

DUAL 4-CHANNEL MULTIPLEXER

■ GENERAL DESCRIPTION

The NJU4052B is a dual 4-channel multiplexer with two binary control inputs and an inhibit input.

The two binary control input signals select 1 of 4 pairs of channels to be turned on and connect them to the two outputs.

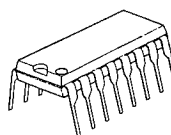
The operating voltage is as wide as 3 to 18V and the quiescent current is as low as 5 μ A max. (at $V_{DD}=5V$).

It is equivalent to RCA CD4052B and Motorola MC14052B.

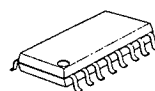
■ FEATURES

- High ON/OFF Output Voltage Ratio --- 65dB Typ.
($R_L=10k\Omega$)
- Low Quiescent Current --- 5 μ A Typ. at $V_{DD}=5V$
- Low Crosstalk between channels --- 80dB Typ.
- Wide Operating Voltage Range. --- 3 ~ 18V
- Linearity in the transfer characteristics.
 $\Delta R_{ON} < 60\Omega$ ($V_{IN}=V_{DD} \sim V_{EE}$, $V_{DD}=15V$)
- Package Outline --- DIP/DMP/SSOP 16
- C-MOS Technology

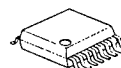
■ PACKAGE OUTLINE



NJU4052BD



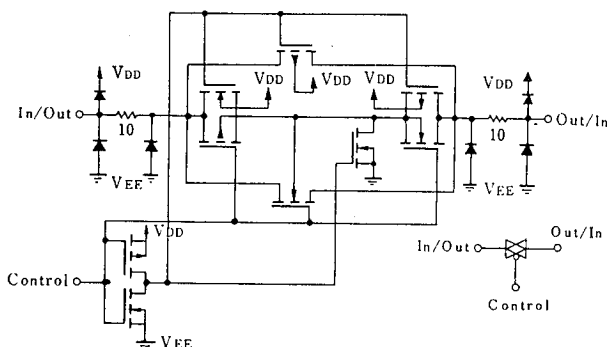
NJU4052BM



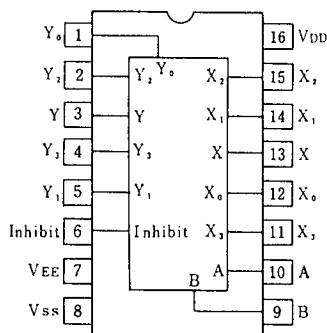
NJU4052BV

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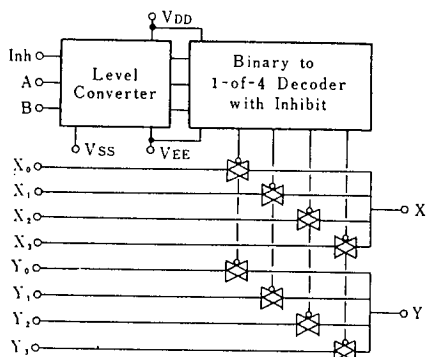
■ BLOCK DIAGRAM



■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



■ TRUTH TABLE

INH	B	A	On Switch	
0	0	0	Y ₀	X ₀
0	0	1	Y ₁	X ₁
0	1	0	Y ₂	X ₂
0	1	1	Y ₃	X ₃
1	x	x	None	

x: Don't Care

ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{DD} - V_{EE}$	- 0.5 ~ + 20	V
Input Voltage(Control Signal)	V_{IN}	$V_{SS}-0.5 \sim V_{DD}+0.5$	V
Input Voltage(Analog Signal)	V_{SIG}	$V_{EE}-0.5 \sim V_{DD}+0.5$	V
Input Current	I_{IN}	± 10	mA
Output Current	I_{OUT}	± 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

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ELECTRICAL CHARACTERISTICS

• DC Characteristics

(V_{SS}=0V)

PARAMETER	SYMBOL	CONDITIONS		V _{DD}	Ta=-40°C		Ta=25°C			Ta=85°C		UNIT
				(V)	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≤V _{IS} ≤V _{DD} V _{EE} =V _{SS} =0V		5 10 15	500 210 140		220 600 100 250 60 160			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 Control Inhibit Switch					5.0 7.5 10					pF
Low Level Input Voltage	V _{IL}	R _L =10kΩ SW=V _{DD} V _{EE} =V _{SS}	V _O =1.0V	5	1.5		1.5			1.5		V
			V _O =1.0V	10	3.0		3.0			3.0		
			V _O =1.5V	15	4.0		4.0			4.0		
High Level Input Voltage	V _{IH}		V _O =4.0V	5	3.5		3.5			3.5		V
			V _O =9.0V	10	7.0		7.0			7.0		
			V _O =13.5V	15	11.0		11.0			11.0		
Input Current	±I _{IN}	V _{IN} =0 or 18V		18	±0.1		±0.1			± 1		μA

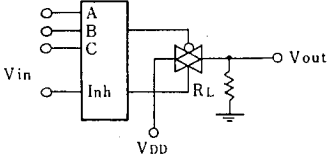
SWITCHING CHARACTERISTICS

(Ta=25°C, CL=50pF)

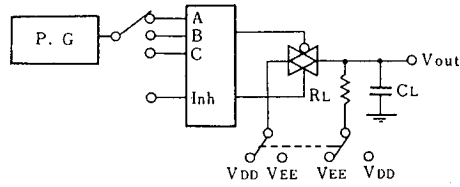
PARAMETER		SYMBOL	CONDITIONS	V _{DD} (V)	MIN	TYP	MAX	UNIT
Propagation Delay Time	SW Input to Output	t _{PLH}	R _L =10kΩ	5	15	45	ns	
				10	8	30		
				15	5	20		
	CONT Input to Output	t _{PHL}		5	15	45	ns	
				10	8	30		
				15	5	20		
	t _{PZH}	5	450	1000	ns			
		10	200	500				
		15	150	400				
Output Enable Time	t _{PHZ}	R _L =10kΩ	5	600	1400	ns		
			10	250	700			
			15	200	500			
Output Disable Time	t _{PLZ}	R _L =10kΩ	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 to B		R _L =1kΩ, V _{IS} =1/2(V _{DD} -V _{SS}) _{P-P}	10	3.0		MHz	
	Control-Out		R _I =1kΩ, R _L =10kΩ, tr=tf=20ns CONTROL/INHIBIT	10	30		mV	

MEASUREMENT CIRCUITS

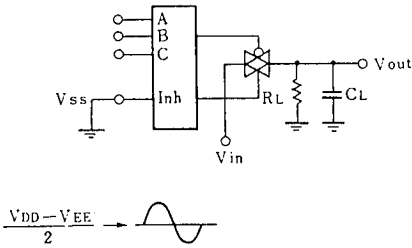
1. Noise Margin



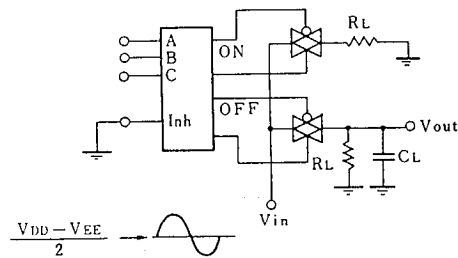
2. Propagation Delay



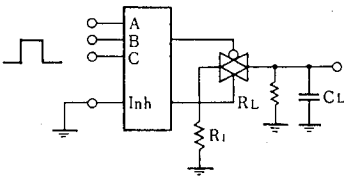
3. Feedthrough



4. Crosstalk (Switch A and B)



5. Crosstalk (Control and Out)



MEMO

[CAUTION]

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