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Single INVERTER without Buffer

S-75LU04ANC

■ General Description

The S-75LU04ANC is a single packaged inverter without buffer fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve operation by only a couple of batteries (1 to 3 V).

The S-75LU04ANC is suitable for a wide variety of linear circuits.

Input voltage is allowed to be applied even if power voltage is not supplied because no diode is inserted between an input pin and V_{CC} .

This allows for interfaces between power supplies of different voltage, output level conversion from 3 V to 1 V and battery backup applications.

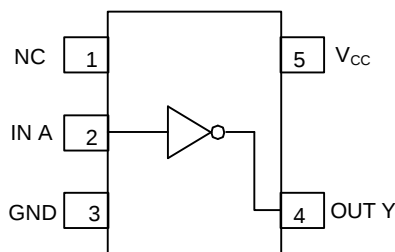
■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0 μ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd = 6 ns (at 3 V)
- High noise immunity: $V_{NIH}=V_{NIL}=28\% V_{CC}$ minimum
- Power down protection: All pins
- Very small plastic package: SC-88A

■ Applications

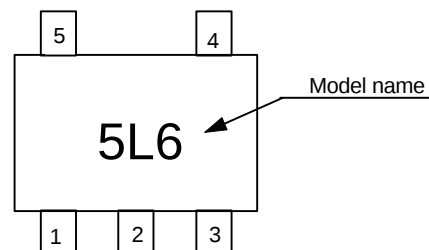
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

■ Pin Assignment



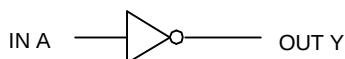
(Top view)

■ Marking



(Top view)

■ Logic Diagram

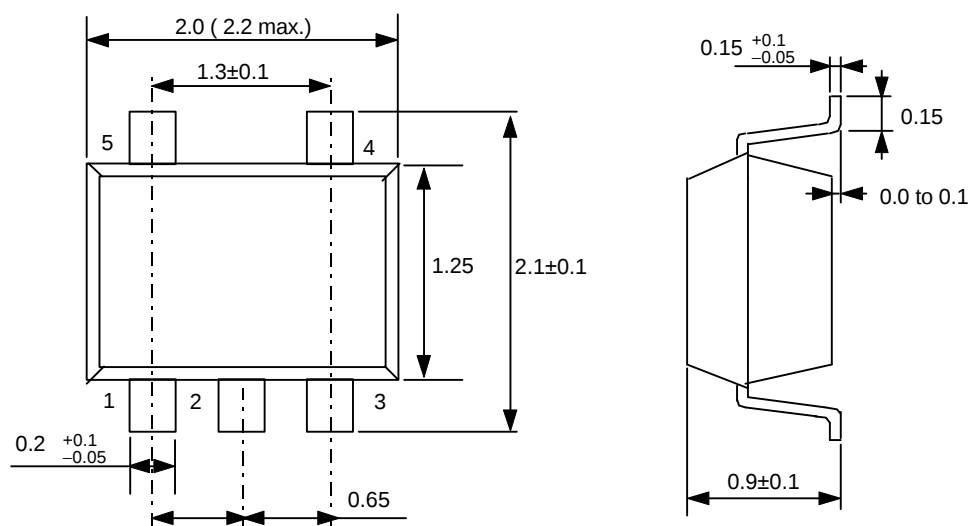


True Values

A	Y
L	H
H	L

■ Physical Dimensions (Unit:mm)

SC-88A



■ Ordering

Delivery form: Taping only

Model name: S-75LU04ANC-5L6-T2

■ Absolute Maximum Ratings

Ta = 25 °C

Item	Symbol	Conditions	Ratings	Unit
Power Supply Voltage	V_{CC}		-0.5 to +5.0	V
Input Voltage	V_{IN}		-0.5 to +5.0	V
Output Voltage	V_{OUT}		-0.5 to $V_{CC}+0.5$	V
Input Parasitic Diode Current	I_{IK}		-20	mA
Output Parasitic Diode Current	I_{OK}		±20	mA
Output Current	I_{OUT}		±12.5	mA
V_{CC} /GND Current	I_{CC}		±25	mA
Power Dissipation	P_D		200	mW
Storage Temp. Range	Tstg		-65 to +150	°C
Lead Temperature (10 sec.)	TL		260	°C

■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V_{CC}	1 to 3.6	v
Input Voltage	V_{IN}	0 to 3.6	v
Output Voltage	V_{OUT}	0 to V_{CC}	v
Op. Temp. Range	Topr	-40 to +85	° C
Input Rise and Fall Time	dt/dv	0 to 1000 ($V_{CC}=1.0$ V)	ns
		0 to 500 ($V_{CC}=2.0$ V)	
		0 to 400($V_{CC}=3.0$ V)	

■ DC Characteristics

Parameter		Sym.	Conditions		Ta=25°C				Ta=-40 to 85°C		Unit
					V _{CC}	Min.	Typ.	Max.	Min.	Max.	
Input Voltage	"H" level	V _{IH}			1.0	0.75	—	—	0.75	—	V
					1.5	1.05	—	—	1.05	—	
					3.0	2.10	—	—	2.10	—	
	"L" level	V _{IL}			1.0	—	—	0.25	—	0.25	
					1.5	—	—	0.45	—	0.45	
					3.0	—	—	0.90	—	0.90	
Output Voltage	"H" level	V _{OH}	V _{IN} =V _{IL}	I _{OH} = -20μA	1.0	0.9	1.0	—	0.9	—	V
					1.5	1.4	1.5	—	1.4	—	
					3.0	2.9	3.0	—	2.9	—	
				I _{OH} =-1mA	1.5	1.07	1.23	—	0.99	—	
				I _{OH} =-2.6mA	3.0	2.61	2.68	—	2.55	—	
	"L" level	V _{OL}	V _{IN} = V _{IH}	I _{OH} = 20μA	1.0	—	0	0.1	—	0.1	
					1.5	—	0	0.1	—	0.1	
					3.0	—	0	0.1	—	0.1	
				I _{OH} =1mA	1.5	—	0.23	0.31	—	0.37	
				I _{OH} =2.6mA	3.0	—	0.23	0.31	—	0.33	
Input Current		I _{IN}	V _{IN} =V _{CC} or GND		3.6	—	—	±0.1	—	±1.0	μA
Current Consump.		I _{CC}	V _{IN} =V _{CC} or GND		3.6	—	—	1.0	—	10.0	μA

Miniaturized Logic IC Family
S-75LU04ANC

■ **AC Characteristics**

$C_L=15\text{ pf}$, Input $t_r = t_f = 6\text{ ns}$, $V_{CC} = 3.3\pm0.3\text{ V}$, $T_a = 25^{\circ}\text{C}$ (unless otherwise specified)

Parameter	Symbol	Measurement Conditions	Min.	Typ.	Max.	Unit
Output Rise/Fall Time	t_{TLH}, t_{THL}		–	6.0	9.0	ns
Propagation Delay Time	t_{pLH}, t_{pHL}		–	4.0	10.0	

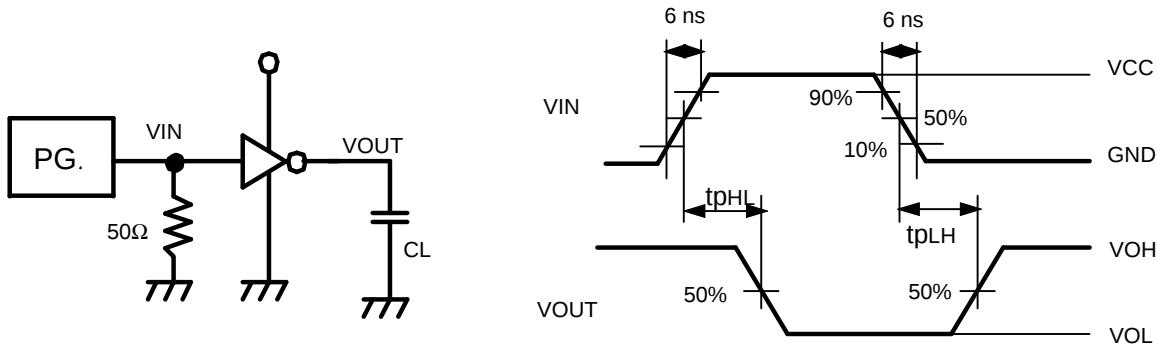
$C_L=25\text{ pf}$, Input $t_r = t_f = 6\text{ ns}$ (unless otherwise specified)

Parameter	Sym.	Measurement Conditions		Ta = 25°C			Ta = -40 to 85°C		Unit
			V _{CC} (V)	Min.	Typ.	Max.	Min.	Max.	
Output Rise/Fall Time	t _{TLH} t _{THL}		1.0	–	35	70	–	90	ns
			1.5	–	15	25	–	30	
			3.0	–	7	10	–	14	
Propagation Delay Time	t _{pLH} t _{pHL}		1.0	–	20	40	–	50	
			1.5	–	10	15	–	20	
			3.0	–	6	9	–	12	
Input Capacitance	C _{IN}			–	5	10	–	10	pF
Equiv. Int. Capacitance	C _{PD}	Note ¹		–	10	–	–	–	pF

Note¹ C_{PD} is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.
 Current consumption is averaged by the following equation.

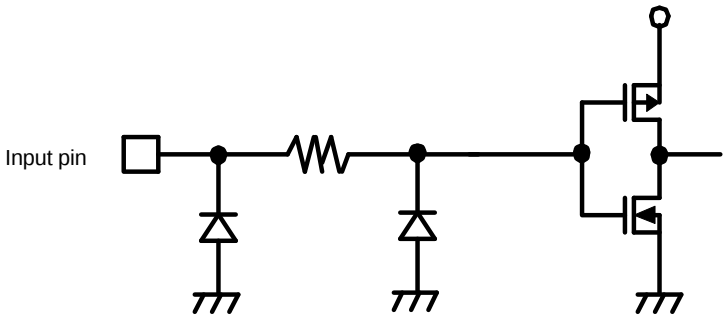
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark: No-load output during measurement of current consumption.

■ **Input Pin Equivalent Circuit**



Collection of Product FAQs

Author: Shirai Masaaki

Date: 99/01/12 (Tuesday) 12:49 (modified: 99/01/18(Monday))

<Information level>

B: For Distri & Rep (Printing N.G.)
Index: A: General

<Product>

Division name: 01 IC
Category 1: 17 ASSP
Category 2: 3. Mini Logic
Cal. No.: Overall

Related documents:

Question:

What are the competitors' names, and what are the model numbers of the competing products? (cross-reference table)

Answer:

See the cross-reference table below. The SII products are not compatible with those of other companies in all specifications.

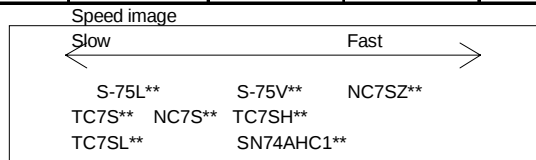
In particular, the S-75V-series products have a longer delay time than that of the other companies' products due to their load capacity (see 75L, 75V).

<How to use this table>

- When a customer refers to any product name in the SOT-23-5-equivalent column during a business-related conversation, introduce SII's SC88A products to this customer if new substrates are to be produced.
- For Toshiba and NS, each row includes two products. The lower product is almost equivalent to SII's (that is, operates at an equivalent speed). The upper product operates at a slower speed than SII's, so the corresponding SII products can be introduced as upgrade versions.

Mini logic cross-reference

Company name	SC88A equivalent				SOT-23-5 equivalent		
	SII	Toshiba	NS(FAIRCHILD)	TI	Toshiba	NS(FAIRCHILD)	TI
Name	Mini-Logic	L-MOS	TinyLogic	SingleGate	L-MOS	TinyLogic	SingleGate
Product name	S-75V00ANC	TC7S00FU TC7SH00FU	NC7S00P5 NC7SZ00P5	SN74AHC1G00DCK	TC7S00F TC7SH00F	NC7S00M5 NC7SZ00M5	SN74AHC1G00DBV
	S-75V02ANC	TC7S02FU TC7SH02FU	NC7S02P5 NC7SZ02P5	SN74AHC1G02DCK	TC7S02F TC7SH02F	NC7S02M5 NC7SZ02M5	SN74AHC1G02DBV
	S-75V04ANC	TC7S04FU TC7SH04FU	NC7S04P5 NC7SZ04P5	SN74AHC1G04DCK	TC7S04F TC7SH04F	NC7S04M5 NC7SZ04M5	SN74AHC1G04DBV
	S-75VU04ANC	TC7SU04FU TC7SHU04FU	NC7SU04P5 NC7SZU04P5	SN74AHC1GU04DCK	TC7SU04F TC7SHU04F	NC7SU04M5 NC7SZU04M5	SN74AHC1GU04DBV
	S-75V08ANC	TC7S08FU TC7SH08FU	NC7S08P5 NC7SZ08P5	SN74AHC1G08DCK	TC7S08F TC7SH08F	NC7S08M5 NC7SZ08M5	SN74AHC1G08DBV
	S-75V14ANC	TC7S14FU TC7SH14FU	NC7S14P5 NC7SZ14P5	SN74AHC1G14DCK	TC7S14F TC7SH14F	NC7S14M5 NC7SZ14M5	SN74AHC1G14DBV
	S-75V32ANC	TC7S32FU TC7SH32FU	NC7S32P5 NC7SZ32P5	SN74AHC1G32DCK	TC7S32F TC7SH32F	NC7S32M5 NC7SZ32M5	SN74AHC1G32DBV
	S-75V86ANC	TC7S86FU TC7SH86FU	NC7S86P5 NC7SZ86P5	SN74AHC1G86DCK	TC7S86F TC7SH86F	NC7S86M5 NC7SZ86M5	SN74AHC1G86DBV
	S-75L00ANC	TC7SL00FU	—	—	TC7SL00F	—	—
	S-75L02ANC	TC7SL02FU	—	—	TC7SL02F	—	—
	S-75L04ANC	TC7SL04FU	—	—	TC7SL04F	—	—
	S-75LU04ANC	TC7SLU04FU	—	—	TC7SLU04F	—	—
	S-75L08ANC	TC7SL08FU	—	—	TC7SL08F	—	—
	S-75L14ANC	—	—	—	—	—	—
	S-75L32ANC	TC7SL32FU	—	—	TC7SL32F	—	—
	S-75L86ANC	—	—	—	—	—	—



Note) Not all types are compared.
For details, see individual specifications.

<Remarks>

FAQ No.: 17S75001