

SINGLE 8-CHANNEL MULTIPLEXER

■ GENERAL DESCRIPTION

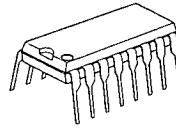
The NJU4051B is a single 8-channel multiplexer with three binary control inputs and an inhibit input.

The three binary control input signals select 1 of 8 channels to be turned on, and connect it to the single output.

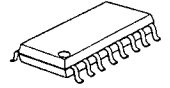
The operating voltage is as wide as 3 to 18V and the quiescent current is as low as 5  $\mu$ A max. (at  $V_{DD}=5V$ ).

It is equivalent to RCA CD4051B and Motorola MC14051B.

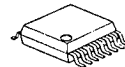
■ PACKAGE OUTLINE



NJU4051BD



NJU4051BM



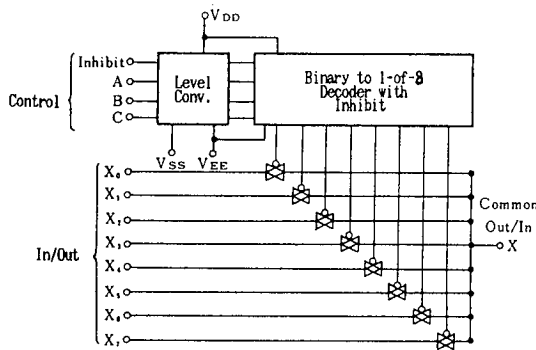
NJU4051BV

■ FEATURES

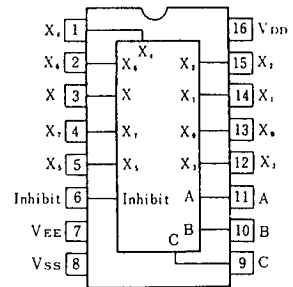
- Wide Operating Voltage -- 3 ~ 18V
- Package Outline -- DIP/DMP/SSOP 16
- C-MOS Technology

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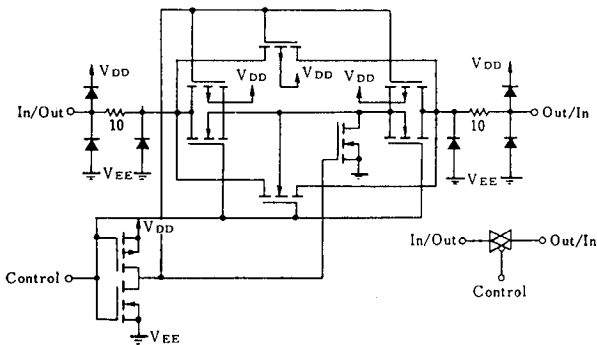
■ BLOCK DIAGRAM



■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



■ TRUTH TABLE

INH	C	B	A	ON SW
0	0	0	0	X <sub>0</sub>
0	0	0	1	X <sub>1</sub>
0	0	1	0	X <sub>2</sub>
0	0	1	1	X <sub>3</sub>
0	1	0	0	X <sub>4</sub>
0	1	0	1	X <sub>5</sub>
0	1	1	0	X <sub>6</sub>
0	1	1	1	X <sub>7</sub>
1	x	x	x	None

x : Don't care

**■ ABSOLUTE MAXIMUM RATINGS**

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{DD} - V_{SS}$	- 0.5 ~ + 20	V
	$V_{DD} - V_{EE}$	- 0.5 ~ + 20	
Input Voltage	$V_{IN}$	- 0.5 ~ $V_{DD}+0.5$ *	V
Output Voltage	$V_o$	- 0.5 ~ $V_{DD}+0.5$ *	V
Input Current	$I_{IN}$	± 10	mA
Output Current	$I_o$	± 10	mA
Power Dissipation	$P_D$	500 (DIP) 200 (DMP) 300 (SSOP)	mW
Operating Temperature Range	$T_{opr}$	- 40 ~ + 85	°C
Storage Temperature Range	$T_{stg}$	- 65 ~ + 150	°C

 \*  $V_{DD}+0.5V$  must be 20V or less.

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**■ ELECTRICAL CHARACTERISTICS**

## • DC Characteristics

 (  $V_{SS}=0V$  )

PARAMETER	SYMBOL	CONDITION	$V_{DD}$ (V)	Ta=-40°C		Ta=25°C		Ta=85°C		UNIT
				MIN	MAX	MIN	TYP	MAX	MIN	
Quiescent Current	$I_{DD}$	No signal, Per Package	5 10 15 20	5 10 20 100	5 10 20 100	5 10 20 100	150 300 600 3000		$\mu A$	
On-State Resistance	$R_{ON}$	$0 \leq V_{i_s} \leq V_{DD}$ $V_{EE}=V_{SS}=0V$	5 10 15	500 210 140	220 100 60	600 250 160	800 300 200		$\Omega$	
On-State Resistance Deviation	$\Delta R_{ON}$	Between 2 channels, $V_{EE}=V_{SS}=0V$	5 10 15		15 10 5				$\Omega$	
Off-Channel Leakage Current		Each channel $V_{EE}=V_{SS}=0V$	18	±1000	±10	±100	±1000		nA	
Input Capacitance	$C_{IN}$	$V_{IN}=0V$ 1N <sub>H</sub> , A, B, C A <sub>0</sub> to A <sub>7</sub>			5.0 10	7.5			pF	
Low Level Input Voltage	$V_{IL}$	$R_L=10k\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$	5 10 15	1.5 3.0 4.0	2.25 4.50 6.75	1.5 3.0 4.0	1.5 3.0 4.0		V	
High Level Input Voltage	$V_{IH}$	$R_L=10k\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$	5 10 15	3.5 7.0 11.0	3.5 7.0 11.0	2.75 5.50 8.25	3.5 7.0 11.0		V	
Input Current	$\pm I_{IN}$	$V_{IN}=0$ or 18V	18	±0.1		±0.1	±1		$\mu A$	

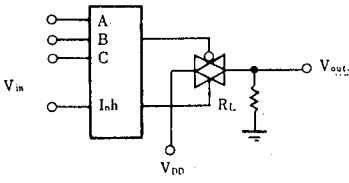
**SWITCHING CHARACTERISTICS**

( Ta=25°C, CL=50pF )

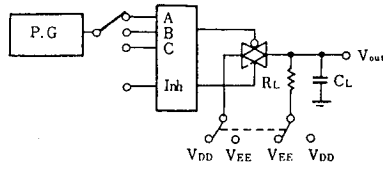
PARAMETER		SYMBOL	CONDITIONS	V <sub>DD</sub> (V)	MIN	TYP	MAX	UNIT
Propagation Delay Time	SW Input to Output	t <sub>PLH</sub>	R <sub>L</sub> =10kΩ	5	15	45	ns	
		t <sub>PHL</sub>		10	8	30		
	CONT Input to Output	t <sub>PLH</sub>		15	5	20		
		t <sub>PHL</sub>		5	15	45		
Output Enable Time	t <sub>PZH</sub>	R <sub>L</sub> =10kΩ	5	600	1400	ns		
	t <sub>PZL</sub>		10	250	700			
Output Disable Time	t <sub>PHZ</sub>	R <sub>L</sub> =10kΩ	5	600	1400	ns		
	t <sub>PLZ</sub>		10	250	700			
Sine-Wave Distortion			R <sub>i</sub> =10kΩ, f=1kHz, V <sub>is</sub> =5V <sub>P-P</sub>	10	0.05		%	
Feedthrough(all-ch. off)			R <sub>i</sub> =1kΩ, 20log <sub>10</sub> V <sub>os</sub> /V <sub>is</sub> =-50dB	10	4.5		MHz	
Crosstalk	SW A and B		R <sub>i</sub> =1kΩ, V <sub>is</sub> =1/2 · (V <sub>DD</sub> -V <sub>SS</sub> ) <sub>P-P</sub> , 20log <sub>10</sub> V <sub>os(B)</sub> /V <sub>is(A)</sub> =-50dB	10	3.0		MHz	
	Control and Out		R <sub>i</sub> =1kΩ, R <sub>L</sub> =10kΩ, CONTROL/INHIBIT tr=tf=20ns	10	30		mV	

MEASUREMENT CIRCUITS

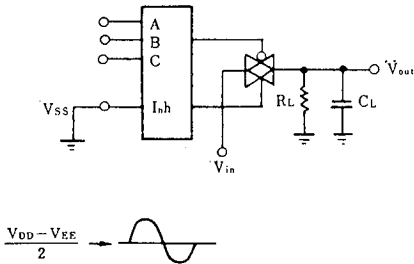
1. Noise Margin



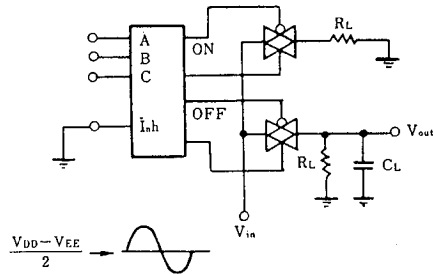
2. Propagation Delay



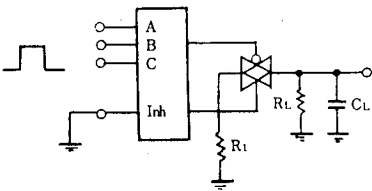
3. Feedthrough



4. Crosstalk (Switch A and B)



5. Crosstalk (Control and Out)



## MEMO

**[CAUTION]**

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