

1. General Description

The EM74LVC8T245; EM74LVCH8T245 is an 8-bit dual supply translating transceivers with 3-state outputs that enable bidirectional level translation. They feature two data input-output ports (pins An and Bn), a direction control input (DIR), an output enable input (\overline{OE}) and dual supply pins ($V_{CC(A)}$ and $V_{CC(B)}$). Both $V_{CC(A)}$ and $V_{CC(B)}$ can be supplied at any voltage between 1.2 V and 5.5 V making the device suitable for translating between any of the low voltage nodes (1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V and 5.0 V). Pins An, \overline{OE} and DIR are referenced to $V_{CC(A)}$ and pins Bn are referenced to $V_{CC(B)}$. A HIGH on DIR allows transmission from An to Bn and a LOW on DIR allows transmission from Bn to An. The output enable input (\overline{OE}) can be used to disable the outputs so the buses are effectively isolated.

The devices are fully specified for partial power-down applications using I_{OFF} . The I_{OFF} circuitry disables the output, preventing any damaging backflow current through the device when it is powered down. In suspend mode when either $V_{CC(A)}$ or $V_{CC(B)}$ are at GND level, both A port and B port are in the high-impedance OFF-state.

Active bus hold circuitry in the EM74LVCH8T245 holds unused or floating data inputs at a valid logic level.

2. Features and Benefits

- Wide supply voltage range
 - $V_{CC(A)}$: 1.2 V to 5.5 V
 - $V_{CC(B)}$: 1.2 V to 5.5 V
- High noise immunity
- Complies with JEDEC standards:
 - JESD8-7 (1.2 V to 1.95 V)
 - JESD8-5 (1.8 V to 2.7 V)
 - JESD8C (2.7 V to 3.6 V)
 - JESD36 (4.5 V to 5.5 V)
- Suspend mode

EM74LVC8T245; EM74LVCH8T245



8-bit dual supply translating transceiver; 3-state

Product datasheet, Rev. 1.2

May 12, 2025

- Latch-up performance exceeds 250 mA
- ± 24 mA output drive ($V_{CC} = 3.0$ V)
- Inputs accept voltages up to 5.5 V
- Low power consumption: 30 μ A maximum I_{CC}
- I_{OFF} circuitry provides partial Power-down mode operation
- ESD protection:
 - HBM ANSI/ESDA/JEDEC JS-001 Class 2 exceeds 2500 V
 - CDM ANSI/ESDA/JEDEC JS-002 Class C3 exceeds 2000 V
- Multiple package options

EM74LVC8T245; EM74LVCH8T245



8-bit dual supply translating transceiver; 3-state

Product datasheet, Rev. 1.2

May 12, 2025

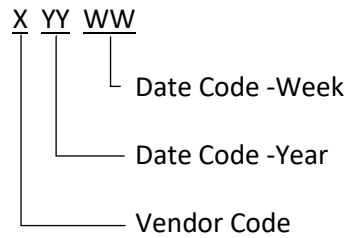
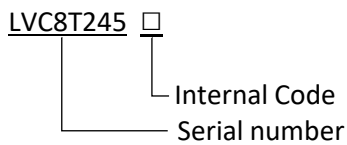
3. Ordering Information

Table 1. Ordering information

Type number	Topside marking	Package		
		Name	Description	Quantity
EM74LVC8T245PW	LVC8T245□ XYYWW	TSSOP-24L	plastic thin shrink small outline package; 24 leads;body width 4.4 mm	3000
EM74LVCH8T245PW	LVCH8T245□ XYYWW			

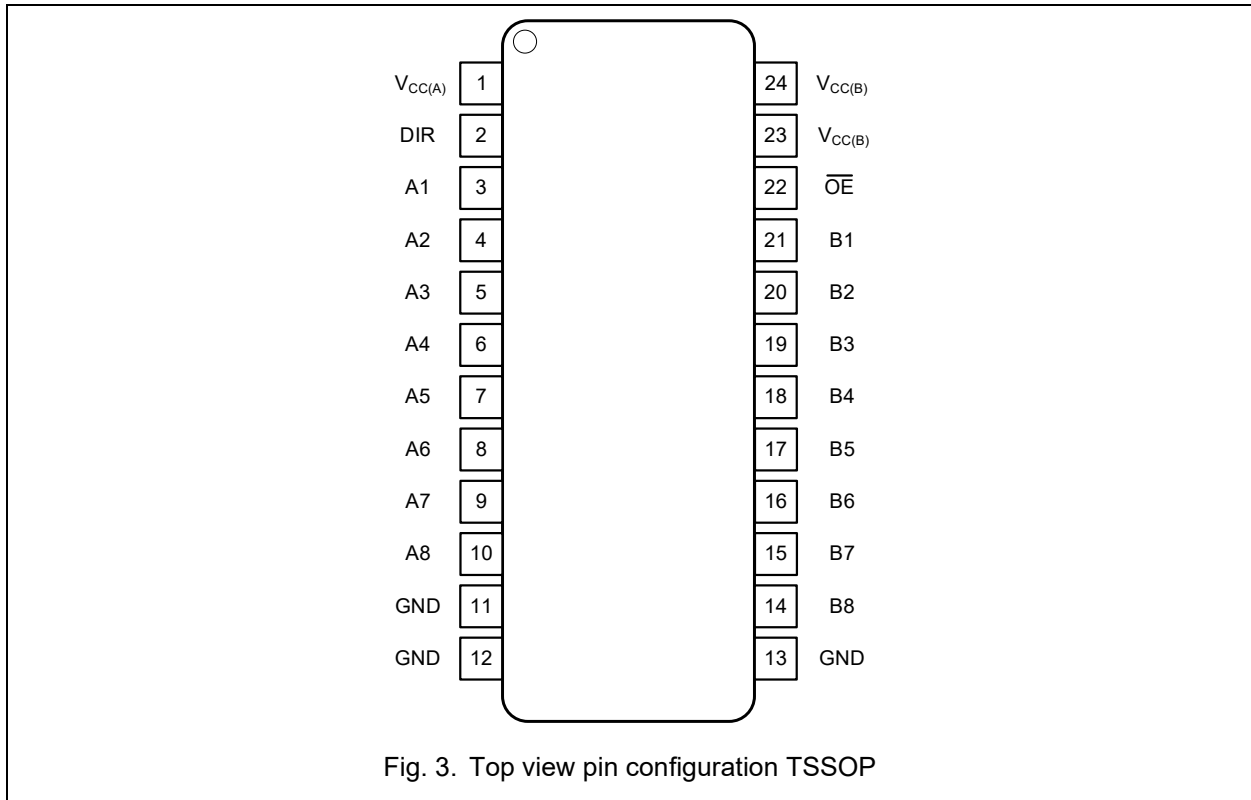
MARKING INFORMATION

NOTE: LVC8T245□ = Serial number and Internal code; XYYWW = Vendor Code and Date Code.



5. Pinning Information

5.1. Pinning



5.2. Pin description

Table 2. Pin description

Symbol	Pin	Description
$V_{CC(A)}$	1	Supply voltage A (An inputs/outputs, \overline{OE} and DIR inputs are referenced to $V_{CC(A)}$)
DIR	2	Direction control
A1, A2, A3, A4, A5, A6, A7, A8	3, 4, 5, 6, 7, 8, 9, 10	Data input or output
GND [1]	11, 12, 13	Ground (0 V)
B1, B2, B3, B4, B5, B6, B7, B8	21, 20, 19, 18, 17, 16, 15, 14	Data input or output
\overline{OE}	22	Output enable input (active LOW)
$V_{CC(B)}$	23, 24	Supply voltage B (Bn inputs/outputs are referenced to $V_{CC(B)}$)

[1] All GND pins must be connected to ground (0V).

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

6. Functional Description

Table 3. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

Supply voltage	Input		Input/output	
$V_{CC(A)}$, $V_{CC(B)}$	\overline{OE} [2]	DIR [2]	An [2]	Bn [2]
1.2 V to 5.5 V	L	L	A = B	input
1.2 V to 5.5 V	L	H	input	B = A
1.2 V to 5.5 V	H	X	Z	Z
GND [1]	X	X	Z	Z

[1] If at least one of $V_{CC(A)}$ or $V_{CC(B)}$ is at GND level, the device goes into suspend mode.

[2] The An inputs/outputs, DIR and OE input circuit is referenced to $V_{CC(A)}$; The Bn inputs/outputs circuit is referenced to $V_{CC(B)}$.

7. Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Table 4. Absolute Maximum Ratings

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND.

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC(A)}$	supply voltage A		-0.5	6.5	V
$V_{CC(B)}$	supply voltage B		-0.5	6.5	V
I_{IK}	input clamping current	$V_I < 0$ V	-50		mA
V_I	input voltage	[1]	-0.5	6.5	V
I_{OK}	output clamping current	$V_O < 0$ V	-50		mA
V_O	output voltage	Active mode [1][2][3]	-0.5	$V_{CCO} + 0.5$	V
		Suspend or 3-state mode [1]	-0.5	6.5	V
I_O	output current	$V_O = 0$ V to V_{CCO} [2]		± 50	mA
I_{CC}	supply current	$I_{CC(A)}$ or $I_{CC(B)}$; per V_{CC} pin		100	mA
I_{GND}	ground current	per GND pin	-100		mA
P_{tot}	total power dissipation			500	mW
T_{stg}	storage temperature		-65	150	°C

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] V_{CCO} is the supply voltage associated with the output port.

[3] $V_{CCO} + 0.5$ V should not exceed 6.5 V.

8. Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. EnergyMath does not recommend exceeding them or designing to Absolute Maximum Ratings.

Table 5. Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V _{CC(A)}	supply voltage A		1.3	5.5	V
		functional	1.2		V
V _{CC(B)}	supply voltage B		1.3	5.5	V
		functional	1.2		V
V _I	input voltage		0	5.5	V
V _O	output voltage	Active mode [1]	0	V _{CCO}	V
		Suspend or 3-state mode	0	5.5	V
T _{amb}	ambient temperature		-40	125	°C
Δt/ΔV	input transition rise and fall rate	V _{CCI} = 1.2 V [2]		20	ns/V
		V _{CCI} = 1.4 V to 1.95 V		20	ns/V
		V _{CCI} = 2.3 V to 2.7 V		20	ns/V
		V _{CCI} = 3 V to 3.6 V		10	ns/V
		V _{CC} = 4.5 V to 5.5 V		5	ns/V

[1] V_{CCO} is the supply voltage associated with the output port.

[2] V_{CCI} is the supply voltage associated with the input port.

9. Static Characteristics

Table 6. Static characteristics

At recommended operating conditions. Voltages are referenced to GND (ground = 0 V). Typical values measured at $T_{amb} = 25^{\circ}\text{C}$ (unless otherwise noted).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	
V_{IH}	HIGH-level input voltage	data input [1]						
		$V_{CC1} = 1.2\text{ V}$	$0.8V_{CC1}$			$0.8V_{CC1}$		V
		$V_{CC1} = 1.4\text{ V to }1.95\text{ V}$	$0.65V_{CC1}$			$0.65V_{CC1}$		V
		$V_{CC1} = 2.3\text{ V to }2.7\text{ V}$	1.7			1.7		V
		$V_{CC1} = 3\text{ V to }3.6\text{ V}$	2.2			2.2		V
		$V_{CC1} = 4.5\text{ V to }5.5\text{ V}$	$0.7V_{CC1}$			$0.7V_{CC1}$		V
		DIR, \overline{OE} input						
		$V_{CC1} = 1.2\text{ V}$	$0.8V_{CC(A)}$			$0.8V_{CC(A)}$		V
		$V_{CC1} = 1.4\text{ V to }1.95\text{ V}$	$0.65V_{CC(A)}$			$0.65V_{CC(A)}$		V
		$V_{CC1} = 2.3\text{ V to }2.7\text{ V}$	1.7			1.7		V
		$V_{CC1} = 3\text{ V to }3.6\text{ V}$	2.0			2.0		V
		$V_{CC1} = 4.5\text{ V to }5.5\text{ V}$	$0.7V_{CC(A)}$			$0.7V_{CC(A)}$		V
V_{IL}	LOW-level input voltage	data input [1]						
		$V_{CC1} = 1.2\text{ V}$			$0.2V_{CC1}$		$0.2V_{CC1}$	V
		$V_{CC1} = 1.4\text{ V to }1.95\text{ V}$			$0.35 V_{CC1}$		$0.35 V_{CC1}$	V
		$V_{CC1} = 2.3\text{ V to }2.7\text{ V}$			0.7		0.7	V
		$V_{CC1} = 3\text{ V to }3.6\text{ V}$			0.8		0.8	V
		$V_{CC1} = 4.5\text{ V to }5.5\text{ V}$			$0.3V_{CC1}$		$0.3V_{CC1}$	V
		DIR, \overline{OE} input						
		$V_{CC1} = 1.2\text{ V}$			$0.2V_{CC(A)}$		$0.2V_{CC(A)}$	V
		$V_{CC1} = 1.4\text{ V to }1.95\text{ V}$			$0.35 V_{CC(A)}$		$0.35 V_{CC(A)}$	V
		$V_{CC1} = 2.3\text{ V to }2.7\text{ V}$			0.7		0.7	V
		$V_{CC1} = 3\text{ V to }3.6\text{ V}$			0.8		0.8	V
		$V_{CC1} = 4.5\text{ V to }5.5\text{ V}$			$0.3V_{CC(A)}$		$0.3V_{CC(A)}$	V

EM74LVC8T245; EM74LVCH8T245
8-bit dual supply translating transceiver; 3-state

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	
V _{OH}	HIGH-level output voltage	V _I = V _{IH}						
		I _O = -100 μA; V _{CCO} = 1.2 V to 4.5 V	V _{CCO} - 0.1			V _{CCO} - 0.1		V
		I _O = -3 mA; V _{CCO} = 1.4 V	1.0			1.0		V
		I _O = -5.5 mA; V _{CCO} = 1.65 V	1.2			1.2		V
		I _O = -10 mA; V _{CCO} = 2.3 V	1.9			1.8		V
		I _O = -20 mA; V _{CCO} = 3.0 V	2.4			2.3		V
		I _O = -32 mA; V _{CCO} = 4.5 V	3.8			3.7		V
V _{OL}	LOW-level output voltage	V _I = V _{IL}						
		I _O = 100 μA; V _{CCO} = 1.2 V to 4.5 V			0.1		0.1	V
		I _O = 3 mA; V _{CCO} = 1.4 V			0.3		0.3	V
		I _O = 5.5 mA; V _{CCO} = 1.65 V			0.45		0.45	V
		I _O = 10 mA; V _{CCO} = 2.3 V			0.3		0.4	V
		I _O = 20 mA; V _{CCO} = 3.0 V			0.55		0.55	V
		I _O = 32 mA; V _{CCO} = 4.5 V			0.55		0.6	V
I _I	input leakage current	DIR, \overline{OE} input; V _I = 0V to 5.5V; V _{CCI} = 1.2V to 5.5V			±2		±10	μA
I _{OZ}	OFF-state output current	A or B port; V _O = 0 V or V _{CCO} ; V _{CCO} = 1.2 V to 5.5 V [2]			±2		±10	μA
		suspend mode A port; V _O = 0 V or V _{CCO} ; V _{CC(A)} = 5.5 V; V _{CC(B)} = 0 V [2]			±2		±10	μA
		suspend mode B port; V _O = 0 V or V _{CCO} ; V _{CC(A)} = 0 V; V _{CC(B)} = 5.5 V [2]			±2		±10	μA
I _{OFF}	power-off leakage current	A port; V _I or V _O = 0 V to 5.5 V; V _{CC(A)} = 0 V; V _{CC(B)} = 1.2 V to 5.5 V			±2		±10	μA
		B port; V _I or V _O = 0 V to 5.5 V; V _{CC(B)} = 0 V; V _{CC(A)} = 1.2 V to 5.5 V			±2		±10	μA

EM74LVC8T245; EM74LVCH8T245
8-bit dual supply translating transceiver; 3-state

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	
I _{BHL}	bus hold LOW current	A or B port [1]						
		V _I = 0.58 V; V _{CC1} = 1.65 V	25			20		μA
		V _I = 0.70 V; V _{CC1} = 2.3 V	45			45		μA
		V _I = 0.80 V; V _{CC1} = 3.0 V	100			80		μA
		V _I = 1.35 V; V _{CC1} = 4.5 V	100			100		μA
I _{BHH}	bus hold HIGH current	A or B port [1]						
		V _I = 1.07 V; V _{CC1} = 1.65 V	-1			-1		μA
		V _I = 1.70 V; V _{CC1} = 2.3 V	-7			-7		μA
		V _I = 2.00 V; V _{CC1} = 3.0 V	-35			-35		μA
		V _I = 3.15 V; V _{CC1} = 4.5 V	-95			-95		μA
I _{BHLO}	bus hold LOW overdrive current	A or B port [1][3]						
		V _{CC1} = 1.6 V	125			125		μA
		V _{CC1} = 1.95 V	200			200		μA
		V _{CC1} = 2.7 V	300			300		μA
		V _{CC1} = 3.6 V	500			500		μA
I _{BHNO}	bus hold HIGH overdrive current	A or B port [1][3]						
		V _{CC1} = 1.6 V	-125			-125		μA
		V _{CC1} = 1.95 V	-200			-200		μA
		V _{CC1} = 2.7 V	-300			-300		μA
		V _{CC1} = 3.6 V	-500			-500		μA
	V _{CC1} = 5.5 V	-900			-900		μA	

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit	
			Min	Typ	Max	Min	Max		
I _{CC}	supply current	A port; V _I = 0 V or V _{CCI} ; I _O = 0 A [1]							
		V _{CC(A)} , V _{CC(B)} = 1.2V to 5.5V			15		20	μA	
		V _{CC(A)} = 5.5V; V _{CC(B)} = 0V			15		20	μA	
		V _{CC(A)} = 0V; V _{CC(B)} = 5.5V	-2			-4		μA	
		B port; V _I = 0 V or V _{CCI} ; I _O = 0 A							
		V _{CC(A)} , V _{CC(B)} = 1.2V to 5.5V			15		20	μA	
		V _{CC(B)} = 0V; V _{CC(A)} = 5.5V	-2			-4		μA	
		V _{CC(B)} = 5.5V; V _{CC(A)} = 0V			15		20	μA	
		A plus B port (I _{CC(A)} + I _{CC(B)}); I _O = 0 A; V _I = 0 V or V _{CCI}							
		V _{CC(A)} , V _{CC(B)} = 1.2V to 5.5V			25		30	μA	
ΔI _{CC}	additional supply current	per input; V _{CC(A)} , V _{CC(B)} = 3.0V to 5.5V							
		DIR and \overline{OE} input; DIR or \overline{OE} input at V _{CC(A)} - 0.6V; A port at V _{CC(A)} or GND; B port = open			50		75	μA	
		A port; A port at V _{CC(A)} - 0.6 V; DIR at V _{CC(A)} ; B port = open [4]			50		75	μA	
		B port; B port at V _{CC(B)} - 0.6 V; DIR at V _{CC(B)} ; A port = open [4]			50		75	μA	

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] V_{CCO} is the supply voltage associated with the output port.

[3] To guarantee the node switches, an external driver must source/sink at least I_{BHLO} / I_{BHHO} when the input is in the range V_{IL} to V_{IH}.

[4] For non bus hold parts only (EM74LVC8T245).

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

10. Dynamic Characteristics

Table 7. Dynamic characteristics for temperature range -40 °C to +85 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 6. for waveforms see Fig. 3 and Fig. 4. [1]

Symbol	Parameter	Conditions	V _{CC(B)}										Unit
			1.5V±0.1V		1.8V±0.15V		2.5V±0.2V		3.3V±0.3V		5.0V±0.5V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
V_{CC(A)} = 1.5 V ± 0.1 V													
t _{pd}	propagation time	An to Bn	0.9	43.2	0.9	39.2	0.8	36.3	0.7	35.1	0.7	35.1	ns
		Bn to An	0.9	43.2	0.9	39.2	0.8	36.3	0.7	35.1	0.7	35.1	ns
t _{dis}	disable time	\overline{OE} to An	1.5	72.5	1.5	72.5	1.5	72.5	1.5	72.5	1.4	72.5	ns
		\overline{OE} to Bn	1.5	72.5	1.5	72.5	1.5	72.5	1.5	72.5	1.4	72.5	ns
t _{en}	enable time	\overline{OE} to An	0.4	92.2	0.4	92.2	0.4	92.2	0.4	92.2	0.4	92.2	ns
		\overline{OE} to Bn	0.4	92.2	0.4	92.2	0.4	92.2	0.4	92.2	0.4	92.2	ns
V_{CC(A)} = 1.8 V ± 0.15 V													
t _{pd}	propagation time	An to Bn	0.9	38.6	0.9	30.5	0.8	26.9	0.7	26.3	0.7	25.8	ns
		Bn to An	0.9	38.6	0.9	30.5	0.8	26.9	0.7	26.3	0.7	25.8	ns
t _{dis}	disable time	\overline{OE} to An	1.5	46.3	1.5	46.3	1.5	46.3	1.5	46.3	1.4	46.3	ns
		\overline{OE} to Bn	1.5	46.3	1.5	46.3	1.5	46.3	1.5	46.3	1.4	46.3	ns
t _{en}	enable time	\overline{OE} to An	0.4	63.2	0.4	58.1	0.4	54.6	0.4	54.1	0.4	53.1	ns
		\overline{OE} to Bn	0.4	63.2	0.4	58.1	0.4	54.6	0.4	54.1	0.4	53.1	ns
V_{CC(A)} = 2.5 V ± 0.2 V													
t _{pd}	propagation time	An to Bn	1.2	33.0	1.2	24.7	1.0	19.7	1.0	18.3	0.9	17.1	ns
		Bn to An	1.2	33.0	1.2	24.7	1.0	19.7	1.0	18.3	0.9	17.1	ns
t _{dis}	disable time	\overline{OE} to An	1.4	25.1	1.4	25.1	1.4	25.1	1.4	25.1	1.4	25.1	ns
		\overline{OE} to Bn	1.4	25.1	1.4	25.1	1.4	25.1	1.4	25.1	1.4	25.1	ns
t _{en}	enable time	\overline{OE} to An	1.0	38.3	1.0	33.1	1.0	29.5	1.0	28.0	1.0	27.0	ns
		\overline{OE} to Bn	1.0	38.3	1.0	33.1	1.0	29.5	1.0	28.0	1.0	27.0	ns
V_{CC(A)} = 3.3 V ± 0.3 V													
t _{pd}	propagation time	An to Bn	0.8	31.2	0.8	22.6	0.8	16.2	0.7	14.5	0.6	13.6	ns
		Bn to An	0.8	31.2	0.8	22.6	0.8	16.2	0.7	14.5	0.6	13.6	ns
t _{dis}	disable time	\overline{OE} to An	1.6	20.2	1.6	20.2	1.6	20.2	1.6	20.2	1.6	20.2	ns
		\overline{OE} to Bn	1.6	20.2	1.6	20.2	1.6	20.2	1.6	20.2	1.6	20.2	ns
t _{en}	enable time	\overline{OE} to An	0.8	31.5	0.8	25.8	0.8	22.4	0.8	21.1	0.8	20.8	ns
		\overline{OE} to Bn	1.8	31.5	0.8	25.8	0.8	22.4	0.8	21.1	0.8	20.8	ns
V_{CC(A)} = 5.0 V ± 0.5 V													
t _{pd}	propagation time	An to Bn	0.7	29.8	0.7	21.3	0.4	14.8	0.3	12.6	0.3	11.2	ns
		Bn to An	0.7	29.8	0.7	21.3	0.4	14.8	0.3	12.6	0.3	11.2	ns
t _{dis}	disable time	\overline{OE} to An	0.3	15.6	0.3	15.6	0.3	15.6	0.3	15.6	0.3	15.6	ns
		\overline{OE} to Bn	0.3	15.6	0.3	15.6	0.3	15.6	0.3	15.6	0.3	15.6	ns
t _{en}	enable time	\overline{OE} to An	0.7	29.1	0.7	21.2	0.7	18.5	0.7	16.8	0.7	15.9	ns
		\overline{OE} to Bn	0.7	29.1	0.7	21.2	0.7	18.5	0.7	16.8	0.7	15.9	ns

[1] t_{pd} is the same as t_{PLH} and t_{PHL}; t_{dis} is the same as t_{PLZ} and t_{PHZ}; t_{en} is the same as t_{PZL} and t_{PZH}.

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

Table 8. Dynamic characteristics for temperature range -40 °C to +125 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 6. for waveforms see Fig. 3 and Fig. 4. [1]

Symbol	Parameter	Conditions	V _{CC(B)}										Unit
			1.5V±0.1V		1.8V±0.15V		2.5V±0.2V		3.3V±0.3V		5.0V±0.5V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
V_{CC(A)} = 1.5 V ± 0.1 V													
t _{pd}	propagation time	An to Bn	0.9	43.3	0.9	38.9	0.8	36.3	0.7	35.1	0.7	35.1	ns
		Bn to An	0.9	43.3	0.9	38.9	0.8	36.3	0.7	35.1	0.7	35.1	ns
t _{dis}	disable time	\overline{OE} to An	1.5	74.5	1.5	74.5	1.5	74.5	1.5	74.5	1.4	74.5	ns
		\overline{OE} to Bn	1.5	74.5	1.5	74.5	1.5	74.5	1.5	74.5	1.4	74.5	ns
t _{en}	enable time	\overline{OE} to An	0.4	94.2	0.4	94.2	0.4	94.2	0.4	94.2	0.4	94.2	ns
		\overline{OE} to Bn	0.4	94.2	0.4	94.2	0.4	94.2	0.4	94.2	0.4	94.2	ns
V_{CC(A)} = 1.8 V ± 0.15 V													
t _{pd}	propagation time	An to Bn	0.9	38.4	0.9	30.8	0.8	27.8	0.7	26.4	0.7	25.3	ns
		Bn to An	0.9	38.4	0.9	30.8	0.8	27.8	0.7	26.4	0.7	25.3	ns
t _{dis}	disable time	\overline{OE} to An	1.5	50.3	1.5	50	1.5	50.2	1.5	50.4	1.4	50.3	ns
		\overline{OE} to Bn	1.5	50.3	1.5	50	1.5	50.2	1.5	50.4	1.4	50.3	ns
t _{en}	enable time	\overline{OE} to An	0.4	67.2	0.4	61.8	0.4	58.5	0.4	58.2	0.4	57.1	ns
		\overline{OE} to Bn	0.4	67.2	0.4	61.8	0.4	58.5	0.4	58.2	0.4	57.1	ns
V_{CC(A)} = 2.5 V ± 0.2 V													
t _{pd}	propagation time	An to Bn	1.2	33.4	1.2	25.4	1.0	19.7	1.0	18.5	0.9	17.3	ns
		Bn to An	1.2	33.4	1.2	25.4	1.0	19.7	1.0	18.5	0.9	17.3	ns
t _{dis}	disable time	\overline{OE} to An	1.4	29.1	1.4	28.8	1.4	29	1.4	29.2	1.4	29.1	ns
		\overline{OE} to Bn	1.4	29.1	1.4	28.8	1.4	29	1.4	29.2	1.4	29.1	ns
t _{en}	enable time	\overline{OE} to An	1.0	42.3	1.0	36.8	1.0	33.4	1.0	32.1	1.0	31.0	ns
		\overline{OE} to Bn	1.0	42.3	1.0	36.8	1.0	33.4	1.0	32.1	1.0	31.0	ns
V_{CC(A)} = 3.3 V ± 0.3 V													
t _{pd}	propagation time	An to Bn	0.8	32.2	0.8	23.2	0.8	16.8	0.7	15.5	0.6	14.6	ns
		Bn to An	0.8	32.2	0.8	23.2	0.8	16.8	0.7	15.5	0.6	14.6	ns
t _{dis}	disable time	\overline{OE} to An	1.6	24.2	1.6	23.9	1.6	24.1	1.6	24.3	1.6	24.2	ns
		\overline{OE} to Bn	1.6	24.2	1.6	23.9	1.6	24.1	1.6	24.3	1.6	24.2	ns
t _{en}	enable time	\overline{OE} to An	0.8	35.5	0.8	29.5	0.8	26.3	0.8	25.2	0.8	24.8	ns
		\overline{OE} to Bn	0.8	35.5	0.8	29.5	0.8	26.3	0.8	25.2	0.8	24.8	ns
V_{CC(A)} = 5.0 V ± 0.5 V													
t _{pd}	propagation time	An to Bn	0.7	30.4	0.7	22.1	0.4	15.5	0.3	13.4	0.3	11.9	ns
		Bn to An	0.7	30.4	0.7	22.1	0.4	15.5	0.3	13.4	0.3	11.9	ns
t _{dis}	disable time	\overline{OE} to An	0.3	19.6	0.3	19.3	0.3	19.5	0.3	19.7	0.3	19.6	ns
		\overline{OE} to Bn	0.3	19.6	0.3	19.3	0.3	19.5	0.3	19.7	0.3	19.6	ns
t _{en}	enable time	\overline{OE} to An	0.7	33.1	0.7	24.9	0.7	22.4	0.7	20.9	0.7	19.9	ns
		\overline{OE} to Bn	0.7	33.1	0.7	24.9	0.7	22.4	0.7	20.9	0.7	19.9	ns

[1] t_{pd} is the same as t_{PLH} and t_{PHL}; t_{dis} is the same as t_{PLZ} and t_{PHZ}; t_{en} is the same as t_{PZL} and t_{PZH}.

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

Table 9. Typical power dissipation capacitance at $V_{CC(A)} = V_{CC(B)}$ and $T_{amb} = 25\text{ }^{\circ}\text{C}$

Voltages are referenced to GND (ground = 0 V). [1][2]

Symbol	Parameter	Conditions	$V_{CC(A)}$ and $V_{CC(B)}$				Unit
			1.8 V	2.5 V	3.3 V	5.0 V	
C_{PD}	power dissipation capacitance	A port: (direction A to B); B port: (direction B to A)	1	1	1	1	pF
		A port: (direction B to A); B port: (direction A to B)	16	16	17	18	pF

[1] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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

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;

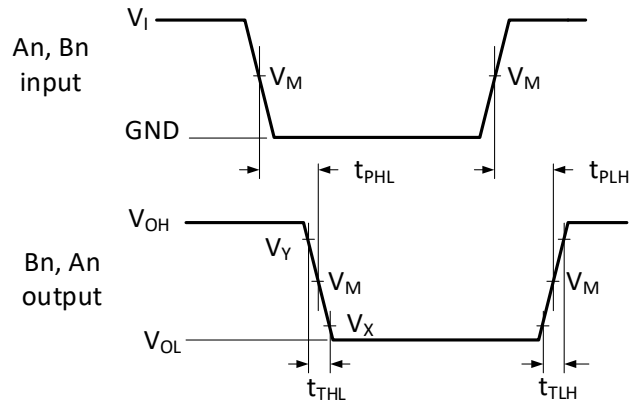
$\sum(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

[2] $f_i = 10\text{ MHz}$; $V_i = \text{GND to } V_{CC}$; $t_r = t_f = 1\text{ ns}$; $C_L = 0\text{ pF}$; $R_L = \infty\ \Omega$.

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

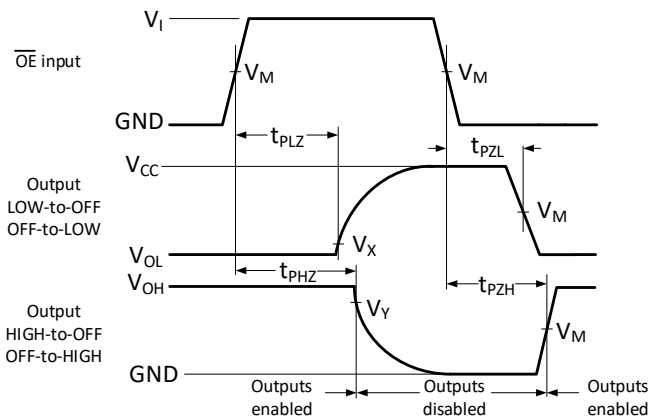
10.1. Waveforms and test circuit



Measurement points are given in Table 10.

V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 4. The input An, Bn to output Bn, An propagation delays



Measurement points are given in Table 10.

V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 5. 3-state enable and disable times

Table 10. Measurement points

Supply voltage	Input [1]	Output [2]		
$V_{CC(A)}, V_{CC(B)}$	V_M	V_M	V_X	V_Y
1.2 V to 1.6 V	$0.5V_{CCI}$	$0.5V_{CCO}$	$V_{OL} + 0.1 V$	$V_{OH} - 0.1 V$
1.65 V to 2.7 V	$0.5V_{CCI}$	$0.5V_{CCO}$	$V_{OL} + 0.15 V$	$V_{OH} - 0.15 V$
3.0 V to 5.5 V	$0.5V_{CCI}$	$0.5V_{CCO}$	$V_{OL} + 0.3 V$	$V_{OH} - 0.3 V$

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] V_{CCO} is the supply voltage associated with the output port.

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

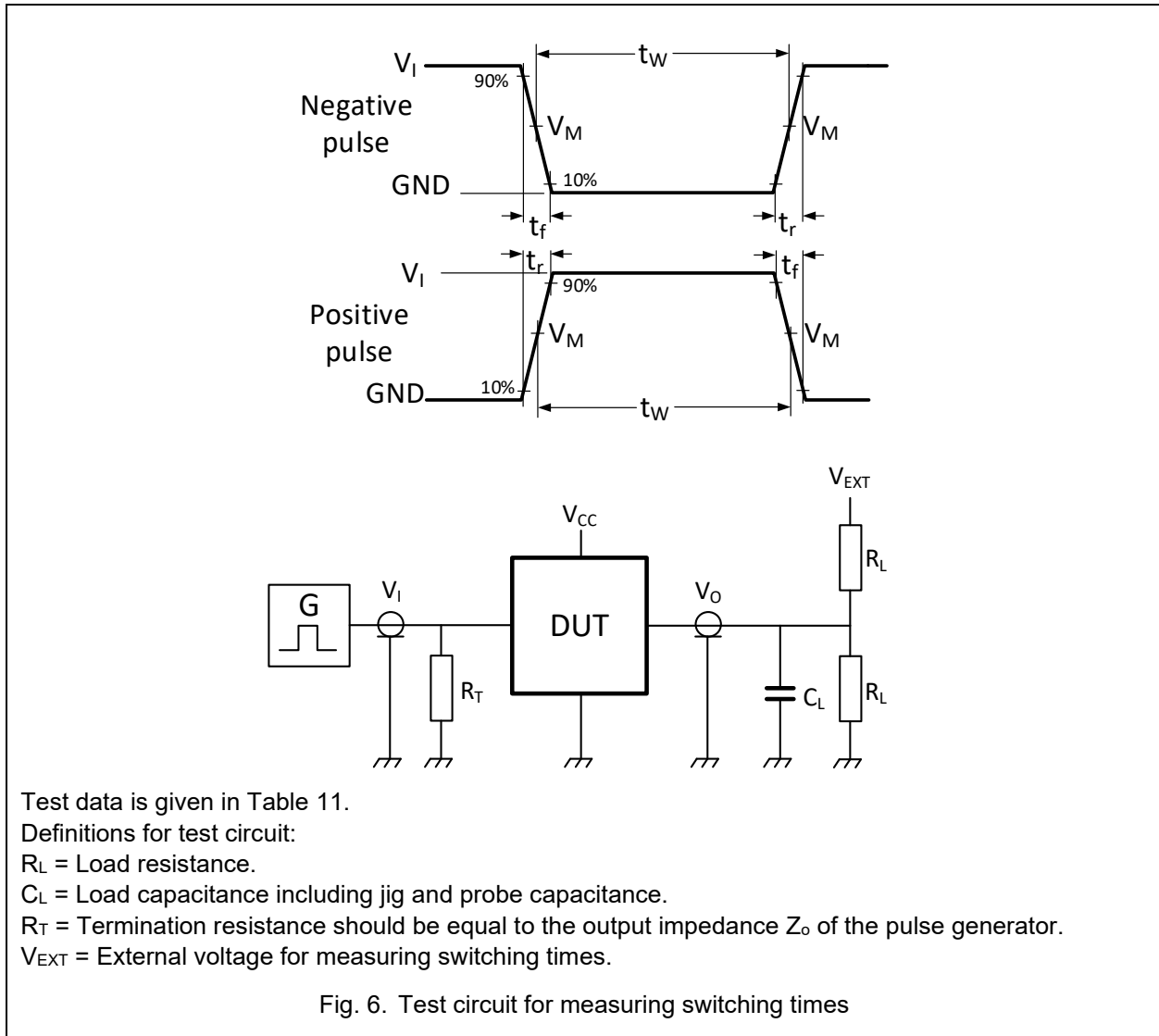


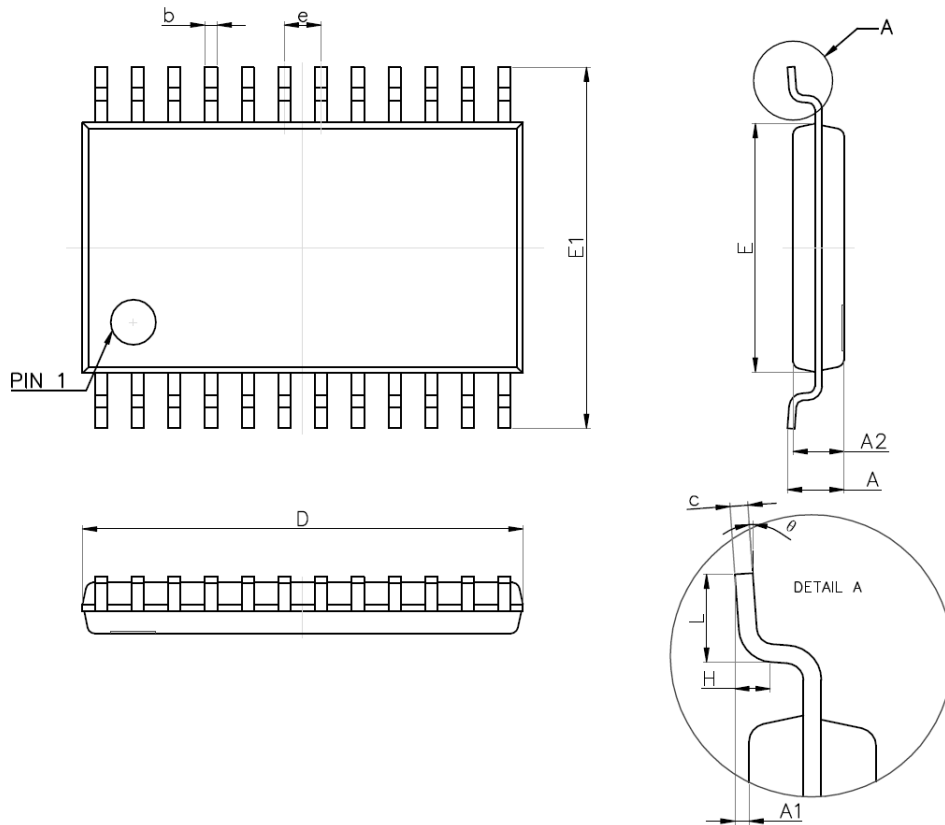
Table 11. Test data

Supply voltage	Input		Load		V_{EXT}		
$V_{CC(A)}, V_{CC(B)}$	V_I [1]	$t_r = t_f$	C_L	R_L	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ} [2]
1.2 V to 5.5 V	V_{CCI}	≤ 2.5 ns	15 pF	2k Ω	open	GND	2V $_{CCO}$

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] V_{CCO} is the supply voltage associated with the output port.

11. Package Outline

TSSOP-24L


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	7.700	7.900	0.303	0.311
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.200		0.047
A2	0.800	1.000	0.031	0.039
A1	0.050	0.150	0.002	0.006
e	0.650(BSC)		0.026(BSC)	
L	0.500	0.700	0.020	0.028
H	0.250(TYP)		0.010(TYP)	
θ	1°	7°	1°	7°

12. Tape and Reel Information

12.1. Carrier tape dimensions

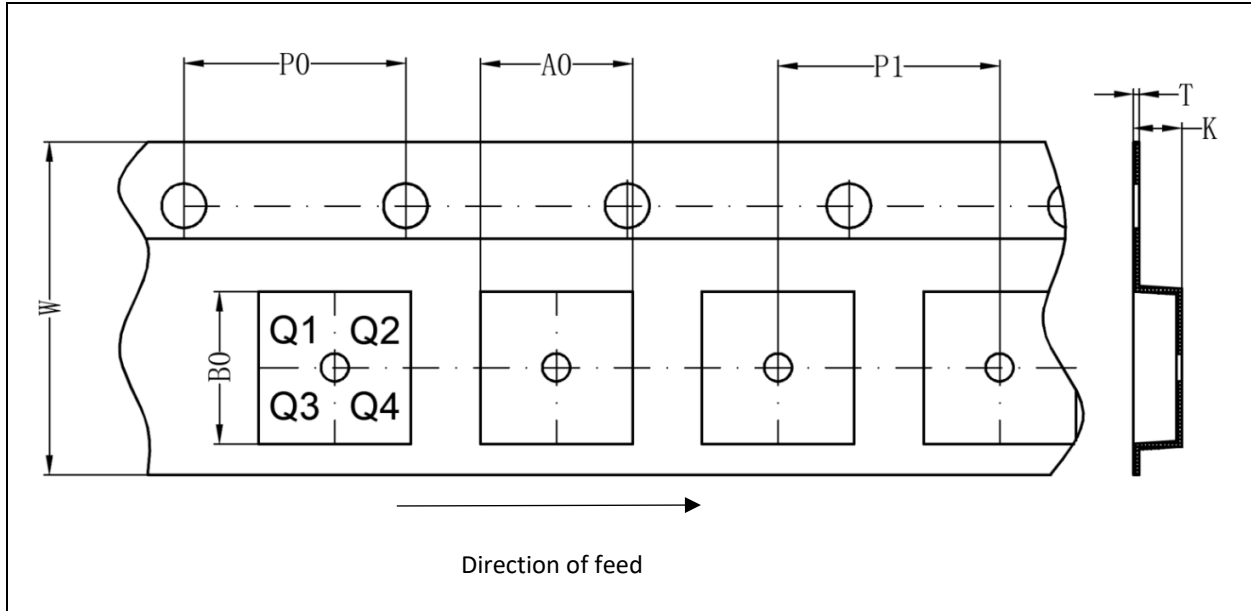


Table 12. Carrier tape dimensions

Package version	A0(mm)	B0(mm)	K0(mm)	T(mm)	P1(mm)	W(mm)	P0(mm)	PIN 1
TSSOP-24L	6.85	6.85	1.7	0.22	8	12	4	Q1

EM74LVC8T245; EM74LVCH8T245

8-bit dual supply translating transceiver; 3-state

12.2. Reel and box dimensions

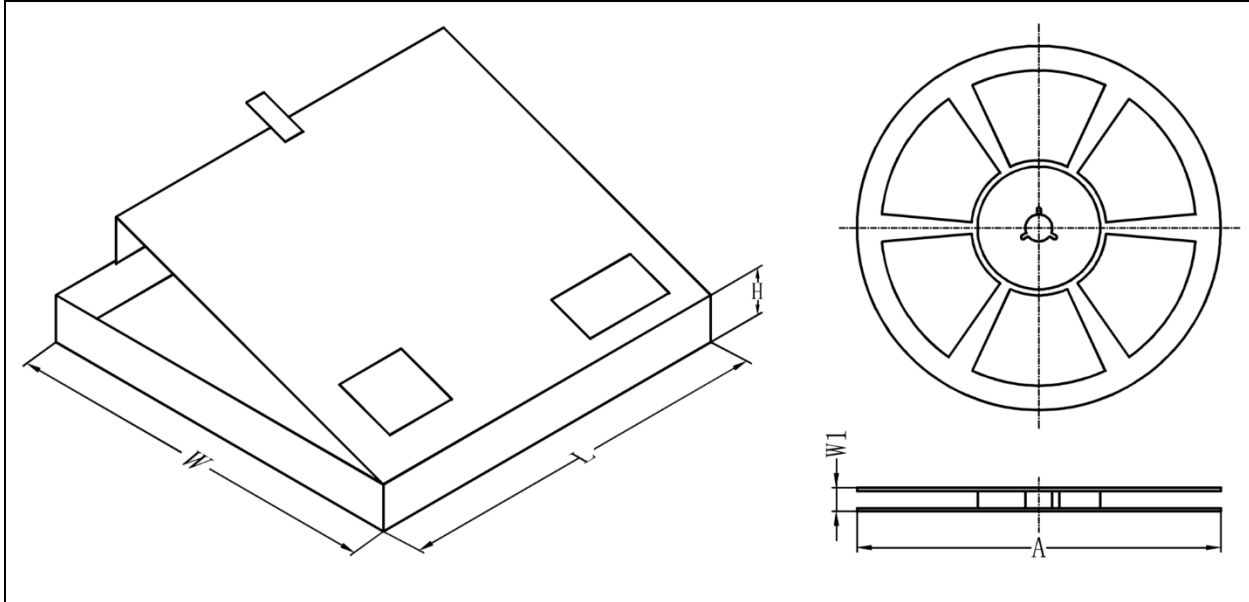


Table 13. Dimensions and quantities

Package version	Type NO. ending	Reel Dimension A (mm)	Reel Width W1 (mm)	SPQ (pcs) [1]	Reels per box	Outer box dimensions L×W×H(mm) [2]
TSSOP-24L	PW	330	22.4	3000	1	358x340x50

[1] Packing quantity dependent on specific product type. Please contact your local Energymath representative for ordering.

[2] Dimensions for reference only.

13. Abbreviations

Table 14. Abbreviations

Acronym	Description
CMOS	Complementary Metal-Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
CDM	Charged Device Model

14. Revision History

Table 15. Revision history

Document ID	Release Date	Data sheet status	Change notice	Supersedes
EM74LVC_LVCH8T245 Rev. 1.2	May 12, 2025	Product datasheet		EM74LVC_LVCH8T245 Rev. 1.1
Modifications:	<ul style="list-style-type: none"> Section 11: Updated package outline. Section 12 :Added tape and reel information. 			
EM74LVC_LVCH8T245 Rev. 1.1	Apr 10, 2025	Product datasheet		EM74LVC_LVCH8T245 Rev. 1.0
Modifications:	<ul style="list-style-type: none"> Updated the V_{OH} and V_{OL} spec. Added the topside marking information. 			
EM74LVC_LVCH8T245 Rev. 1.0	Feb 10, 2025	Product datasheet		