

RD74LVC1G07

Single Buffer / Driver with Open Drain

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Description

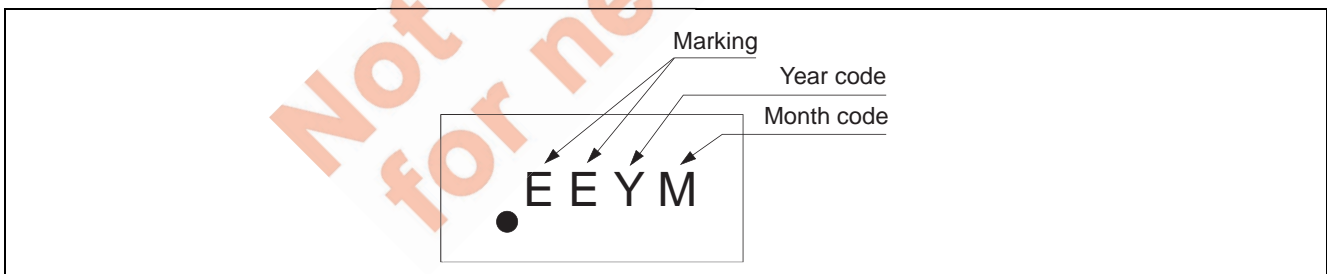
The RD74LVC1G07 has a buffer in a 5-pin package. Low voltage and high-speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

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)
RD74LVC1G07WPE	WCSP-5 pin	SXBG0005LB-A (TBS-5CV)	WP	E (3,000 pcs/reel)

Article Indication



Function Table

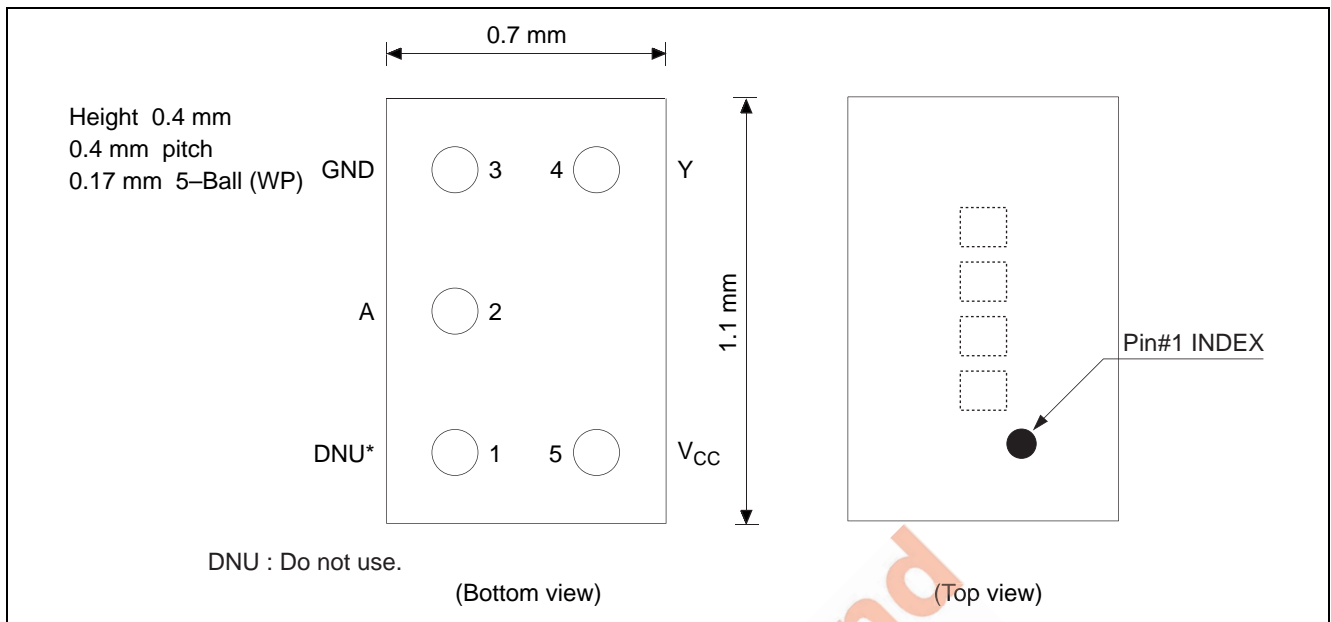
Input A	Output Y
H	Z
L	L

H: High level

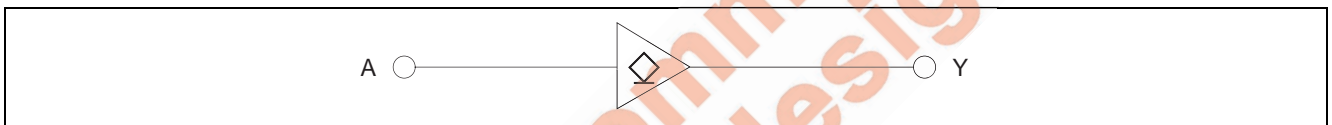
L: Low level

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 : 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}	200	$^{\circ}\text{C}/\text{W}$	WP
Storage temperature	Tstg	-65 to 150	$^{\circ}\text{C}$	

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.

- The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
- 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	
Output current	I_{OL}	—	4	mA	$V_{CC} = 1.65\text{ V}$
		—	8		$V_{CC} = 2.3\text{ V}$
		—	16		$V_{CC} = 3.0\text{ V}$
		—	24		
		—	32		
Operating free-air temperature	T_a	-40	85	°C	

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

Electrical Characteristics

$T_a = -40$ to 85°C

Item	Symbol	V_{CC} (V)	Min	Typ	Max	Unit	Test Condition
Input voltage	V_{IH}	1.65 to 1.95	$V_{CC} \times 0.65$	—	—	V	
		2.3 to 2.7	1.7	—	—		
		3.0 to 3.6	2.0	—	—		
		4.5 to 5.5	$V_{CC} \times 0.7$	—	—		
	V_{IL}	1.65 to 1.95	—	—	$V_{CC} \times 0.35$		
		2.3 to 2.7	—	—	0.7		
		3.0 to 3.6	—	—	0.8		
		4.5 to 5.5	—	—	$V_{CC} \times 0.3$		
Output voltage	V_{OL}	Min to Max	—	—	0.1	V	$I_{OL} = 100\ \mu\text{A}$
		1.65	—	—	0.45		$I_{OL} = 4\ \text{mA}$
		2.3	—	—	0.3		$I_{OL} = 8\ \text{mA}$
		3.0	—	—	0.4		$I_{OL} = 16\ \text{mA}$
		—	—	—	0.55		$I_{OL} = 24\ \text{mA}$
		4.5	—	—	0.55		$I_{OL} = 32\ \text{mA}$
Input current	I_{IN}	0 to 5.5	—	—	± 5	μA	$V_{IN} = 5.5\ \text{V}$ or GND
Off state output current	I_{OZ}	5.5	—	—	10	μA	$V_O = 5.5\ \text{V}$ or GND
Quiescent supply current	I_{CC}	5.5	—	—	10	μA	$V_{IN} = V_{CC}$ or GND, $I_O = 0$
	ΔI_{CC}	3 to 5.5	—	—	500		One input at $V_{CC} - 0.6\ \text{V}$, Other input at V_{CC} or GND
Output leakage current	I_{OFF}	0	—	—	± 10	μA	V_{IN} or $V_O = 0$ to $5.5\ \text{V}$
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

$V_{CC} = 1.8 \pm 0.15 \text{ V}$

Item	Symbol	Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t _{ZL} t _{LZ}	2.4	8.3	ns	C _L = 30 pF, R _L = 1.0 kΩ	A	Y

$V_{CC} = 2.5 \pm 0.2 \text{ V}$

Item	Symbol	Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t _{ZL} t _{LZ}	1.0	5.5	ns	C _L = 30 pF, R _L = 500 Ω	A	Y

$V_{CC} = 3.3 \pm 0.3 \text{ V}$

Item	Symbol	Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t _{ZL} t _{LZ}	1.5	4.2	ns	C _L = 50 pF, R _L = 500 Ω	A	Y

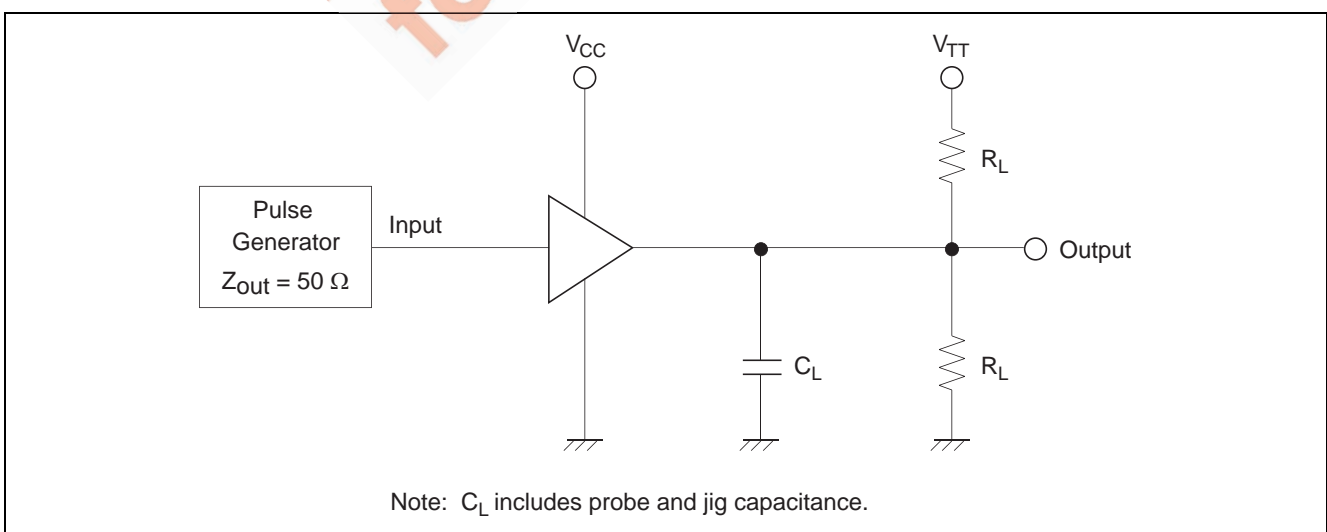
$V_{CC} = 5.0 \pm 0.5 \text{ V}$

Item	Symbol	Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Max				
Propagation delay time	t _{ZL} t _{LZ}	1.0	3.5	ns	C _L = 50 pF, R _L = 500 Ω	A	Y

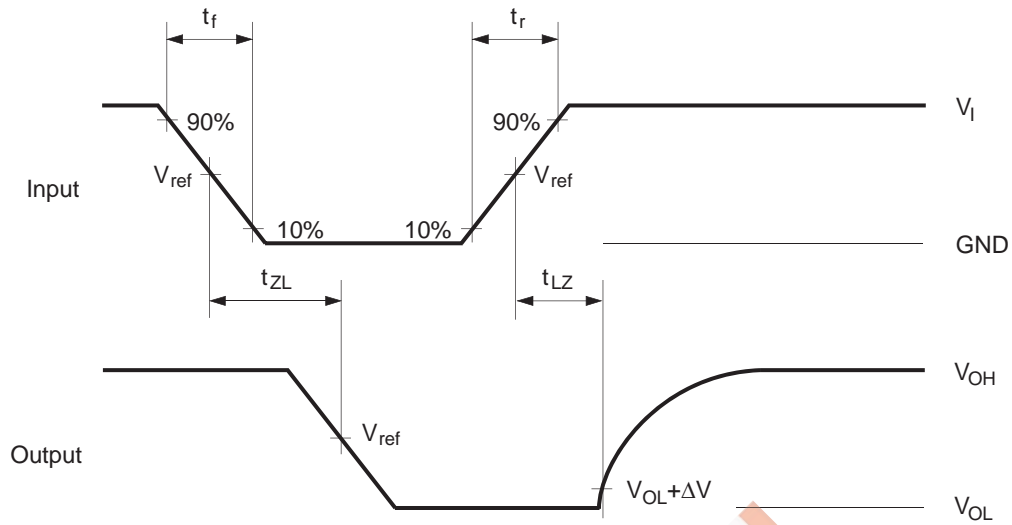
Operating Characteristics

Item	Symbol	V _{CC} (V)	Ta = 25°C			Unit	Test Conditions
			Min	Typ	Max		
Power dissipation capacitance	C _{PD}	1.8	—	20	—	pF	f = 10 MHz
		2.5	—	21	—		
		3.3	—	22	—		
		5.0	—	26	—		

Test Circuit



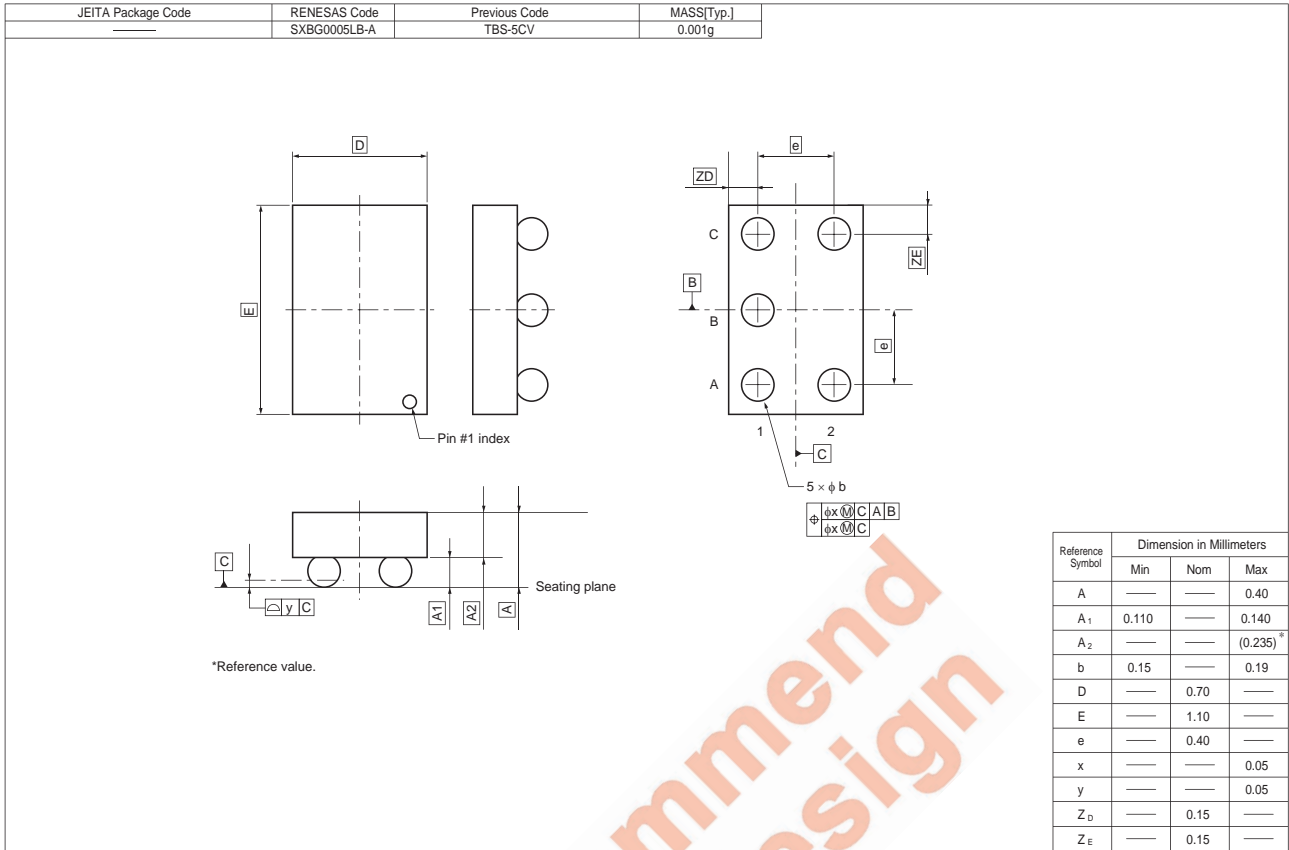
Waveform



V_{CC} (V)	INPUTS		V_{ref}	C_L	R_L	ΔV	V_{TT}
	V_I	t_r / t_f					
1.8 ± 0.15	V_{CC}	≤ 2 ns	$V_{CC} / 2$	30 pF	1.0 k Ω	0.15 V	$V_{CC} \times 2$
2.5 ± 0.2	V_{CC}	≤ 2 ns	$V_{CC} / 2$	30 pF	500 Ω	0.15 V	$V_{CC} \times 2$
3.3 ± 0.3	3 V	≤ 2.5 ns	1.5 V	50 pF	500 Ω	0.3 V	6 V
5.0 ± 0.5	V_{CC}	≤ 2.5 ns	$V_{CC} / 2$	50 pF	500 Ω	0.3 V	$V_{CC} \times 2$

- Notes: 1. Input waveform : PRR \leq 10 MHz, $Z_o = 50 \Omega$.
 2. The output are measured one at a time with one transition per measurement.

Package Dimensions



Not recommend for new design

Keep safety first in your circuit designs!

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