

C²MOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC40H242P/F TC40H243P/F

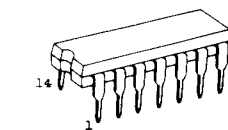
QUAD BIDIRECTIONAL BUS BUFFER

TC40H242 INVERTED 3-STATE OUTPUTS

TC40H243 NONINVERTED 3-STATE OUTPUTS

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{DD}	V _{SS} -0.5 ~ V _{SS} +10	V
Input Voltage	V _{IN}	V _{SS} -0.5 ~ V _{DD} +0.5	V
Output Voltage	V _{OUT}	V _{SS} -0.5 ~ V _{SS} +0.5	V
Input Current	I _{IN}	±10	mA
Power Dissipation	P _D	300 (DIP) / 180 (MFP)	mW
Storage Temperature	T _{stg}	-65 ~ 150	°C
Lead Temp./Time	T _{sol}	260°C • 10 sec	



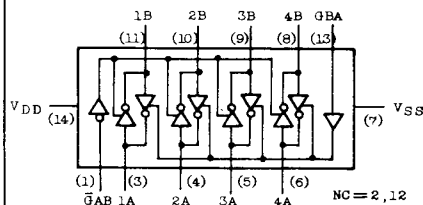
DIP14 (3D14A-P)



MFP14 (P143B-P)

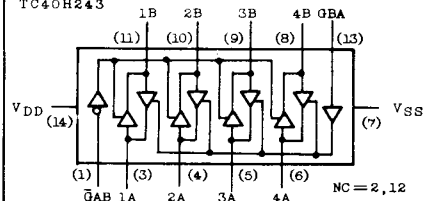
PIN CONNECTION AND TRUTH TABLE

TC40H242



CONTROL INPUTS		DATA PORT STATUS			
$\overline{G}AB$	$\overline{G}BA$	A		B	
L	L	INPUT	L	OUTPUT	H
			H		L
H	H	OUTPUT	L	INPUT	H
			H		L
L	H	Don't use			
H	L	High Impedance			

TC40H243



CONTROL INPUTS		DATA PORT STATUS			
GAB	GBA	A		B	
L	L	INPUT	L	OUTPUT	L
			H		H
H	H	OUTPUT	L	INPUT	L
			H		H
L	H	Don't use			
H	L	High Impedance			

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{DD}	—	2.0	—	8.0	V
Input Voltage	V _{IN}	—	0	—	V _{DD}	V
Operating Temperature	T _{opr}	—	-40	—	85	°C

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ELECTRICAL CHARACTERISTICS ($V_{SS}=0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD} (V)	-40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High Level Output Voltage	V_{OH}	$ I_{OUT} < 1\mu A$ $V_{IN}=V_{SS}, V_{DD}$	5	4.95	-	4.95	5.0	-	4.95	-	V
Low Level Output Voltage	V_{OL}	$ I_{OUT} < 1\mu A$ $V_{IN}=V_{SS}, V_{DD}$	5	-	0.05	-	0.0	0.05	-	0.05	
High Level Output Current	I_{OH}	$V_{OUT}=4.6V$ $V_{IN}=V_{SS}, V_{DD}$	5	-0.95	-	-0.88	-	-	-0.8	-	mA
High Level Output Current	I_{OL}	$V_{OUT}=0.4V$ $V_{IN}=V_{SS}, V_{DD}$	5	4.7	-	4.4	-	-	4.0	-	
Input Voltage	"H" Level	$ I_{OUT} < 1\mu A$ $V_{OUT}=0.5V$	5	4.0	-	4.0	-	-	4.0	-	V
	"L" Level	$V_{OUT}=4.5V$	5	-	1.0	-	-	1.0	-	1.0	
Input Current	"H" Level	I_{IH} $V_{IN}=8.0V$	8	-	0.5	-	10^{-4}	0.5	-	5	μA
	"L" Level	I_{IL} $V_{IN}=0.0V$	8	-	-0.5	-	-10^{-4}	-0.5	-	-5	
Output Disable Current	"H" Level	I_{DH} $V_{DH}=8.0V$	8	-	0.5	-	10^{-4}	0.5	-	5	μA
	"L" Level	I_{DL} $V_{DL}=0.0V$	8	-	-0.5	-	-10^{-4}	-0.5	-	-5	
Quiescent Supply Current	I_{DD}	$*V_{IN}=V_{SS}, V_{DD}$	5	-	5.0	-	0.005	5.0	-	25	μA

*All valid input combinations.

SWITCHING CHARACTERISTICS ($T_a=25^\circ C$, $V_{SS}=0V$, $V_{DD}=5V$, $C_L=50pF$, $R_L=1k\Omega$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	TC40H242			TC40H243			UNIT
				MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Output Rise Time		t_{or}	Fig. 1	-	15	30	-	15	30	ns
Output Fall Time		t_{of}		-	14	30	-	14	30	
Propagation Delay Time	(Low-High)	t_{pLH}	Fig. 1	-	23	35	-	22	35	ns
	(High-Low)	t_{pHL}		-	26	39	-	25	39	
Output Disable Time	"H" Level	t_{pHZ}	Fig. 3	-	32	48	-	32	48	ns
	"L" Level	t_{pLZ}	Fig. 2	-	29	44	-	29	44	
Output Enable Time	"H" Level	t_{pZH}	Fig. 3	-	29	44	-	29	44	
	"L" Level	t_{pZL}	Fig. 2	-	32	48	-	32	48	
Input Capacitance		C_{IN}		-	5		-	5		pF
Output Capacitance		C_{OUT}		-	19		-	19		pF

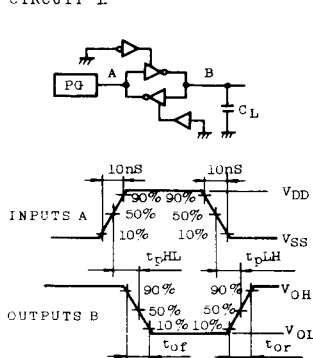
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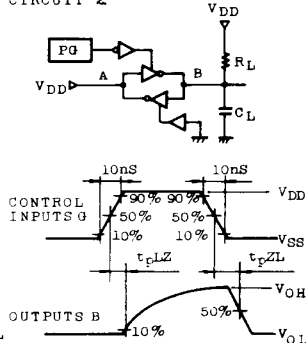
SWITCHING TIME TEST CIRCUIT AND WAVEFORM

TC40H242

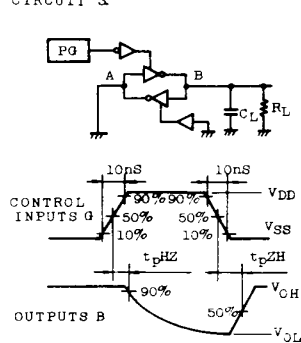
CIRCUIT 1



CIRCUIT 2

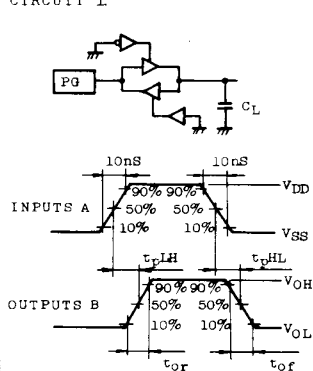


CIRCUIT 3

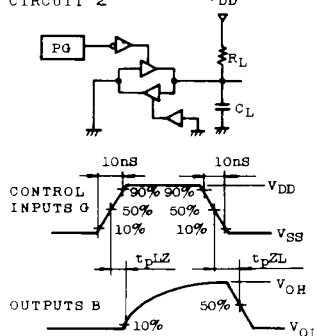


TC40H243

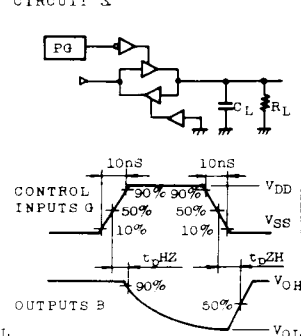
CIRCUIT 1



CIRCUIT 2

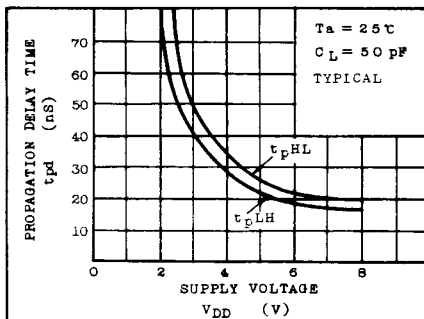
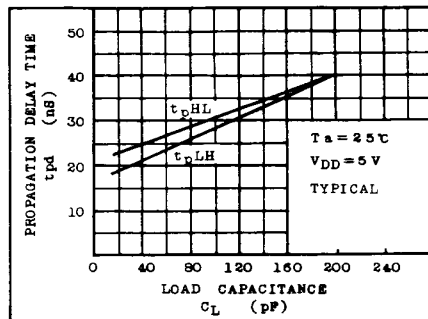
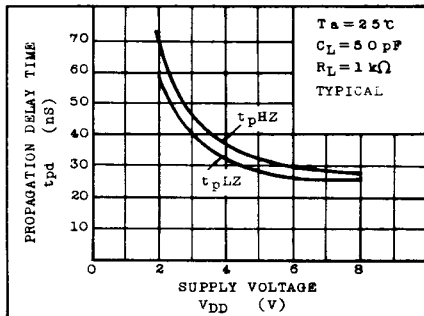
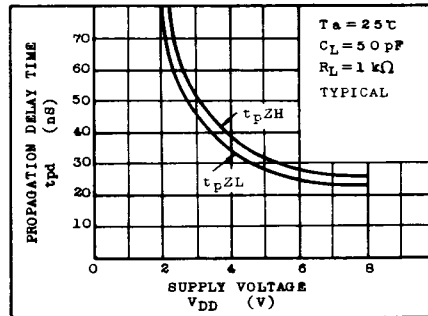
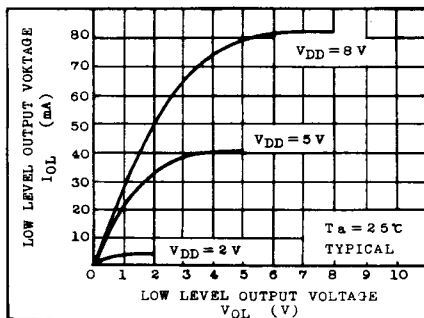


CIRCUIT 3



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 $t_{pd} - V_{DD}$  $t_{pd} - C_L$  $t_{pd} - V_{DD}$  $t_{pd} - V_{DD}$  $I_{OL} - V_{OL}$  $I_{OH} - (V_{DD} - V_{OH})$ 