

SINGLE 8-CHANNEL MULTIPLEXER

■ GENERAL DESCRIPTION

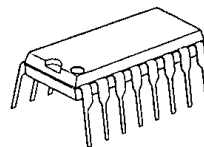
The NJU4051B is a single 8-channel multiplexer with three binary control inputs and an inhibit input.

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

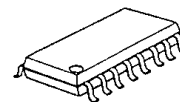
The operating voltage is as wide as 3 to 18V and the quiescent current is as low as 5μA max.(at V_{DD}=5V).

It is equivalent to RCA CD4051B and Motorola MC14051B.

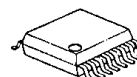
■ PACKAGE OUTLINE



NJU4051BD



NJU4051BM



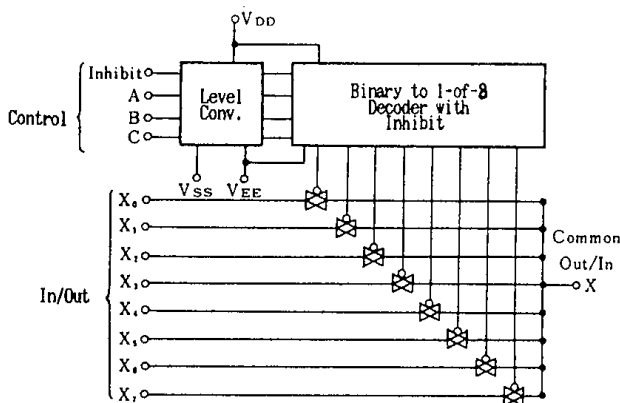
NJU4051BV

■ FEATURES

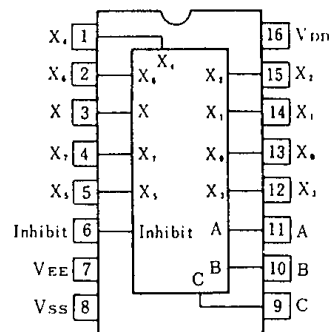
- Wide Operating Voltage -- 3 ~ 18V
- Package Outline -- DIP/DMP/SSOP 16
- C-MOS Technology

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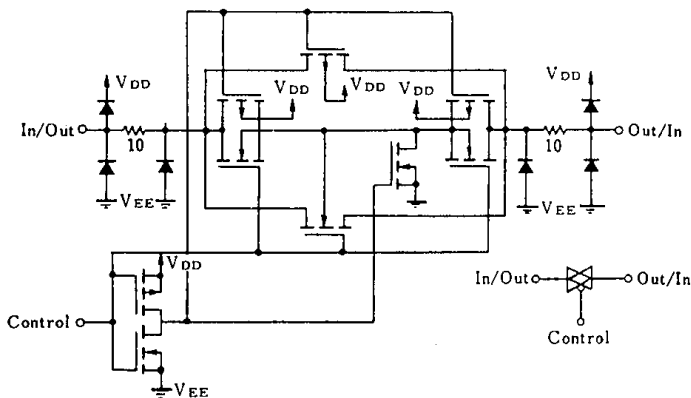
■ BLOCK DIAGRAM



■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



■ TRUTH TABLE

INH	C	B	A	ON SW
0	0	0	0	X ₀
0	0	0	1	X ₁
0	0	1	0	X ₂
0	0	1	1	X ₃
0	1	0	0	X ₄
0	1	0	1	X ₅
0	1	1	0	X ₆
0	1	1	1	X ₇
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		150 300 600 3000	μA	
On-State Resistance	R_{ON}	$0 \leq V_{is} \leq V_{DD}$ $V_{EE}=V_{SS}=0V$	5 10 15	500 210 140		220 100 60	600 250 160	800 300 200	Ω	
On-State Resistance Deviation	ΔR_{ON}	Between 2 channels, $V_{EE}=V_{SS}=0V$	5 10 15			15 10 5			Ω	
Off-Channel Leakage Current		Each channel $V_{EE}=V_{SS}=0V$	18	±1000		±10	±100	±1000	nA	
Input Capacitance	C_{IN}	$V_{IN}=0V$ INH, A, B, C A ₀ to A ₇				5.0 10	7.5		pF	
Low Level Input Voltage	V_{IL}	$R_L=10k\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$ $V_o=1.0V$ $V_o=1.0V$ $V_o=1.5V$	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}	$R_L=10k\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$ $V_o=4.0V$ $V_o=9.0V$ $V_o=13.5V$	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	μA	

SWITCHING CHARACTERISTICS

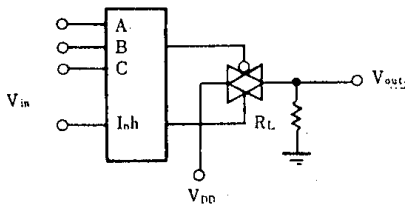
(Ta=25°C, CL=50pF)

PARAMETER		SYMBOL	CONDITIONS	V _{DD} (V)	MIN	TYP	MAX	UNIT
Propagation Delay Time	SW Input to Output	t _{PLH}	R _L =10kΩ	5	15	45	ns	
		t _{PHL}		10	8	30		
	CONT Input to Output	t _{PLH}		15	5	20	ns	
		t _{PHL}		5	15	45		
Output Enable Time	t _{PZH}	R _L =10kΩ	5	600	1400	ns		
	t _{PZL}		10	250	700			
Output Disable Time	t _{FHZ}	R _L =10kΩ	15	200	500	ns		
	t _{PLZ}		5	600	1400			
Sine-Wave Distortion			R _L =10kΩ, f=1kHz, V _{is} =5V _{P-P}	10	0.05		%	
Feedthrough(all-ch. off)			R _L =1kΩ, 20log ₁₀ V _{os} /V _{is} =-50dB	10	4.5		MHz	
Crosstalk	SW A and B		R _L =1kΩ, V _{is} =1/2 · (V _{DD} -V _{SS}) _{P-P} , 20log ₁₀ V _{os(B)} /V _{is(A)} =-50dB	10	3.0		MHz	
	Control and Out		R _L =1kΩ, R _L =10kΩ, CONTROL/INHIBIT tr=tf=20ns	10	30		mV	

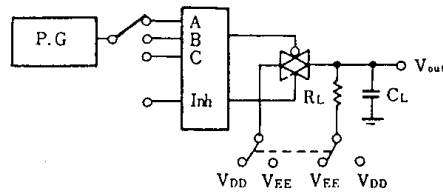
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MEASUREMENT CIRCUITS

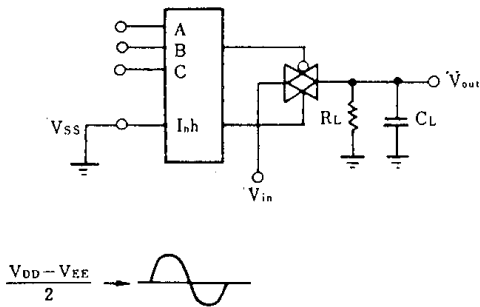
1. Noise Margin



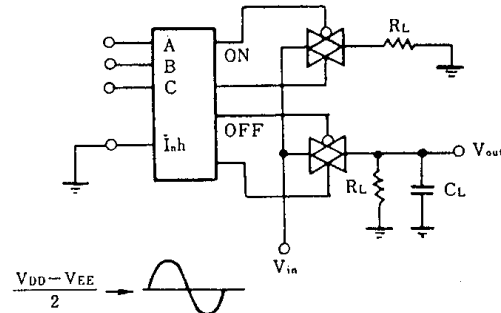
2. Propagation Delay



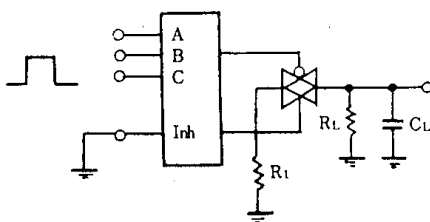
3. Feedthrough



4. Crosstalk (Switch A and B)



5. Crosstalk (Control and Out)



NJU4051B

MEMO

[CAUTION]

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