

SINGLE 8-CHANNEL MULTIPLEXER

■ GENERAL DESCRIPTION

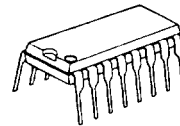
The NJU4051B is a single 8-channel multiplexer with three binary control inputs and an inhibit input.

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

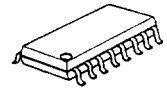
The operating voltage is as wide as 3 to 18V and the quiescent current is as low as 5 μ A max. (at $V_{DD}=5V$).

It is equivalent to RCA CD4051B and Motorola MC14051B.

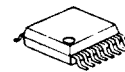
■ PACKAGE OUTLINE



NJU4051BD



NJU4051BM

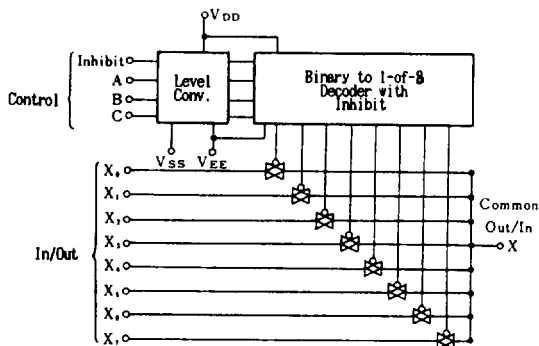


NJU4051BV

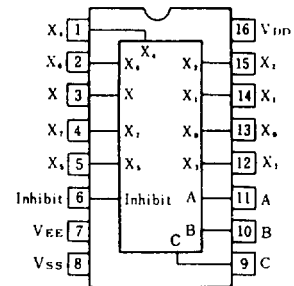
■ FEATURES

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

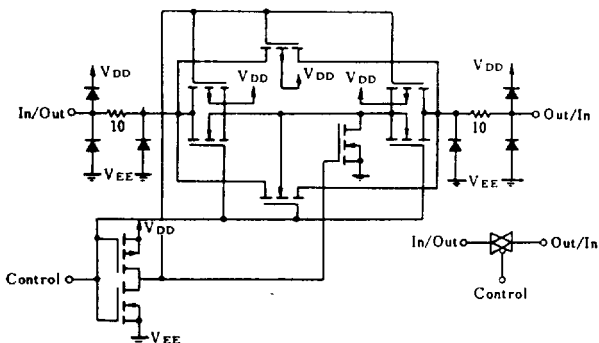
■ BLOCK DIAGRAM



■ 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

 ($T_a=25^{\circ}\text{C}$)

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	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	- 65 ~ + 150	$^{\circ}\text{C}$

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

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■ ELECTRICAL CHARACTERISTICS

• DC Characteristics

 ($V_{SS}=0\text{V}$)

PARAMETER	SYMBOL	CONDITION	V_{DD} (V)	$T_a=-40^{\circ}\text{C}$		$T_a=25^{\circ}\text{C}$			$T_a=85^{\circ}\text{C}$		UNIT
				MIN	MAX	MIN	TYP	MAX	MIN	MAX	
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}	$0 \leq V_{IN} \leq V_{DD}$ $V_{EE}=V_{SS}=0\text{V}$	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, $V_{EE}=V_{SS}=0\text{V}$	5 10 15			15 10 5					Ω
Off-Channel Leakage Current		Each channel $V_{EE}=V_{SS}=0\text{V}$	18	± 1000		± 10	± 100		± 1000		nA
Input Capacitance	C_{IN}	$V_{IN}=0\text{V}$ INH, A, B, C A ₀ to A ₇				5.0 10	7.5				pF
Low Level Input Voltage	V_{IL}	$R_L=10\text{k}\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$ $V_o=1.0\text{V}$ $V_o=1.0\text{V}$ $V_o=1.5\text{V}$	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}	$R_L=10\text{k}\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$ $V_o=4.0\text{V}$ $V_o=9.0\text{V}$ $V_o=13.5\text{V}$	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

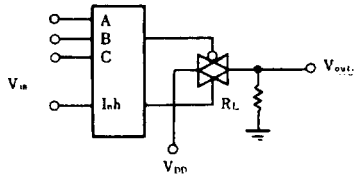
(Ta=25°C, C_L=50pF)

PARAMETER		SYMBOL	CONDITIONS	V _{DD} (V)	MIN	TYP	MAX	UNIT
Propagation Delay Time	SW Input to Output	t _{PLH}	R _L =10kΩ	5 10 15	15 8 5	45 30 20	ns	
		t _{PHL}		5 10 15	15 8 5	45 30 20		
	CONT Input to Output	t _{PLH}		5 10 15	450 200 150	1000 500 400	ns	
		t _{PHL}		5 10 15	450 200 150	1000 500 400		
Output Enable Time		t _{PZH} • t _{PZL}	R _L =10kΩ	5 10 15	600 250 200	1400 700 500	ns	
Output Disable Time		t _{PHZ} • t _{PLZ}		5 10 15	600 250 200	1400 700 500	ns	
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

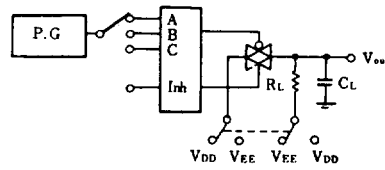


MEASUREMENT CIRCUITS

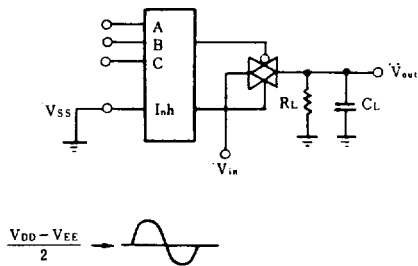
1. Noise Margin



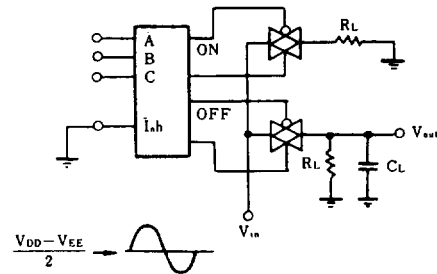
2. Propagation Delay



3. Feedthrough



4. Crosstalk (Switch A and B)



5. Crosstalk (Control and Out)

