

TC40H240P/F • TC40H244P/F

TC40H241P/F

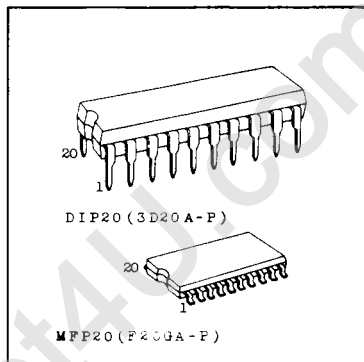
C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

OCTAL BUS BUFFER

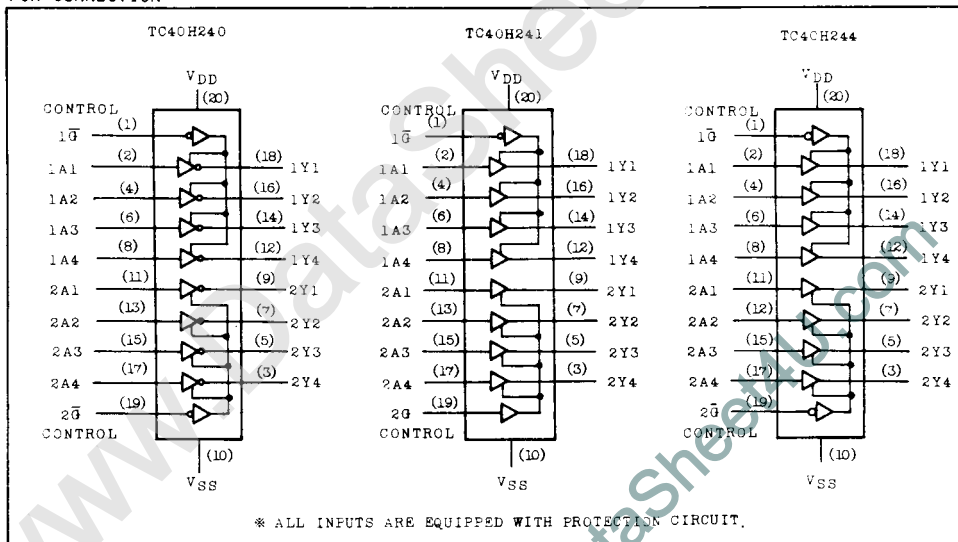
TC40H240 INVERTED 3-STATE OUTPUTS
TC40H241 NONINVERTED 3-STATE OUTPUTS
TC40H244 NONINVERTED 3-STATE OUTPUTS

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	SYMBOL
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 _{DD} +0.5	V
Input Current	I _{IN}	±10	V
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	



PIN CONNECTION



RECOMMENDED OPERATING CONDITIONS (V_{SS}=0.0V)

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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TC40H241P/F

TRUTH TABLE

TC40H240

TC40H241

TC40H244

INPUTS			OUTPUTS		INPUTS			OUTPUTS		INPUTS			OUTPUTS		
CONTROL	DATA	AN	Yn		CONTROL	DATA	AN	Yn		CONTROL	DATA	AN	Yn		
1G	2G	2G	2G	2G	1G	2G	2G	2G	2G	1G	2G	2G	2G	2G	
L	L	L	L	H	L	H	L	L	L	L	L	L	L	L	L
L	L	H	L	L	L	H	H	H	L	L	H	H	L	L	
H	L	X	1Y1~1Y4	Hz	H	H	X	1Y1~1Y4	Hz	H	L	X	1Y1~1Y4	Hz	
L	H	X	2Y1~2Y4	Hz	L	L	X	2Y1~2Y4	Hz	L	H	X	2Y1~2Y4	Hz	
H	H	X	1Y1~1Y4, 2Y1~2Y4	Hz	H	L	X	1Y1~1Y4, 2Y1~2Y4	Hz	H	H	X	1Y1~1Y4, 2Y1~2Y4	Hz	

X-DON'T CARE, Hz-HIGH IMPEDANCE.

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} < 1μA V _{IN} =V _{SS} , V _{DD}	5	4.95	-	4.95	5.0	-	4.95	-	V
Low Level Output Voltage	V _{OL}	I _{OUT} < 1μA V _{IN} =V _{SS} , V _{DD}	5	-	0.05	-	0.0	0.05	-	0.05	V
High Level Output Current	I _{OH}	V _{OUT} =4.6V V _{IN} =V _{SS} , V _{DD}	5	-0.95	-	-0.88	-	-	-0.8	-	mA
Low Level Output Current	I _{OL}	V _{OUT} =0.4V V _{IN} =V _{SS} , V _{DD}	5	4.7	-	4.4	-	-	4.0	-	mA
Input Voltage	"H" Level	V _{IH}	5	4.0	-	4.0	-	-	4.0	-	V
	"L" Level	V _{IL}									
Input Current	"H" Level	I _{IH}	8	-	0.3	-	10 ⁻⁵	0.3	-	1.0	μA
	"L" Level	I _{IL}	8	-	-0.3	-	-10 ⁻⁵	-0.3	-	-1.0	μA
Output Disable Current	"H" Level	I _{DH}	8	-	0.5	-	10 ⁻⁴	0.5	-	5	μA
	"L" Level	I _{DL}	8	-	-0.5	-	-10 ⁻⁴	-0.5	-	-5	μA
Quiescent Supply Current	I _{DD}	*V _{IN} =V _{SS} , V _{DD}	8	-	5.0	-	0.005	5.0	-	25	μA

*All valid input combinations.

SWITCHING CHARACTERISTICS (T_a=25°C, V_{SS}=0V, V_{DD}=5V, C_L=50pF, R_L=1kΩ)

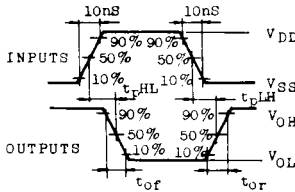
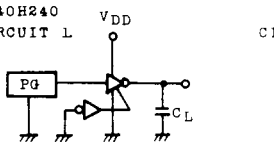
CHARACTERISTIC	SYMBOL	TEST CONDITION	TC40H240			TC40H241			TC40H244			UNIT	
			MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
Output Rise Time	t _{OR}	Fig. 1	-	15	30	-	15	30	-	15	30	ns	
Output Fall Time	t _{OF}		-	15	30	-	15	30	-	15	30	ns	
Propagation Delay Time	(Low-High)	t _{pLH}	Fig. 1	-	24	36	-	24	36	-	24	36	ns
	(High-Low)	t _{pHL}		-	28	42	-	28	42	-	28	42	ns
Output Disable Time	"H" Level	t _{pHZ}	Fig. 3	-	27	45	-	30	45	-	24	45	ns
	"L" Level	t _{pLZ}	Fig. 2	-	27	45	-	27	45	-	27	45	ns
Output Enable Time	"H" Level	t _{pZH}	Fig. 3	-	27	45	-	27	45	-	24	45	ns
	"L" Level	t _{pZL}	Fig. 2	-	30	45	-	27	45	-	30	45	ns
Input Capacitance	C _{IN}		-	5	-	-	5	-	-	5	-	pF	
Output Capacitance	C _{OUT}		-	16	-	-	16	-	-	16	-	pF	

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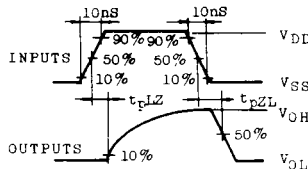
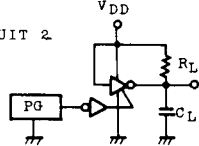
SWITCHING TIME TEST CIRCUIT AND WAVEFORM

TC40H240

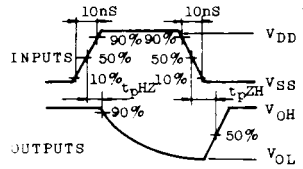
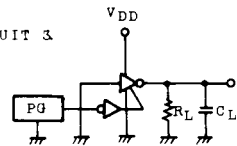
CIRCUIT 1



CIRCUIT 2

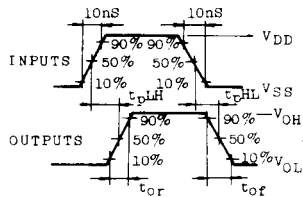
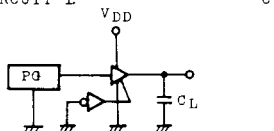


CIRCUIT 3

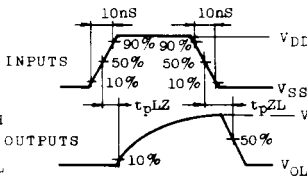
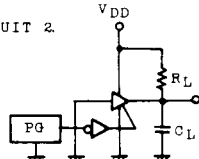


TC40H241

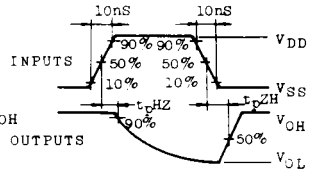
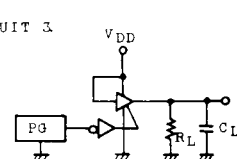
CIRCUIT 1



CIRCUIT 2

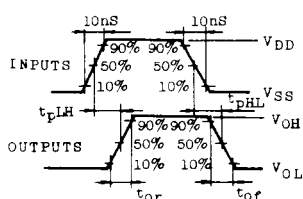
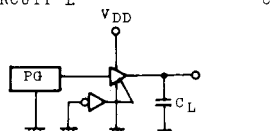


CIRCUIT 3

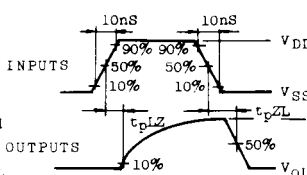
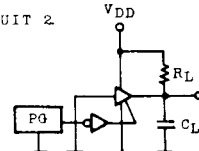


TC40H244

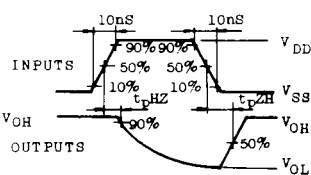
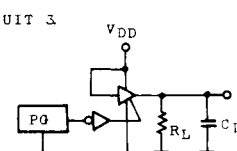
CIRCUIT 1



CIRCUIT 2

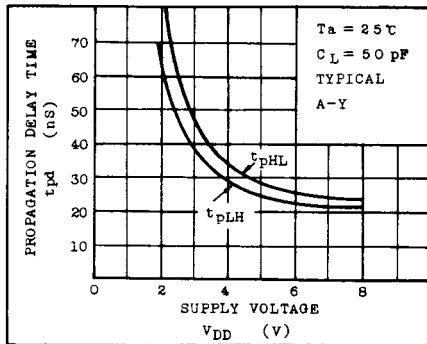


CIRCUIT 3

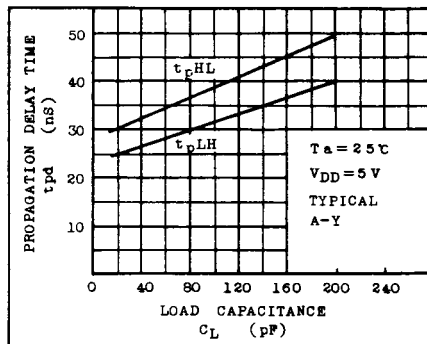


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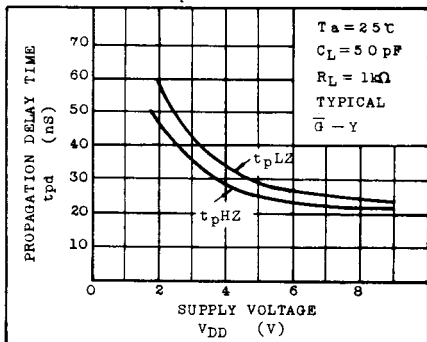
$t_{pd} - V_{DD}$



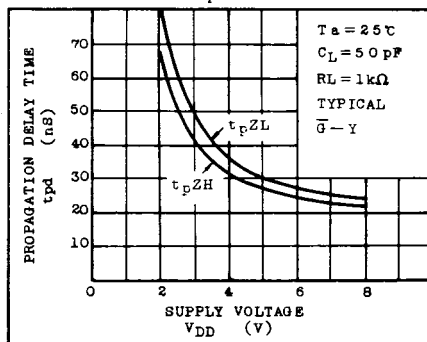
$t_{pd} - C_L$



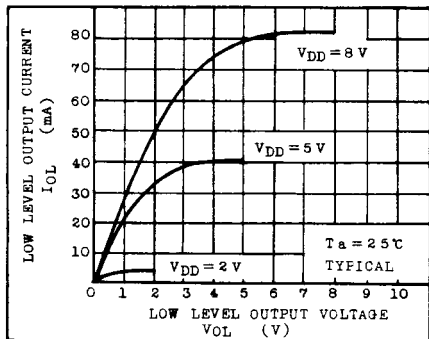
$t_{pd} - V_{DD}$



$t_{pd} - V_{DD}$



$I_{OL} - V_{OL}$



$I_{OH} - (V_{DD} - V_{OH})$

