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With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## C-MOS COMPARATOR WITH C-MOS OUTPUT

### ■ GENERAL DESCRIPTION

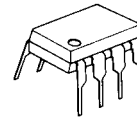
The NJU7102A and 04A dual and quad C-MOS Comparators performing wide operating voltage from 3 to 14V, low operating current and low offset voltage.

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

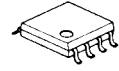
### ■ FEATURES

- 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

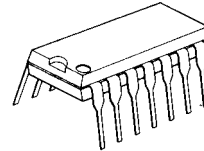
### ■ PACKAGE OUTLINE



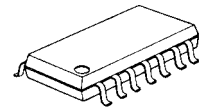
NJU7102AD



NJU7102AM

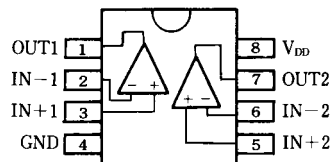


NJU7104AD

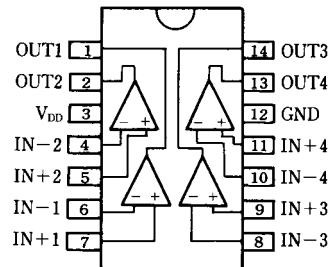


NJU7104AM

### ■ PIN CONFIGURATION

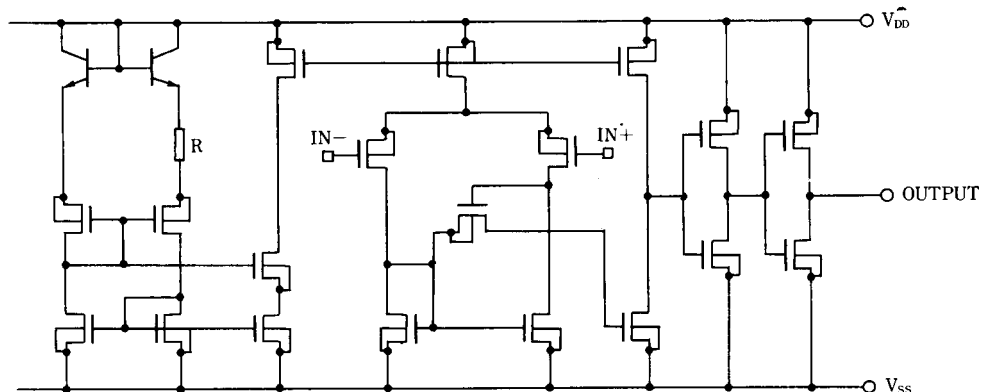


NJU7102AD/AM



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

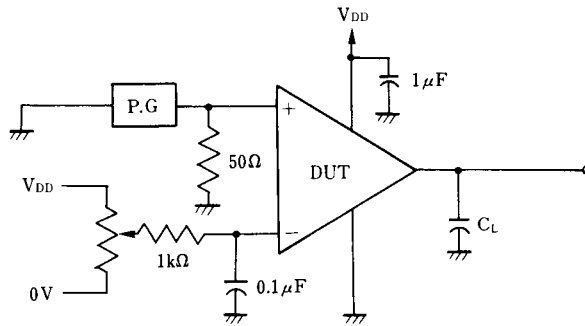
( note2 ) This condition is available for operating voltage V<sub>DD</sub>=5~10V and driving voltage is over 4.5V or under 0.3V.

## ■ SWITCHING CHARACTERISTICS

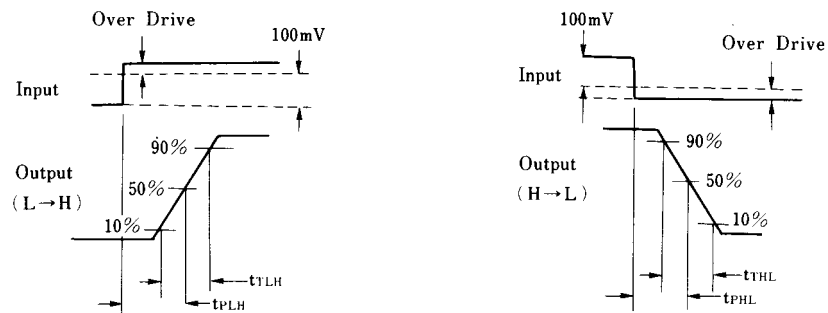
( Ta=25°C, V<sub>DD</sub>=5V, f=10kHz, C<sub>L</sub>=15pF )

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



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