SINGLE 8-CHANNEL MULTIPLEXER

■ GENERAL DESCRIPTION

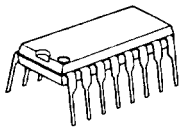
The NJU4051B is a single 8-channel multiplexer with three binary control inputs and an inhibit input.

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

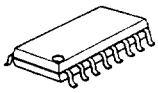
The operating voltage is as wide as 3 to 18V and the quiescent current is as low as 5μA max.(at V_{DD}=5V).

It is equivalent to RCA CD4051B and Motorola MC14051B.

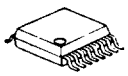
■ PACKAGE OUTLINE



NJU4051BD



NJU4051BM



NJU4051BV

■ FEATURES

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

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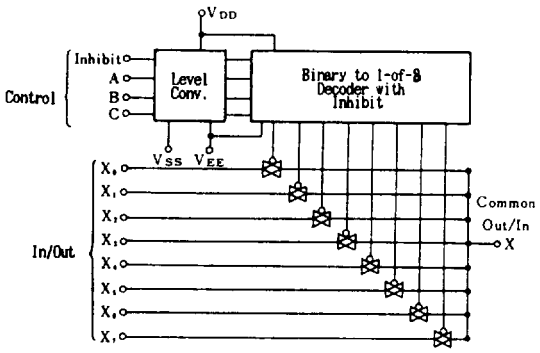
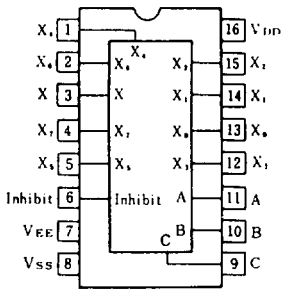
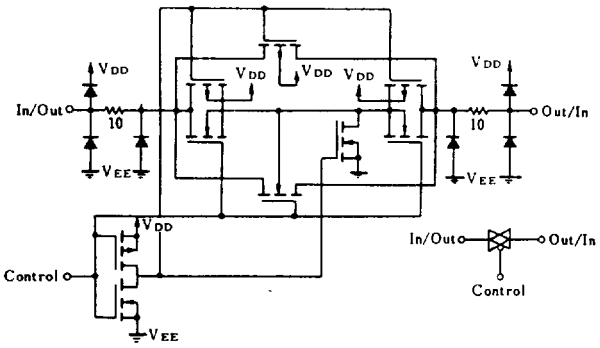
■ BLOCK DIAGRAM



■ 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℃)

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	Vo	- 0.5 ～ V_{DD}+0.5 *	V
Input Current	I_{IN}	± 10	mA
Output Current	Io	± 10	mA
Power Dissipation	P_D	500 (DIP) 200 (DMP) 300 (SSOP)	mW
Operating Temperature Range	Topr	- 40 ～ + 85	℃
Storage Temperature Range	Tstg	- 65 ～ + 150	℃

* 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℃ MIN	Ta=-40℃ MAX	Ta=25℃ MIN	Ta=25℃ TYP	Ta=25℃ MAX	Ta=85℃ MIN	Ta=85℃ MAX	UNIT
Quiescent Current	I_{DD}	No signal, Per Package	5		5			5		150	μA
			10		10			10		300	
			15		20			20		600	
			20		100			100		3000	
On-State Resistance	R_{ON}	$0 \leqq V_{is} \leqq V_{DD}$ $V_{EE}=V_{SS}=0V$	5		500		220	600		800	Ω
			10		210		100	250		300	
			15		140		60	160		200	
On-State Resistance Deviation	ΔR_{ON}	Between 2 channels, $V_{EE}=V_{SS}=0V$	5				15				Ω
			10				10				
			15				5				
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	7.5			pF
							10				
Low Level Input Voltage	V_{IL}	RL=10kΩ SW=V_{DD} $V_{EE}=V_{SS}$ Vo=1.0V	5		1.5		2.25	1.5		1.5	V
		Vo=1.0V	10		3.0		4.50	3.0		3.0	
		Vo=1.5V	15		4.0		6.75	4.0		4.0	
High Level Input Voltage	V_{IH}	RL=10kΩ SW=V_{DD} $V_{EE}=V_{SS}$ Vo=4.0V	5	3.5		3.5	2.75		3.5		V
		Vo=9.0V	10	7.0		7.0	5.50		7.0		
		Vo=13.5V	15	11.0		11.0	8.25		11.0		
Input Current	±I_{IN}	V_{IN}=0 or 18V	18		±0.1			±0.1		±1	μA

■ SWITCHING CHARACTERISTICS

(Ta=25℃, 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		15	45	ns
				10		8	30	
				15		5	20	
		t_{PHL}		5		15	45	
				10		8	30	
				15		5	20	
	CONT Input to Output	t_{PLH}		5		450	1000	ns
				10		200	500	
				15		150	400	
		t_{PHL}		5		450	1000	
				10		200	500	
				15		150	400	
Output Enable Time		t_{PZH} • t_{PZL}	R_L=10kΩ	5		600	1400	ns
				10		250	700	
				15		200	500	
Output Disable Time		t_{PHZ} • t_{PLZ}		5		600	1400	ns
				10		250	700	
				15		200	500	
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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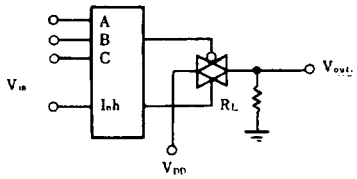
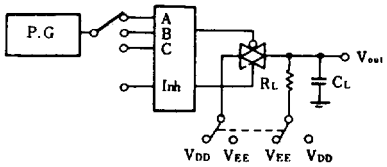
■ MEASUREMENT CIRCUITS

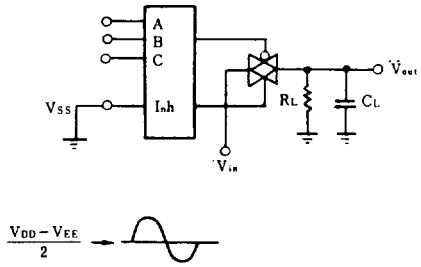
1. Noise Margin



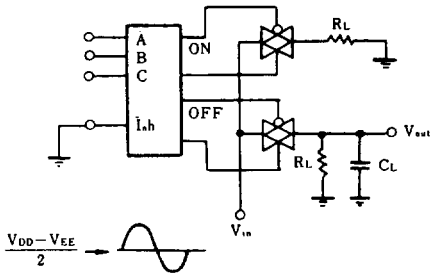
2. Propagation Delay



3. Feedthrough



4. Crosstalk (Switch A and B)



5. Crosstalk (Control and Out)