DESCRIPTION

The SLP74LV1T08 is a single, level translating 2-input AND gate. The input is designed with a lower threshold circuit to match 1.8 V input logic at V_{CC} = 3.3V and can be used in 1.8V to 3.3V level up translation. In addition, the 5V tolerant input pins enable level down translation (3.3V to 2.5V output at V_{CC} = 2.5V).

The output level is referenced to the supply voltage and supports 1.8V, 2.5V, 3.3V and 5.0V CMOS levels. The wide V_{CC} range of 1.6V to 5.5V allows generation of desired output levels to connect to controllers or processors.

FEATURES

- Single supply voltage translator at 1.8V, 2.5V, 3.3V and 5.0V
- Logic output is referenced to V_{CC}
- Input accept voltages up to 5V
- Up translation

    1.2V to 1.8V at V_{CC} = 1.8V 1.5V to 2.5V at V_{CC} = 2.5V 1.8V to 3.3V at V_{CC} = 3.3V 3.3V to 5.0V at V_{CC} = 5.0V

- Down translation

    3.3V to 1.8V at V_{CC} = 1.8V 3.3V to 2.5V at V_{CC} = 2.5V 5.0V to 3.3V at V_{CC} = 3.3V

- ESD protection:

    HBM Exceeds 2000V

    CDM Exceeds 1000V

- Latch-up performance exceeds 250mA
- Specified from -40°C to +85°C and from -40°C to +125°C
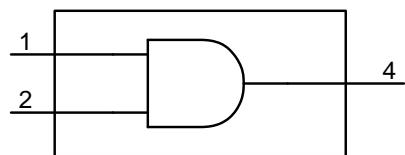
BLOCK DIAGRAM

Fig.1 Function diagram
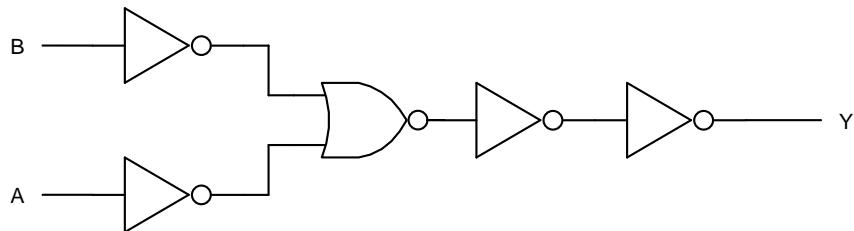
Fig.2 Logic diagram
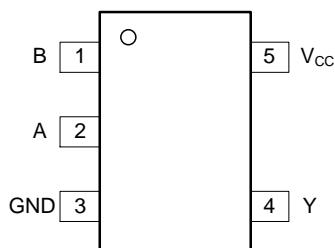
PIN CONFIGURATION

Fig.3 Pin configuration

PIN DESCRIPTION

Pin No.	Pin Name	I/O	Description
1	B	I	Data input
2	A	I	Data input
3	GND	/	Ground
4	Y	O	Data output
5	V_{CC}	/	Supply voltage

FUNCTIONAL DESCRIPTION[1]

Input A	Input B	Output Y
L	L	L
L	H	L
H	L	L
H	H	H

[1] H = HIGH voltage level;

L = LOW voltage level.

LIMITING VALUES

Characteristics	Symbol	Conditions	Min.	Max.	Unit
Supply voltage	V_{CC}		-0.5	+7.0	V
Input voltage	V_I		-0.5	+7.0	V
Input clamping current	I_{IK}	$V_I < 0V$ [1]	-20		mA
Output clamping current	I_{OK}	$V_O < 0V$ or $V_O > V_{CC}$ [1]	-20	+20	mA
Output voltage	V_O	Active mode	-0.5	$V_{CC}+0.5$	V
		Power-down mode	-0.5	+4.6	V
Output current	I_O	$V_O = 0V$ to V_{CC}	-25	+25	mA
Supply current	I_{CC}			+50	mA
Ground current	I_{GND}		-50		mA
Storage temperature	T_{stg}		-65	+150	°C
Thermal resistance, junction to ambient	R_{thJA}			239	°C/W
Latch up	LU	$T_A = 25°C, 125°C$	250		mA
ESD human-body model	ESD-HBM	$T_A = 25°C$	2000		V
ESD charged-device model	ESD-CDM	$T_A = 25°C$	1000		V

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

RECOMMENDED OPERATING CONDITION(UNLESS OTHERWISE SPECIFIED, $T_A = 25$ C)

Voltages are referenced to GND (ground = 0V)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}		1.6		5.5	V
Input voltage	V_I		0		5.5	V
Output voltage	V_O		0		V_{CC}	V
Ambient temperature	T_A		-40	+25	+125	°C
Input transition rise and fall rate	$\Delta t/\Delta V$	$V_{CC} = 1.8V$ to $5.5V$			20	ns/V

STATIC CHARACTERISTICS

Voltages are referenced to GND (ground = 0V)

Characteristics	Symbol	Test condition	25℃		-40℃ to 85℃		-40℃ to +125℃		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
HIGH-level input voltage	V_{IH}	V_{CC} = 1.65V to 1.8V	0.94		1.0		1.0		V
		V_{CC} = 2.0V	0.99		1.03		1.03		V
		V_{CC} = 2.25V to 2.5V	1.135		1.18		1.18		V
		V_{CC} = 2.75V	1.21		1.23		1.23		V
		V_{CC} = 3.0V to 3.3V	1.35		1.37		1.37		V
		V_{CC} = 3.6V	1.47		1.48		1.48		V
		V_{CC} = 4.5V to 5.5V	2.02		2.03		2.03		V
		V_{CC} = 5.5V	2.10		2.11		2.11		V
LOW-level input voltage	V_{IL}	V_{CC} = 1.65V to 2.0V		0.58		0.55		0.55	V
		V_{CC} = 2.25V to 2.75V		0.75		0.71		0.71	V
		V_{CC} = 3.0V to 3.6V		0.80		0.80		0.80	V
		V_{CC} = 4.5V to 5.5V		0.80		0.80		0.80	V
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL}							
		I_O = -20μA; V_{CC} =1.65V to 5.5V	V_{CC}-0.1		V_{CC}-0.1		V_{CC}-0.1		V
		I_O = -2mA; V_{CC} = 1.65V	1.28		1.21		1.21		V
		I_O = -2mA; V_{CC} = 1.8V	1.5		1.45		1.45		V
		I_O = -2.3mA; V_{CC} = 2.3V	2.0		2.0		2.0		V
		I_O = -3mA; V_{CC} = 2.3V	2.0		1.93		1.93		V
		I_O = -3mA; V_{CC} = 2.5V	2.25		2.15		2.15		V
		I_O = -3mA; V_{CC} = 3.0V	2.78		2.7		2.7		V
		I_O = -5.5mA; V_{CC} = 3.0V	2.6		2.49		2.49		V
		I_O = -5.5mA; V_{CC} = 3.3V	2.9		2.8		2.8		V
		I_O = -4mA; V_{CC} = 4.5V	4.2		4.1		4.1		V
		I_O = -8mA; V_{CC} = 4.5V	4.1		3.95		3.95		V
		I_O = -8mA; V_{CC} = 5.0V	4.6		4.5		4.5		V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL}							
		I_O = 20μA; V_{CC} =1.65V to 5.5V		0.1		0.1		0.1	V
		I_O = 2mA; V_{CC} = 1.65V		0.2		0.25		0.25	V
		I_O = 2.3mA; V_{CC} = 2.3V		0.1		0.15		0.15	V
		I_O = 3mA; V_{CC} = 2.3V		0.15		0.2		0.2	V
		I_O = 3mA; V_{CC} = 3.0V		0.1		0.15		0.15	V
		I_O = 5.5mA; V_{CC} = 3.0V		0.2		0.25		0.25	V
		I_O = 4mA; V_{CC} = 4.5V		0.15		0.2		0.2	V

Characteristics	Symbol	Test condition	25℃		-40℃ to 85℃		-40℃ to +125℃		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
		I_O = 8mA; V_{CC} = 4.5V		0.3		0.35		0.35	V
Input leakage current	I_I	V_I = 5.5V or GND; V_{CC} = 0V to 5.5V		±0.1		±1.0		±1.0	µA
Supply current	I_{CC}	V_I = V_{CC} or GND; I_O = 0A; V_{CC} = 1.65V to 5.5V		1.0		10		10	µA
Additional supply current	ΔI_{CC}	Per input pin; V_{CC} = 1.8V V_I = 0.3V or 1.1V; I_O = 0A; other pins at V_{CC} or GND		10		10		10	µA
		Per input pin; V_{CC} = 5.5V V_I = 0.3V or 3.4V; I_O = 0A; other pins at V_{CC} or GND		1.35		1.5		1.5	mA

DYNAMIC CHARACTERISTICS

GND = 0V. For test circuit, see WAVEFORMS.

Characteristics	Symbol	Test condition	-40℃ to +125℃					Unit
			Min.	Typ. 25℃	Max. 25℃	Max. 85℃	Max. 125℃	
Propagation delay	t_{pd}	A, B to Y;[1]						
		V_{CC} = 1.8V; C_L = 15pF		9.3	14.0	16.2	16.7	ns
		V_{CC} = 1.8V; C_L = 30pF		10.2	15.3	17.9	18.4	ns
		V_{CC} = 2.5V; C_L = 15pF		5.9	8.6	10.1	10.6	ns
		V_{CC} = 2.5V; C_L = 30pF		6.6	9.6	11.1	11.6	ns
		V_{CC} = 3.3V; C_L = 15pF		4.4	6.2	7.2	7.5	ns
		V_{CC} = 3.3V; C_L = 30pF		5.2	7.3	8.6	8.9	ns
		V_{CC} = 5.0V; C_L = 15pF		3.4	4.4	4.9	5.1	ns
		V_{CC} = 5.0V; C_L = 30pF		3.6	4.7	5.2	5.4	ns
Input capacitance	C_I			3.6	10	10	10	pF

[1] t_{pd} is the same as t_{PLH} and $t_{PHL.}$

WAVEFORMS
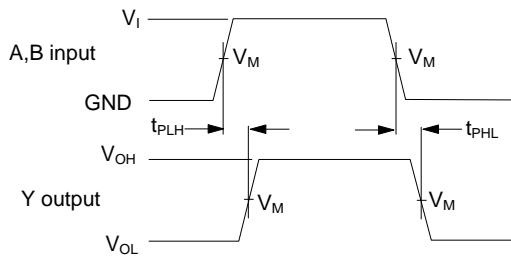
Fig.4 The input (A, B) to output (Y) propagation delays

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

Measurement points: $V_M = 0.5 * V_{CC}$;
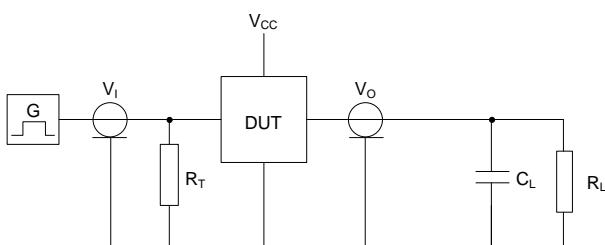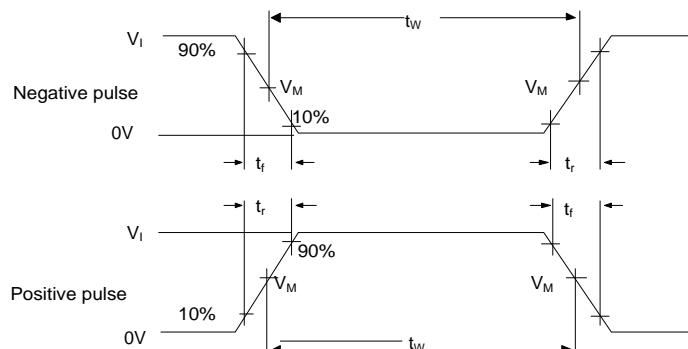
Fig.5 Definitions test circuit
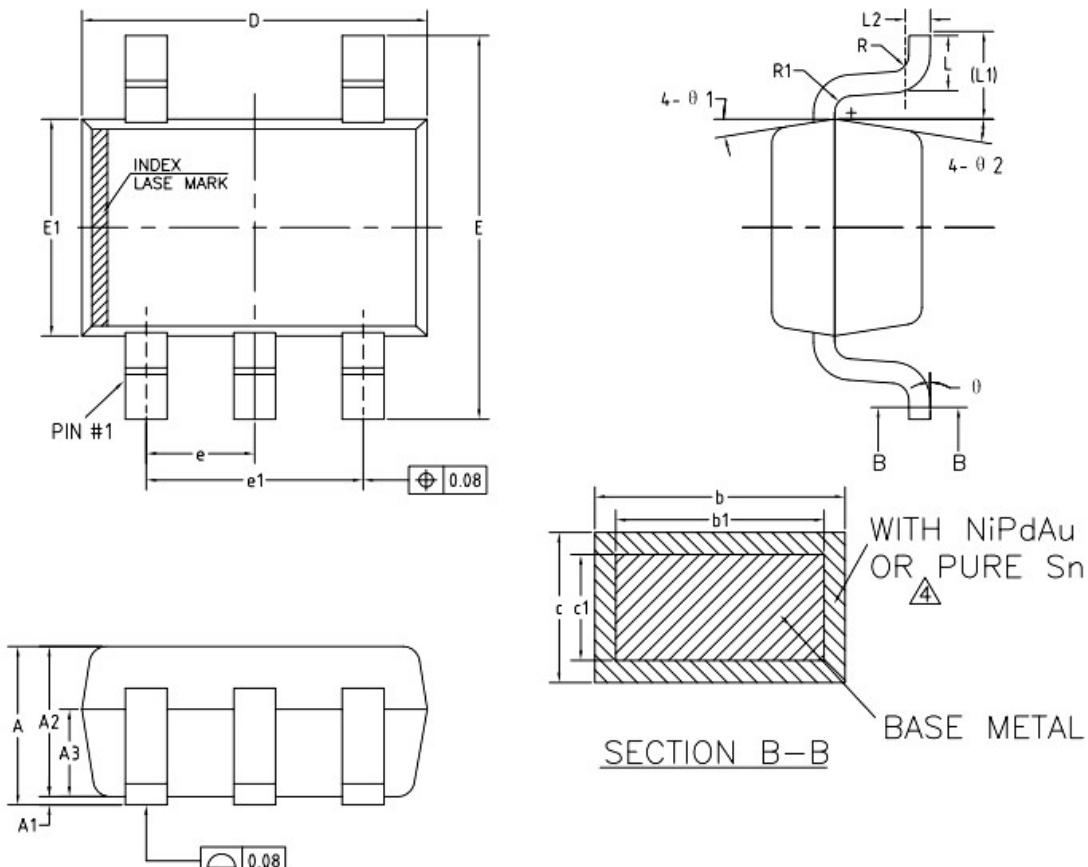
R_T = Termination resistance should be equal to output impedance Z_o of the pulse generator

C_L = Load capacitance including jig and probe capacitance

R_L = Load resistor

Test data
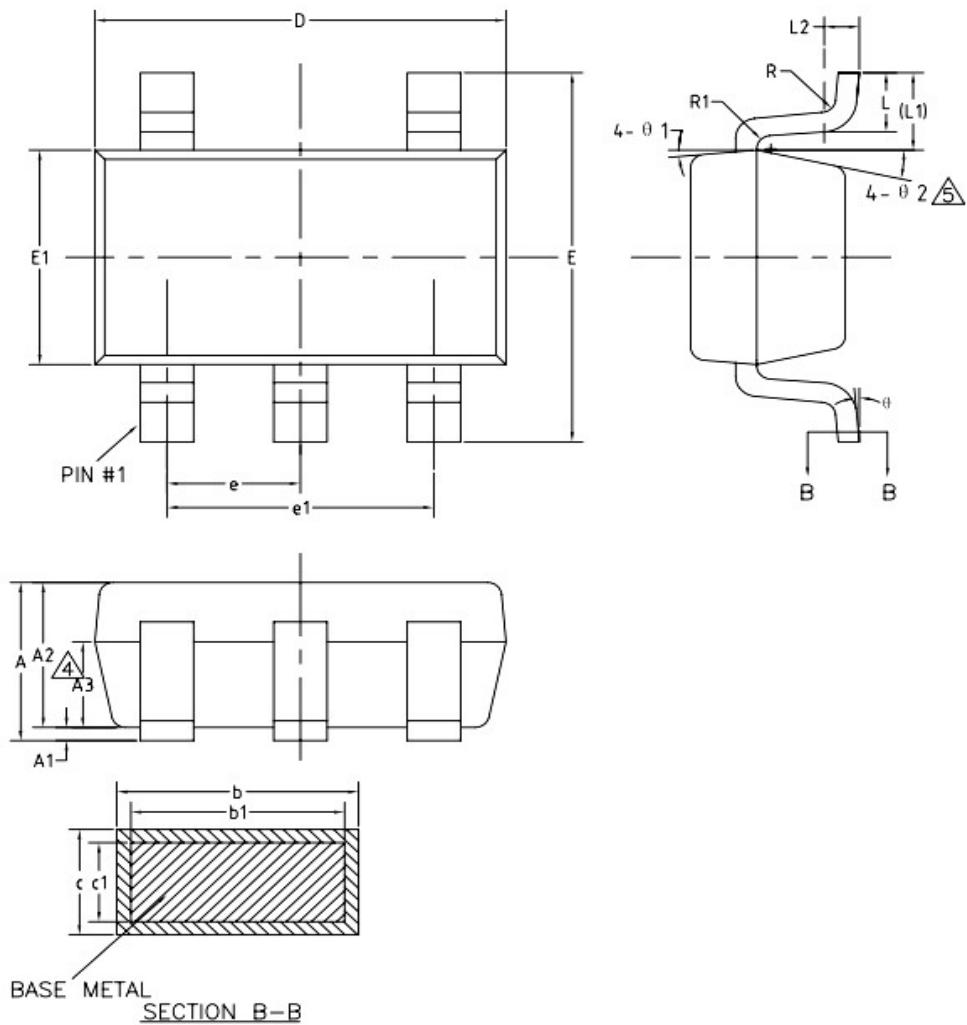
Supply voltage	Input			Load	
	V_I	t_r, t_f	f_{max}	C_L	R_L
1.8V	V_{CC}	≤ 3.0ns	15MHz	15pF, 30pF	1MΩ
2.5V	V_{CC}	≤ 3.0ns	25MHz	15pF, 30pF	1MΩ
3.3V	3V	≤3.0ns	50MHz	15pF, 30pF	1MΩ
5.0V	3V	≤ 3.0ns	50MHz	15pF, 30pF	1MΩ

Package Dimension

SC70-5

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL		MIN	NOM	MAX
A		0.85	–	1.05
A1		0	–	0.10
A2		0.80	0.90	1.00
A3		0.47	0.52	0.57
b	NiPdAu	0.22	–	0.29
	PURE Sn	0.23	–	0.33
b1		0.22	0.25	0.28
c	NiPdAu	0.115	–	0.15
	PURE Sn	0.12	–	0.18
c1		0.115	0.13	0.14
D		2.02	2.07	2.12
E		2.20	2.30	2.40
E1		1.25	1.30	1.35
e		0.60	0.65	0.70
e1		1.20	1.30	1.40
L		0.28	0.33	0.38
L1		0.50REF		
L2		0.15BSC		
R		0.10	–	–
R1		0.10	–	0.25
θ		0°	–	8°
θ 1		6°	9°	12°
θ 2		6°	9°	12°

SOT23-5

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	–	–	1.25
A1	0	–	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	–	0.50
b1	0.36	0.38	0.45
c	0.14	–	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	–	–
R1	0.10	–	0.25
θ	0°	–	8°
θ 1	3°	5°	7°
θ 2	6°	–	14°

information

Order code	Marking code	Package	Baseqty	Deliverymode
UMW SN74LV1T08DBVR	NEE3	SOT23-5	3000	Tape and reel
UMW SN74LV1T08DCKR	WE3	SC70-5	3000	Tape and reel

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Logic Gates *category:*

Click to view products by Youtai *manufacturer:*

Other Similar products are found below :

74HC85N NL17SG32DFT2G CD4068BE NL17SG86DFT2G NLV14001UBDR2G NLX1G11AMUTCG NLX1G97MUTCG 74LS38 74LVC1G08Z-7 74LVC32ADTR2G CD4025BE MC74HCT20ADTR2G NLV17SZ00DFT2G NLV17SZ126DFT2G NLV27WZ17DFT2G NLV74HC02ADR2G 74HC32S14-13 74LS133 74LVC1G32Z-7 74LVC1G86Z-7 NLV74HC14ADR2G NLV74HC20ADR2G NLVVHC1G09DFT1G NLX2G86MUTCG 74LVC2G32RA3-7 74LVC2G00HD4-7 NL17SG02P5T5G 74LVC2G86HK3-7 NLV7SZ97DFT2G NLVVHC1G14DFT2G NLX1G99DMUTWG NLVVHC1G00DFT2G NLV7SZ57DFT2G NLV74VHC04DTR2G NLV27WZ00USG NLU1G86CMUTCG NLU1G08CMUTCG NL17SZ32P5T5G NL17SZ00P5T5G NL17SH02P5T5G 74AUP2G00RA3-7 NLVVHC1GT00DFT2G NLV74HC02ADTR2G NLX1G332CMUTCG NLVHCT132ADTR2G NL17SG86P5T5G NL17SZ05P5T5G NLV74VHC00DTR2G NLVVHC1G02DFT1G NLV74HC86ADR2G