

## C-MOS COMPARATOR WITH C-MOS OUTPUT

### ■ GENERAL DESCRIPTION

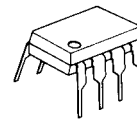
The NJU7102A and 04A dual and quad C-MOS Comparators performing wide operating voltage from 3 to 14V, low operating current and low offset voltage.

The NJU7102A and 04A operated on a single-power-supply can interface with most of TTL and C-MOS type standard logic ICs.

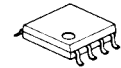
### ■ FEATURES

- Single-Power-Supply
- Wide Operating Voltage ( $V_{DD}=3\sim 14V$ )
- Low Operating Current ( $9\mu A/\text{circuit typ.}$ )
- Wide Common Mode Input Voltage ( $0\sim 3.8V @ V_{DD}=5V$ )
- High Input Impedance
- Low Bias Current ( $I_B=1pA$ )
- Low Offset Voltage
- C-MOS ( Push-Pull ) Output
- Package Outline  
DIP/DMP8 ( NJU7102A )  
DIP/DMP14 ( NJU7104A )
- C-MOS Technology

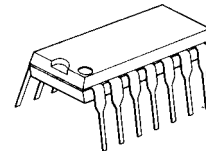
### ■ PACKAGE OUTLINE



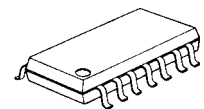
NJU7102AD



NJU7102AM

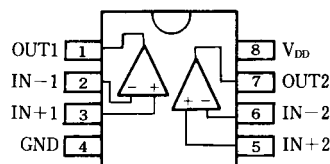


NJU7104AD

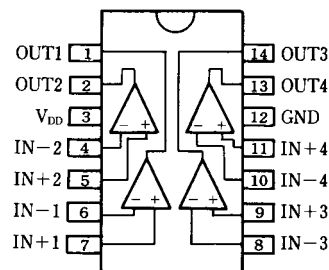


NJU7104AM

### ■ PIN CONFIGURATION

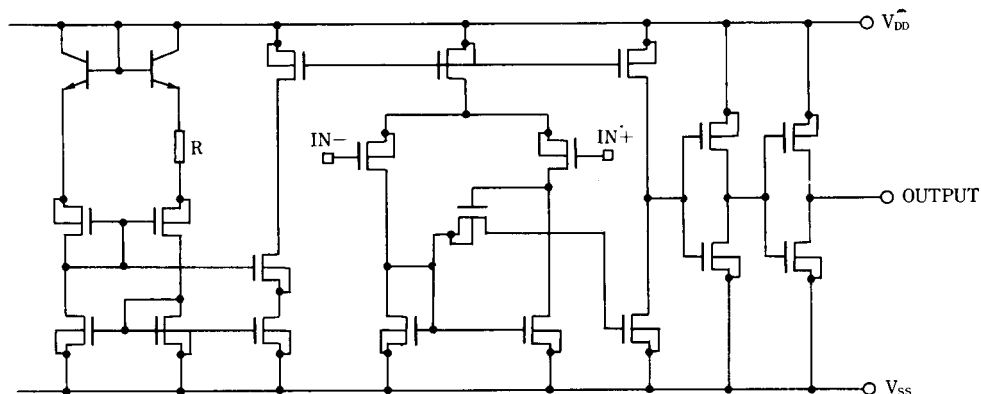


NJU7102AD/AM



NJU7104AD/AM

### ■ EQUIVALENT CIRCUIT



# NJU7102A/04A

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>DD</sub>	16	V
Differential Input Voltage	V <sub>ID</sub>	± 16 ( note1 )	V
Input Voltage	V <sub>IC</sub>	16	V
Output Voltage	V <sub>O</sub>	16	V
Output Current	I <sub>O</sub>	20	mA
Power Dissipation	P <sub>D</sub>	( DIP8 ) 500 ( DIP14 ) 700 ( DMP8 ) 300 ( DMP14 ) 300	mW
Operating Temperature Range	T <sub>opr</sub>	0~+70	°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125	°C

( note1 ) If the supply voltage ( V<sub>DD</sub> ) is less than 16V, the input voltage must not over the V<sub>DD</sub> level though 16V is limit specified.

## ■ ELECTRICAL CHARACTERISTICS

( Ta=25°C, V<sub>DD</sub>=5V )

PARAMETER	SYMBOL	TEST CONDITION	NJU7102A			NJU7104A			UNIT
			MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Operating Voltage	V <sub>DD</sub>		3	-	14	3	-	14	V
Input Offset Voltage	V <sub>IO</sub>	V <sub>IC</sub> =V <sub>ICmin</sub> ( note2 )	-	1.2	12	-	1.2	12	mV
Input Offset Current	I <sub>IO</sub>		-	1	-	-	1	-	pA
Input Bias Current	I <sub>B</sub>		-	1	-	-	1	-	pA
Input Common Mode Voltage Range	V <sub>ICM</sub>		0	-	3.8	0	-	3.8	V
Output Voltage	V <sub>OH</sub>	V <sub>ID</sub> =+1V, I <sub>OH</sub> =+5V	4.5	4.7	-	4.5	4.7	-	V
	V <sub>OL</sub>	V <sub>ID</sub> =+1V, I <sub>OL</sub> =+6mA	-	0.22	0.30	-	0.234	0.30	V
Common Mode Rejection Ratio	CMR	V <sub>IC</sub> =V <sub>ICmin</sub>	-	82	-	-	78	-	dB
Supply Voltage Rejection Ratio	SVR	V <sub>DD</sub> =5~10V	-	90	-	-	92	-	dB
Operating Current	I <sub>DD</sub>	No Load, V <sub>O</sub> =0V	-	18	40	-	36	80	μA

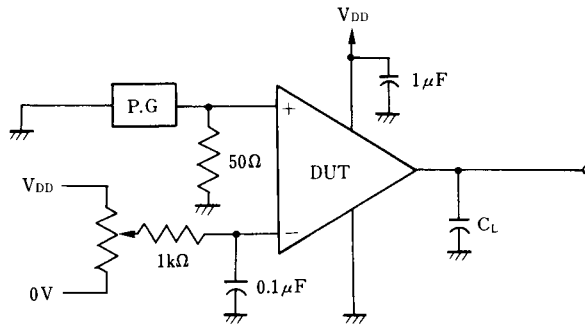
( note2 ) This condition is available for operating voltage V<sub>DD</sub>=5~10V and driving voltage is over 4.5V or under 0.3V.

## ■ SWITCHING CHARACTERISTICS

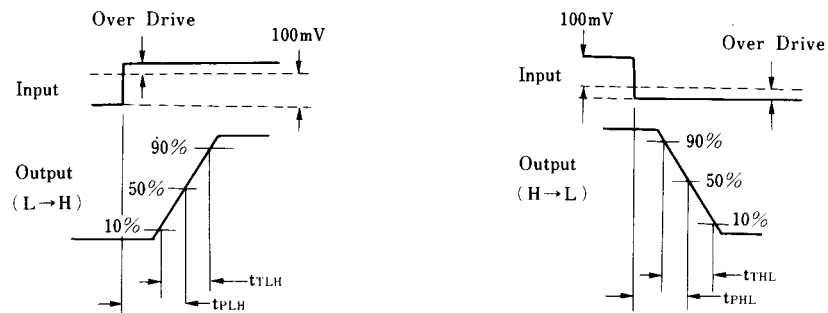
( Ta=25°C, V<sub>DD</sub>=5V, f=10kHz, C<sub>L</sub>=15pF )

PARAMETER	SYMBOL	CONDITIONS	NJU7102A			NJU7104A			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
Propagation Delay High to Low	t <sub>PHL</sub>	V <sub>IC</sub> =0V	Over Drive=5mV	-	3.0	-	-	2.3	-	μs
			TTL level step	-	0.17	-	-	0.17	-	
Propagation Delay Low to High	t <sub>PLH</sub>	V <sub>IC</sub> =0V	Over Drive=5mV	-	1.9	-	-	1.3	-	μs
			TTL level step	-	0.8	-	-	0.8	-	
Output Signal Falling Time	t <sub>FHL</sub>	Over Drive=50mV	-	30	-	-	30	-	ns	
Output Signal Rising Time	t <sub>FHL</sub>	Over Drive=50mV	-	70	-	-	70	-	ns	

## ■ MEASUREMENT CIRCUIT



## ■ TIMING WAVEFORM



**[CAUTION]**

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