

8-BIT Dual-Supply Bus Transceiver with Configurable Level-Shifting, Voltage Translation, and 3-State Outputs

General Description

The ET74LVCH8T245 is an 8-bit noninverting bus transceiver that uses two separate configurable power supply rails. The device is designed for asynchronous communication between two data buses.

The logic levels of the direction-control (DIR) input and the output-enable (OE) input activate either the B-port outputs, the A-port outputs, or place both output ports into a high-impedance state. The control pins (DIR and OE) are referenced to V_{CCA} .

Features

- Control Inputs (DIR and OE) V_{IH} and V_{IL} Levels are Referenced to V_{CCA}
- Bus Hold on Data Inputs Eliminates the Need for External Pull-up and Pull-down Resistors
- VCC Isolation
- Fully Configurable Dual-Rail Design
- Ioff Supports Partial-Power-Down Mode Operation

Applications

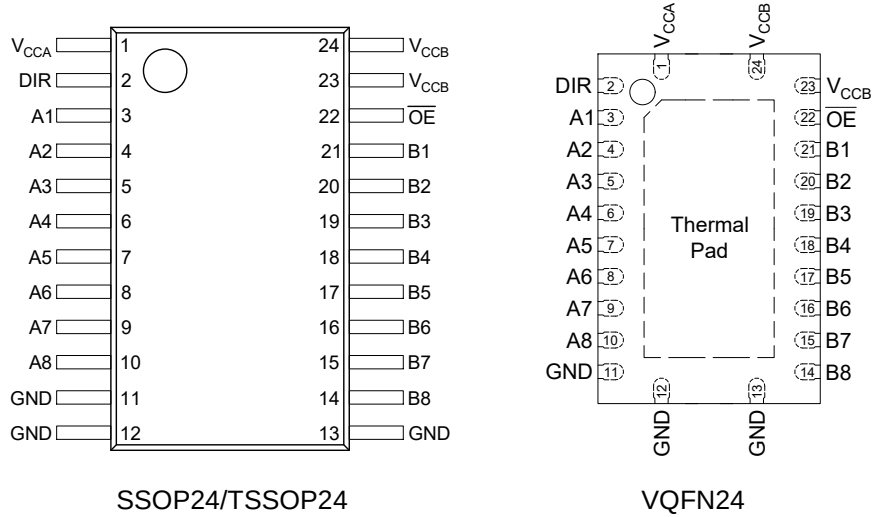
- Consumer and Industrial Equipment
- Telecommunications

Ordering Information

Part No.	Package
ET74LVCH8T245S	SSOP24(8.65*8.00mm)
ET74LVCH8T245S1	SSOP24(8.15*7.65mm)
ET74LVCH8T245V	TSSOP24(7.80*6.40mm)
ET74LVCH8T245Y	VQFN24(3.50*5.50mm)

ET74LVCH8T245

Pin Configuration



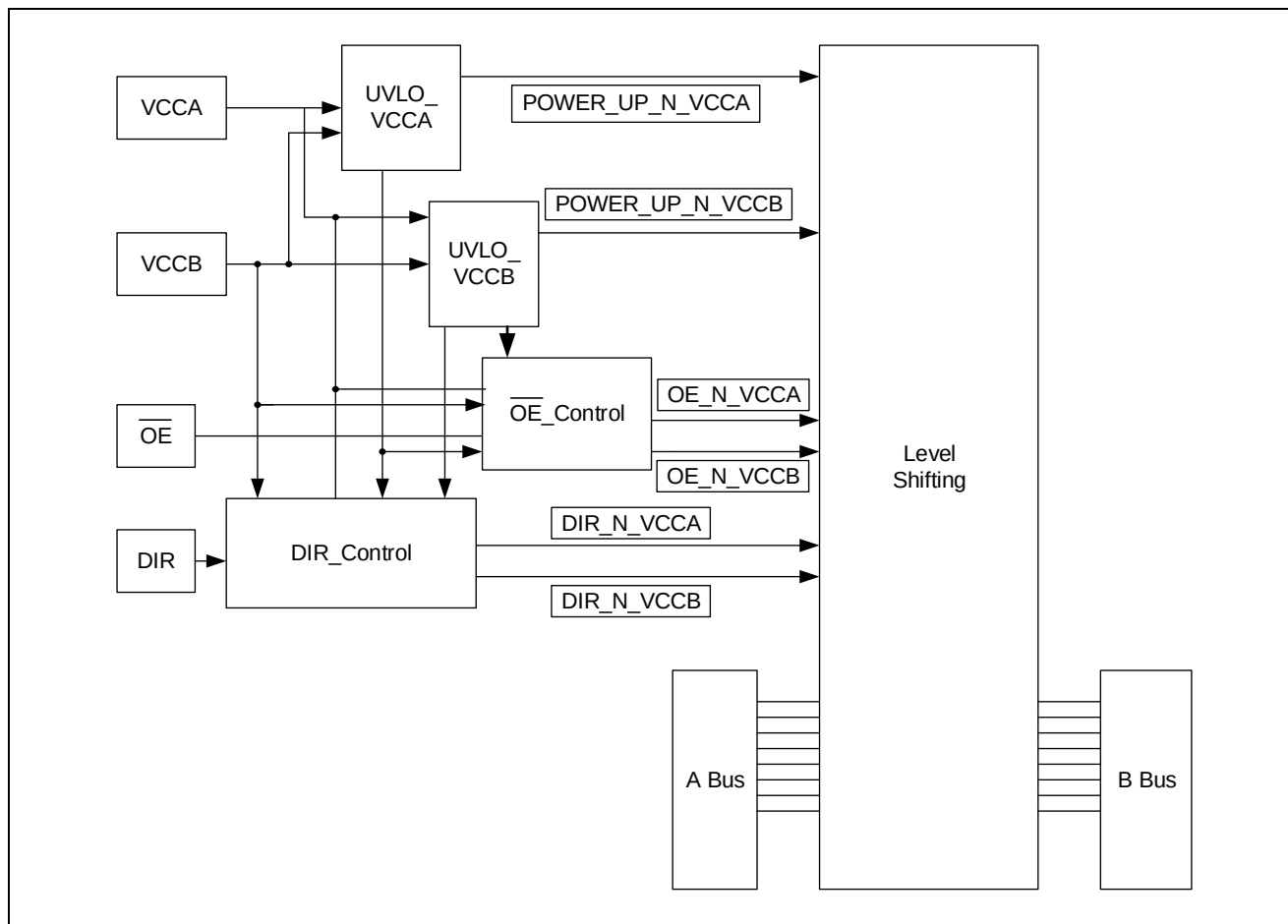
Top View

Pin Assignment

Pin			I/O	Description
Pin Name	T/SSOP24	VQFN24		
V_{CCA}	1	1	—	A port supply voltage.
V_{CCB}	23,24	23,24	—	B port supply voltage.
DIR	2	2	I	Direction-control signal. Referenced to V_{CCA} .
$\overline{OE}$	22	22	I	3-state output-mode enables. Pull OE high to place all outputs in 3-state mode. Referenced to V_{CCA} .
A1~A8	3~10	3~10	I/O	Input/output A1~A8. Referenced to V_{CCA} .
B1~B8	14~21	14~21	I/O	Input/output B1~B8. Referenced to V_{CCB} .
GND	11,12,13	11,12,13	—	Ground

ET74LVCH8T245

Block Diagram



Device Functional Modes

Input circuits of the data I/Os are always active.

Control Inputs		Output Circuits		Operation
OE	DIR	A Port	B Port	
L	L	Enabled	Hi-Z	B data to A bus
L	H	Hi-Z	Enabled	A data to B bus
H	X	Hi-Z	Hi-Z	Isolation

Description

The ET74LVCH8T245 is designed for asynchronous communication between two data buses which allows for universal low-voltage bidirectional translation between any of the 1.8V, 2.5V, 3.3V, and 5.5V voltage nodes. The A port is designed to track V_{CCA}; The B port is designed to track V_{CCB}, all ports accept supply voltage from 1.65 V to 5.5 V. The input circuitry on both A and B ports are always active.

Active bus-hold circuitry holds unused or undriven inputs at a valid logic state. Use of pull-up or pull-down resistors with the bus-hold circuitry is not recommended. This device is fully specified for partial-power-down

ET74LVCH8T245

applications using Ioff. The Ioff circuitry disables the outputs, preventing damaging current backflow through the device.

The VCC isolation feature ensures that if either V_{CCA} or V_{CCB} is at GND, then the outputs are in the high impedance state. To ensure the high-impedance state during power up or power down, OE should be tied to V_{CCA} through a pull-up resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

Absolute Maximum Ratings

Symbol	Rating	Value	Unit
V _{CCA} & V _{CCB}	Supply Voltage ⁽¹⁾	-0.5~6.5	V
Input A1~A8 & B1~B8	I/O ports input Voltage	-0.5~6.5	V
Output A1~A8 & B1~B8	I/O ports output Voltage	-0.5~6.5	V
Input clamp current	V _I < 0	-50	mA
Output clamp current	V _O < 0	-50	mA
Voltage range applied to any output in the high or low state	A port	-0.5 ~ V _{CCA} +0.5	V
	B port	-0.5 ~ V _{CCB} +0.5	
T _{J(MAX)}	Maximum Junction Temperature	150	°C
T _{STG}	Storage Temperature	-40~150	°C
ESD _{HBM}	Human Body Model ⁽²⁾	6000	V
ESD _{CDM}	ESD Capability ⁽²⁾	1000	V
Latch up	Current Maximum Rating ⁽²⁾	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.

Notes:

1. Refer to ELECTRICAL CHARACTERISTICS and APPLICATION INFORMATION for Safe Operating Area.
2. This device series incorporates ESD protection and is tested by the following methods:
ESD Human Body Model tested per EIA/JESD22-A114
CDM tested per JESD22-C101
Latch up Current Maximum Rating tested per JEDEC78

Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
R _{θJA}	SSOP24	Thermal Characteristics, Thermal Resistance, Junction-to-Air	88	°C/W
	TSSOP24		90	°C/W
	VQFN24		37.5	°C/W

ET74LVCH8T245

Recommended Operating Conditions

For V_{CCA} values not specified in the data sheet, $V_{IH}(\min) = V_{CCA} \times 0.7V$, $V_{IL}(\max) = V_{CCA} \times 0.3V$.

Symbol	Description		Min	Max	Unit
V_{CCA}	Supply Voltage		1.65	5.5	V
V_{CCB}			1.65	5.5	
V_{IH}	High-level input voltage (Data inputs)	$V_{CCI}=1.65$ to $4.5V$	$V_{CCI} \times 0.65$		V
		$V_{CCI}=2.3$ to $2.7V$	1.8		
		$V_{CCI}=3$ to $3.6V$	2.2		
		$V_{CCI}=4.5$ to $5.5V$	$V_{CCI} \times 0.7$		
V_{IL}	Low-level input voltage (Data inputs)	$V_{CCI}=1.65$ to $4.5V$		$V_{CCI} \times 0.35$	V
		$V_{CCI}=2.3$ to $2.7V$		0.6	
		$V_{CCI}=3$ to $3.6V$		0.8	
		$V_{CCI}=4.5$ to $5.5V$		$V_{CCI} \times 0.3$	
V_{IH}	High-level input voltage (Control inputs) (referenced to V_{CCA})	$V_{CCI}=1.65$ to $4.5V$	$V_{CCI} \times 0.65$		V
		$V_{CCI}=2.3$ to $2.7V$	1.8		
		$V_{CCI}=3$ to $3.6V$	2.2		
		$V_{CCI}=4.5$ to $5.5V$	$V_{CCI} \times 0.7$		
V_{IL}	Low-level input voltage (Control inputs) (referenced to V_{CCA})	$V_{CCI}=1.65$ to $4.5V$		$V_{CCI} \times 0.35$	V
		$V_{CCI}=2.3$ to $2.7V$		0.6	
		$V_{CCI}=3$ to $3.6V$		0.8	
		$V_{CCI}=4.5$ to $5.5V$		$V_{CCI} \times 0.3$	
V_I	Control inputs		0	5.5	V
$V_{I/O}$	Input/output voltage	Active state	0	V_{CCO}	V
		3-State	0	5.5	
I_{OH}	High-level input current	$V_{CCO} = 1.65$ to $4.5V$		-4	mA
		$V_{CCO} = 2.3$ to $2.7V$		-8	
		$V_{CCO} = 3$ to $3.6V$		-24	
		$V_{CCO} = 4.5$ to $5.5V$		-32	
I_{OL}	Low-level input current	$V_{CCO} = 1.65$ to $4.5V$		4	mA
		$V_{CCO} = 2.3$ to $2.7V$		8	
		$V_{CCO} = 3$ to $3.6V$		24	
		$V_{CCO} = 4.5$ to $5.5V$		32	
$\Delta t/\Delta v$	Input transition rise or fall rate (Data inputs)	$V_{CCI}=1.65$ to $4.5V$		20	ns/V
		$V_{CCI}=2.3$ to $2.7V$		20	
		$V_{CCI}=3$ to $3.6V$		10	
		$V_{CCI}=4.5$ to $5.5V$		5	
T_A	Operating free-air temperature		-40	85	°C

ET74LVCH8T245

Electrical Characteristics

All typical limits apply over $T_A = 25^\circ\text{C}$, and all maximum and minimum limits apply over $T_A = -40^\circ\text{C}$ to 85°C (unless otherwise noted)

Symbol	Parameter	Test Conditions		Min	Typ	Max	Unit
V_{OH}	High-level output voltage	$I_{OH} = -100\mu\text{A}$ $V_I = V_{IH}$	$V_{CCA} = 1.65\text{V to } 4.5\text{V}$ $V_{CCB} = 1.65\text{V to } 4.5\text{V}$	V_{CCO} -0.1			V
		$I_{OH} = -4\text{mA}$ $V_I = V_{IH}$	$V_{CCA} = 1.65\text{V}$ $V_{CCB} = 1.65\text{V}$	1.2			
		$I_{OH} = -8\text{mA}$ $V_I = V_{IH}$	$V_{CCA} = 2.3\text{V}$ $V_{CCB} = 2.3\text{V}$	1.9			
		$I_{OH} = -24\text{mA}$ $V_I = V_{IH}$	$V_{CCA} = 3\text{V}$ $V_{CCB} = 3\text{V}$	2.4			
		$I_{OH} = -32\text{mA}$ $V_I = V_{IH}$	$V_{CCA} = 4.5\text{V}$ $V_{CCB} = 4.5\text{V}$	3.8			
V_{OL}	Low-level output voltage	$I_{OL} = 100\mu\text{A}$ $V_I = V_{IL}$	$V_{CCA} = 1.65\text{V to } 4.5\text{V}$ $V_{CCB} = 1.65\text{V to } 4.5\text{V}$			0.1	V
		$I_{OL} = 4\text{mA}$ $V_I = V_{IL}$	$V_{CCA} = 1.65\text{V}$ $V_{CCB} = 1.65\text{V}$			0.45	
		$I_{OL} = 8\text{mA}$ $V_I = V_{IL}$	$V_{CCA} = 2.3\text{V}$ $V_{CCB} = 2.3\text{V}$			0.3	
		$I_{OL} = 24\text{mA}$ $V_I = V_{IL}$	$V_{CCA} = 3\text{V}$ $V_{CCB} = 3\text{V}$			0.55	
		$I_{OL} = 32\text{mA}$ $V_I = V_{IL}$	$V_{CCA} = 4.5\text{V}$ $V_{CCB} = 4.5\text{V}$			0.55	
I_I	Control inputs (DIR)	$V_I =$ V_{CCA} or GND	$V_{CCA} = 1.65\text{V to } 4.5\text{V}$ $V_{CCB} = 1.65\text{V to } 4.5\text{V}$		± 0.5	± 2	μA
I_{BHL}	Bus-hold low Sustaining current	$V_I = 0.58\text{V}$	$V_{CCA} = 1.65\text{V}, V_{CCB} = 1.65\text{V}$	15			μA
		$V_I = 0.7\text{V}$	$V_{CCA} = 2.3\text{V}, V_{CCB} = 2.3\text{V}$	45			
		$V_I = 0.8\text{V}$	$V_{CCA} = 3\text{V}, V_{CCB} = 3\text{V}$	75			
		$V_I = 1.35\text{V}$	$V_{CCA} = 4.5\text{V}, V_{CCB} = 4.5\text{V}$	100			
I_{BHH}	Bus-hold high Sustaining current	$V_I = 1.07\text{V}$	$V_{CCA} = 1.65\text{V}, V_{CCB} = 1.65\text{V}$	-15			μA
		$V_I = 1.7\text{V}$	$V_{CCA} = 2.3\text{V}, V_{CCB} = 2.3\text{V}$	-45			
		$V_I = 2\text{V}$	$V_{CCA} = 3\text{V}, V_{CCB} = 3\text{V}$	-75			
		$V_I = 3.15\text{V}$	$V_{CCA} = 4.5\text{V}, V_{CCB} = 4.5\text{V}$	-100			
I_{BHLO}	Bus-hold low sustaining current	$V_I = 0 \text{ to } V_{CC}$	$V_{CCA} = 1.65\text{V}, V_{CCB} = 1.65\text{V}$	200			μA
			$V_{CCA} = 2.3\text{V}, V_{CCB} = 2.3\text{V}$	300			
			$V_{CCA} = 3\text{V}, V_{CCB} = 3\text{V}$	500			
			$V_{CCA} = 4.5\text{V}, V_{CCB} = 4.5\text{V}$	900			

ET74LVCH8T245

Electrical Characteristics(Continued)

Symbol	Parameter	Test Conditions		Min	Typ	Max	Unit
$I_{BH\bar{H}O}$	Bus-hold high Sustaining current	$V_I = 0 \text{ to } V_{CC}$	$V_{CCA} = 1.65V, V_{CCB} = 1.65V$	-200			μA
			$V_{CCA} = 2.3V, V_{CCB} = 2.3V$	-300			
			$V_{CCA} = 3V, V_{CCB} = 3V$	-500			
			$V_{CCA} = 4.5V, V_{CCB} = 4.5V$	-900			
I_{OFF}	Input & output power-off leakage current	$V_I \text{ or } V_O = 0 \text{ to } 5.5V$	B Port $V_{CCA} = 0V, V_{CCB} = 0 \text{ to } 5.5V$		± 0.5	± 2	μA
			A Port $V_{CCA} = 0 \text{ to } 5.5V, V_{CCB} = 0V$		± 0.5	± 2	
I_{OZ}	Off-state output current	$V_O = V_{CCO} \text{ or GND}$ $V_I = V_{CCI} \text{ or GND}$	$\bar{O}E = V_{IH}$ $V_{CCA} = 1.65V \text{ to } 4.5V$ $V_{CCB} = 1.65V \text{ to } 4.5V$			± 2	μA
			$\bar{O}E = X, \text{ B Port}$ $V_{CCA} = 0V, V_{CCB} = 5.5V$			± 2	
			$\bar{O}E = X, \text{ A Port}$ $V_{CCA} = 5.5V, V_{CCB} = 0V$			± 2	
I_{CCA}	Supply current A port	$V_I = V_{CCI} \text{ or GND}, I_O = 0$	$V_{CCA} = 1.65V \text{ to } 4.5V$ $V_{CCB} = 1.65V \text{ to } 4.5V$			20	μA
			$V_{CCA} = 5V, V_{CCB} = 0V$			20	
			$V_{CCA} = 0V, V_{CCB} = 5V$			-2	
I_{CCB}	Supply current B port	$V_I = V_{CCI} \text{ or GND}, I_O = 0$	$V_{CCA} = 1.65V \text{ to } 4.5V$ $V_{CCB} = 1.65V \text{ to } 4.5V$			20	μA
			$V_{CCA} = 5V, V_{CCB} = 0V$			-2	
			$V_{CCA} = 0V, V_{CCB} = 5V$			20	
$I_{CCA} + I_{CCB}$	Combined supply current	$V_I = V_{CCI} \text{ or GND}, I_O = 0$	$V_{CCA} = 1.65V \text{ to } 4.5V$ $V_{CCB} = 1.65V \text{ to } 4.5V$			30	μA
ΔI_{CCA}	Supply-current change DIR	DIR at $V_{CCA} - 0.6V$, B port=open, A port at V_{CCA} or GND	$V_{CCA} = 3V \text{ to } 5.5V$ $V_{CCB} = 3V \text{ to } 5.5V$			50	μA
C_i	Input capacitance (control inputs)	$V_I = V_{CCI} \text{ or GND}$	$V_{CCA} = 3.3V$ $V_{CCB} = 3.3V$		4.5	5.5	pF
C_{io}	Input and output capacitance (A or B port)	$V_O = V_{CCA/B} \text{ or GND}$	$V_{CCA} = 3.3V$ $V_{CCB} = 3.3V$		7.7	10	pF

ET74LVCH8T245

Switching Characteristics

$V_{CCA} = 1.8V \pm 0.15V$

Parameter	From (Input)	To (Output)	Test Conditions	Min	Max	Unit
t_{PLH}, t_{PHL}	A	B	$V_{CCB} = 1.8V \pm 0.15V$	1.7	19.9	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.3	17.2	
			$V_{CCB} = 3.3V \pm 0.3V$	1	16.4	
			$V_{CCB} = 5V \pm 0.5V$	0.4	16.1	
t_{PLH}, t_{PHL}	B	A	$V_{CCB} = 1.8V \pm 0.15V$	0.9	19.8	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.8	17.6	
			$V_{CCB} = 3.3V \pm 0.3V$	0.7	17.6	
			$V_{CCB} = 5V \pm 0.5V$	0.7	17.4	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	1.5	32.6	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.5	32.4	
			$V_{CCB} = 3.3V \pm 0.3V$	1.5	32.3	
			$V_{CCB} = 5V \pm 0.5V$	1.4	32.2	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	2.4	32.2	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.9	31.1	
			$V_{CCB} = 3.3V \pm 0.3V$	1.7	51.0	
			$V_{CCB} = 5V \pm 0.5V$	1.3	49.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	0.4	22.1	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.4	21.0	
			$V_{CCB} = 3.3V \pm 0.3V$	0.4	19.0	
			$V_{CCB} = 5V \pm 0.5V$	0.4	19.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	1.8	25.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.5	23.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.2	19.6	
			$V_{CCB} = 5V \pm 0.5V$	0.9	17.8	

ET74LVCH8T245

Switching Characteristics(Continued)

$V_{CCA} = 2.5V \pm 0.2V$

Parameter	From (Input)	To (Output)	Test Conditions	Min	Max	Unit
t_{PLH}, t_{PHL}	A	B	$V_{CCB} = 1.8V \pm 0.15V$	1.5	18.6	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.2	15.5	
			$V_{CCB} = 3.3V \pm 0.3V$	0.8	15.1	
			$V_{CCB} = 5V \pm 0.5V$	0.8	14.8	
t_{PLH}, t_{PHL}	B	A	$V_{CCB} = 1.8V \pm 0.15V$	1.2	17.1	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1	15.7	
			$V_{CCB} = 3.3V \pm 0.3V$	1	15.2	
			$V_{CCB} = 5V \pm 0.5V$	0.9	15.0	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	1.5	35.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.4	34.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.4	34.0	
			$V_{CCB} = 5V \pm 0.5V$	1.4	34.0	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	2.3	32.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.8	30.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.7	50.0	
			$V_{CCB} = 5V \pm 0.5V$	1.7	50.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	1	16.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1	16.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1	16.0	
			$V_{CCB} = 5V \pm 0.5V$	1	16.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	1.7	22.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.5	20.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.5	20.0	
			$V_{CCB} = 5V \pm 0.5V$	1.2	18.0	

ET74LVCH8T245

Switching Characteristics(Continued)

$V_{CCA} = 3.3V \pm 0.3V$

Parameter	From (Input)	To (Output)	Test Conditions	Min	Max	Unit
t_{PLH}, t_{PHL}	A	B	$V_{CCB} = 1.8V \pm 0.15V$	1.5	17.5	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.1	15.0	
			$V_{CCB} = 3.3V \pm 0.3V$	0.8	14.5	
			$V_{CCB} = 5V \pm 0.5V$	0.5	14.3	
t_{PLH}, t_{PHL}	B	A	$V_{CCB} = 1.8V \pm 0.15V$	0.8	16.9	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.8	15.2	
			$V_{CCB} = 3.3V \pm 0.3V$	0.7	14.5	
			$V_{CCB} = 5V \pm 0.5V$	0.6	14.1	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	1.6	52.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.6	50.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.6	50.0	
			$V_{CCB} = 5V \pm 0.5V$	1.6	50.0	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	2.1	30.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.7	28.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.5	48.0	
			$V_{CCB} = 5V \pm 0.5V$	1.5	48.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	0.8	16.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.8	16.0	
			$V_{CCB} = 3.3V \pm 0.3V$	0.8	16.0	
			$V_{CCB} = 5V \pm 0.5V$	0.8	16.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	1.7	22.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.5	20.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.5	20.0	
			$V_{CCB} = 5V \pm 0.5V$	1.2	18.0	

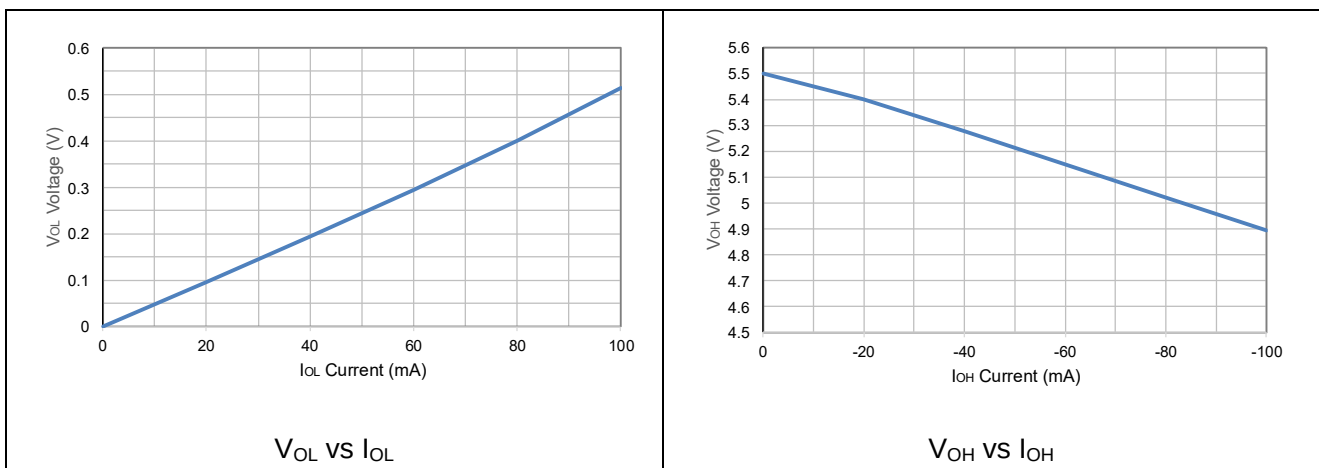
ET74LVCH8T245

Switching Characteristics(Continued)

$V_{CCA} = 5V \pm 0.5V$

Parameter	From (Input)	To (Output)	Test Conditions	Min	Max	Unit
t_{PLH}, t_{PHL}	A	B	$V_{CCB} = 1.8V \pm 0.15V$	1.5	17.3	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1	14.8	
			$V_{CCB} = 3.3V \pm 0.3V$	0.7	14.4	
			$V_{CCB} = 5V \pm 0.5V$	0.4	14.2	
t_{PLH}, t_{PHL}	B	A	$V_{CCB} = 1.8V \pm 0.15V$	0.7	16.8	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.4	15.0	
			$V_{CCB} = 3.3V \pm 0.3V$	0.3	14.3	
			$V_{CCB} = 5V \pm 0.5V$	0.3	14.1	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	0.3	50.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.3	50.0	
			$V_{CCB} = 3.3V \pm 0.3V$	0.3	50.0	
			$V_{CCB} = 5V \pm 0.5V$	0.3	50.0	
t_{PHZ}, t_{PLZ}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	2	36.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.6	36.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.4	50.0	
			$V_{CCB} = 5V \pm 0.5V$	0.7	50.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	A	$V_{CCB} = 1.8V \pm 0.15V$	0.7	16.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	0.7	16.0	
			$V_{CCB} = 3.3V \pm 0.3V$	0.7	16.0	
			$V_{CCB} = 5V \pm 0.5V$	0.7	16.0	
t_{PZH}, t_{PZL}	$\overline{OE}$	B	$V_{CCB} = 1.8V \pm 0.15V$	1.7	22.0	ns
			$V_{CCB} = 2.5V \pm 0.2V$	1.5	20.0	
			$V_{CCB} = 3.3V \pm 0.3V$	1.5	20.0	
			$V_{CCB} = 5V \pm 0.5V$	1.2	18.0	

Typical Characteristics



ET74LVCH8T245

Operating Characteristics

Parameter		Test Conditions		Typ	Unit
CpdA	A-port input, B-port output	CL = 0, f = 10MHz, tr = tr = 1ns	VCCA = VCCB = 1.8V	3	pF
			VCCA = VCCB = 2.5V	3.5	
			VCCA = VCCB = 3.3V	4	
			VCCA = VCCB = 5V	7	
	B-port input, A-port output	CL = 0, f = 10MHz, tr = tr = 1ns	VCCA = VCCB = 1.8V	14	
			VCCA = VCCB = 2.5V	14.5	
			VCCA = VCCB = 3.3V	15	
			VCCA = VCCB = 5V	20	
CpdB	A-port input, B-port output	CL = 0, f = 10MHz, tr = tr = 1ns	VCCA = VCCB = 1.8V	14.5	pF
			VCCA = VCCB = 2.5V	15	
			VCCA = VCCB = 3.3V	16	
			VCCA = VCCB = 5V	22	
	B-port input, A-port output	CL = 0, f = 10MHz, tr = tr = 1ns	VCCA = VCCB = 1.8V	3	
			VCCA = VCCB = 2.5V	3.5	
			VCCA = VCCB = 3.3V	4	
			VCCA = VCCB = 5V	7	

Feature Description

Fully Configurable Dual-Rail Design

Both VCCA and VCCB can be supplied at any voltage from 1.65V to 5.5V, making the device suitable for translating between any of the voltage nodes: 1.8V, 2.5V, 3.3V and 5V.

Partial-Power-Down Mode Operation

Ioff circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down. This can occur in applications where subsections of a system are powered down (partial power down) to reduce power consumption.

Active Bus Hold Circuitry

Active bus-hold circuitry holds unused or undriven inputs at a valid logic state, which helps with board space savings and reduced component costs. Use of pullup or pulldown resistors with the bus-hold circuitry is not recommended.

Supports High-Speed Translation

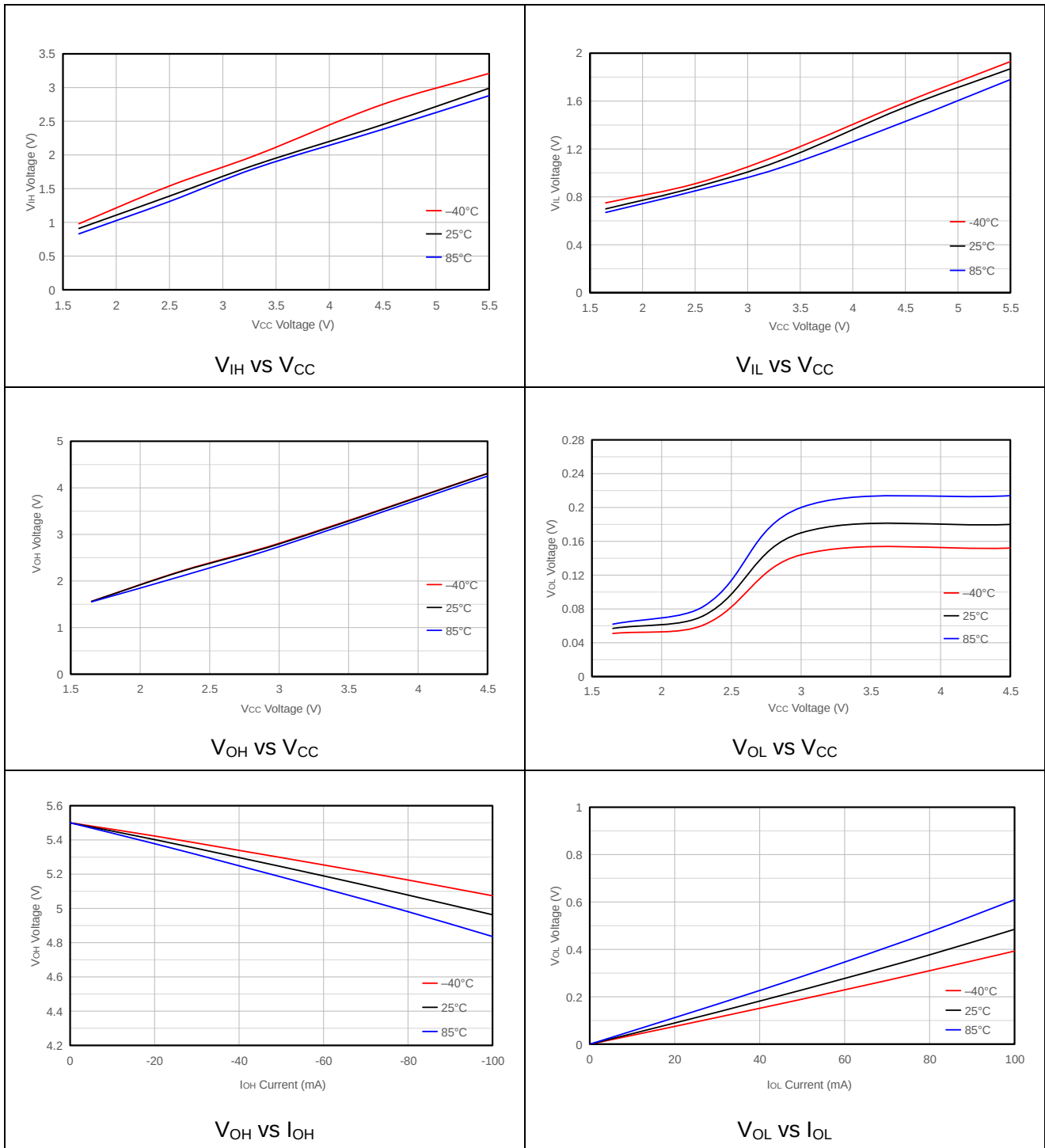
The device can support high data rate applications, which can be calculated from the maximum propagation delay. This also depends on the output load. For example, for a 3.3V to 5V conversion, the maximum frequency is 200MHz.

ET74LVCH8T245

VCC Isolation

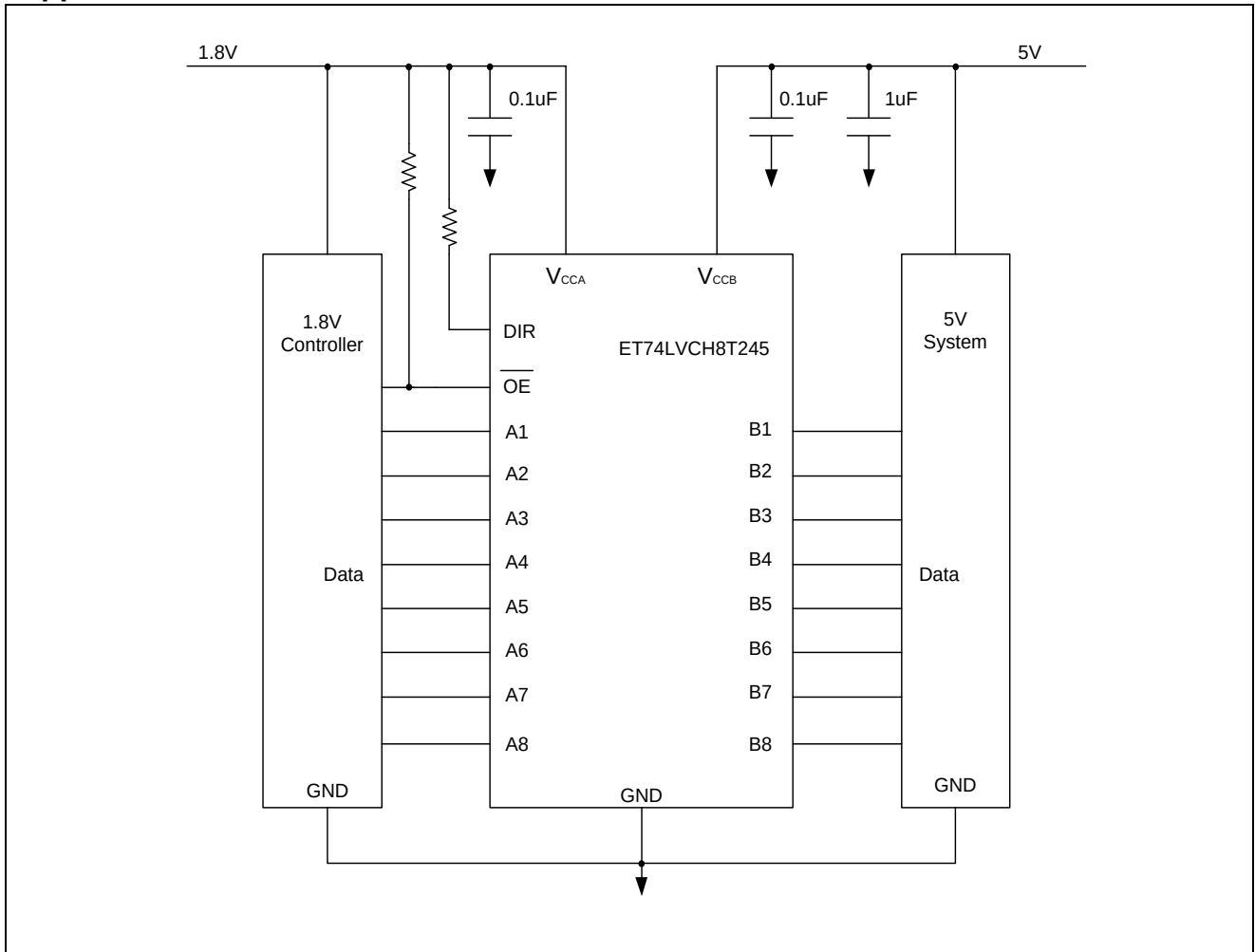
The VCC isolation feature ensures that if either VCCA or VCCB are at GND (or < 0.4V), both ports will be in a high impedance state (IOZ shown in Electrical Characteristics). This prevents false logic levels from being presented to either bus.

Temperature Characteristics



ET74LVCH8T245

Application Circuits



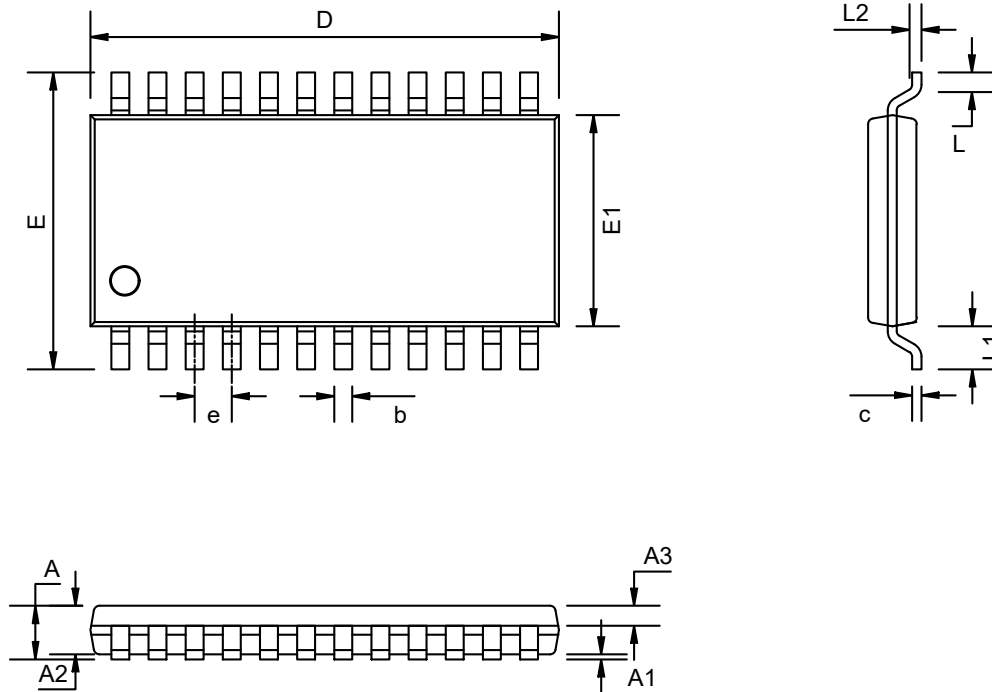
Applications Information

The ET74LVCH8T245 device can be used in level-translation applications for interfacing devices or systems operating at different interface voltages with one another. The maximum output current can be up to 32mA when device is powered by 5V.

ET74LVCH8T245

Package Dimension

SSOP24 (8.65×6mm)

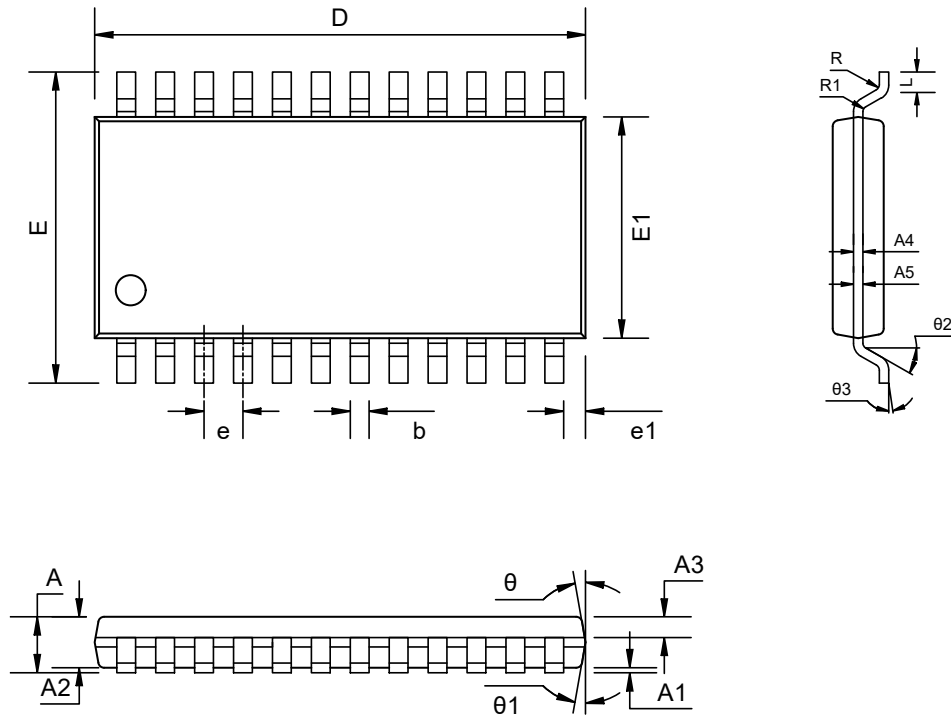


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Nom	Max
A	-	-	1.75
A1	0.10	-	0.25
A2	1.30	1.40	1.50
A3	0.34	0.39	0.44
b	0.23	0.28	0.33
c	0.10	-	0.19
D	8.45	8.65	8.85
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	0.635BSC		
L	0.50	0.65	0.80
L1	1.05BSC		
L2	0.25BSC		

ET74LVCH8T245

SSOP24 (8.15×7.65mm)

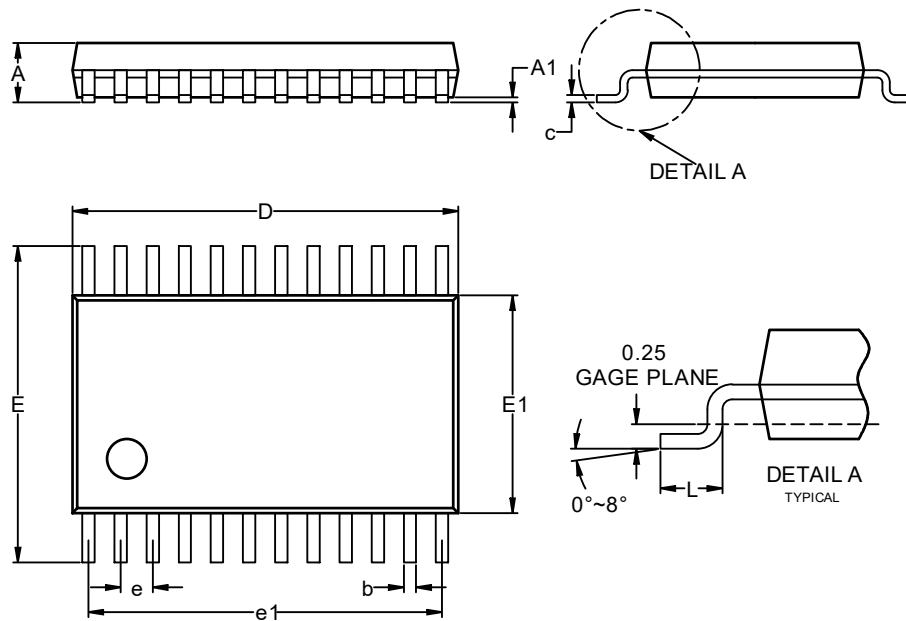


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Nom	Max
A	1.65	-	1.85
A1	0.05	-	0.25
A2	1.45	-	1.55
A3	0.674TYP		
A4	0.152TYP		
A5	0.172TYP		
b	0.30TYP		
D	8.15	-	8.25
E	7.65	-	7.95
E1	5.25	-	5.35
e	0.65TYP		
e1	0.375TYP		
L	0.60	-	0.80
R	0.20TYP		
R1	0.15TYP		
θ	12°TYP		
θ1	12°TYP		
θ2	10°TYP		
θ3	0°~8°		

TSSOP24

ET74LVCH8T245

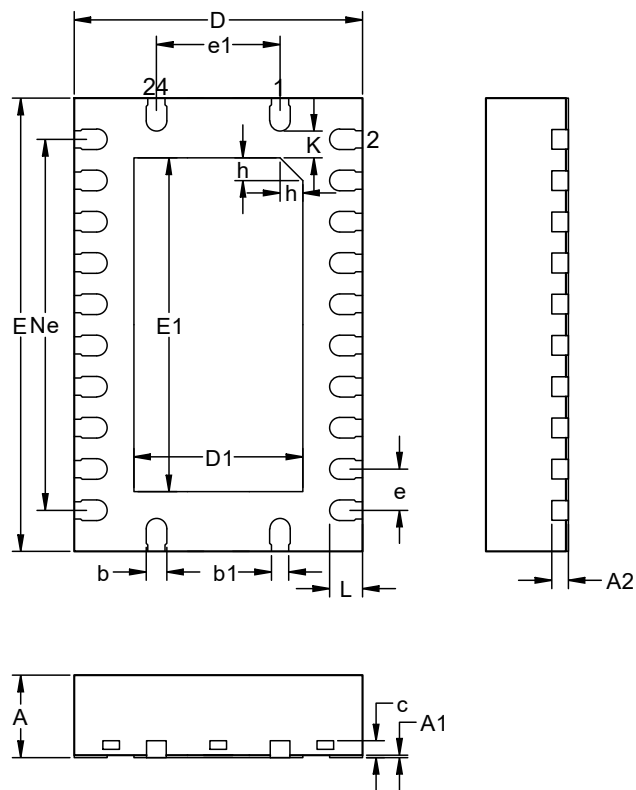


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Nom	Max
A	—	—	1.20
A1	0.05	—	0.15
b	0.19	0.24	0.30
c	0.15TYP		
D	7.70	7.80	7.90
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	0.65BSC		
e1	7.15BSC		
L	0.50	—	0.75

ET74LVCH8T245

VQFN24



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

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
b1	0.180REF		
c	0.203REF		
D	3.40	3.50	3.60
D1	2.00	2.10	2.20
e	0.500BSC		
e1	1.500BSC		
Ne	4.500BSC		
E	5.40	5.50	5.60
E1	4.00	4.10	4.20
L	0.35	0.40	0.45
h	0.30	0.35	0.40
k	0.300REF		

ET74LVCH8T245

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
0.0	2022-04-15	Preliminary Version	Yuangr	Yuangr	Zhuji
1.0	2022-09-20	Initial Version	Tianqh	Yuangr	Zhuji
1.1	2023-12-18	Update Package	Tugz	Yuangr	Liuji
1.2	2025-04-20	Update temperature characteristic curve	Tianqh	Yuangr	Zhuji