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.

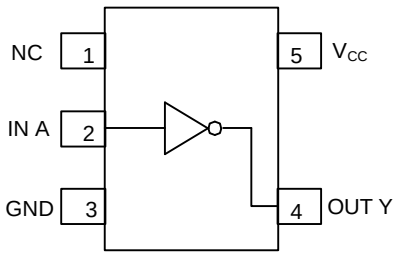
■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0 µA 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

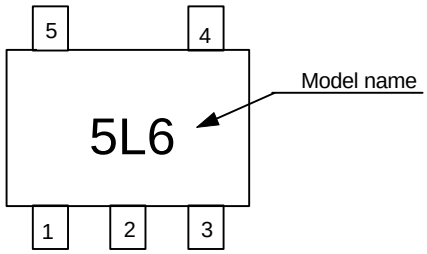
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

■ Pin Assignment



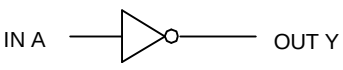
(Top view)

■ Marking



(Top view)

■ Logic Diagram

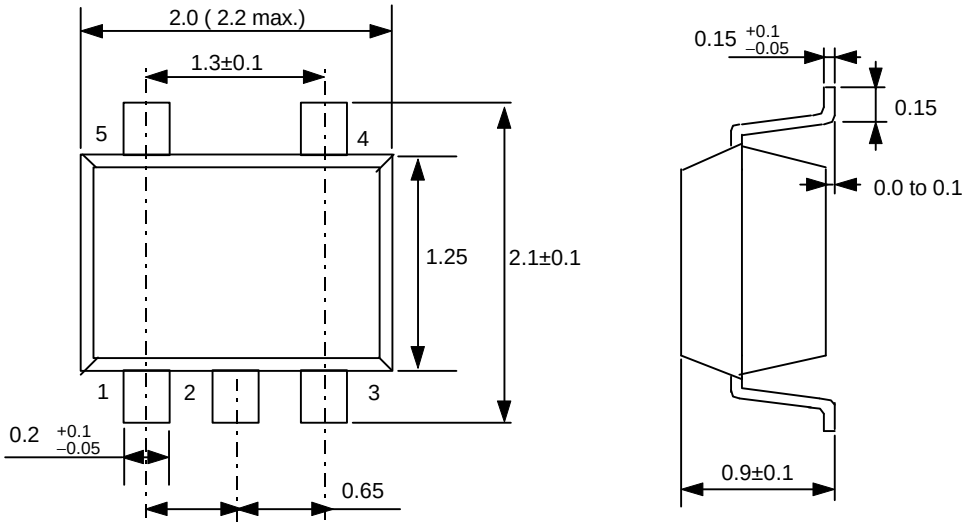


True Values

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

■ AC Characteristics

C_L=15 pf, Input tr = tf = 6 ns, V_{CC} = 3.3±0.3 V, Ta =25°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	

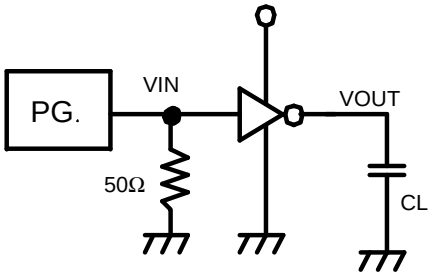
C_L=25 pf, Input tr = tf = 6 ns (unless otherwise specified)

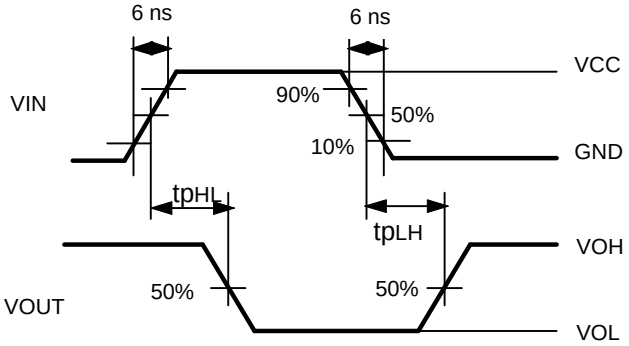
Parameter	Sym.	Measurement Conditions	Ta = 25°C			Ta = -40 to 85°C		Unit
		V_{CC}(V)	Min.	Typ.	Max.	Min.	Max.	
Output Rise/Fall Time	t_{TLH} t_{THL}	1.0	–	35	70	–	90	ns
		1.5	–	15	25	–	30	
		3.0	–	7	10	–	14	
Propagation Delay Time	t_{pLH} t_{pHL}	1.0	–	20	40	–	50	
		1.5	–	10	15	–	20	
		3.0	–	6	9	–	12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

Note[1] 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.

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

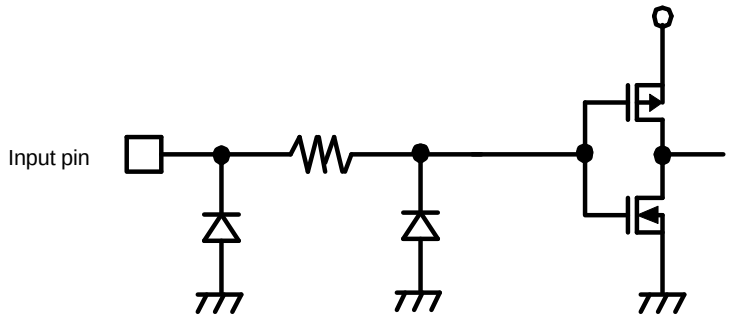
Measurement Circuit





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).

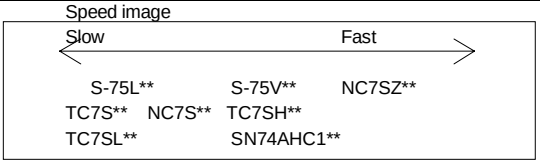
<How to use this table>

- 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

	SC88A equivalent				SOT-23-5 equivalent		
Company name	SII	Toshiba	NS(FAIRCHILD)	TI	Toshiba	NS(FAIRCHILD)	T,I
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	SN74AHC1GU04DC	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	—	—	—	—	—	—

Speed image



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

<Remarks>

FAQ No.: 17S75001