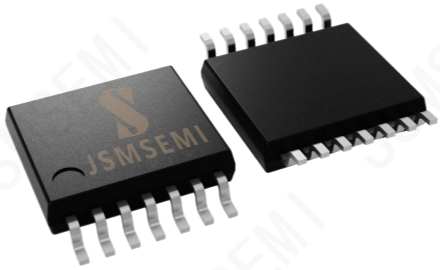
1、General Description

The 74LVC07APW,118-JSM provides six non-inverting buffers. The outputs are open-drain and can be connected to other opendrain outputs to implement active-LOW wired-OR or active-HIGH wired-AND functions. Inputs can be driven from either 3.3V or 5V devices.

This feature allows the use of these devices as translators in mixed 3.3V and 5V applications.



Features:

- 5V tolerant inputs and outputs (open-drain) for interfacing with 5V logic
- Wide supply voltage range from 1.2V to 5.5V
- CMOS low power consumption
- Direct interface with TTL levels
- Inputs accept voltages up to 5V
- Specified from -40℃ to +125℃
- Packaging information: TSSOP-14

2、Block Diagram And Pin Description

2.1、Block Diagram

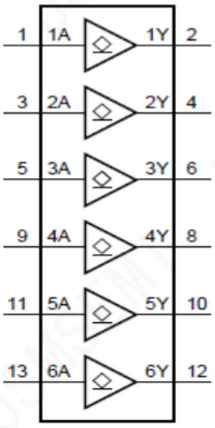


Figure 1. Logic symbol

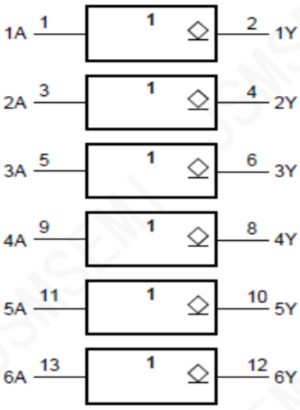


Figure 2. IEC logic symbol

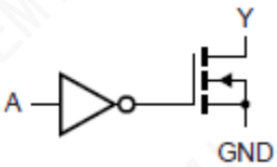
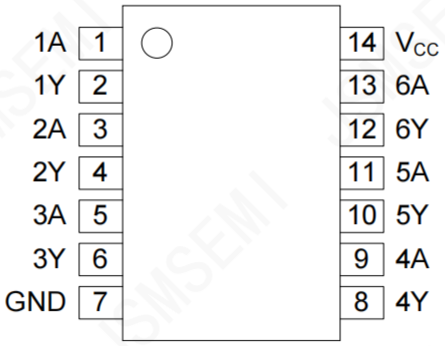


Figure 3. Logic diagram for one gate

Ordering Information

Order number	Package	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
74LVC07APW,118-JSM	TSSOP-14	-40 to 125° C	3	T&R,2500	Rohs

2.2、Pin Configurations



TSSOP-14

2.3、Pin Description

Pin No.	Pin Name	Description
TSSOP-14		
1	1A	data input
2	1Y	data output
3	2A	data input
4	2Y	data output
5	3A	data input
6	3Y	data output
7	GND	ground (0V)
8	4Y	data output
9	4A	data input
10	5Y	data output
11	5A	data input
12	6Y	data output
13	6A	data input
14	V_{CC}	supply voltage

2.4、Function Table

Input	Output
nA	**nY**
L	L
H	Z

Note: H=HIGH voltage level; L=LOW voltage level; Z=high-impedance OFF-state.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(Voltages are referenced to GND(ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+6.5	V
input clamping current	I_{IK}	$V_I<0V$	-50	-	mA
input voltage	V_I	-	-0.5	+6.5	V
output clamping current	I_{OK}	$V_O<0V$	-50	-	mA
output voltage	V_O	active mode	-0.5	+6.5	V
		high-impedance mode	-0.5	+6.5	V
output current	I_O	V_O=0V to V_{CC}	-	50	mA
supply current	I_{CC}	-	-	100	mA
ground current	I_{GND}	-	-100	-	mA
total power dissipation	P_{tot}	-	-	500	mW
storage temperature	T_{stg}	-	-65	+150	℃
Soldering temperature	T_L	10s	260		℃

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	1.65	-	5.5	V
		functional	1.2	-	-	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	active mode	0	-	V_{CC}	V
		high-impedance mode	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	℃
input transition rise and fall rate	$\Delta t/\Delta V$	V_{CC}=1.65V to 2.7V	0	-	20	ns/V
		V_{CC}=2.7V to 3.6V	0	-	10	ns/V

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

(T_{amb}=-40℃ to +85℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.2V		1.08	-	-	V
		V_{CC}=1.65V to 1.95V		0.65×V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.7	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7×V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.2V		-	-	0.12	V
		V_{CC}=1.65V to 1.95V		-	-	0.35×V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.30×V_{CC}	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.65V to 5.5V	-	-	0.20	V
			I_O=4mA; V_{CC}=1.65V	-	-	0.45	V
			I_O=8mA; V_{CC}=2.3V	-	-	0.3	V
			I_O=12mA; V_{CC}=2.7V	-	-	0.4	V
			I_O=24mA; V_{CC}=3.0V	-	-	0.55	V
			I_O=32mA; V_{CC}=4.5V	-	-	0.55	V
input leakage current	I_I	V_I=5.5V or GND; V_{CC}=1.65V to 5.5V		-	-	±5	uA
OFF-state output current	I_{OZ}	V_I=V_{IH}; V_O=5.5V or GND; V_{CC}=1.65V to 5.5V				±10	uA
power-off leakage current	I_{OFF}	V_I or V_O=5.5V; V_{CC}=0V		-	-	±10	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A; V_{CC}=5.5V		-	-	10	uA
additional supply current	ΔI_{CC}	per input pin; V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.7V to 5.5V		-	-	500	uA
input capacitance	C_I	V_{CC}=0V to 5.5V; V_I= GND to V_{CC}		-	5.0	-	pF

Note: All typical values are measured at V_{CC}=3.3V (unless stated otherwise) and T_{amb}=25℃.

3.3.2、DC Characteristics 2

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.2V		1.08	-	-	V
		V_{CC}=1.65V to 1.95V		0.65× V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.7	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7× V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.2V		-	-	0.12	V
		V_{CC}=1.65V to 1.95V		-	-	0.35× V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.30× V_{CC}	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.65V to 5.5V	-	-	0.30	V
			I_O=4mA; V_{CC}=1.65V	-	-	0.6	V
			I_O=8mA; V_{CC}=2.3V	-	-	0.75	V
			I_O=12mA; V_{CC}=2.7V	-	-	0.6	V
			I_O=24mA; V_{CC}=3.0V	-	-	0.8	V
			I_O=32mA; V_{CC}=4.5V	-	-	0.8	V
input leakage current	I_I	V_I=5.5V or GND; V_{CC}=1.65V to 5.5V		-	-	±20	uA
OFF-state output current	I_{OZ}	V_I=V_{IH}; V_O=5.5V or GND; V_{CC}=1.65V to 5.5V		-	-	±20	uA
power-off leakage current	I_{OFF}	V_I or V_O=5.5V; V_{CC}=0V		-	-	±20	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A; V_{CC}=5.5V		-	-	40	uA
additional supply current	ΔI_{CC}	per input pin; V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.7V to 5.5V		-	-	5000	uA

Note: All typical values are measured at V_{CC}=3.3V (unless stated otherwise) and T_{amb}=25℃.

3.3.4、AC Characteristics 1

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
nA to nY OFF-state to LOW propagation delay	t_{PZL}	see Figure 5	V_{CC}=1.65V to 1.95V	0.5	-	6.5	ns
			V_{CC}=2.3V to 2.7V	0.5	-	3.5	ns
			V_{CC}=2.7V	0.5	-	4.5	ns
			V_{CC}=3.0V to 3.6V	0.5	-	4.5	ns
			V_{CC}=4.5V to 5.5V	0.5	-	3.5	ns
nA to nY LOW to OFF-state propagation delay	t_{PLZ}	see Figure 5	V_{CC}=1.65V to 1.95V	0.5	-	6.5	ns
			V_{CC}=2.3V to 2.7V	0.5	-	3.5	ns
			V_{CC}=2.7V	0.5	-	4.5	ns
			V_{CC}=3.0V to 3.6V	0.5	-	4.5	ns
			V_{CC}=4.5V to 5.5V	0.5	-	3.5	ns

Note: [1] Typical values are measured at T_{amb}=25℃ and V_{CC}=1.2V, 1.8V, 2.5V, 2.7V, 3.3V and 5.0V respectively.

3.3.3、AC Characteristics 2

(T_{amb}=-40℃ to +85℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
nA to nY OFF-state to LOW propagation delay	t_{PZL}	see Figure 5	V_{CC}=1.2V	-	8.0	-	ns
			V_{CC}=1.65V to 1.95V	0.5	1.7	5.5	ns
			V_{CC}=2.3V to 2.7V	0.5	1.2	2.8	ns
			V_{CC}=2.7V	0.5	1.8	3.3	ns
			V_{CC}=3.0V to 3.6V	0.5	1.2	3.6	ns
			V_{CC}=4.5V to 5.5V	0.5	1.6	2.6	ns
nA to nY LOW to OFF-state propagation delay	t_{PLZ}	see Figure 5	V_{CC}=1.2V	-	10	-	ns
			V_{CC}=1.65V to 1.95V	0.5	3.0	5.5	ns
			V_{CC}=2.3V to 2.7V	0.5	1.7	2.8	ns
			V_{CC}=2.7V	0.5	2.1	3.3	ns
			V_{CC}=3.0V to 3.6V	0.5	2.5	3.6	ns
			V_{CC}=4.5V to 5.5V	0.5	1.6	2.6	ns
Power dissipation capacitance	C_{PD}	per buffer; V_I= GND to V_{CC}	V_{CC}=1.65V to 1.95V	-	6.5	-	pF
			V_{CC}=2.3V to 2.7V	-	6.9	-	pF
			V_{CC}=3.0V to 3.6V	-	7.2	-	pF

Note:

[1] Typical values are measured at T_{amb}=25℃ and V_{CC}=1.2V, 1.8V, 2.5V, 2.7V, 3.3V and 5.0V respectively.

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

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

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

4、Testing Circuit

4.1、AC Testing Circuit

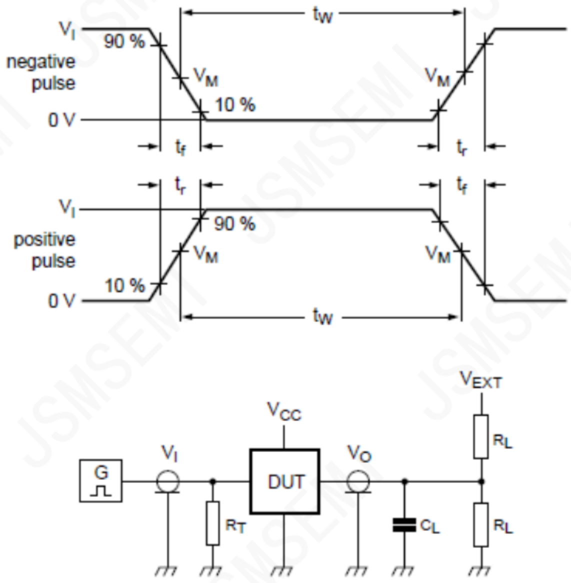


Figure 4. Load circuitry for switching times

Definitions for test circuit:

R_L=Load resistance.

C_L=Load capacitance including jig and probe capacitance.

R_T=Termination resistance should be equal to the output impedance Z_o of the pulse generator.

V_{EXT}=External voltage for measuring switching times.

4.2、AC Testing Waveforms

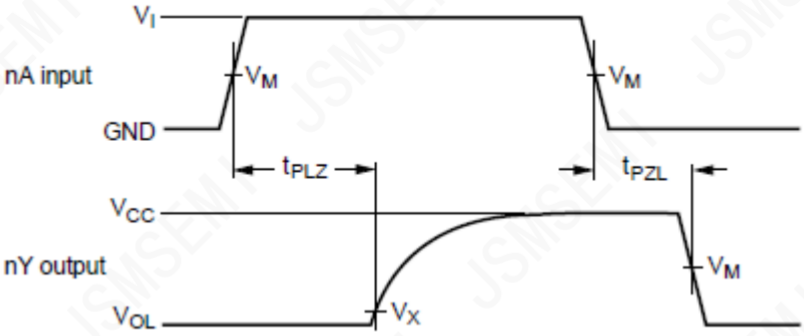


Figure 5. The input (nA) to output (nY) propagation delays

4.3、Measurement Points

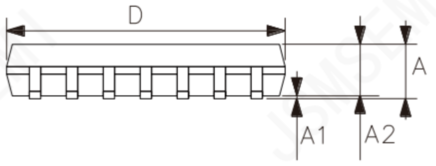
Supply voltage	**Input**	**Output**
V_{CC}	V_M	V_X
< 2.7V	$0.5\times V_{CC}$	V_{OL}+0.15V
≥2.7V to 3.6V	1.5V	V_{OL}+0.3V
≥4.5V to 5.5V	$0.5\times V_{CC}$	V_{OL}+0.3V

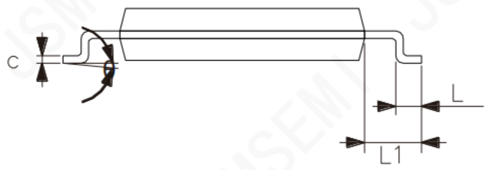
4.4、Test Data

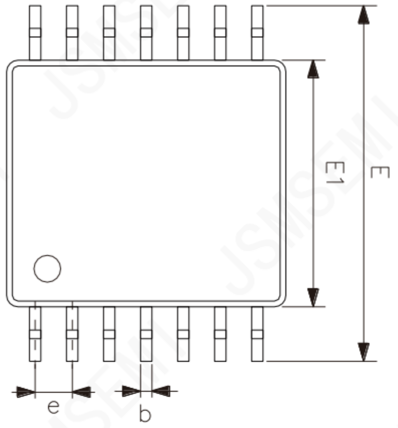
Supply voltage	**Input**		**Load**		**V_{EXT}**		
V_{CC}	V_I	t_r , t_f	C_L	R_L	t_{PLH}, t_{PHL}	t_{PLZ}, t_{PZL}	t_{PHZ}, t_{PZH}
1.2V	V_{CC}	≤ 2.0ns	30pF	1kΩ	open	$2\times V_{CC}$	GND
1.65V to 1.95V	V_{CC}	≤ 2.0ns	30pF	1kΩ	open	$2\times V_{CC}$	GND
2.3V to 2.7V	V_{CC}	≤ 2.0ns	30pF	500Ω	open	$2\times V_{CC}$	GND
2.7V	2.7V	≤ 2.5ns	50pF	500Ω	open	$2\times V_{CC}$	GND
3.0V to 3.6V	2.7V	≤ 2.5ns	50pF	500Ω	open	$2\times V_{CC}$	GND
4.5V to 5.5V	V_{CC}	≤ 2.5ns	50pF	500Ω	open	$2\times V_{CC}$	GND

5、Package Information

5.1、TSSOP-14







符号	尺寸(mm)	
	最小	最大
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°

6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○：Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×：Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

Important Notice

JSMSEMI Semiconductor (JSMSEMI) PRODUCTS ARE NEITHER DESIGNED NOR INTENDED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS UNLESS THE SPECIFIC JSMSEMI PRODUCTS ARE SPECIFICALLY DESIGNATED BY JSMSEMI FOR SUCH USE. BUYERS ACKNOWLEDGE AND AGREE THAT ANY SUCH USE OF JSMSEMI PRODUCTS WHICH JSMSEMI HAS NOT DESIGNATED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS IS SOLELY AT THE BUYER’S RISK.

JSMSEMI assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using JSMSEMI products.

Resale of JSMSEMI products or services with statements diferent from or beyond the parameters stated by JSMSEMI for that product or service voids all express and any implied warranties for the associated JSMSEMI product or service. JSMSEMI is not responsible or liable for any such statements.

JSMSEMI All Rights Reserved. Information and data in this document are owned by JSMSEMI wholly and may not be edited, reproduced, or redistributed in any way without the express written consent from JSMSEMI.

Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc.When designing equipment, refer to the "Delivery Specification" for the JSMSEMI product that you intend to use.

For additional information please contact Kevin@ jsmsemi.com or visit www.jsmsemi.com