TC5023BP

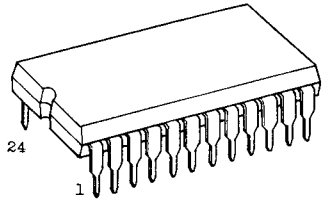
C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

TC5023BP 16-LINE DATA SELECTOR/MULTIPLEXER

TC5023BP is data selector which selects one of 16 input signals $X_0 \sim X_{15}$ according to binary address inputs A, B, C and D.

The data input (X_n) which corresponds to the binary address appears inverted on output $\overline{Z}$.

If STROBE input is set to "H", output $\overline{Z}$ becomes "H" regardless of other inputs.

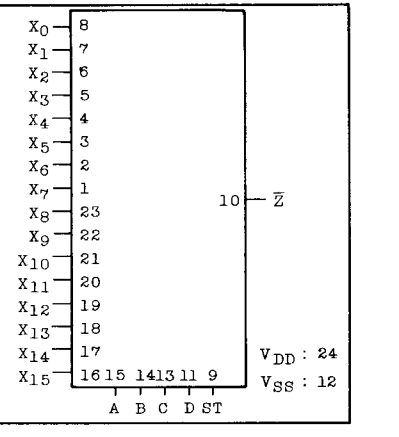


DIP 24 (6D24A-P)

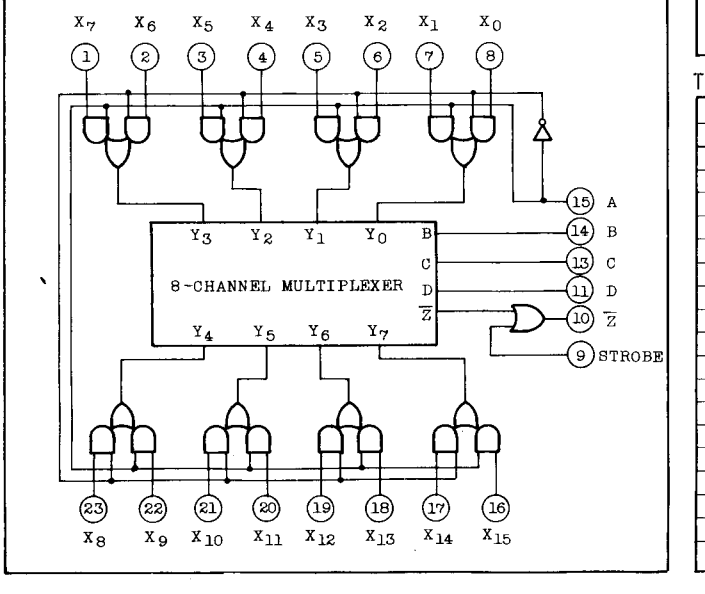
ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{DD}	V_{SS}-0.5 ~ V_{SS}+20	V
Input Voltage	V_{IN}	V_{SS}-0.5 ~ V_{DD}+0.5	V
Output Voltage	V_{OUT}	V_{SS}-0.5 ~ V_{DD}+0.5	V
DC Input Current	I_{IN}	±10	mA
Power Dissipation	P_D	300	mW
Storage Temperature Range	T_{stg}	-65 ~ 150	°C
Lead Temp./Time	T_{sol}	260°C · 10sec	

PIN ASSIGNMENT



LOGIC DIAGRAM



TRUTH TABLE

INPUTS					OUTPUT
D	C	B	A	ST	$\overline{Z}$
*	*	*	*	H	H
L	L	L	L	L	$\overline{X_0}$
L	L	L	H	L	$\overline{X_1}$
L	L	H	L	L	$\overline{X_2}$
L	L	H	H	L	$\overline{X_3}$
L	H	L	L	L	$\overline{X_4}$
L	H	L	H	L	$\overline{X_5}$
L	H	H	L	L	$\overline{X_6}$
L	H	H	H	L	$\overline{X_7}$
H	L	L	L	L	$\overline{X_8}$
H	L	L	H	L	$\overline{X_9}$
H	L	H	L	L	$\overline{X_{10}}$
H	L	H	H	L	$\overline{X_{11}}$
H	H	L	L	L	$\overline{X_{12}}$
H	H	L	H	L	$\overline{X_{13}}$
H	H	H	L	L	$\overline{X_{14}}$
H	H	H	H	L	$\overline{X_{15}}$

* : Don't Care

RECOMMENDED OPERATING CONDITIONS (V_{SS}=0V)

CHARACTERISTIC	SYMBOL		MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}		3	-	18	V
Input Voltage	V_{IN}		0	-	V_{DD}	V
Operating Temp.	Topr		-40	-	85	°C

ELECTRICAL CHARACTERISTICS (V_{SS}=0V)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	V_{DD} (V)	-40°C MIN.	-40°C MAX.	25°C MIN.	25°C TYP.	25°C MAX.	85°C MIN.	85°C MAX.	UNIT
High Level Output Voltage	V_{OH}	$\|I_{OUT}\| < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5	4.95	-	4.95	5.00	-	4.95	-	V
			10	9.95	-	9.95	10.00	-	9.95	-	
			15	14.95	-	14.95	15.00	-	14.95	-	
Low Level Output Voltage	V_{OL}	$\|I_{OUT}\| < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5	-	0.05	-	0.00	0.05	-	0.05	
			10	-	0.05	-	0.00	0.05	-	0.05	
			15	-	0.05	-	0.00	0.05	-	0.05	
High Level Output Current	I_{OH}	V_{OH} = 4.6V V_{OH} = 9.5V V_{OH} = 13.5V $V_{IN} = V_{SS}, V_{DD}$	5	-0.2	-	-0.16		-	-0.12	-	mA
			10	-0.5	-	-0.4		-	-0.3	-	
			15	-1.4	-	-1.2		-	-1.0	-	
Low Level Output Current	I_{OL}	V_{OL} = 0.4V V_{OL} = 0.5V V_{OL} = 1.5V $V_{IN} = V_{SS}, V_{DD}$	5	0.52	-	0.44		-	0.36	-	
			10	1.3	-	1.1		-	0.9	-	
			15	3.6	-	3.0		-	2.4	-	
High Level Input Voltage	V_{IH}	V_{OUT}=0.5V,4.5V V_{OUT}=1.0V,9.0V V_{OUT}=1.5V,13.5V $\|I_{OUT}\| < 1\mu A$	5	3.5	-	3.5	2.75	-	3.5	-	V
			10	7.0	-	7.0	5.5	-	7.0	-	
			15	11.0	-	11.0	8.25	-	11.0	-	
Low Level Input Voltage	V_{IL}	V_{OUT}=0.5V,4.5V V_{OUT}=1.0V,9.0V V_{OUT}=1.5V,13.5V $\|I_{OUT}\| < 1\mu A$	5	-	1.5	-	2.25	1.5	-	1.5	
			10	-	3.0	-	4.5	3.0	-	3.0	
			15	-	4.0	-	6.75	4.0	-	4.0	
Input Current High Level	I_{IH}	V_{IH} = 18V	18	-	0.3	-	10^{-5}	0.3	-	1.0	µA
Input Current Low Level	I_{IL}	V_{IL} = 0V	18	-	-0.3	-	-10^{-5}	-0.3	-	-1.0	
Quiescent Supply Current	I_{DD}	$V_{IN} = V_{SS}, V_{DD}$ *	5	-	20	-	0.005	20	-	150	µA
			10	-	40	-	0.010	40	-	300	
			15	-	80	-	0.015	80	-	600	

* All valid input combinations

SWITCHING CHARACTERISTICS (Ta=25°C, V_{SS}=0V, C_L=50pF)

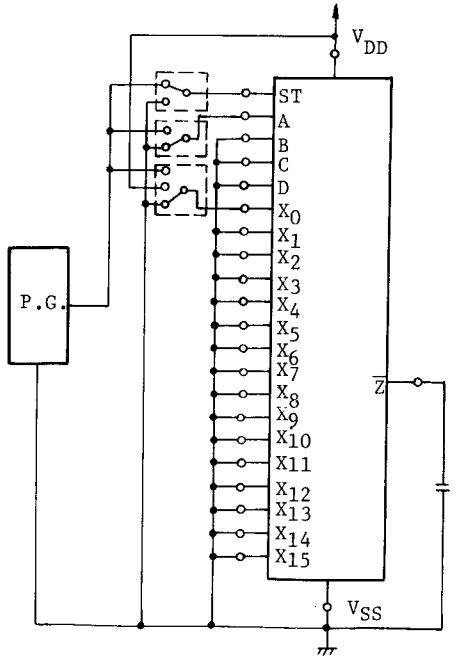
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	V_{DD} (V)	MIN.	TYP.	MAX.	UNIT
Output Rise Time	t_{TLH}		5	-	130	400	ns
			10	-	65	200	
			15	-	50	160	
Output Fall Time	t_{THL}		5	-	100	200	
			10	-	50	100	
			15	-	40	80	

SWITCHING CHARACTERISTICS (Ta=25°C, V_{SS}=0V, C_L=50pF)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	V_{DD}(V)	MIN.	TYP.	MAX.	UNIT
(LOW-HIGH) Propagation Delay Time (X_n,A,B,C,D - $\overline{Z}$)	tpLH		5	-	900	1800	ns
			10	-	370	800	
			15	-	250	550	
(HIGH-LOW) Propagation Delay Time (X_n,A,B,C,D - $\overline{Z}$)	tpHL		5	-	650	1400	
			10	-	260	600	
			15	-	190	400	
(LOW-HIGH) Propagation Delay Time (STROBE - $\overline{Z}$)	tpLH		5	-	280	600	ns
			10	-	130	300	
			15	-	100	250	
(HIGH-LOW) Propagation Delay Time (STROBE - $\overline{Z}$)	tpHL		5	-	800	1600	
			10	-	340	700	
			15	-	230	500	
Input Capacity	C_{IN}	All Inputs		-	5	7.5	pF

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS

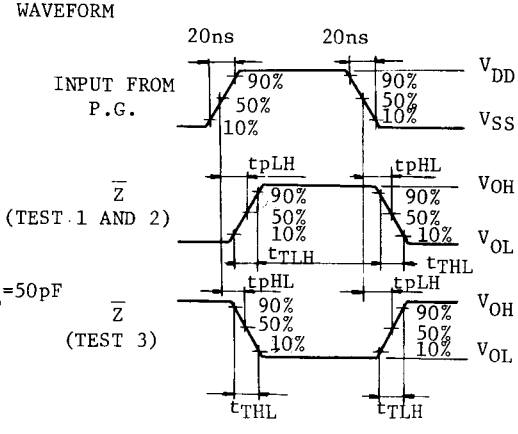
TEST CIRCUIT



TEST CONDITION

TEST	STROBE	A	X0
1	P.G.	V_{SS}	V_{DD}
2	V_{SS}	P.G.	V_{DD}
3	V_{SS}	V_{SS}	P.G.

WAVEFORM



P.G.: PULSE GENERATOR DUTY RATIO = 50%,