



### 8-CHANNEL MULTIPLEXER WITH SAMPLE AND HOLD

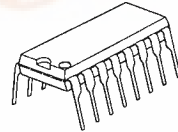
#### ■ GENERAL DESCRIPTION

The NJU7304 is a C-MOS 8-channel multiplexer with sample and hold function.

It consists of C-MOS op amplifier, analog switch, hold-capacitor and 1/8 decoder.

Any channels can be selected by 3-bit control input signal.

#### ■ PACKAGE OUTLINE

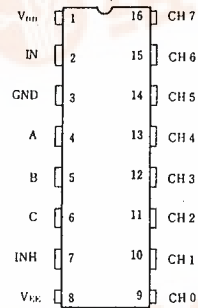


NJU7304D

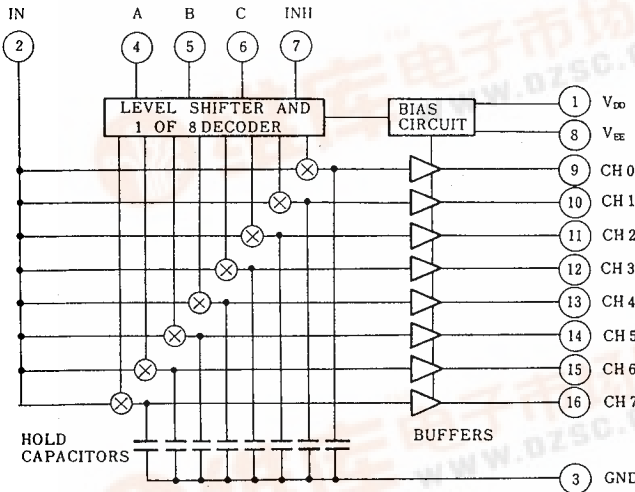
#### ■ FEATURES

- Multi-signal-input in combination with a Microprocessor and D/A converter.
- Wide Operating Voltage -- 20V
- Low Droop -- 1mV/5ms Typ.
- C-MOS compatible Input
- Package Outline -- DIP 16
- C-MOS Technology

#### ■ PIN CONFIGURATION



#### ■ BLOCK DIAGRAM



#### ■ TRUTH TABLE

INH	C	B	A	OUTPUT
0	0	0	0	CH0
0	0	0	1	CH1
0	0	1	0	CH2
0	1	0	0	CH4
0	1	0	1	CH5
0	1	1	0	CH6
0	1	1	1	CH7
1	X	X	X	X

x: Output signal is kept during INH=1.



**■ TERMINAL DESCRIPTION**

NO.	SYMBOL	FUNCTION	NO.	SYMBOL	FUNCTION
1	V <sub>DD</sub>	Positive Power Supply	7	INH	INH Input
2	IN	Signal Input	8	V <sub>EE</sub>	Negative Power Supply
3	GND	Ground	9~16	CH0 ~ CH7	Output
4, 5, 6	A, B, C	Address Input			

**■ ABSOLUTE MAXIMUM RATINGS**

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>DD</sub> - GND	- 0.5 ~ + 20	V
	V <sub>DD</sub> - V <sub>EE</sub>	- 0.5 ~ + 20	V
Input Voltage	V <sub>IN</sub>	V <sub>EE</sub> -0.5 ~ V <sub>DD</sub> +0.5	V
Output Voltage	V <sub>OUT</sub>	V <sub>EE</sub> -0.5 ~ V <sub>DD</sub> +0.5	V
Input Current	I <sub>IN</sub>	- 10 ~ + 10	mA
Output Current	I <sub>OUT</sub>	- 10 ~ + 10	mA
Power Dissipation	P <sub>D</sub>	500 (DIP)	mW
Operating Temperature Range	T <sub>opr</sub>	0 ~ + 75	°C
Storage Temperature Range	T <sub>stg</sub>	- 40 ~ + 125	°C

**■ ELECTRICAL CHARACTERISTICS**

## • DC Characteristics

 ( V<sub>DD</sub>=15V, V<sub>EE</sub>=-2V, t<sub>rw</sub>=1μs, t<sub>hold</sub>=5ms, Ta=25°C )

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I <sub>DD</sub>	All Input=GND, No Load			8	mA
Input Voltage	V <sub>INAN</sub>		0		10	V
Off-set Voltage 1	V <sub>OFF1</sub>	CH0~ V <sub>INAN</sub> =0V, R <sub>L</sub> =50kΩ			±30	mV
Off-set Voltage 2	V <sub>OFF2</sub>	CH7 V <sub>INAN</sub> =5V, R <sub>L</sub> =50kΩ			±30	
Off-set Differential Voltage	ΔV <sub>OFF</sub>	V <sub>OFF1</sub> (n) - V <sub>OFF2</sub> (n)   n=0, 1, ... 7			20	mV
Input Current	I <sub>IH</sub>	V <sub>IN</sub> =GND or V <sub>DD</sub>			±10	μA
Control Input	High Input Voltage	V <sub>IH</sub>	4		5	V
	Low Input Voltage	V <sub>IL</sub>	0		1	
Output Current	I <sub>OL</sub>	V <sub>INAN</sub> =0V, V <sub>OL</sub> =0.5V	0.5			mA
	I <sub>OH</sub>	V <sub>INAN</sub> =10V, V <sub>OH</sub> =9.5V			- 1	

## • AC Characteristics

 (  $V_{DD}=15V$ ,  $V_{EE}=-2V$ ,  $t_{bw}=1\mu s$ ,  $t_{HOLD}=5ms$ ,  $T_a=25^\circ C$  )

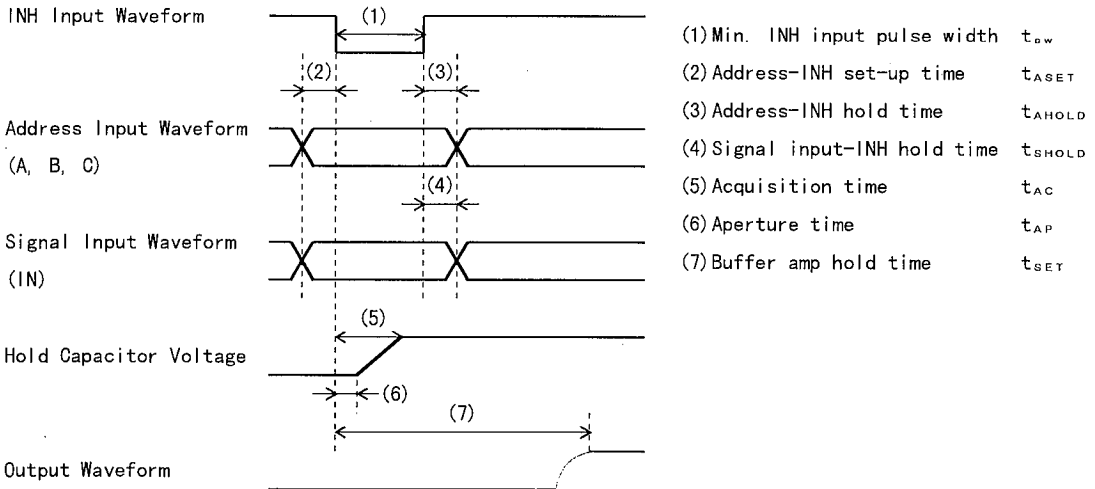
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Acquisition Time	$t_{AC}$			700		ns
Aperture Time	$t_{AP}$			150		ns
Feedthrough	$V_{FTH}$	$T_a=50^\circ C$ , $V_{INAN}=0V$ , 5V			$\pm 15$	mV
Droop	$V_{DRP}$	$T_a=50^\circ C$ , $V_{INAN}=0V$ , 5V			$\pm 10$	mV
Buffer Amp. Settling Time	$t_{SET}$			20		$\mu s$

## ■ CONTROL INPUT SWITCHING CHARACTERISTICS

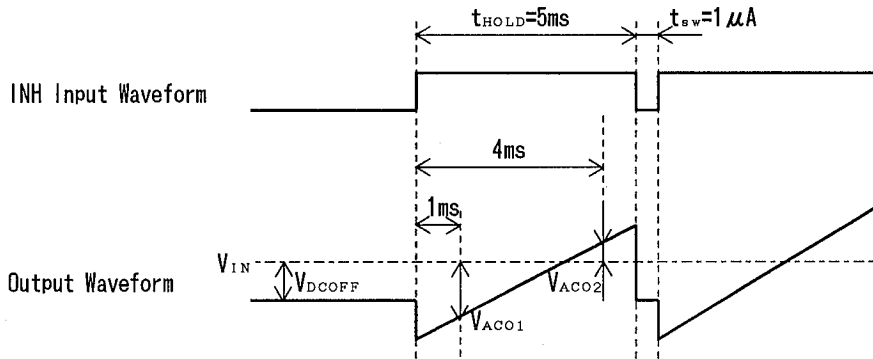
 (  $V_{DD}=15V$ ,  $V_{EE}=-2V$ ,  $t_{bw}=1\mu s$ ,  $t_{HOLD}=5ms$ ,  $T_a=25^\circ C$  )

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
INH Min. Input Pulse Width	$t_{bw}$		1	5		$\mu s$
Address-INH Set-up Time	$t_{ASET}$		300			ns
Address-INH Hold Time	$t_{AHOLD}$		300			ns
Signal-INH Hold Time	$t_{SHOLD}$		300			ns

## ■ TIMING CHART



## ■ OFF SET VOLTAGE, FEEDTHROUGH, DROOP MEASUREMENT METHOD



Offset voltage, feedthrough and droop are :

(1) Offset Voltage  $V_{OFF} = (V_{ACO1} + V_{ACO2}) / 2$

(2) Feedthrough  $V_{FTH} = V_{ACO1} - V_{DCOFF}$

(3) Droop  $V_{DRP} = V_{ACO2} - V_{ACO1}$

# NJU7304

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## MEMO

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