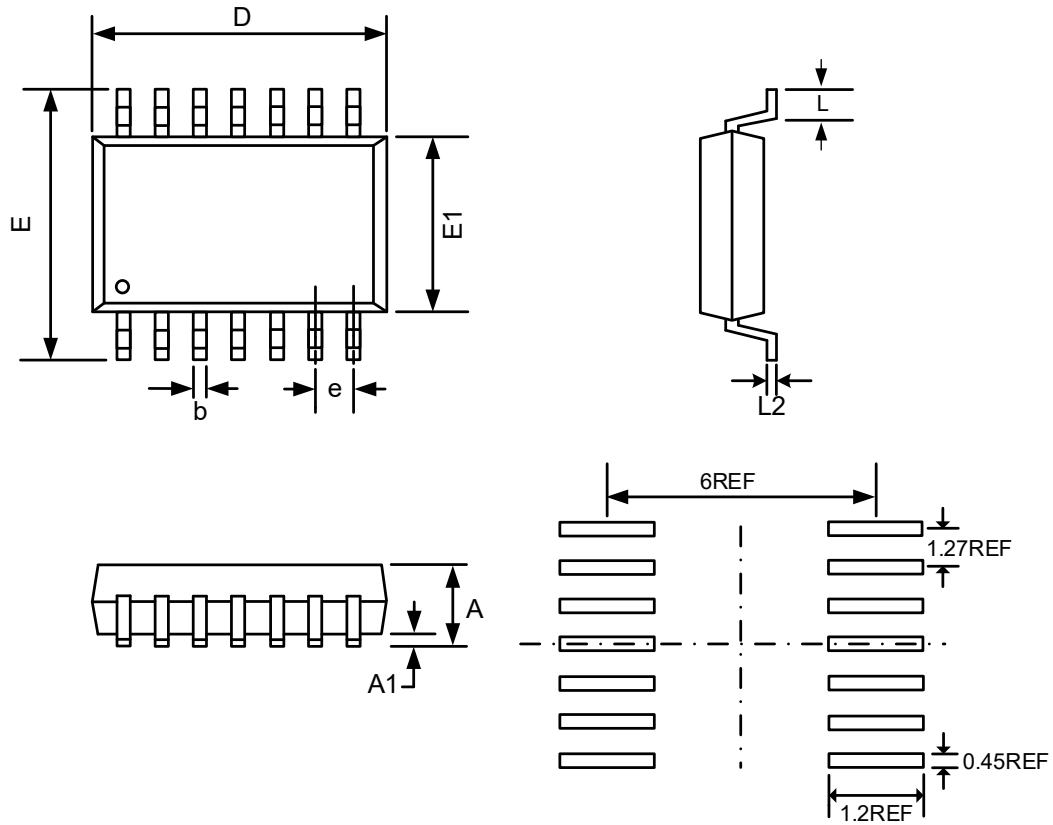
- A. C_L includes probe and jig capacitance.
- B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.
- C. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
- D. All input pulses are supplied by generators having the following characteristics:
 $PRR \leq 10\text{ MHz}$, $Z_O = 50\Omega$
- 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.

Figure4. Input to output propagation delay times

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Package Dimension

SOP14 (8.65mm × 3.9mm)



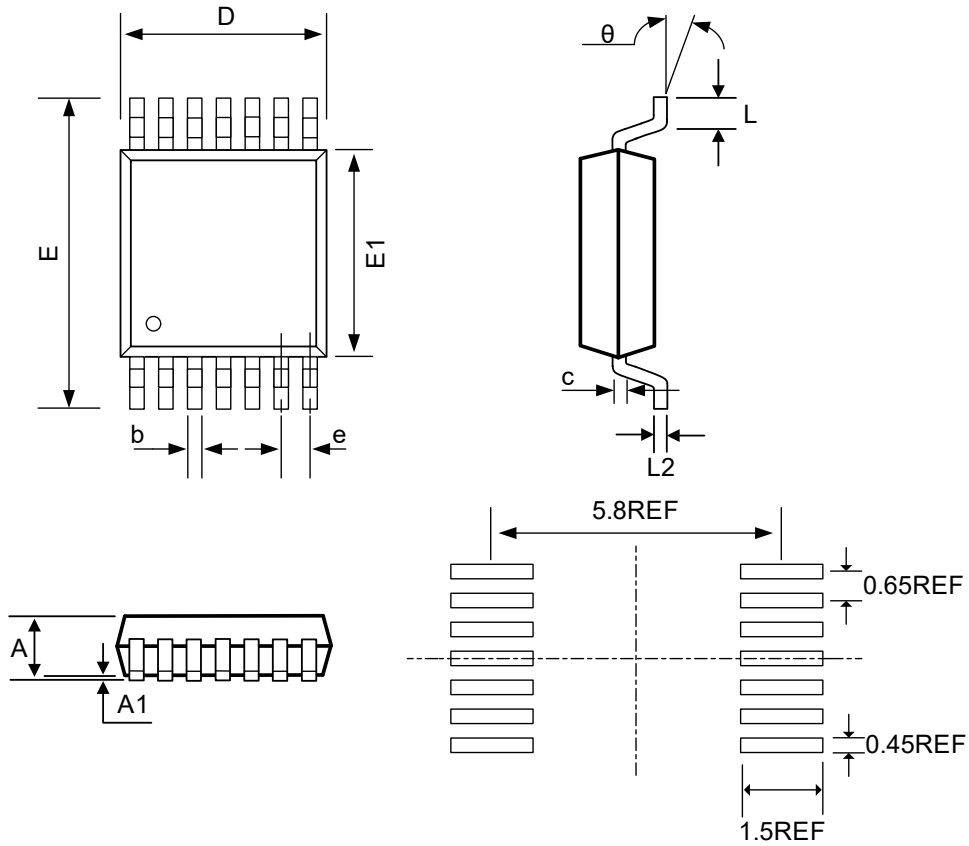
COMMON DIMENSIONS

(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 (5.0mm × 4.4mm)



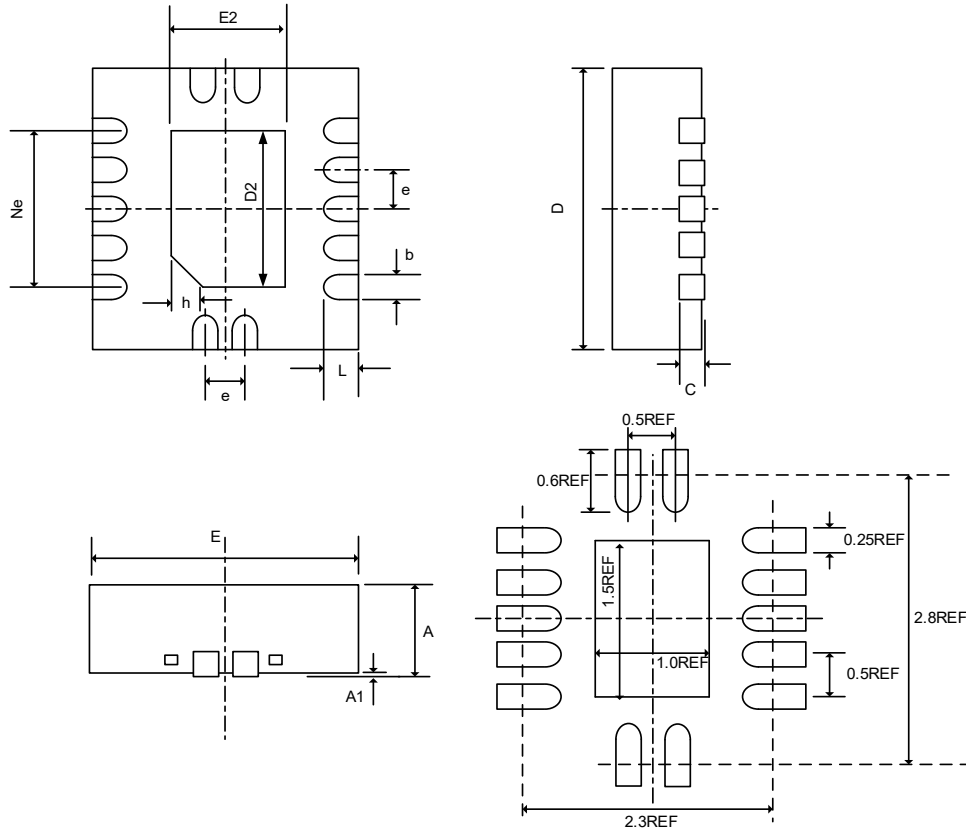
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	MAX
A	--	1.20
A1	0.05	0.15
b	0.19	0.30
c	0.15 REF	
D	4.90	5.10
E	6.20	6.60
E1	4.30	4.50
e	0.65BSC	
L	0.50	0.72
L2	0.25 REF	
θ	0°	8°

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QFN14 (3.0mm × 2.5mm)



COMMON DIMENSIONS

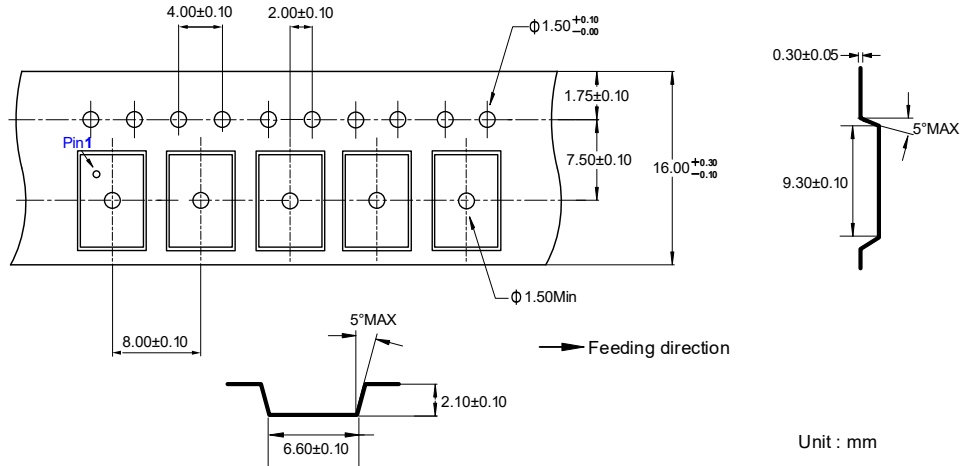
(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.20	0.25	0.30
c	0.20 REF		
D	2.90	3.00	3.10
D2	1.40	1.50	1.60
Ne	2.00 BSC		
e	0.50 BSC		
E	2.40	2.50	2.60
E2	0.90	1.00	1.10
L	0.30	0.40	0.50
K	0.20	-	-
h	0.25 REF		

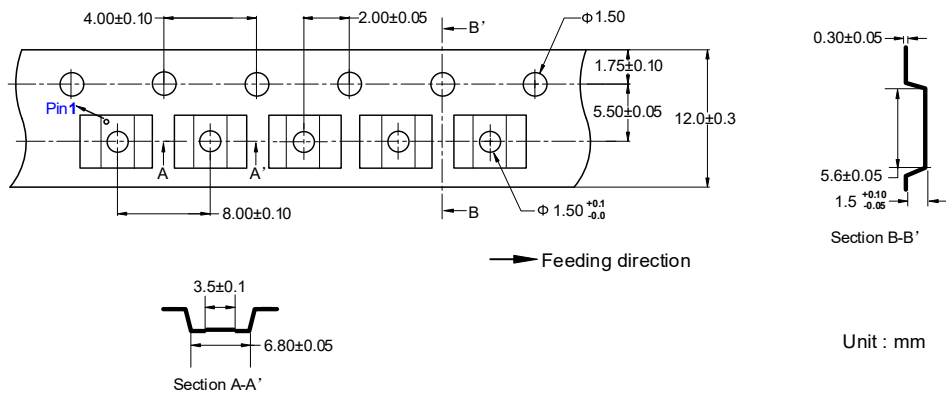
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Tape Information

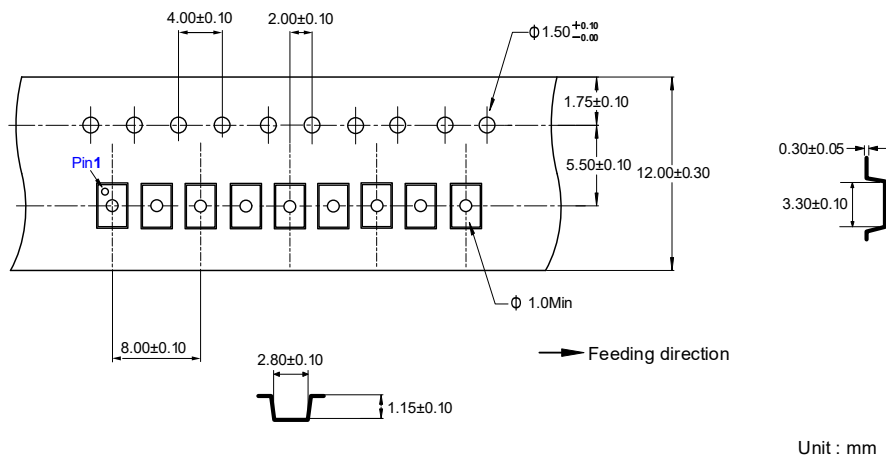
SOP14 (3.9mm × 8.65mm)



TSSOP14 (5.0mm × 4.4mm)



QFN14 (3.0mm × 2.5mm)



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Marking Information

T125A XXXXX ● ET74HCT125M T125A = Part Number XXXXX = Tracking Number	T125A XXXXX ● ET74HCT125V T125A = Part Number XXXXX = Tracking Number	T125A XXXXX ● ET74HCT125Y T125A = Part Number XXXXX = Tracking Number
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Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2025-11-06	Official Version	Wang anran	Yang xiaoxu	Liu jiaying
1.1	2026-03-20	Update Format, Add Marking	Xu tao	Yang xiaoxu	Liu jiaying