HD74LVC2G126

Dual Bus Buffer with 3–state Output

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Description

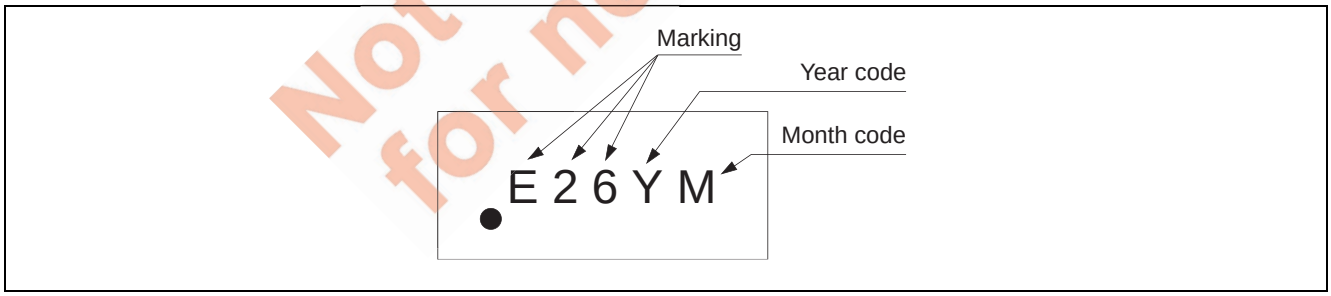
The HD74LVC2G126 has dual bus buffer with 3–state output in an 8-pin package. Low voltage and high-speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

Features

- The basic gate function is lined up as renesas uni logic series.
- Supply voltage range: 1.65 to 5.5 V
- Operating temperature range: –40 to +85°C
- All inputs: V_{IH} (Max.) = 5.5 V (@V_{CC} = 0 V to 5.5 V)
- All outputs: V_O (Max.) = 5.5 V (@V_{CC} = 0 V)
- Output current: ±4 mA (@V_{CC} = 1.65 V)
  ±8 mA (@V_{CC} = 2.3 V)
  ±24 mA (@V_{CC} = 3.0 V)
  ±32 mA (@V_{CC} = 4.5 V)
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LVC2G126CLE	WCSP–8 pin	SXBG0008KB–A (TBS–8AV)	CL	E (3,000 pcs/reel)

Article Indication

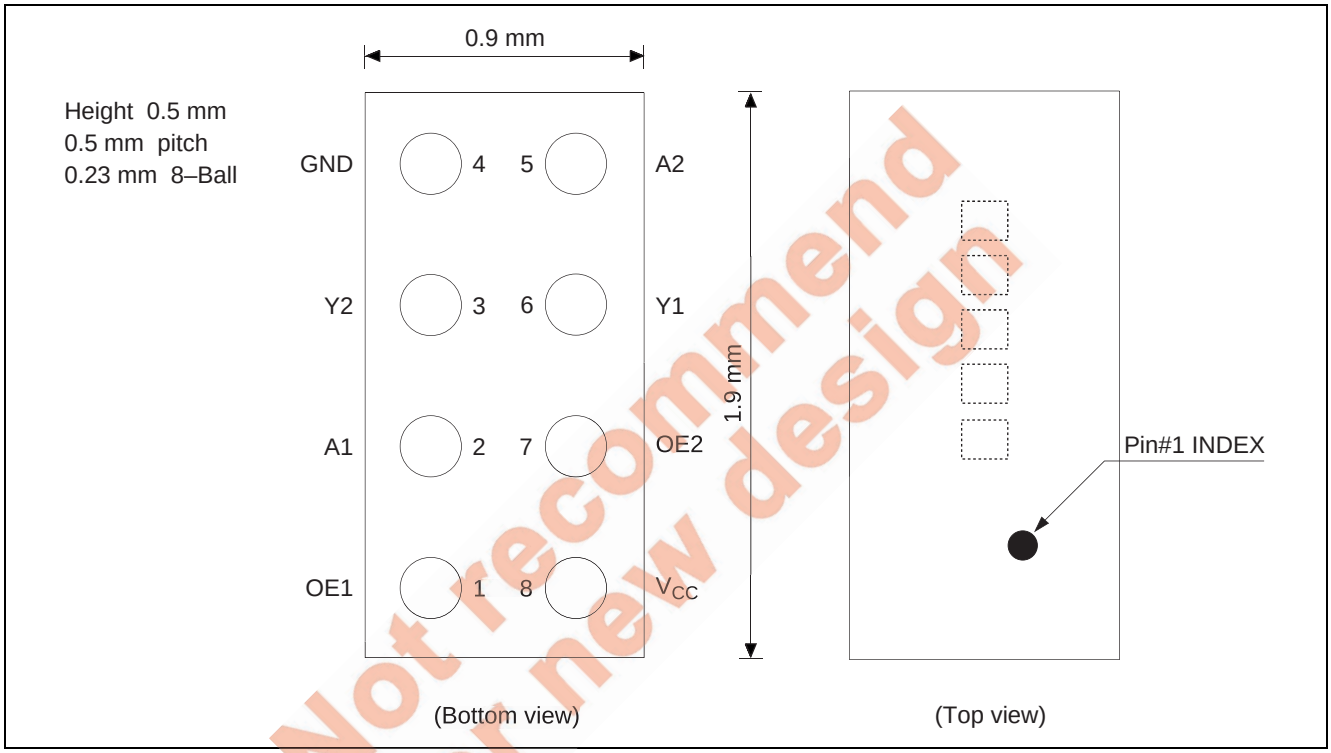


Function Table

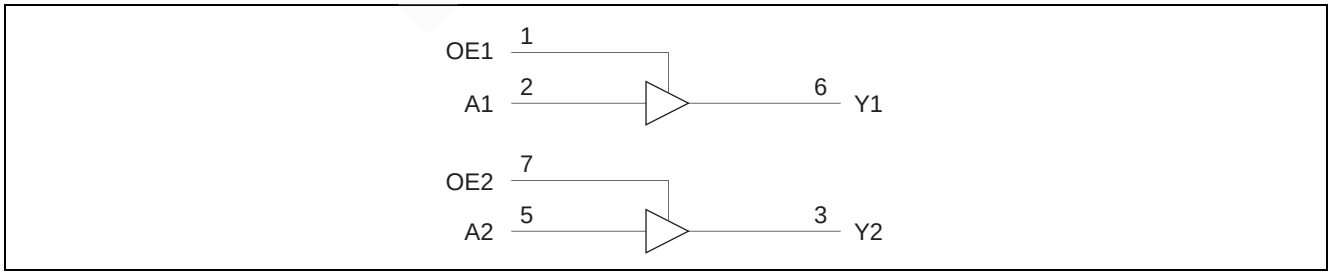
Inputs		Output Y
OE	A	
H	H	H
H	L	L
L	X	Z

H: High level
L: Low level
X: Immaterial
Z: High impedance

Pin Arrangement



Logic Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V_{CC}	–0.5 to 6.5	V	
Input voltage range [*1]	V_I	–0.5 to 6.5	V	
Output voltage range [*1, 2]	V_O	–0.5 to V_{CC} +0.5	V	Output : H or L
		–0.5 to 6.5		V_{CC}: OFF or Output "Z"
Input clamp current	I_{IK}	–50	mA	V_I < 0
Output clamp current	I_{OK}	–50	mA	V_O < 0
Continuous output current	I_O	±50	mA	V_O = 0 to V_{CC}
Continuous current through V_{CC} or GND	I_{CC} or I_{GND}	±100	mA	
Package Thermal impedance	θ_{ja}	102	°C/W	
Storage temperature	Tstg	–65 to 150	°C	

Notes: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore no two of which may be realized at the same time.

1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. This value is limited to 5.5 V maximum.

Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Conditions
Supply voltage range	V_{CC}	1.65	5.5	V	
Input voltage range	V_I	0	5.5	V	
Output voltage range	V_O	0	V_{CC}	V	
		0	5.5		Output : Z
Output current	I_{OL}	—	4	mA	V_{CC} = 1.65 V
		—	8		V_{CC} = 2.3 V
		—	16		V_{CC} = 3.0 V
		—	24		
		—	32		V_{CC} = 4.5 V
	I_{OH}	—	–4		V_{CC} = 1.65 V
		—	–8		V_{CC} = 2.3 V
		—	–16		V_{CC} = 3.0 V
		—	–24		
		—	–32		V_{CC} = 4.5 V
Input transition rise or fall rate	$\Delta t / \Delta v$	0	20	ns / V	V_{CC} = 1.65 to 1.95 V, 2.3 to 2.7 V
		0	10		V_{CC} = 3.0 to 3.6 V
		0	5		V_{CC} = 4.5 to 5.5 V
Operating free-air temperature	T_a	–40	85	°C	

Note: Unused or floating inputs must be held high or low.

Electrical Characteristics

Ta = –40 to 85°C

Item	Symbol	V_{CC} (V)	Min	Typ	Max	Unit	Test condition
Input voltage	V_{IH}	1.65 to 1.95	V_{CC}×0.65	—	—	V	
		2.3 to 2.7	1.7	—	—		
		3.0 to 3.6	2.0	—	—		
		4.5 to 5.5	V_{CC}×0.7	—	—		
	V_{IL}	1.65 to 1.95	—	—	V_{CC}×0.35		
		2.3 to 2.7	—	—	0.7		
		3.0 to 3.6	—	—	0.8		
		4.5 to 5.5	—	—	V_{CC}×0.3		
Output voltage	V_{OH}	Min to Max	V_{CC}–0.1	—	—	V	I_{OH} = –100 µA
		1.65	1.2	—	—		I_{OH} = –4 mA
		2.3	1.9	—	—		I_{OH} = –8 mA
		3.0	2.4	—	—		I_{OH} = –16 mA
			2.3	—	—		I_{OH} = –24 mA
		4.5	3.8	—	—		I_{OH} = –32 mA
	V_{OL}	Min to Max	—	—	0.1		I_{OL} = 100 µA
		1.65	—	—	0.45		I_{OL} = 4 mA
		2.3	—	—	0.3		I_{OL} = 8 mA
		3.0	—	—	0.4		I_{OL} = 16 mA
			—	—	0.55		I_{OL} = 24 mA
		4.5	—	—	0.55		I_{OL} = 32 mA
Input current	I_{IN}	0 to 5.5	—	—	±5	µA	V_{IN} = 5.5 V or GND
Off state Output current	I_{OZ}	3.6	—	—	10	µA	V_O = 5.5 V or GND
Quiescent supply current	I_{CC}	1.65 to 5.5	—	—	10	µA	V_{IN} = V_{CC} or GND, I_O = 0
	ΔI_{CC}	3 to 5.5	—	—	500		One input at V_{CC}–0.6 V, Other input at V_{CC} or GND
Output leakage current	I_{OFF}	0	—	—	±10	µA	V_{IN} or V_O = 0 to 5.5 V
Input capacitance	C_{IN}	3.3	—	3.5	—	pF	V_{IN} = V_{CC} or GND

Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

Switching Characteristics

V_{CC} = 1.8±0.15 V

Item	Symbol	Ta = –40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t_{PLH} t_{PHL}	3.5	9.8	ns	C_L = 30 pF, R_L = 1.0 kΩ	A	Y
Output enable time	t_{ZH} t_{ZL}	3.5	10.0	ns		OE	Y
Output disable time	t_{HZ} t_{LZ}	1.7	12.6	ns		OE	Y

V_{CC} = 2.5±0.2 V

Item	Symbol	Ta = –40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t_{PLH} t_{PHL}	1.7	4.9	ns	C_L = 30 pF, R_L = 500 Ω	A	Y
Output enable time	t_{ZH} t_{ZL}	1.7	5.0	ns		OE	Y
Output disable time	t_{HZ} t_{LZ}	1.0	5.7	ns		OE	Y

V_{CC} = 3.3±0.3 V

Item	Symbol	Ta = –40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t_{PLH} t_{PHL}	1.4	4.0	ns	C_L = 50 pF, R_L = 500 Ω	A	Y
Output enable time	t_{ZH} t_{ZL}	1.5	4.1	ns		OE	Y
Output disable time	t_{HZ} t_{LZ}	1.0	4.4	ns		OE	Y

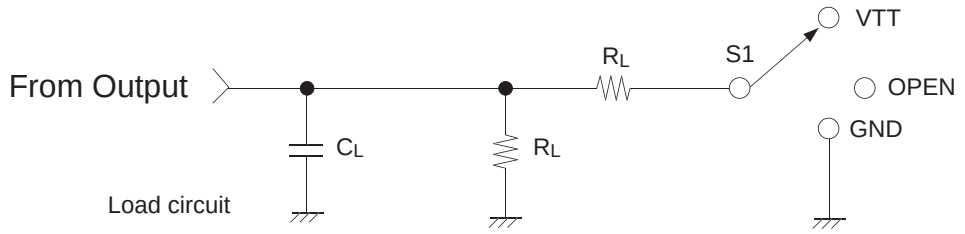
V_{CC} = 5.0±0.5 V

Item	Symbol	Ta = –40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t_{PLH} t_{PHL}	1.0	3.2	ns	C_L = 50 pF, R_L = 500 Ω	A	Y
Output enable time	t_{ZH} t_{ZL}	1.0	3.1	ns		OE	Y
Output disable time	t_{HZ} t_{LZ}	1.0	3.3	ns		OE	Y

Operating Characteristics

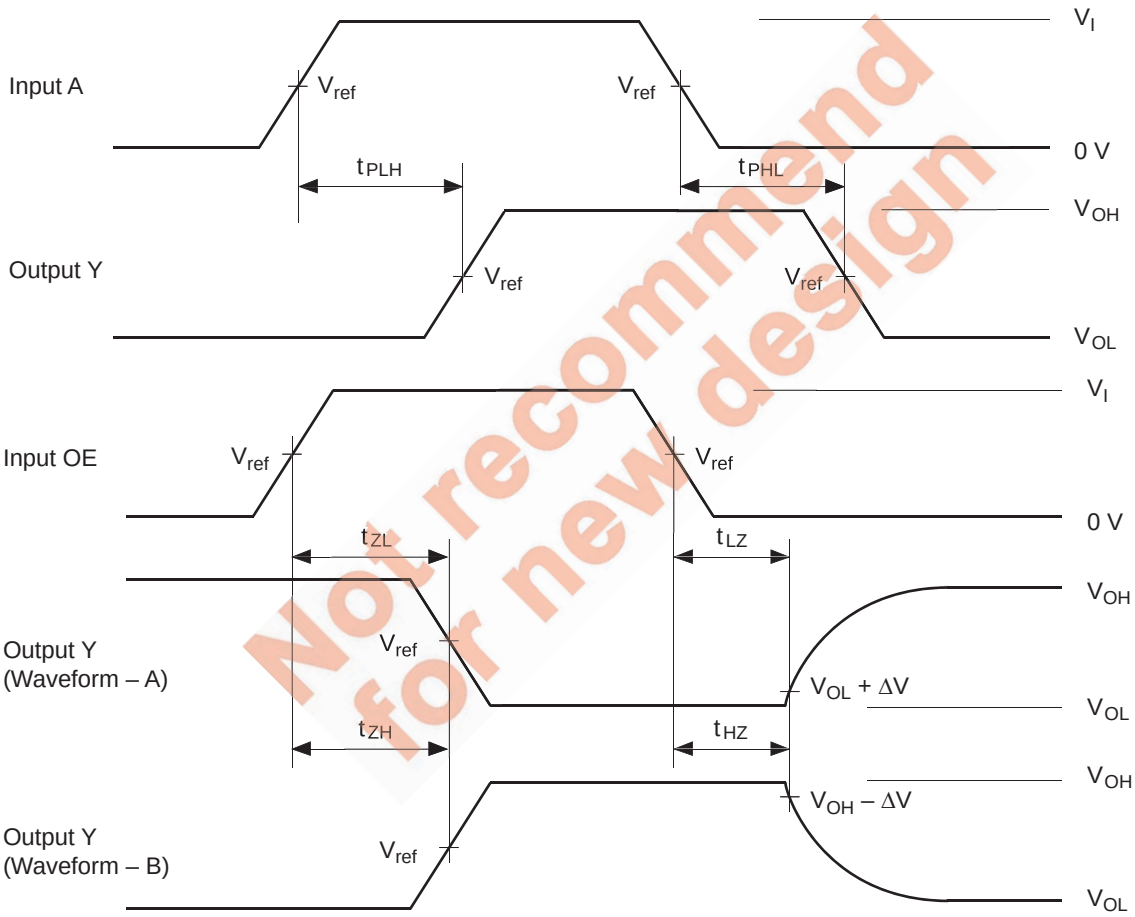
Item	Symbol	V_{CC} (V)	Ta = 25°C			Unit	Test Conditions
			Min	Typ	Max		
Power dissipation capacitance	C_{PD}	1.8	—	19	—	pF	f = 10 MHz
		2.5	—	19	—		
		3.3	—	20	—		
		5.0	—	22	—		

Test Circuit



TEST	S1
t_{PLH} / t_{PHL}	OPEN
t_{ZH} / t_{HZ}	GND
t_{ZL} / t_{LZ}	VTT

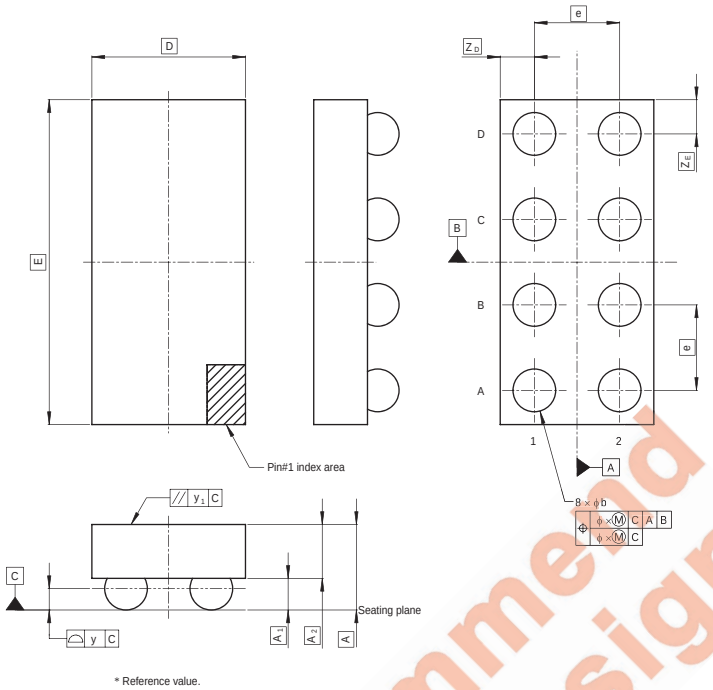
V_{CC} (V)	INPUTS		V_{ref}	VTT	C_L	R_L	ΔV
	V_I	t_r / t_f					
1.8±0.15	V_{CC}	≤ 2 ns	V_{CC} / 2	2 × V_{CC}	30 pF	1.0 kΩ	0.15 V
2.5±0.2	V_{CC}	≤ 2 ns	V_{CC} / 2	2 × V_{CC}	30 pF	500 Ω	0.15 V
3.3±0.3	V_{CC}	≤ 2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V
5.0±0.5	V_{CC}	≤ 2.5 ns	V_{CC} / 2	2 × V_{CC}	50 pF	500 Ω	0.3 V



Notes: 1. C_L includes probe and jig capacitance.
2. Waveform–A is for an output with internal conditions such that the output is low except when disabled by the output control.
3. Waveform–B is for an output with internal conditions such that the output is high except when disabled by the output control.
4. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10MHz, Zo = 50 Ω.
5. The output are measured one at a time with one transition per measurement.

Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
S-XFBGA8-0.9x1.9-0.50	SXBG0008KB-A	TBS-8AV	0.0015g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	—	—	0.50
A_1	0.155	—	0.185
A_2	—	—	(0.315)*
b	0.20	—	0.25
D	—	0.90	—
E	—	1.90	—
e	—	0.50	—
x	—	—	0.05
y	—	—	0.05
y_1	—	—	0.20
Z_D	—	0.20	—
Z_E	—	0.20	—

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