

TRIPLE 2-CHANNEL MULTIPLEXER

■ GENERAL DESCRIPTION

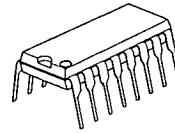
The NJU4053B is a triple 2-channel multiplexer with three independent control inputs and an inhibit input.

The three control input signals select 1 of a pair of channels to be turned on and connect them to the three outputs.

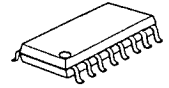
The operating voltage is as wide as 3 to 18V and the quiescent current is as low as $5\mu\text{A}$ max. (at $V_{DD}=5\text{V}$).

It is equivalent to RCA CD4053B and Motorola MC14053B.

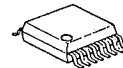
■ PACKAGE OUTLINE



NJU4053BD



NJU4053BM

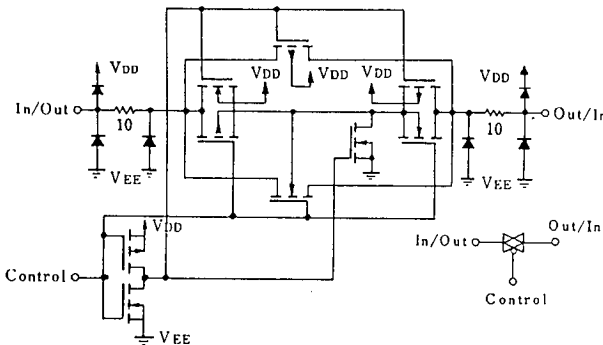


NJU4053BV

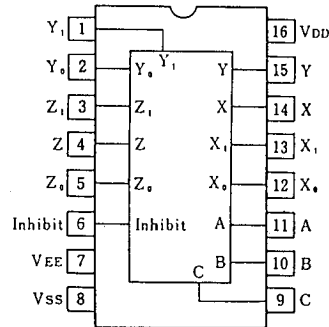
■ FEATURES

- High ON/OFF Output Voltage Ratio
--- 85dB Typ. ($R_L=10\text{k}\Omega$)
- Low Quiescent Current
--- $5\mu\text{A}$ Typ. at $V_{DD}=5\text{V}$
- Low Crosstalk between channels
--- 80dB Typ.
- Wide Operating Voltage
--- 3 ~ 18V
- Linearity in the transfer characteristics.
 $\Delta R_{ON} < 60\Omega$ ($V_{IN}=V_{DD}\sim V_{EE}$, $V_{DD}=15\text{V}$)
- Package Outline
--- DIP/DMP/SSOP 16
- C-MOS Technology

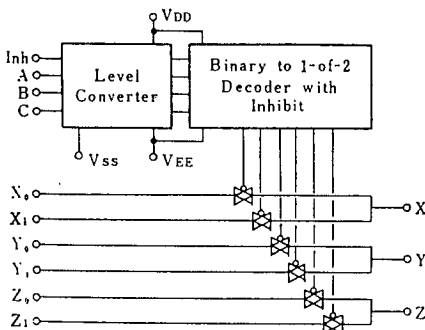
■ EQUIVALENT CIRCUIT



■ PIN CONFIGURATION



■ BLOCK DIAGRAM



■ TRUTH TABLE

INH	C	B	A	On Switch		
0	0	0	0	Z ₀	Y ₀	X ₀
0	0	0	1	Z ₀	Y ₀	X ₁
0	0	1	0	Z ₀	Y ₁	X ₀
0	0	1	1	Z ₀	Y ₁	X ₁
0	1	0	0	Z ₁	Y ₀	X ₀
0	1	0	1	Z ₁	Y ₀	X ₁
0	1	1	0	Z ₁	Y ₁	X ₀
0	1	1	1	Z ₁	Y ₁	X ₁
1	X	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

■ ELECTRICAL CHARACTERISTICS

• DC Characteristics

($V_{SS}=0V$)

PARAMETER	SYMBOL	CONDITIONS	V_{DD} (V)	Ta=-40°C		Ta=25°C			Ta=85°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}	$0 \leq V_{IS} \leq V_{DD}$ $V_{EE}=V_{SS}=0V$	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}	$V_{IN}=0V$ Control Inhibit Switch					5.0 10	7.5			pF
Low Level Input Voltage	V_{IL}	$R_L=10k\Omega$ $SW=V_{DD}$ $V_{EE}=V_{SS}$	$V_O=1.0V$ 5 $V_O=1.0V$ 10 $V_O=1.5V$ 15		1.5 3.0 4.0			1.5 3.0 4.0		1.5 3.0 4.0	V
High Level Input Voltage	V_{IH}		$V_O=4.0V$ 5 $V_O=9.0V$ 10 $V_O=13.5V$ 15		3.5 7.0 11.0		3.5 7.0 11.0		3.5 7.0 11.0		V
Input Current	$\pm I_{IN}$		$V_{IN}=0$ or 18V	18	±0.1		±0.1			± 1	μA

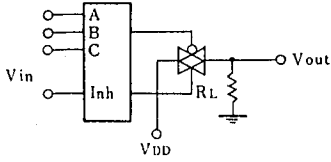
SWITCHING CHARACTERISTICS

(Ta=25°C, CL=50pF)

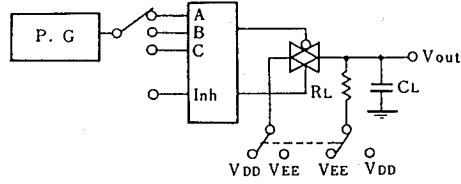
PARAMETER		SYMBOL	CONDITIONS	V _{DD} (V)	MIN	TYP	MAX	UNIT
Propagation Delay Time	SW Input to Output	t _{PLH}	R _L =10kΩ	5	15	45		ns
				10	8	30		
				15	5	20		
	CONT Input to Output	t _{PHL}		5	15	45		ns
				10	8	30		
				15	5	20		
	t _{PZH}	5	450	1000		ns		
		10	200	500				
		15	150	400				
	t _{PZL}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

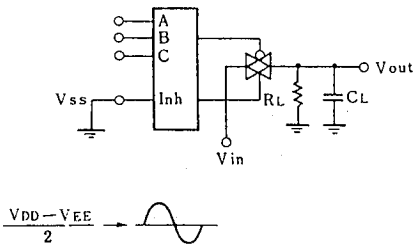
1. Noise Margin



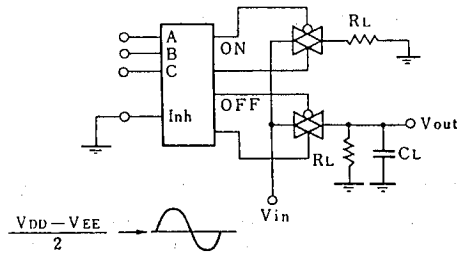
2. Propagation Delay



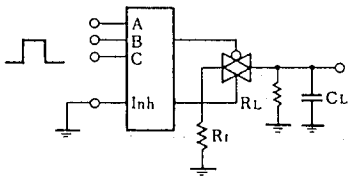
3. Feedthrough



4. Crosstalk (Switch A and B)



5. Crosstalk (Control and Out)



MEMO

[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[NJR:](#)

[NJU4053BV-TE1](#) [NJU4053BV-TE2](#) [NJU4053BM-TE1](#) [NJU4053BM-TE2](#) [NJU4053BV](#) [NJU4053BD](#) [NJU4053BM](#)
[NJU4053BM-T1](#) [NJU4053BM-T2](#) [NJU4066BM-T1](#) [NJU4066BM-T2](#)