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## Single 2-Input NAND Gate

## S-75V00ANC

The S-75V00ANC is a single 2-Input NAND Gate fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

All gates of the internal circuitry have buffered outputs to ensure high noise immunity and output stability.

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 5 V to 3 V and battery backup applications.

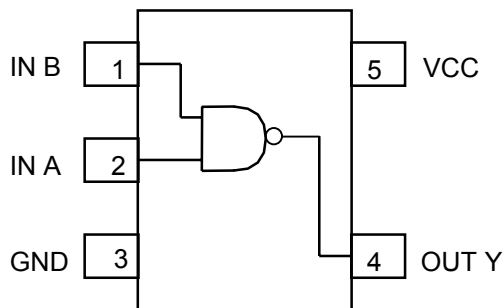
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 3.7 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

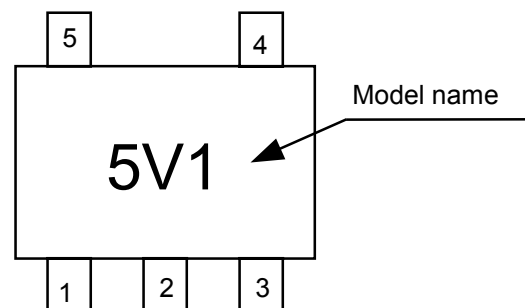
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



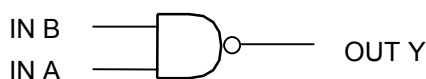
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

## ■ Ordering

Delivery form: Taping only  
 Model name: S-75V00ANC-5V1-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	Topr	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 100 (V <sub>CC</sub> =3.3±0.3V)	ns/V
		0 to 20 (V <sub>CC</sub> =5±0.5V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit				
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.			
Input Voltage	"H" level	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V			
			3 to 5.5	V <sub>CC</sub> X0.7	—	—	V <sub>CC</sub> X0.7	—				
	"L" level	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5				
			3 to 5.5	—	—	V <sub>CC</sub> X0.3	—	V <sub>CC</sub> X0.3				
Output Voltage	"H" level	V <sub>OH</sub> or V <sub>IH</sub>	V <sub>IN</sub> =V <sub>IL</sub> or V <sub>IH</sub>	I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V	
					3.0	2.9	3.0	—	2.9	—		
					4.5	4.4	4.5	—	4.4	—		
					I <sub>OH</sub> =-4mA	3.0	2.58	—	—	2.48		—
					I <sub>OH</sub> =-8mA	4.5	3.94	—	—	3.80		—
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—	0.1		
					3.0	—	0	0.1	—	0.1		
					4.5	—	0	0.1	—	0.1		
					I <sub>OL</sub> =4mA	3.0	—	—	0.36	—		0.44
					I <sub>OL</sub> =8mA	4.5	—	—	0.36	—		0.44
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA			
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA			

■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

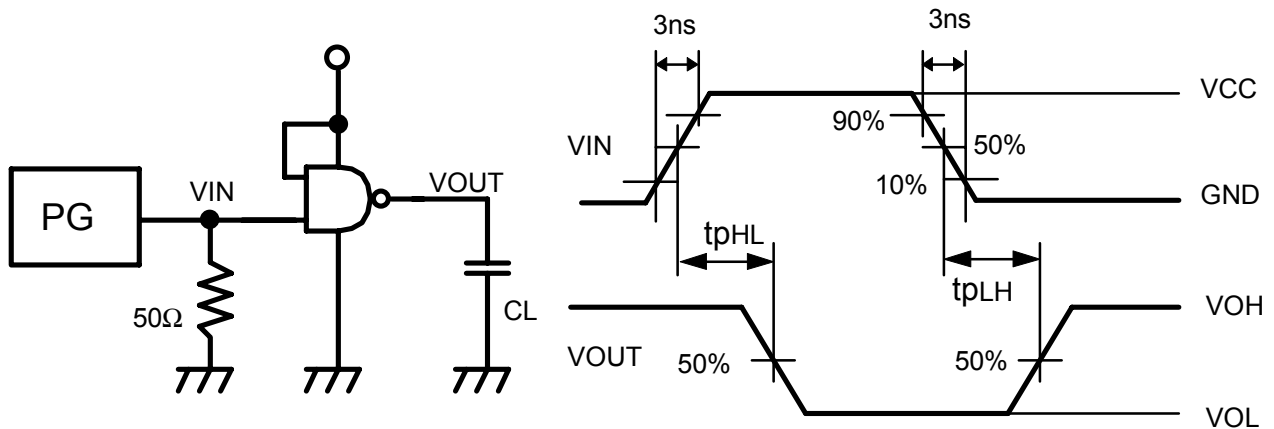
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
		V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	MIN.	MAX.	
Output Rise/Fall time	t <sub>pLH</sub>	3.3±0.3	15	—	5.5	7.9	1.0	9.5	nS
			50	—	10.0	14.0	1.0	15.0	
	t <sub>pHL</sub>	5.0±0.5	15	—	3.7	5.5	1.0	6.5	
			50	—	6.1	8.5	1.0	9.0	
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	14	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

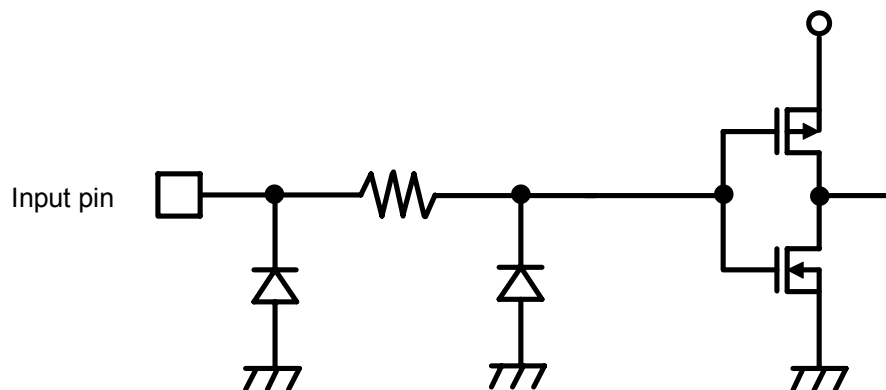
$$I_{CC(ops)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit



## Single 2-Input NOR Gate

## S-75V02ANC

The S-75V02ANC is a single 2-input NOR gate fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

All gates of the internal circuitry have buffered outputs to ensure high noise immunity and output stability.

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 5 V to 3 V and battery backup applications.

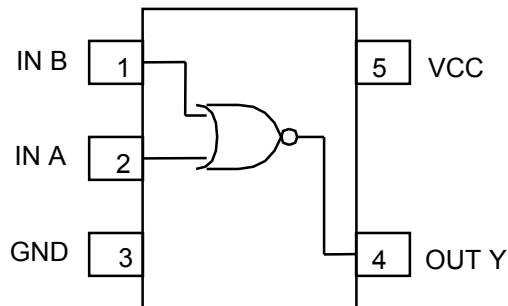
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 3.6 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

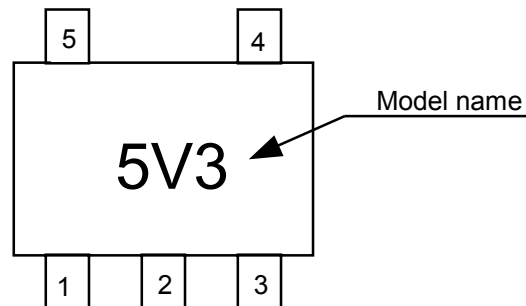
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



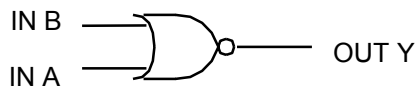
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75V02ANC-5V3-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 100 (V <sub>CC</sub> =3.3±0.3V)	ns/V
		0 to 20 (V <sub>CC</sub> =5±0.5V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.		
Input Voltage	"H" level	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
	"L" level	V <sub>IL</sub>	3 to 5.5	V <sub>CC</sub> X0.7	—	—	V <sub>CC</sub> X0.7	—			
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V
				I <sub>OH</sub> =-4mA	3.0	2.9	3.0	—	2.9	—	
				I <sub>OH</sub> =-8mA	4.5	4.4	4.5	—	4.4	—	
					3.0	2.58	—	—	2.48	—	
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—	0.1	
				I <sub>OL</sub> =4mA	3.0	—	0	0.1	—	0.1	
				I <sub>OL</sub> =8mA	4.5	—	0	0.1	—	0.1	
					3.0	—	—	0.36	—	0.44	
				4.5	—	—	0.36	—	0.44		
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA		

■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

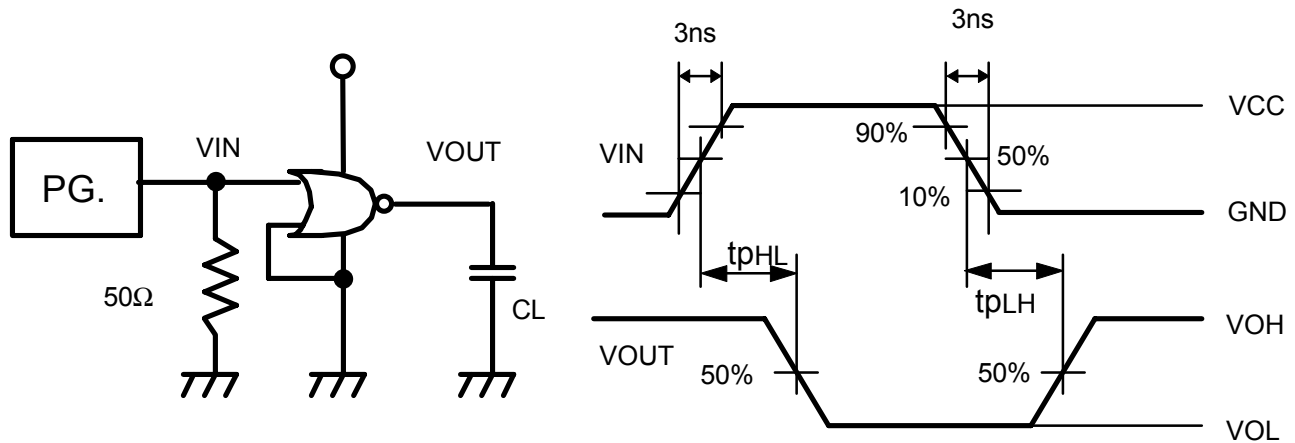
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
				V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	
Output Rise/Fall time	t <sub>pLH</sub>	3.3±0.3	15	—	5.6	7.9	1.0	9.5	ns
			50	—	10.0	14.0	1.0	15.0	
	5.0±0.5	15	—	3.6	5.5	1.0	6.5		
		50	—	5.7	8.0	1.0	9.0		
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	15	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

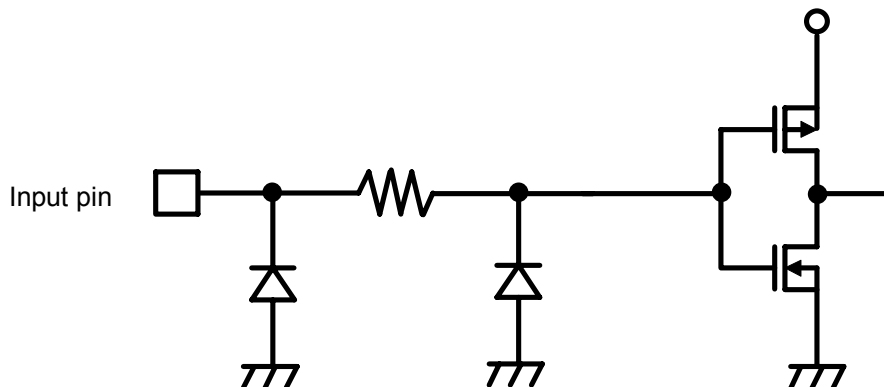
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



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

■ Input Pin Equivalent Circuit



# INVERTER

# S-75V04ANC

The S-75V04ANC is a INVERTER fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

The special purpose unbuffered circuit design 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 5 V to 3 V and battery backup applications.

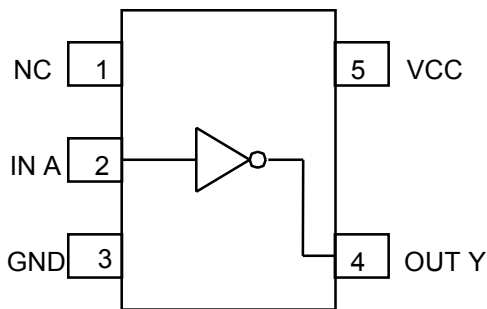
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 3.8 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

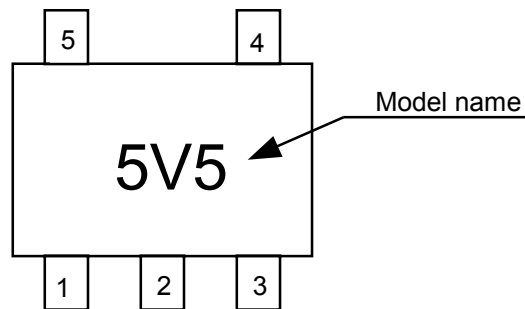
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



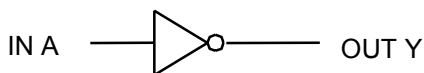
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	Y
L	H
H	L



## ■ Ordering

Delivery form: Taping only  
 Model name: S-75V04ANC-5V5-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	Topr	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 100 (V <sub>CC</sub> =3.3±0.3V)	ns/V
		0 to 20 (V <sub>CC</sub> =5±0.5V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.		
Input Voltage	"H" level	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
			3 to 5.5	V <sub>CC</sub> X0.7	—	—	V <sub>CC</sub> X0.7	—			
	"L" level	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5			
			3 to 5.5	—	—	V <sub>CC</sub> X0.3	—	V <sub>CC</sub> X0.3			
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V
					3.0	2.9	3.0	—	2.9	—	
				I <sub>OH</sub> =-4mA	4.5	4.4	4.5	—	4.4	—	
					3.0	2.58	—	—	2.48	—	
				I <sub>OH</sub> =-8mA	4.5	3.94	—	—	3.80	—	
					—	—	—	—	—	—	
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—	0.1	
					3.0	—	0	0.1	—	0.1	
				I <sub>OL</sub> =4mA	4.5	—	0	0.1	—	0.1	
					3.0	—	—	0.36	—	0.44	
I <sub>OL</sub> =8mA	4.5	—	—	0.36	—	0.44					
	—	—	—	—	—	—					
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA		

■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

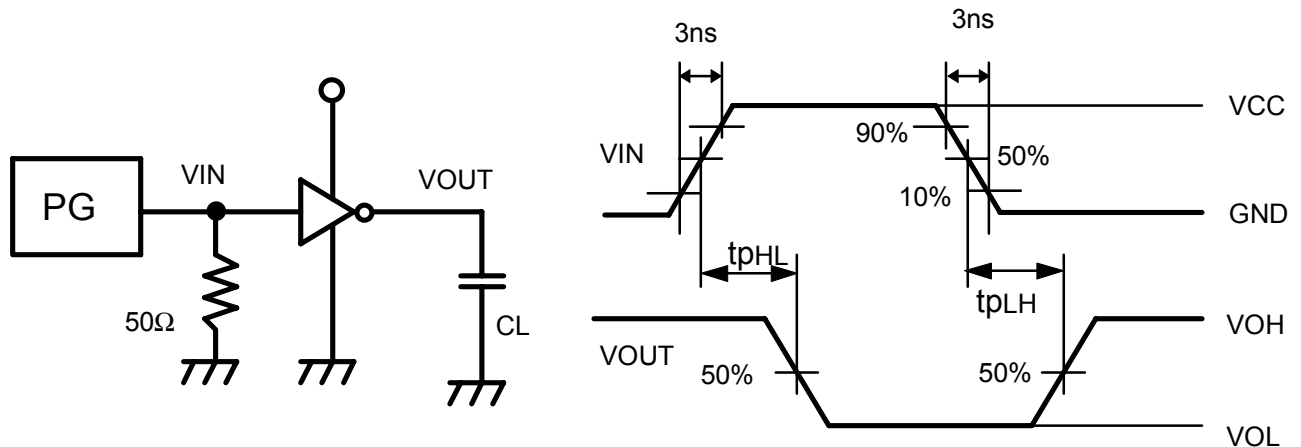
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
		V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	MIN.	MAX.	
Output Rise/Fall time	t <sub>pLH</sub>	3.3±0.3	15	—	5.0	7.1	1.0	8.5	ns
			50	—	9.6	13.5	1.0	14.5	
	5.0±0.5	15	—	3.8	5.5	1.0	6.5		
		50	—	5.7	8.0	1.0	9.0		
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	13	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

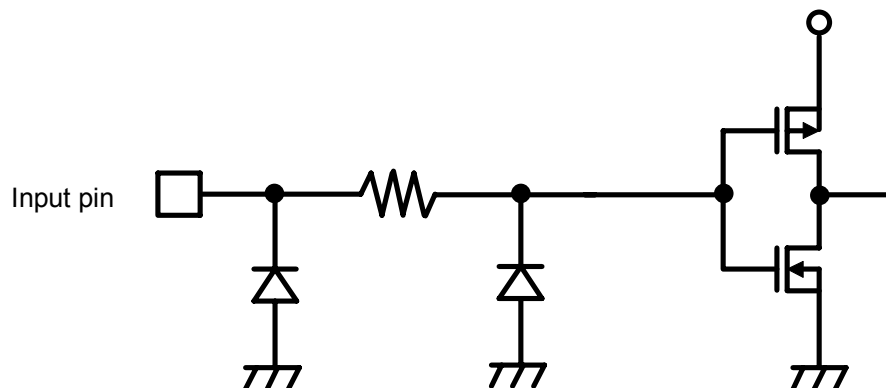
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input pin Equivalent Circuit



## Single INVERTER without Buffer

## S-75VU04ANC

The S-75VU04ANC is an inverter fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

The special purpose unbuffered circuit design 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 5 V to 3 V and battery backup applications.

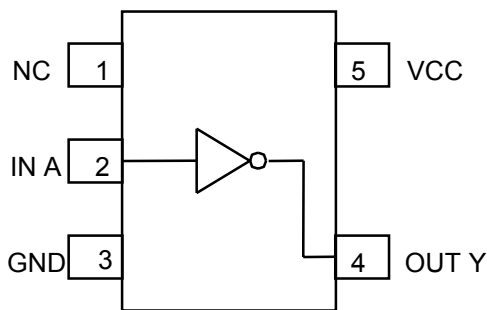
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 3.5 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=10\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

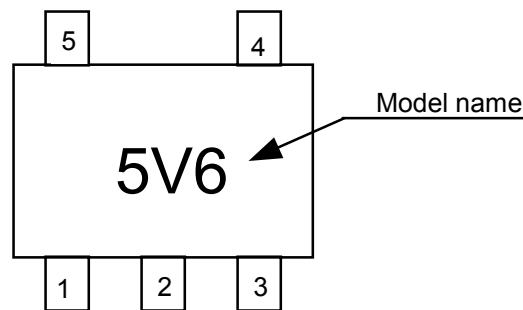
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



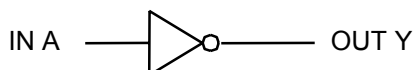
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	Y
L	H
H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75VU04ANC-5V6-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	Topr	-40 to +85	°C

## ■ DC Characteristics

Parameter		Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit	
				V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.	MAX.	
Input Voltage	"H" level	V <sub>IH</sub>	V <sub>OUT</sub> =V <sub>OL</sub>	2.0	1.7	—	—	1.7	—	V
				3 to 5.5	V <sub>CC</sub> X0.8	—	—	V <sub>CC</sub> X0.8	—	
Input Voltage	"L" level	V <sub>IL</sub>	V <sub>OUT</sub> =V <sub>OH</sub>	2.0	—	—	0.3	—	0.3	V
				3 to 5.5	—	—	V <sub>CC</sub> X0.2	—	V <sub>CC</sub> X0.2	
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub> I <sub>OH</sub> =-50μA	2.0	1.8	2.0	—	1.8	—	V
				3.0	2.7	3.0	—	2.7	—	
		V <sub>IN</sub> = GND	I <sub>OH</sub> =-4mA	3.0	2.58	—	—	2.48	—	
			I <sub>OH</sub> =-8mA	4.5	3.94	—	—	3.80	—	
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub> I <sub>OL</sub> =50μA	2.0	—	0	0.2	—	0.2	
				3.0	—	0	0.3	—	0.3	
		V <sub>IN</sub> = V <sub>CC</sub>	I <sub>OL</sub> =4mA	3.0	—	—	0.36	—	0.44	
			I <sub>OL</sub> =8mA	4.5	—	—	0.36	—	0.44	
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA	
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA	

■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

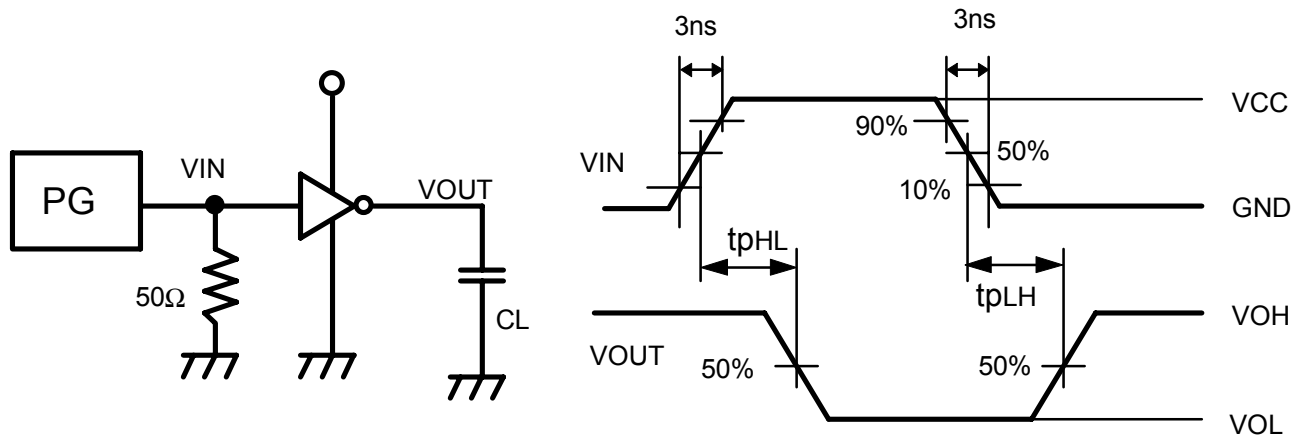
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
				V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	
Output Rise/Fall time	t <sub>pLH</sub>	3.3±0.3	15	—	5.0	8.9	1.0	10.5	ns
			50	—	8.9	12.5	1.0	13.5	
	5.0±0.5	15	—	3.5	5.5	1.0	6.5		
		50	—	5.4	7.5	1.0	8.0		
Input Capacitance	C <sub>IN</sub>			—	5	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	6	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

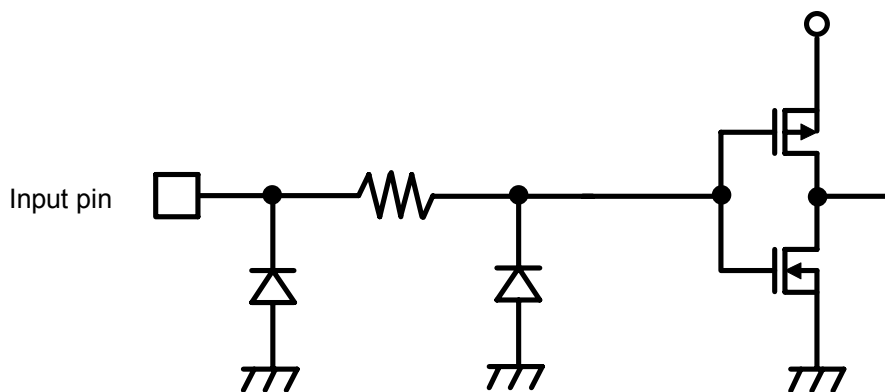
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



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

■ Input Pin Equivalent Circuit



## Single 2-Input AND Gate

## S-75V08ANC

The S-75V08ANC is a Single 2-Input AND Gate fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

All gates of the internal circuitry have buffered outputs to ensure high noise immunity and output stability.

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<sub>CC</sub>.

This allows for interfaces between power supplies of different voltage, output level conversion from 5 V to 3 V and battery backup applications.

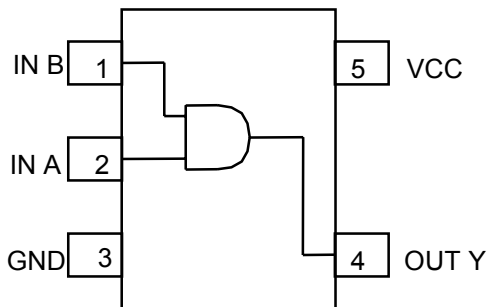
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0 μA max. (at 5.5 V, 25°C)
- Typical propagation delay: t<sub>pd</sub> = 4.3 ns (at 5 V)
- High noise immunity: V<sub>NIH</sub>=V<sub>NIL</sub>=28% V<sub>CC</sub> min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

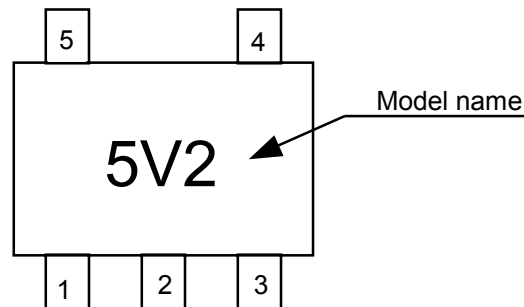
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



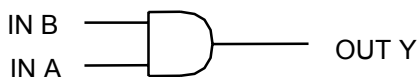
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

## ■ Ordering

Delivery form: Taping only  
 Model name: S-75V08ANC-5V2-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 100 (V <sub>CC</sub> =3.3±0.3V)	ns/V
		0 to 20 (V <sub>CC</sub> =5±0.5V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.		
Input Voltage	"H" level	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
			3 to 5.5	V <sub>CC</sub> X0.7	—	—	V <sub>CC</sub> X0.7	—			
	"L" level	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5			
			3 to 5.5	—	—	V <sub>CC</sub> X0.3	—	V <sub>CC</sub> X0.3			
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V
					3.0	2.9	3.0	—	2.9	—	
				I <sub>OH</sub> =-4mA	4.5	4.4	4.5	—	4.4	—	
					3.0	2.58	—	—	2.48	—	
				I <sub>OH</sub> =-8mA	4.5	3.94	—	—	3.80	—	
					—	—	—	—	—	—	
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—	0.1	
					3.0	—	0	0.1	—	0.1	
				I <sub>OL</sub> =4mA	4.5	—	0	0.1	—	0.1	
					3.0	—	—	0.36	—	0.44	
I <sub>OL</sub> =8mA	4.5	—	—	0.36	—	0.44					
	—	—	—	—	—	—					
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA		

■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

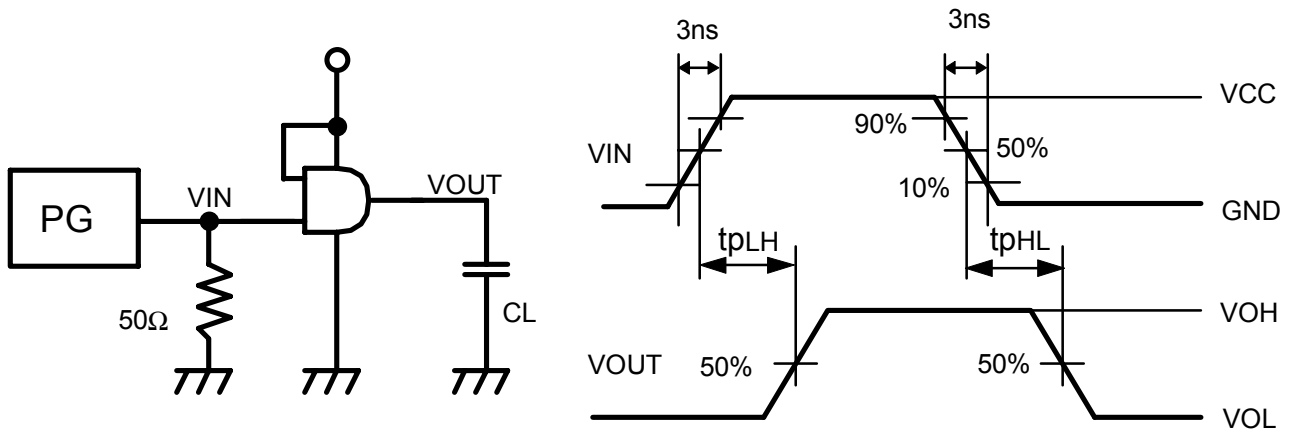
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
				V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	
Output Rise/Fall time	t <sub>pLH</sub>	3.3±0.3	15	—	6.2	8.8	1.0	10.5	ns
			50	—	9.6	13.5	1.0	14.5	
	5.0±0.5	15	—	4.3	5.9	1.0	7.0		
		50	—	5.7	7.9	1.0	9.0		
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	14	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

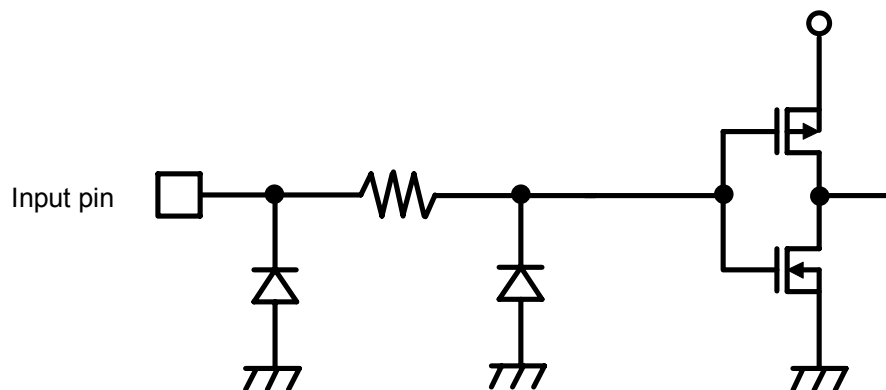
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit





## SCHMITT INVERTER

## S-75V14ANC

The S-75V14ANC is a SCHMITT INVERTER fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

All gates of the internal circuitry have buffered outputs to ensure high noise immunity and output stability.

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 5 V to 3 V and battery backup applications.

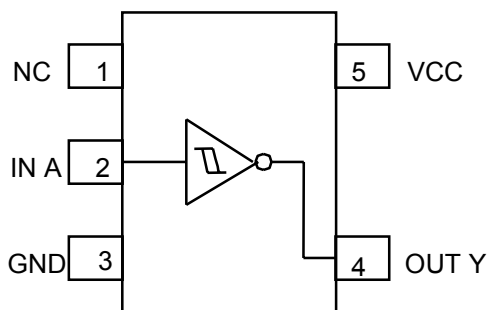
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 5.5 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

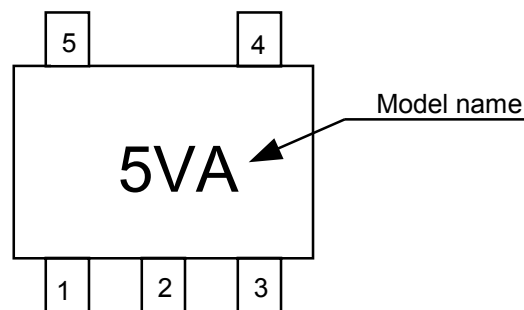
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



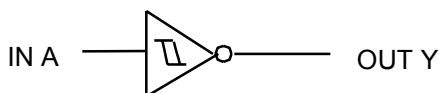
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B
L	H
H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75V14ANC-5VA-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	Topr	-40 to +85	°C

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit				
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.			
Threshold Voltage	"H" level	V <sub>P</sub>	V <sub>IN</sub> =V <sub>IL</sub>	3.0	—	—	2.20	—	2.20	V		
				4.5	—	—	3.15	—	3.15			
				5.5	—	—	3.85	—	3.85			
	"L" level			3.0	0.90	—	—	0.90	—			
				4.5	1.35	—	—	1.35	—			
				5.5	1.65	—	—	1.65	—			
Hysteresis	V <sub>H</sub>	V <sub>H</sub>	V <sub>IN</sub> =V <sub>IL</sub>	3.0	0.30	—	1.20	0.30	1.20	V		
				4.5	0.40	—	1.40	0.40	1.40			
				5.5	0.5	—	1.60	0.5	1.60			
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V	
					3.0	2.9	3.0	—	2.9	—		
					4.5	4.4	4.5	—	4.4	—		
					I <sub>OH</sub> =-4mA	3.0	2.58	—	—	2.48		—
						4.5	3.94	—	—	3.80		—
						5.5	—	—	—	—		—
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—	0.1		
					3.0	—	0	0.1	—	0.1		
					4.5	—	0	0.1	—	0.1		
					I <sub>OL</sub> =4mA	3.0	—	—	0.36	—		0.44
						4.5	—	—	0.36	—		0.44
						5.5	—	—	0.36	—		0.44
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA			
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA			

■ **AC Characteristics**

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

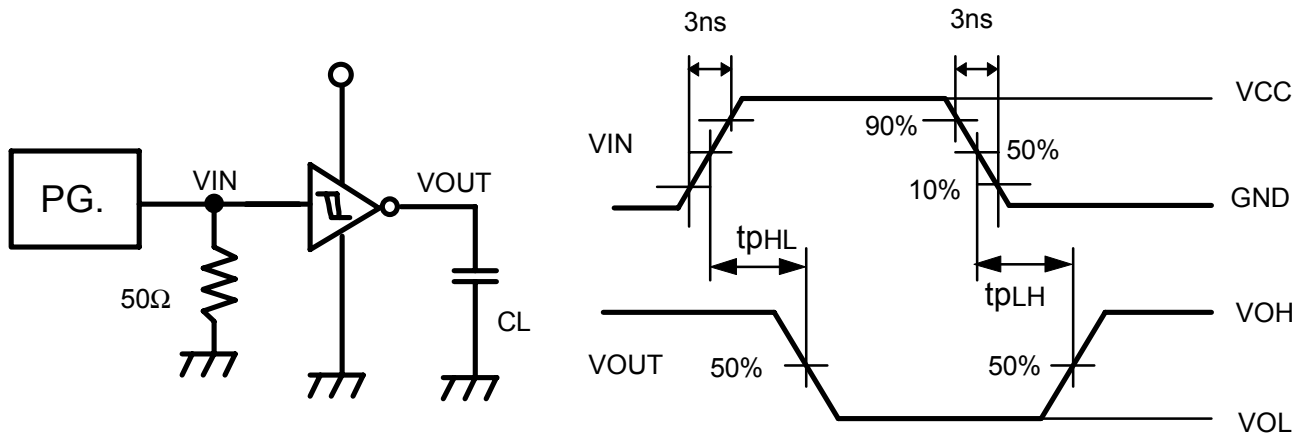
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
				V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	
Output Rise/Fall Time	t <sub>pLH</sub>	3.3±0.3	15	—	8.3	12.8	1.0	15.0	ns
			50	—	10.8	16.3	1.0	18.5	
	5.0±0.5	15	—	5.5	8.6	1.0	10.0		
		50	—	7.0	10.6	1.0	12.0		
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	14	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

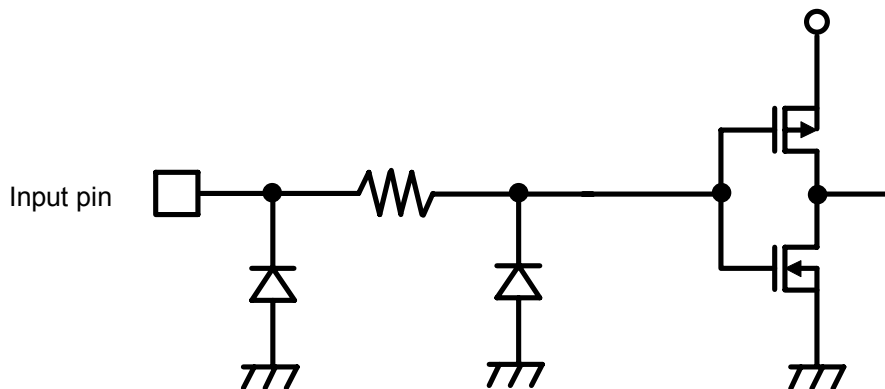
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



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

■ **Input Pin Equivalent Circuit**



## Single 2-Input OR Gate

## S-75V32ANC

The S-75V32ANC is a single 2-input OR gate fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

All gates of the internal circuitry have buffered outputs to ensure high noise immunity and output stability.

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 5 V to 3 V and battery backup applications.

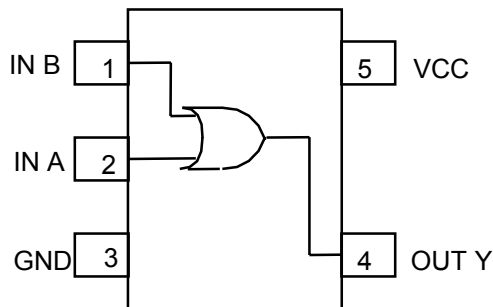
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 3.8 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

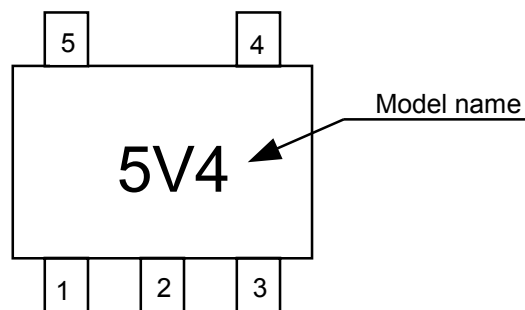
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



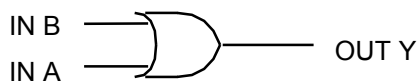
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

## ■ Ordering

Delivery form: Taping only  
 Model name: S-75V32ANC-5V4-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 100 (V <sub>CC</sub> =3.3±0.3V)	ns/V
		0 to 20 (V <sub>CC</sub> =5±0.5V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.		
Input Voltage	"H" level	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
			3 to 5.5	V <sub>CC</sub> X0.7	—	—	V <sub>CC</sub> X0.7	—			
	"L" level	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5			
			3 to 5.5	—	—	V <sub>CC</sub> X0.3	—	V <sub>CC</sub> X0.3			
Output Voltage	"H" level	V <sub>OH</sub> or V <sub>IH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V
				I <sub>OH</sub> =-4mA	3.0	2.9	3.0	—	2.9	—	
			I <sub>OH</sub> =-8mA	4.5	4.4	4.5	—	4.4	—		
				3.0	2.58	—	—	2.48	—		
				4.5	3.94	—	—	3.80	—		
				4.5	—	—	—	—	—		
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—	0.1	
					3.0	—	0	0.1	—	0.1	
				I <sub>OL</sub> =4mA	4.5	—	0	0.1	—	0.1	
					3.0	—	—	0.36	—	0.44	
I <sub>OL</sub> =8mA	4.5	—	—	0.36	—	0.44					
	3.0	—	—	—	—	—					
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA		

■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

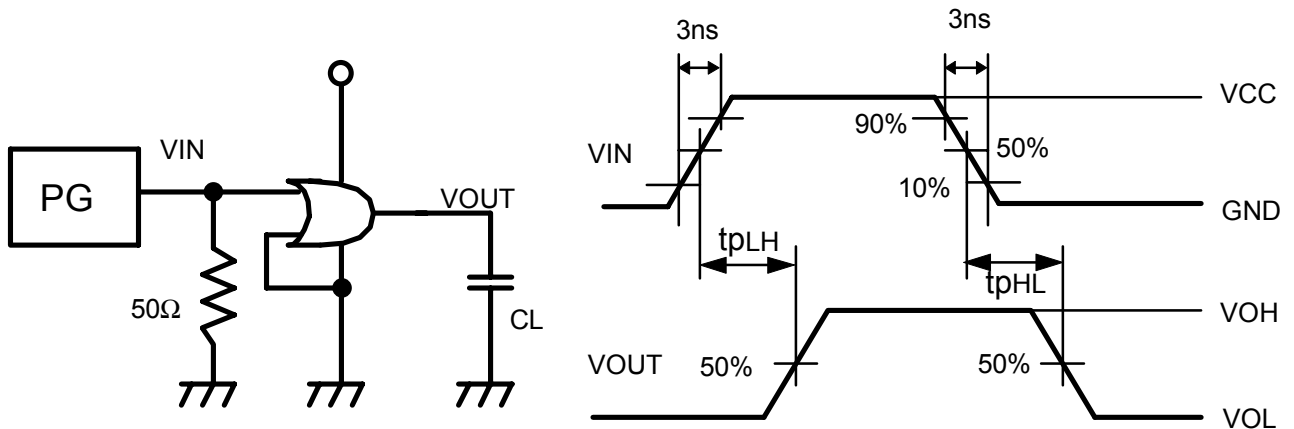
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
				V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	
Output Rise/Fall time	t <sub>pLH</sub>	3.3±0.3	15	—	5.5	7.9	1.0	9.5	ns
			50	—	10.0	14.0	1.0	15.0	
	5.0±0.5	15	—	3.8	5.5	1.0	6.5		
		50	—	6.1	8.5	1.0	9.0		
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	15	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

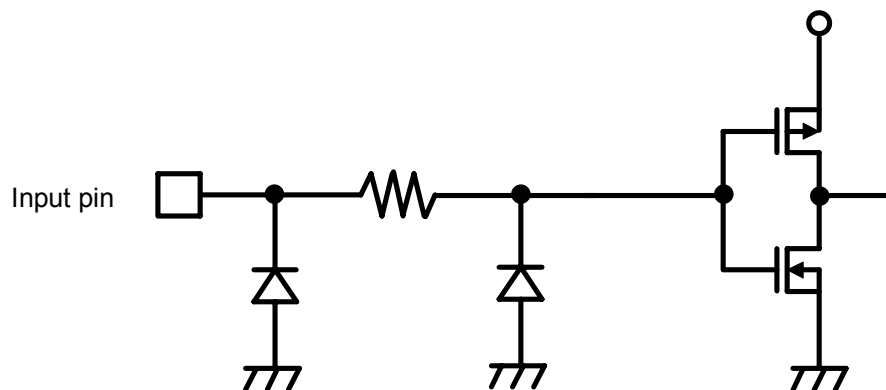
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit



## EXCLUSIVE OR GATE

## S-75V86ANC

The S-75V86ANC is a EXCLUSIVE OR GATE fabricated by utilizing advanced silicon-gate CMOS technology which provides the inherent benefit of CMOS low power consumption to achieve ultra high speed operation correspond to LSTTL IC's.

All gates of the internal circuitry have buffered outputs to ensure high noise immunity and output stability.

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 5 V to 3 V and battery backup applications.

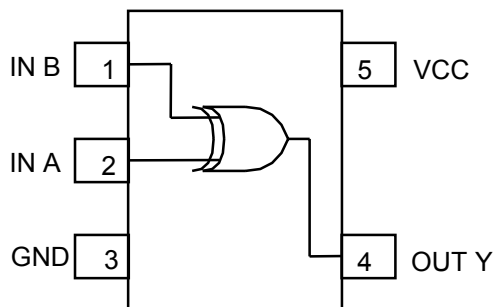
### ■ Features

- Wide power supply range: 2 V to 5.5 V
- Low current consumption: 1.0  $\mu$ A max. (at 5.5 V, 25°C)
- Typical propagation delay: tpd = 4.8 ns (at 5 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

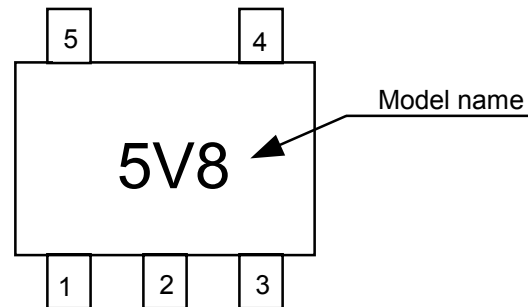
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



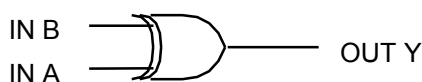
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75V86ANC-5V8-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±50	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	2 to 5.5	V
Input Voltage	V <sub>IN</sub>	0 to 5.5	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 100 (V <sub>CC</sub> =3.3±0.3V)	ns/V
		0 to 20 (V <sub>CC</sub> =5±0.5V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.		
Input Voltage	"H" level	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
	"L" level	V <sub>IL</sub>	3 to 5.5	V <sub>CC</sub> X0.7	—	—	V <sub>CC</sub> X0.7	—			
Output Voltage	"H" level	V <sub>OH</sub> or V <sub>IH</sub>	V <sub>IN</sub> =V <sub>IL</sub> I <sub>OH</sub> =-50μA	2.0	1.9	2.0	—	1.9	—	V	
				3.0	2.9	3.0	—	2.9	—		
				4.5	4.4	4.5	—	4.4	—		
				I <sub>OH</sub> =-4mA	3.0	2.58	—	—	2.48		—
	"L" level	V <sub>OL</sub> or V <sub>IH</sub>	V <sub>IN</sub> =V <sub>IL</sub> or V <sub>IH</sub>	I <sub>OL</sub> =50μA	2.0	—	0	0.1	—		0.1
					3.0	—	0	0.1	—		0.1
					4.5	—	0	0.1	—		0.1
					I <sub>OL</sub> =4mA	3.0	—	—	0.36		—
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA		
			5.5	—	—	1.0	—	10.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	5.5	—	—	1.0	—	10.0	μA		



■ AC Characteristics

Input  $t_r = t_f = 3 \text{ ns}$  (unless otherwise specified)

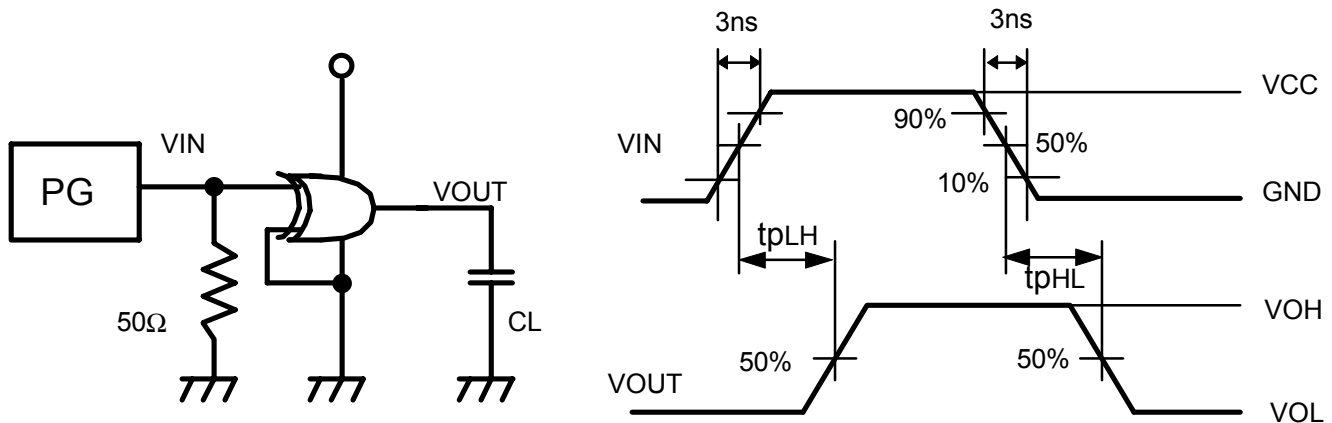
Parameter	Sym.	Measurement Conditions		Ta=25°C			Ta=-40 to 85°C		Unit
		V <sub>CC</sub> (V)	C <sub>L</sub> (pF)	MIN.	TYP.	MAX.	MIN.	MAX.	
Output Rise/Fall Time	t <sub>pLH</sub>	3.3±0.3	15	—	7.0	11.0	1.0	13.0	ns
			50	—	10.4	14.5	1.0	16.5	
	5.0±0.5	15	—	4.8	6.8	1.0	8.0		
		50	—	6.5	9.0	1.0	10.0		
Input Capacitance	C <sub>IN</sub>			—	4	10	—	10	pF
Equiv. Int. Capacitance	C <sub>PD</sub>	Note <sup>1</sup>		—	18	—	—	—	pF

Note<sup>1</sup> C<sub>PD</sub> is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

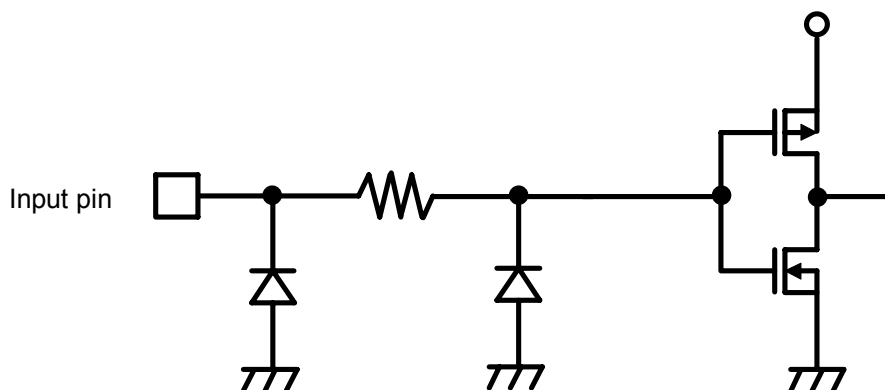
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



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

■ Input Pin Equivalent Circuit



## Single 2-Input NAND Gate

## S-75L00ANC

The S-75L00ANC is a single 2-input NAND gate 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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.

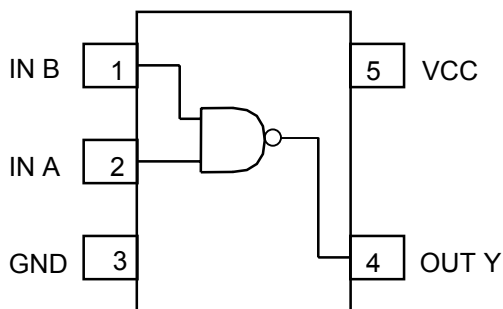
### ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay:  $t_{pd} = 7$  ns (at 3.0 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

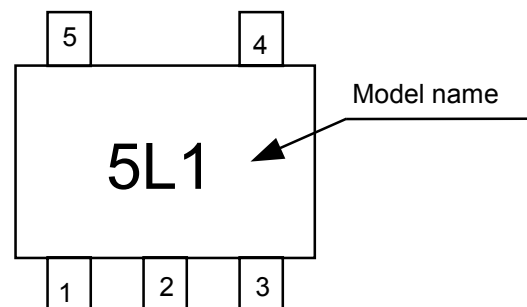
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



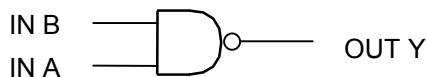
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

## ■ Ordering

Delivery form: Taping only  
 Model name: S-75L00ANC-5L1-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	1 to 3.6	V
Input Voltage	V <sub>IN</sub>	0 to 3.6	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 1000 (V <sub>CC</sub> =1.0 V)	ns
		0 to 500 (V <sub>CC</sub> =2.0 V)	
		0 to 400 (V <sub>CC</sub> =3.0 V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C				Ta=-40 to 85°C		Unit						
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.	MAX.							
Input Voltage	"H" level	V <sub>IH</sub>	1.0	0.75	—	—	0.75	—	V						
			1.5	1.05	—	—	1.05	—							
			3.0	2.10	—	—	2.10	—							
	"L" level		V <sub>IL</sub>	1.0	—	—	0.25	—		0.25					
				1.5	—	—	0.45	—		0.45					
				3.0	—	—	0.90	—		0.90					
Output Voltage	"H" level	V <sub>OH</sub>		V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA		1.5	1.07	1.23	—	0.99	—					
					I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68	—	2.55	—				
						1.0	—	0	0.1	—	0.1				
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =20μA		1.5	—	0	0.1	—	0.1				
					3.0	—	0	0.1	—	0.1					
					1.5	—	0.23	0.31	—	0.37					
				I <sub>OL</sub> =2.6mA	3.0	—	0.23	0.31	—	0.33					
					Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	±0.1		—	±1.0	μA
					Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0		—	10.0	μA

■ AC Characteristics

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}, t_{THL}$		—	4.0	8.5	ns
Propagation Delay Time	$t_{PLH}, t_{PHL}$		—	6.0	9.0	

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

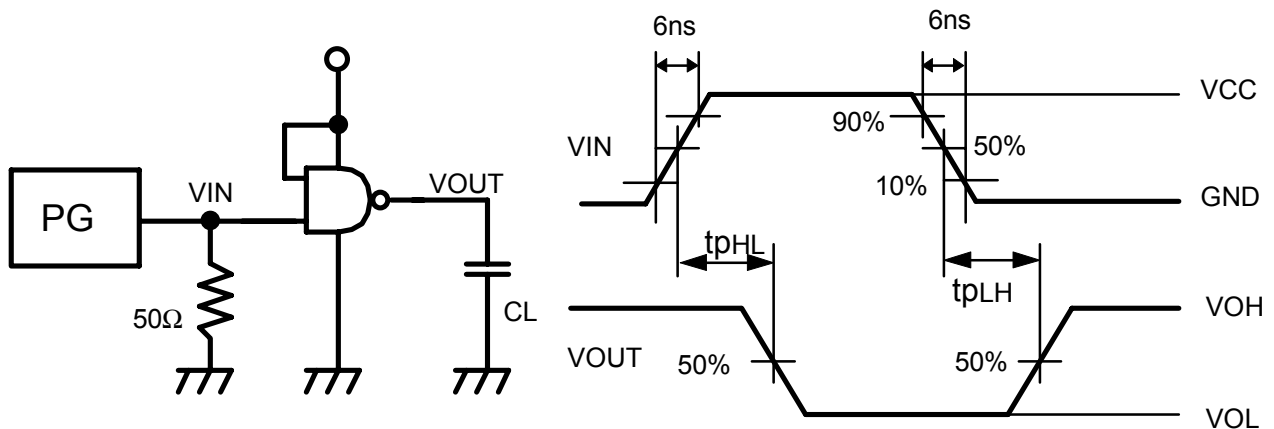
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\text{ to }85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{PLH}$ $t_{PHL}$		1.0	—	30	60	—	75	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF	
Equiv.Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

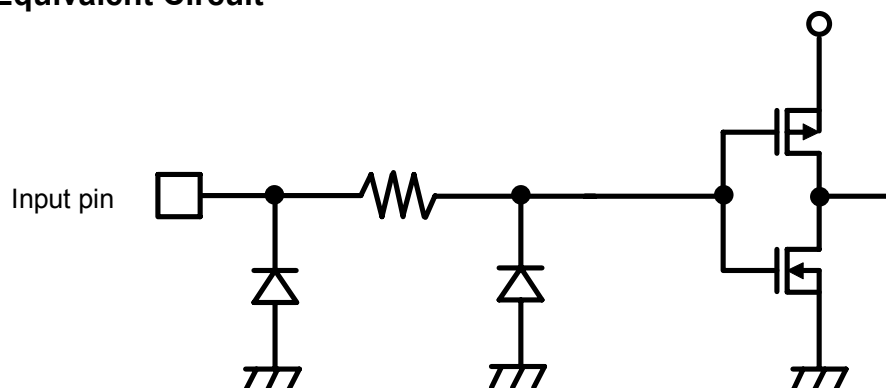
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit



## Single 2-Input NOR Gate

## S-75L02ANC

The S-75L02ANC is a single 2-input NOR gate 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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.

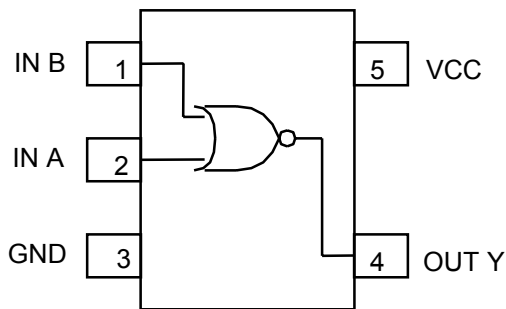
### ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd = 7 ns (at 3 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

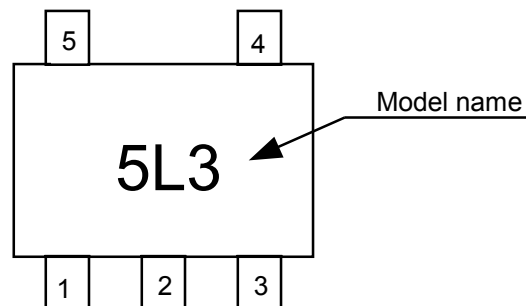
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



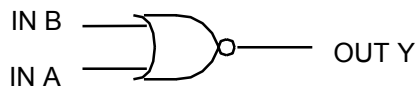
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75L02ANC-5L3-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	1 to 3.6	V
Input Voltage	V <sub>IN</sub>	0 to 3.6	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 1000 (V <sub>CC</sub> =1.0 V)	ns
		0 to 500 (V <sub>CC</sub> =2.0 V)	
		0 to 400 (V <sub>CC</sub> =3.0 V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit				
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.			
Input Voltage	"H" level	V <sub>IH</sub>	1.0	0.75	—	—	0.75	—	V			
			1.5	1.05	—	—	1.05	—				
			3.0	2.10	—	—	2.10	—				
	"L" level	V <sub>IL</sub>	1.0	—	—	0.25	—	0.25				
			1.5	—	—	0.45	—	0.45				
			3.0	—	—	0.90	—	0.90				
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA	1.5	1.07	1.23	—	0.99	—		
					3.0	2.61	2.68	—	2.55	—		
				"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IL</sub> or V <sub>IH</sub>	I <sub>OL</sub> =20μA	I <sub>OL</sub> =20μA	1.0	—		0
	1.5	—	0						0.1	—		0.1
	3.0	—	0					0.1	—	0.1		
	I <sub>OL</sub> =1mA	1.5	—					0.23	0.31	—		0.37
		3.0	—					0.23	0.31	—		0.33
	Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND					3.6	—	—		±0.1
				3.6	—	—	1.0	—	10.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0	—	10.0	μA			

■ **AC Characteristics**

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}, t_{THL}$		—	4.0	8.0	ns
Propagation Delay Time	$t_{pLH}, t_{pHL}$		—	6.0	9.0	

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

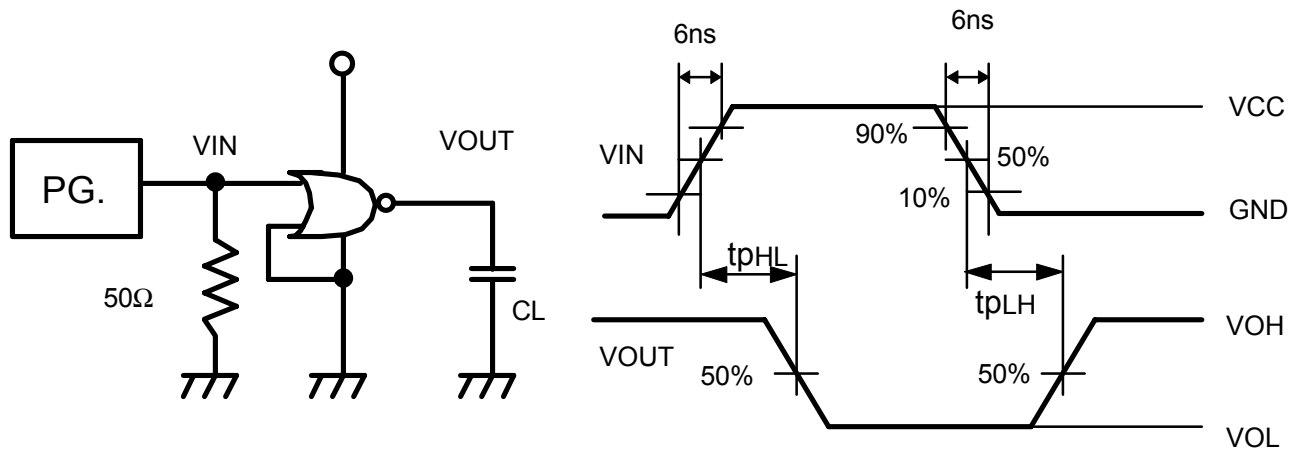
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\text{ to }85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{pLH}$ $t_{pHL}$		1.0	—	30	60	—	75	
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF	
Equiv. Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

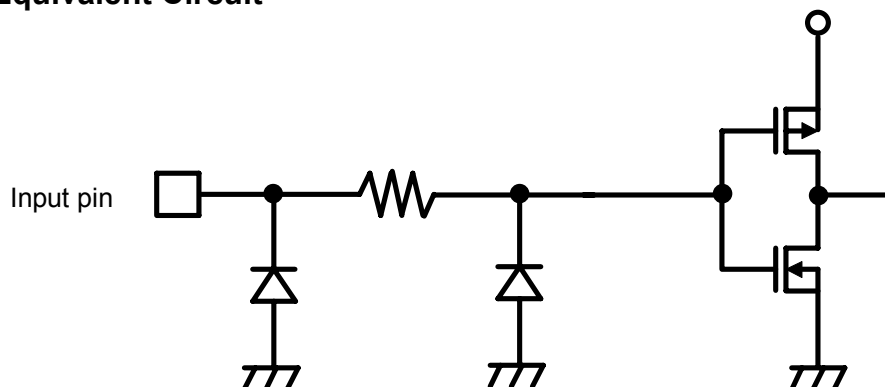
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



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

■ **Input Pin Equivalent Circuit**



# INVERTER

# S-75L04ANC

The S-75L04ANC is an inverter 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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<sub>CC</sub>.

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

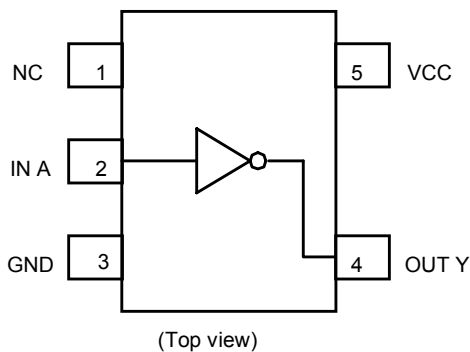
### ■ Features

- 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: t<sub>pd</sub> = 7ns (at 3 V)
- High noise immunity: V<sub>NIH</sub>=V<sub>NIL</sub>=28% V<sub>CC</sub> min.
- Power down protection: All pins
- Very small plastic package: SC-88A

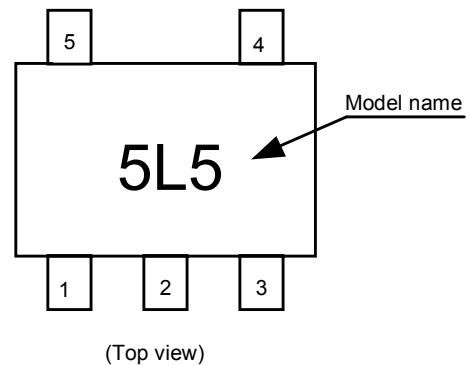
### ■ Applications

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

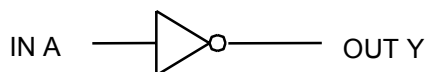
### ■ Pin Assignment



### ■ Marking



### ■ Logic Diagram



True Values

A	Y
L	H
H	L



## ■ Ordering

Delivery form: Taping only  
 Model name: S-75L04ANC-5L5-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

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

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C				Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.	MAX.				
Input Voltage	"H" level	V <sub>IH</sub>	1.0	0.75	—	—	0.75	—	V			
			1.5	1.05	—	—	1.05	—				
			3.0	2.10	—	—	2.10	—				
	"L" level	V <sub>IL</sub>	1.0	—	—	0.25	—	0.25				
			1.5	—	—	0.45	—	0.45				
			3.0	—	—	0.90	—	0.90				
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA	1.5	1.07	1.23	—	0.99	—		
					I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68	—	2.55		—
						3.0	—	—	—	—		—
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =20μA	1.0	—	0	0.1	—	0.1		
					1.5	—	0	0.1	—	0.1		
					3.0	—	0	0.1	—	0.1		
					I <sub>OL</sub> =1mA	1.5	—	0.23	0.31	—		0.37
I <sub>OL</sub> =2.6mA	3.0	—	0.23	0.31		—	0.33					
	Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	±0.1	—	±1.0	μA		
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0	—	10.0	μA			

■ AC Characteristics

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}$ , $t_{THL}$		—	4.0	8.0	ns
Propagation Delay Time	$t_{pLH}$ , $t_{pHL}$		—	6.0	9.0	

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

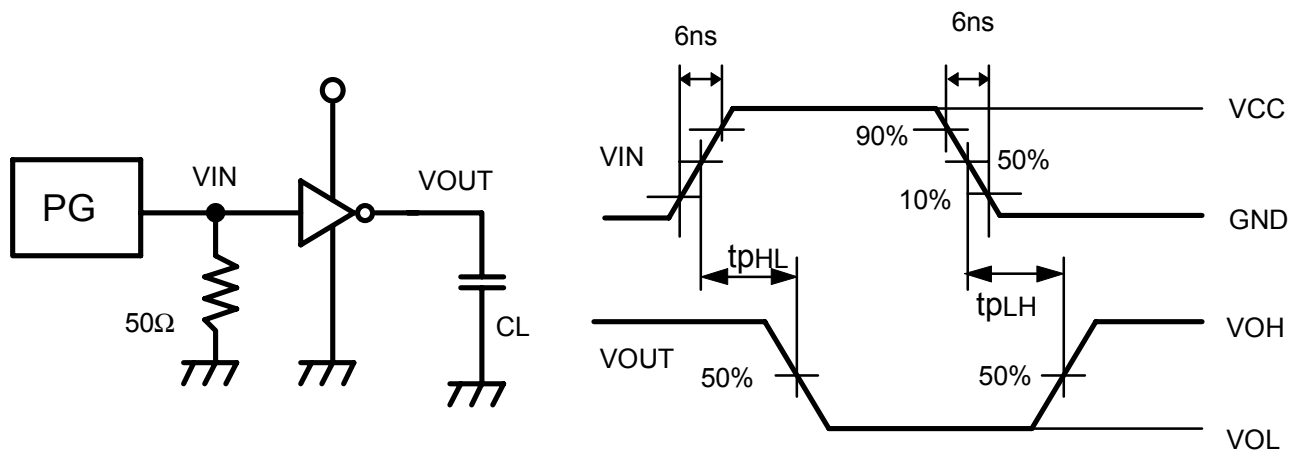
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\text{ to }85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{pLH}$ $t_{pHL}$		1.0	—	30	60	—	75	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF	
Equiv. Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

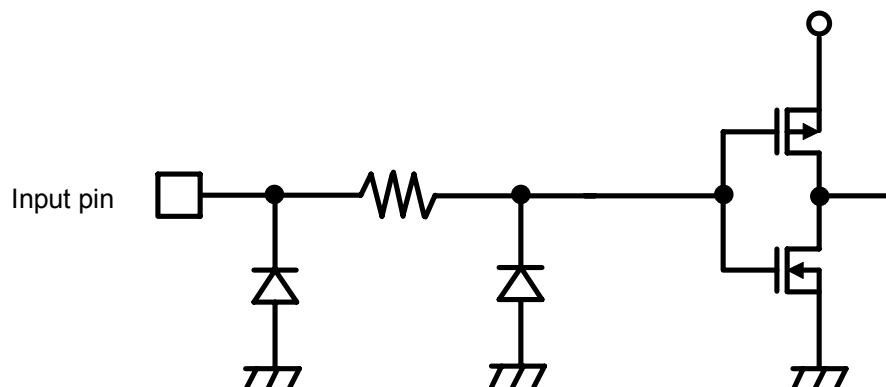
$$I_{CC(\text{opr})} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input pin Equivalent Circuit



## Single INVERTER without Buffer

## S-75LU04ANC

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.

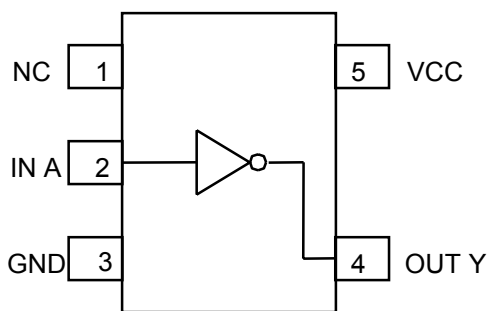
### ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd = 6 ns (at 3 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=10\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

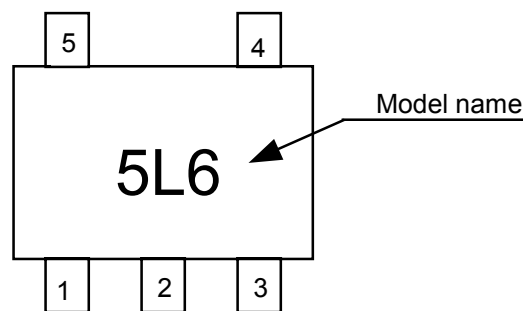
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



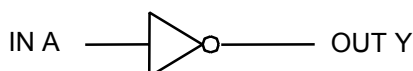
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	Y
L	H
H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75LU04ANC-5L6-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

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

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit							
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.						
Input Voltage	"H" level	V <sub>IH</sub>	1.0	0.75	—	—	0.75	—	V						
			1.5	1.05	—	—	1.05	—							
			3.0	2.10	—	—	2.10	—							
	"L" level		V <sub>IL</sub>	1.0	—	—	0.25	—		0.25					
				1.5	—	—	0.45	—		0.45					
				3.0	—	—	0.90	—		0.90					
Output Voltage	"H" level	V <sub>OH</sub>		V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA		1.5	1.07	1.23	—	0.99	—					
					I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68	—	2.55	—				
						1.0	—	0	0.1	—	0.1				
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =20μA		1.5	—	0	0.1	—	0.1				
					3.0	—	0	0.1	—	0.1					
					1.5	—	0.23	0.31	—	0.37					
				I <sub>OL</sub> =2.6mA	3.0	—	0.23	0.31	—	0.33					
					Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	±0.1		—	±1.0	μA
					Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0		—	10.0	μA

■ **AC Characteristics**

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	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)

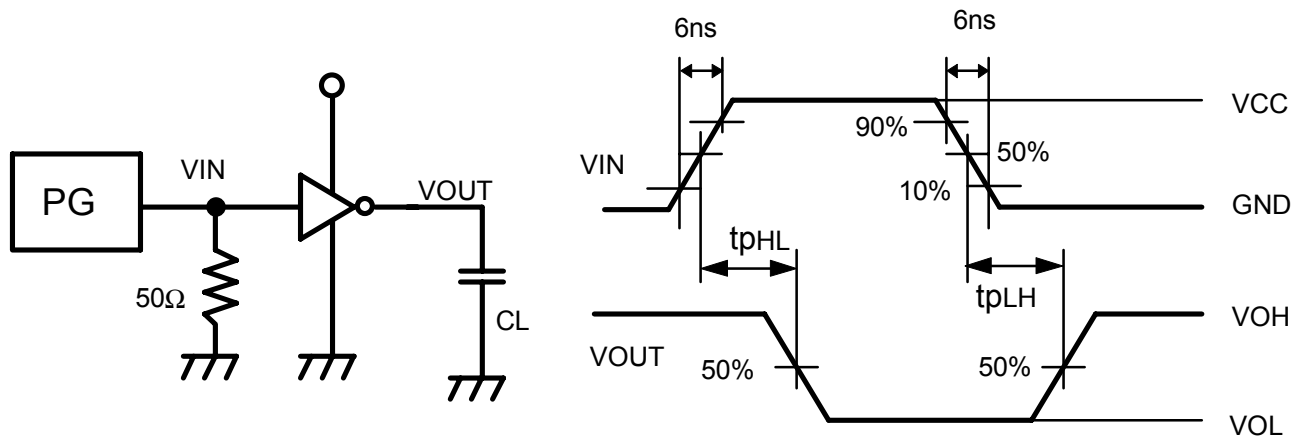
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40$ to $85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{pLH}$ $t_{pHL}$		1.0	—	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 <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

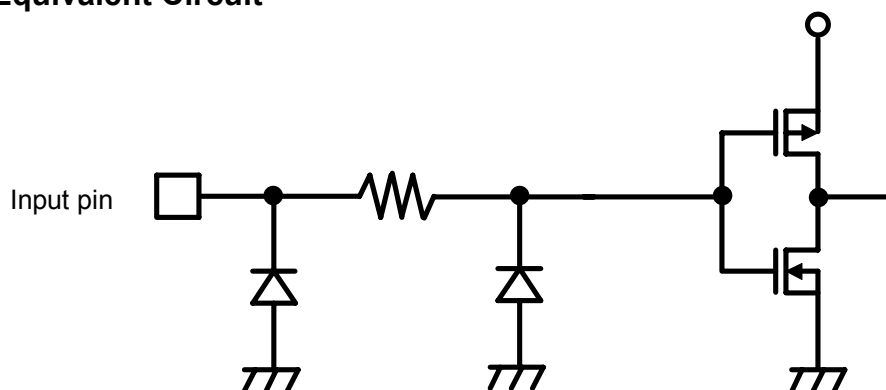
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



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

■ **Input Pin Equivalent Circuit**



## Single 2-Input AND Gate

## S-75L08ANC

The S-75L08ANC is a single 2-Input AND Gate 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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.

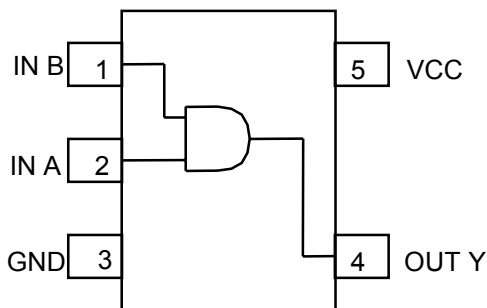
### ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd = 7 ns (at 3 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

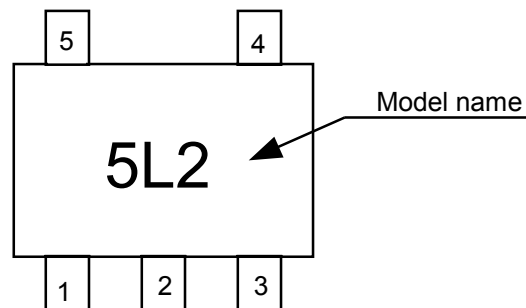
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



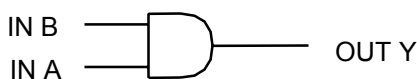
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

■ Ordering

Delivery form: Taping only  
 Model name: S-75L08ANC-5L2-TF

■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

■ Recommended Operating Conditions

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

■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C				Ta=-40 to 85°C		Unit			
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.	MAX.				
Input Voltage	"H" level	V <sub>IH</sub>	1.0	0.75	—	—	0.75	—	V			
			1.5	1.05	—	—	1.05	—				
			3.0	2.10	—	—	2.10	—				
	"L" level		V <sub>IL</sub>	1.0	—	—	0.25	—		0.25		
				1.5	—	—	0.45	—		0.45		
				3.0	—	—	0.90	—		0.90		
Output Voltage	"H" level	V <sub>OH</sub>		V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA	1.5	1.07	1.23	—	0.99	—			
				I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68	—	2.55	—		
					3.0	—	—	—	—	—		
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IL</sub> or V <sub>IH</sub>	I <sub>OL</sub> =20μA	1.0	—	0	0.1	—	0.1		
					1.5	—	0	0.1	—	0.1		
					3.0	—	0	0.1	—	0.1		
I <sub>OL</sub> =1mA					1.5	—	0.23	0.31	—	0.37		
					I <sub>OL</sub> =2.6mA	3.0	—	0.23	0.31	—	0.33	
Input Current						I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	±0.1	—
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0	—	10.0	μA			

■ AC Characteristics

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}$ , $t_{THL}$		—	4.0	8.0	ns
Propagation Delay Time	$t_{PLH}$ , $t_{PHL}$		—	6.0	9.0	

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

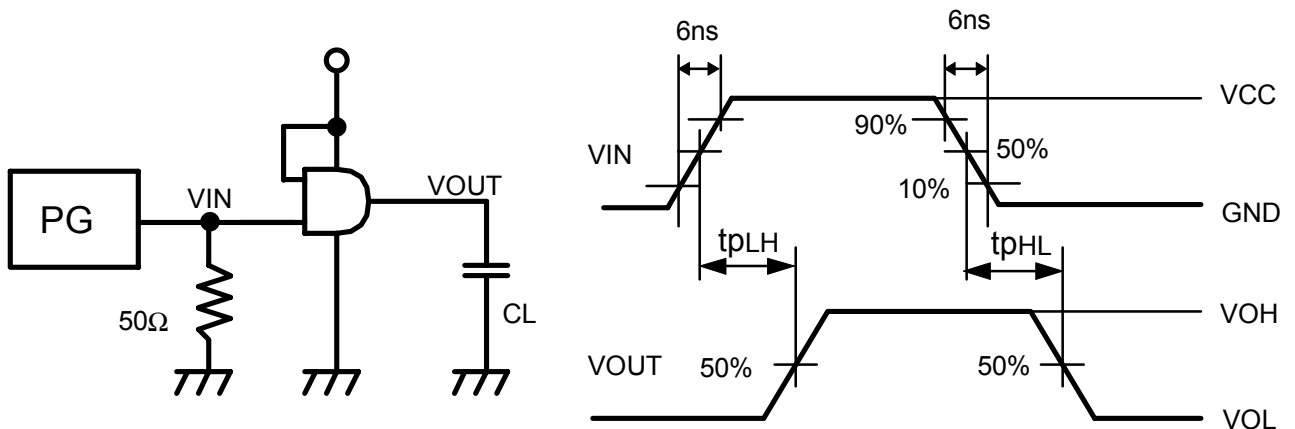
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40$ to $85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{PLH}$ $t_{PHL}$		1.0	—	30	60	—	75	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF	
Equiv. Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

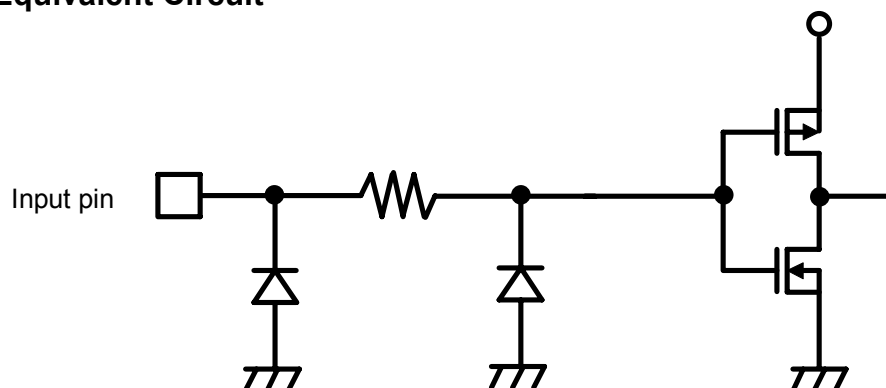
$$I_{CC(oper)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit





# SCHMITT INVERTER

# S-75L14ANC

The S-75L14ANC is a SCHMITT INVERTER 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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.

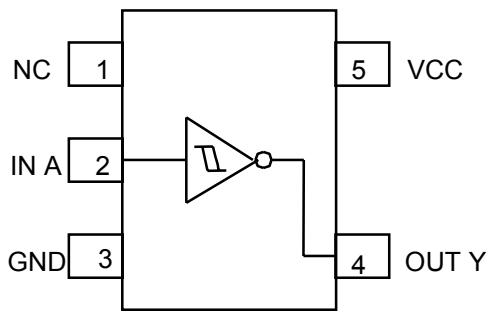
## ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd = 8 ns (at 3 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

## ■ Applications

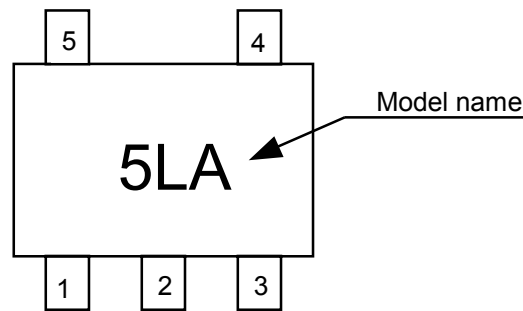
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

## ■ Pin Assignment



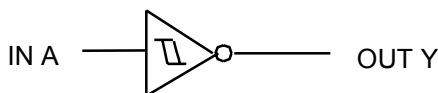
(Top view)

## ■ Marking



(Top view)

## ■ Logic Diagram



True Values

A	B
L	H
H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75L14ANC-5LA-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

Parameter	Symbol	Standard	Unit
Power Voltage	V <sub>CC</sub>	1 to 3.6	V
Input Voltage	V <sub>IN</sub>	0 to 3.6	V
Output Voltage	V <sub>OUT</sub>	0 to V <sub>CC</sub>	V
Op. Temp. Range	T <sub>opr</sub>	-40 to +85	°C
Input Rise and Fall Time	dt/dv	0 to 1000 (V <sub>CC</sub> =1.0 V)	ns
		0 to 500 (V <sub>CC</sub> =2.0 V)	
		0 to 400 (V <sub>CC</sub> =3.0 V)	

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C				Ta=-40 to 85°C		Unit				
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.	MAX.					
Input Voltage	"H" level	V <sub>IH</sub>	V <sub>IN</sub> =V <sub>IH</sub>	1.0	0.80	—	—	0.80	—	V			
				1.5	1.20	—	—	1.20	—				
				3.0	2.10	—	—	2.10	—				
	"L" level			V <sub>IL</sub>	V <sub>IN</sub> =V <sub>IL</sub>	1.0	—	—	0.20		—	0.20	
						1.5	—	—	0.45		—	0.45	
						3.0	—	—	0.90		—	0.90	
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>			I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA	1.5	1.07	1.23	—	0.99	—			
					I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68	—	2.55	—		
						—	—	—	—	—	—		
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =20μA		1.0	—	0	0.1	—	0.1		
					1.5	—	0	0.1	—	0.1			
					3.0	—	0	0.1	—	0.1			
				I <sub>OL</sub> =1mA	1.5	—	0.23	0.31	—	0.37			
					I <sub>OL</sub> =2.6mA	3.0	—	0.23	0.31	—	0.33		
						—	—	—	—	—	—		
Hysteresis Voltage	V <sub>H</sub>	V <sub>IN</sub> =V <sub>IH</sub>	V <sub>IN</sub> =V <sub>IH</sub>	1.0		0.20	—	0.50	—	—	V		
				1.5	0.25	—	0.50	—	—				
				3.0	0.45	—	0.65	—	—				
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	±0.1	—	±1.0	μA				
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0	—	10.0	μA				

■ AC Characteristics

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}, t_{THL}$		—	4.0	8.0	ns
Propagation Delay Time	$t_{pLH}, t_{pHL}$		—	4.0	10.5	

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

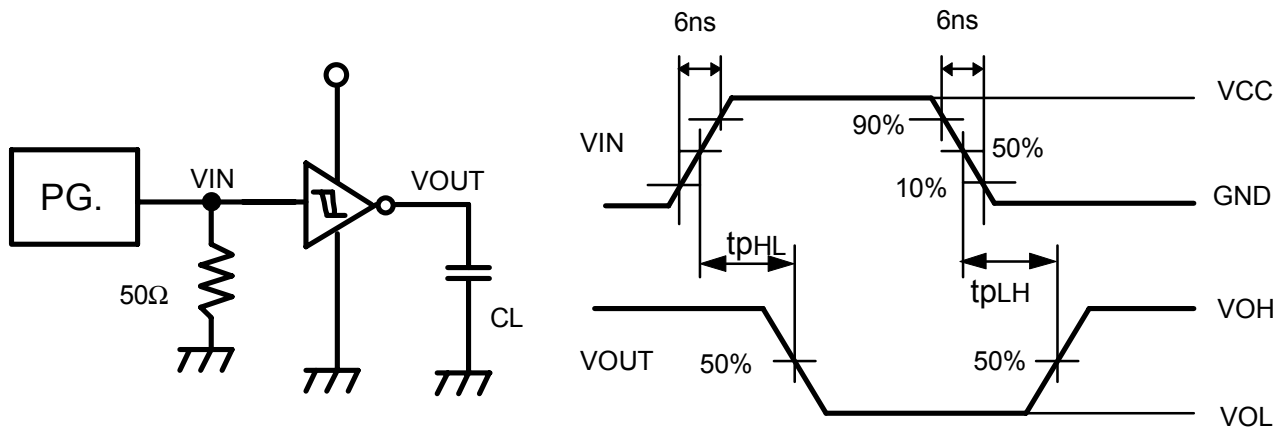
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\text{ to }85^\circ\text{C}$		Unit
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.	
Output Rise/Fall Time	$t_{TLH}$		1.0	—	35	70	—	ns
	$t_{THL}$		1.5	—	15	25	—	
			3.0	—	7	10	—	
Propagation Delay Time	$t_{pLH}$		1.0	—	35	70	—	ns
	$t_{pHL}$		1.5	—	15	25	—	
			3.0	—	8	12	—	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF
Equiv.Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

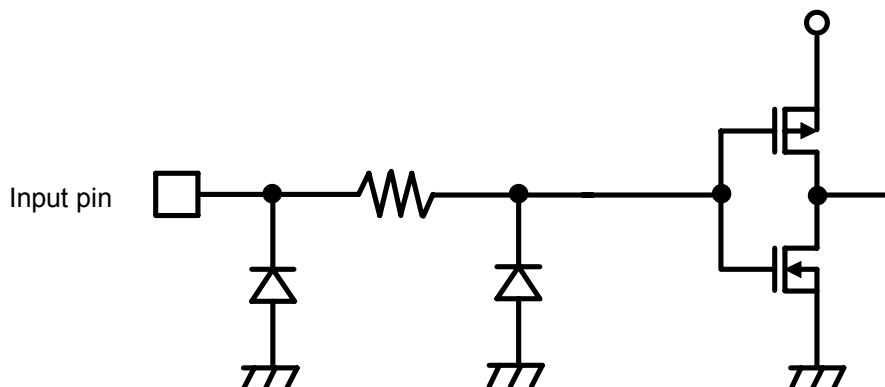
$$I_{CC(\text{opr})} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit



## Single 2-Input OR Gate

## S-75L32ANC

The S-75L32ANC is a single 2-input OR gate 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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.

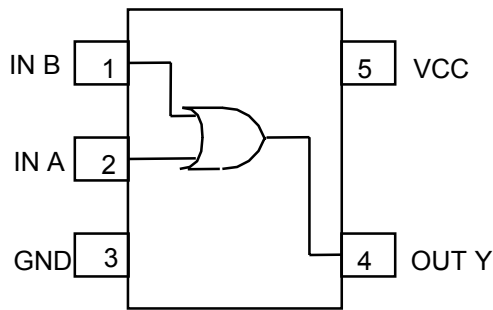
### ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd =7 ns (at 3 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

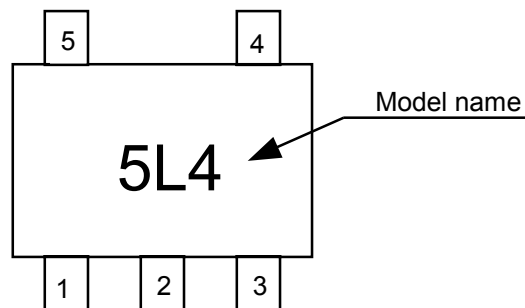
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



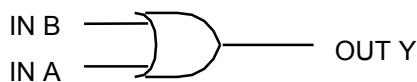
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

## ■ Ordering

Delivery form: Taping only  
 Model name: S-75L32ANC-5L4-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

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

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C				Ta=-40 to 85°C		Unit						
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.	MAX.							
Input Voltage	"H" level	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	1.0	0.75	—	—	0.75	—	V						
			1.5	1.05	—	—	1.05	—							
			3.0	2.10	—	—	2.10	—							
	"L" level		1.0	—	—	0.25	—	0.25							
			1.5	—	—	0.45	—	0.45							
			3.0	—	—	0.90	—	0.90							
Output Voltage	"H" level	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA	1.5	1.07	1.23	—	0.99	—						
				I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68	—	2.55		—				
					1.0	—	0	0.1	—		0.1				
	"L" level		V <sub>IN</sub> =V <sub>IL</sub>		I <sub>OL</sub> =20μA	1.5	—	0	0.1		—	0.1			
				3.0		—	0	0.1	—		0.1				
				1.5		—	0.23	0.31	—		0.37				
				I <sub>OL</sub> =2.6mA	3.0	—	0.23	0.31	—		0.33				
					Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—		—	±0.1	—	±1.0	μA
					Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—		—	1.0	—	10.0	μA

■ AC Characteristics

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}$ , $t_{THL}$		—	4.0	8.0	ns
Propagation Delay Time	$t_{PLH}$ , $t_{PHL}$		—	6.0	9.0	

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

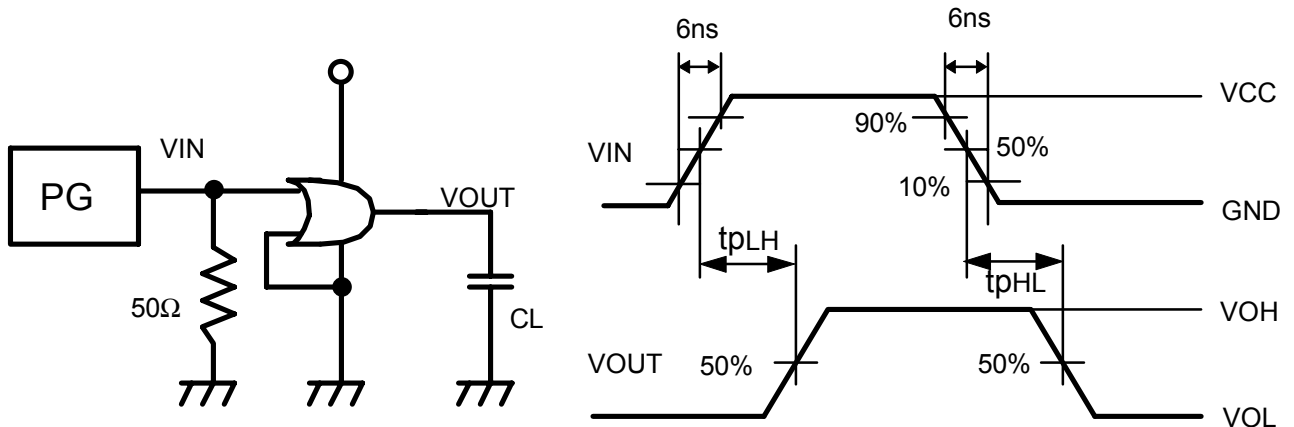
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\text{ to }85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{PLH}$ $t_{PHL}$		1.0	—	30	60	—	75	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF	
Equiv. Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

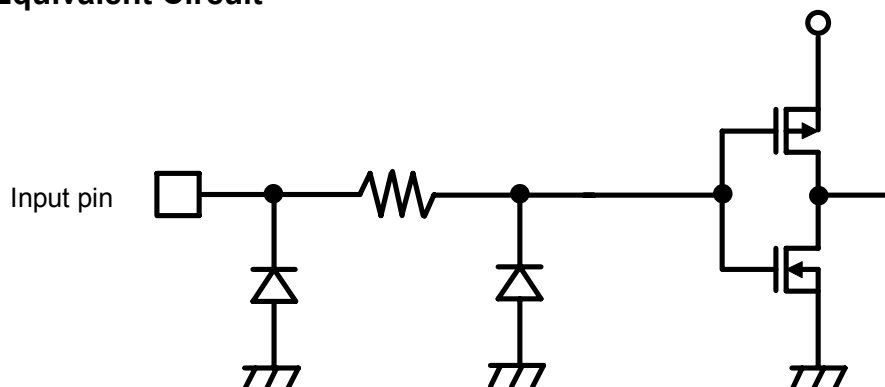
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit



## EXCLUSIVE OR GATE

## S-75L86ANC

The S-75L86ANC is an EXCLUSIVE OR GATE 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 3V).

The internal circuitry has buffered outputs to ensure high noise immunity and output stability.

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

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

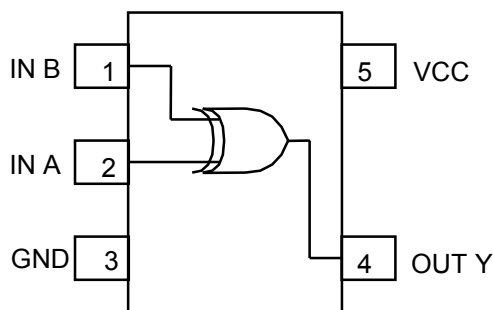
### ■ Features

- Wide power supply range: 1 V to 3.6 V
- Low current consumption: 1.0  $\mu$ A max. (at 3.6 V, 25°C)
- Typical propagation delay: tpd = 7 ns (at 3 V)
- High noise immunity:  $V_{NIH}=V_{NIL}=28\% V_{CC}$  min.
- Power down protection: All pins
- Very small plastic package: SC-88A

### ■ Applications

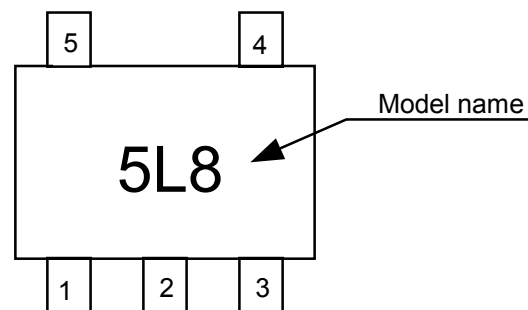
- Personal computers, peripherals
- Cellular phones
- Cameras
- Games

### ■ Pin Assignment



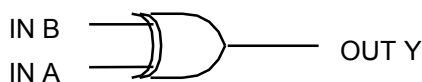
(Top view)

### ■ Marking



(Top view)

### ■ Logic Diagram



True Values

A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

## ■ Ordering

Delivery form: Taping only  
Model name: S-75L86ANC-5L8-TF

## ■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Ratings	Unit
Power Supply Voltage	V <sub>CC</sub>	-0.5 to +5.0	V
Input Voltage	V <sub>IN</sub>	-0.5 to +5.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to V <sub>CC</sub> +0.5	V
Input Parasitic Diode Current	I <sub>IK</sub>	-20	mA
Output Parasitic Diode Current	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±12.5	mA
V <sub>CC</sub> /GND Current	I <sub>CC</sub>	±25	mA
Power Dissipation	P <sub>D</sub>	200	mW
Storage Temp. Range	T <sub>stg</sub>	-65 to +150	°C
Lead Temperature (10 sec.)	TL	260	°C

## ■ Recommended Operating Conditions

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

## ■ DC Characteristics

Parameter	Sym.	Conditions	Ta=25°C			Ta=-40 to 85°C		Unit				
			V <sub>CC</sub>	MIN.	TYP.	MAX.	MIN.		MAX.			
Input Voltage	"H" level	V <sub>IH</sub>	1.0	0.75	—	—	0.75	—	V			
			1.5	1.05	—	—	1.05	—				
			3.0	2.10	—	—	2.10	—				
	"L" level	V <sub>IL</sub>	1.0	—	—	0.25	—	0.25				
			1.5	—	—	0.45	—	0.45				
			3.0	—	—	0.90	—	0.90				
Output Voltage	"H" level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> =-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 <sub>OH</sub> =-1mA	1.5	1.07	1.23	—	0.99		—
						3.0	2.61	2.68	—	2.55		—
							I <sub>OH</sub> =-2.6mA	3.0	2.61	2.68		—
	"L" level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> =20μA	1.0	—	0	0.1	—	0.1		
					1.5	—	0	0.1	—	0.1		
					3.0	—	0	0.1	—	0.1		
					I <sub>OL</sub> =1mA	1.5	—	0.23	0.31	—		0.37
						3.0	0.23	0.31	—	0.33		
							I <sub>OL</sub> =2.6mA	3.0	—	0.23		0.31
Input Current	I <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	±0.1	—	±1.0	μA			
Current Consump.	I <sub>CC</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	3.6	—	—	1.0	—	10.0	μA			



■ AC Characteristics

$C_L=15\text{pf}$ , Input  $t_r=t_f=6\text{ns}$ ,  $V_{CC}=3.3\pm 0.3\text{V}$ ,  $T_a=25^\circ\text{C}$  (unless otherwise specified)

Parameter	Sym.	Measurement Conditions	MIN.	TYP.	MAX.	Unit
Output Rise/Fall Time	$t_{TLH}, t_{THL}$		—	4.0	8.0	ns
Propagation Delay Time	$t_{pLH}, t_{pHL}$		—	6.0	9.0	

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

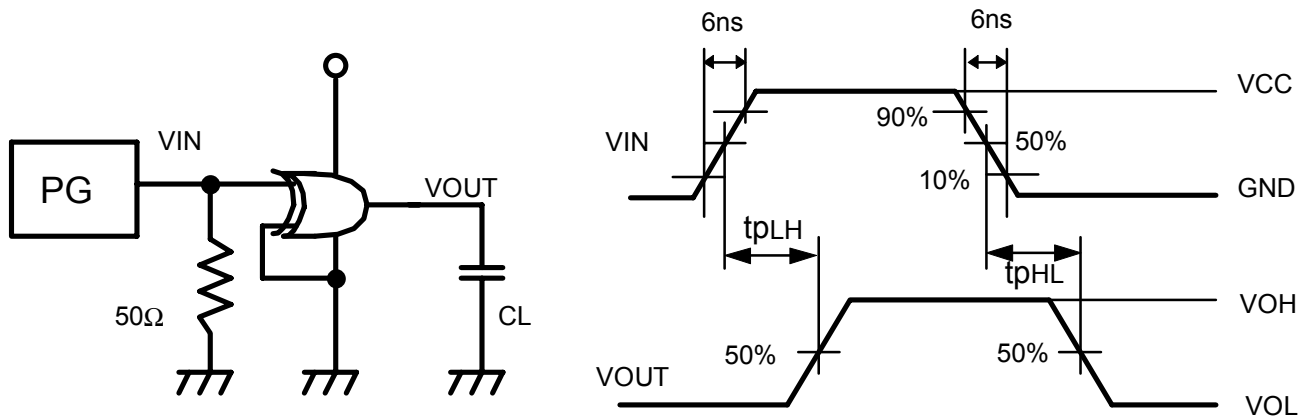
Parameter	Sym.	Measurement Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\text{ to }85^\circ\text{C}$		Unit	
			$V_{CC}(\text{V})$	Min.	Typ.	Max.	Min.		Max.
Output Rise/Fall Time	$t_{TLH}$ $t_{THL}$		1.0	—	35	70	—	90	ns
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Propagation Delay Time	$t_{pLH}$ $t_{pHL}$		1.0	—	30	60	—	75	
			1.5	—	15	25	—	30	
			3.0	—	7	10	—	14	
Input Capacitance	$C_{IN}$		—	5	10	—	10	pF	
Equiv. Int. Capacitance	$C_{PD}$	Note <sup>1</sup>	—	10	—	—	—	pF	

Note<sup>1</sup>  $C_{PD}$  is the no-load equivalent capacitance inside the circuitry. Refer to the measurement circuit shown below.

Current consumption is averaged by the following equation.

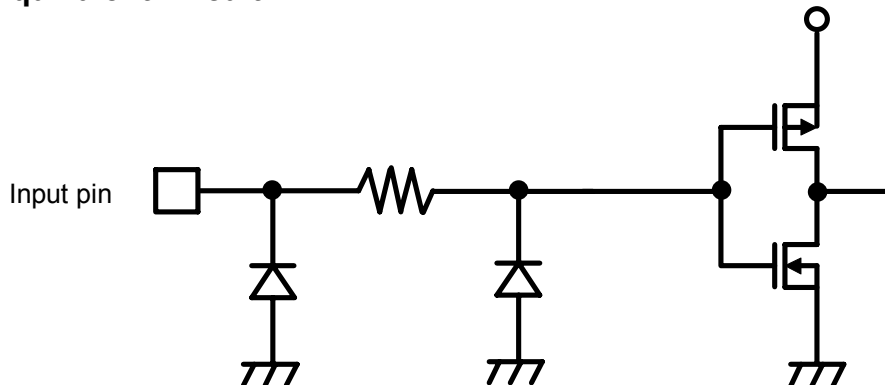
$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{in} + I_{CC}$$

Measurement Circuit



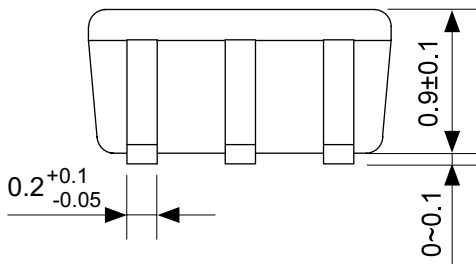
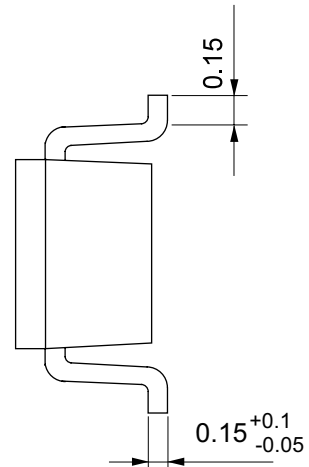
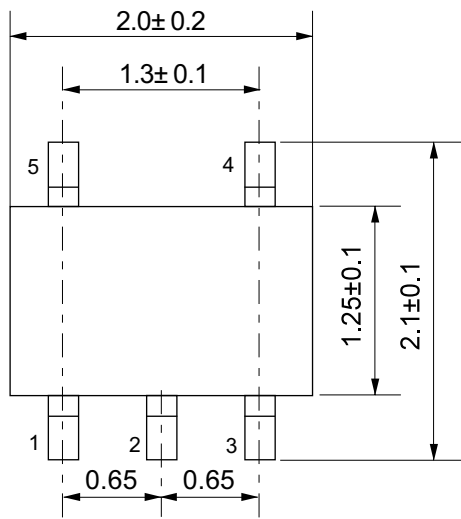
Remark No-load output during measurement of current consumption.

■ Input Pin Equivalent Circuit



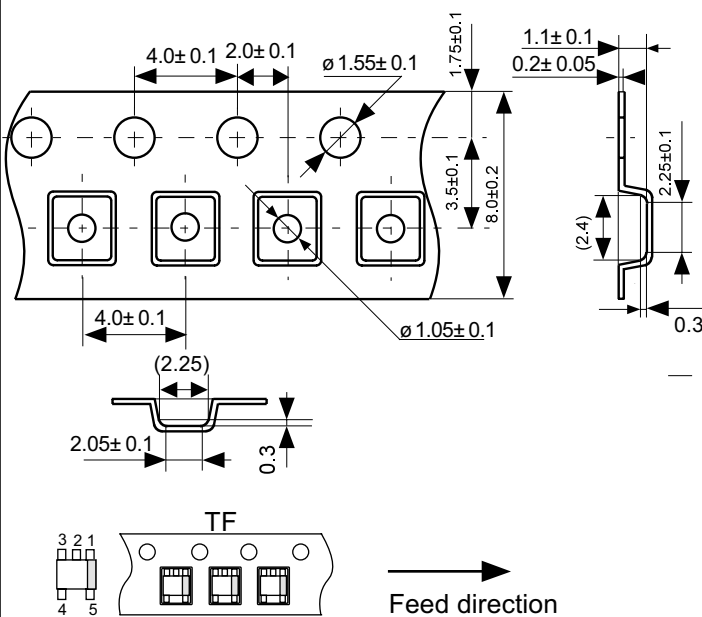
●Dimensions

Unit: mm



No.:NP005-B-P-SD-1.0

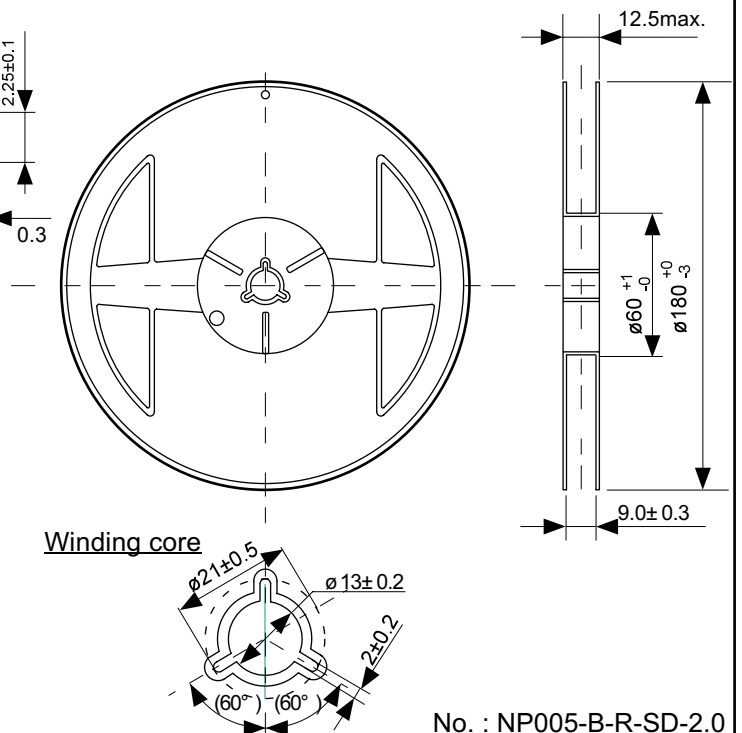
●Taping Specifications



No. : NP005-B-C-SD-1.0

●Reel Specifications

3000 pcs/reel



No. : NP005-B-R-SD-2.0

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