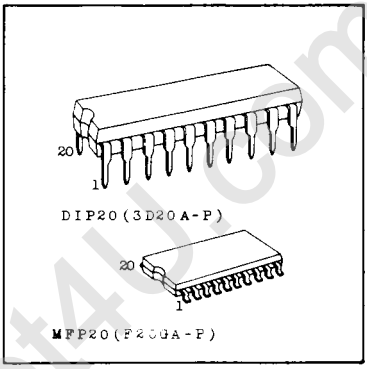
TC40H240P/F • TC40H244P/F

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

TC40H241P/F

OCTAL BUS BUFFER

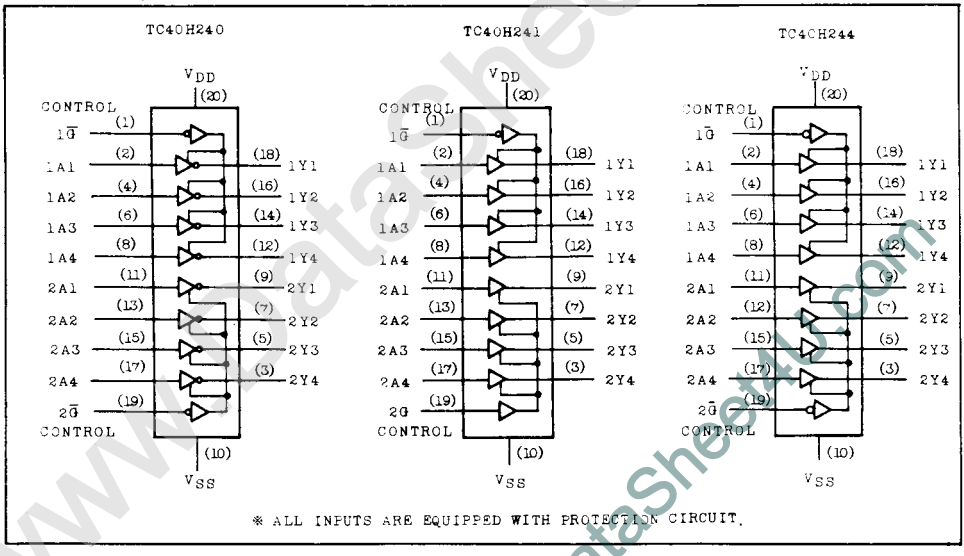
TC40H240 INVERTED 3-STATE OUTPUTS
TC40H241 NONINVERTED 3-STATE OUTPUTS
TC40H244 NONINVERTED 3-STATE OUTPUTS



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



* ALL INPUTS ARE EQUIPPED WITH PROTECTION CIRCUIT.

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	Topr	—	-40	-	85	°C

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TRUTH TABLE

TC40H240

INPUTS			OUTPUTS
CONTROL		DATA	
$\overline{1G}$	$\overline{2G}$	An	Yn
L	L	L	H
L	L	H	L
H	L	X	1Y1~1Y4 Hz
L	H	X	2Y1~2Y4 Hz
H	H	X	1Y1~1Y4, 2Y1~2Y4 Hz

TC40H241

INPUTS			OUTPUTS
CONTROL		DATA	
$\overline{1G}$	2G	An	Yn
L	H	L	L
L	H	H	H
H	H	X	1Y1~1Y4 Hz
L	L	X	2Y1~2Y4 Hz
H	L	X	1Y1~1Y4, 2Y1~2Y4 Hz

TC40H244

INPUTS			OUTPUTS
CONTROL		DATA	
$\overline{1G}$	$\overline{2G}$	An	Yn
L	L	L	L
L	L	H	H
H	L	X	1Y1~1Y4 Hz
L	H	X	2Y1~2Y4 Hz
H	H	X	1Y1~1Y4, 2Y1~2Y4 Hz

X = DON'T CARE. Hz = HIGE 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	
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	-	
Input Voltage	"H" Level	V_{IH}	$\|I_{OUT}\|$<1μA, V_{OUT}=0.5V, V_{OUT}=4.5V	5	4.0	-	4.0	-	-	4.0	-	V
	"L" Level	V_{IL}		5	-	1.0	-	-	1.0	-	1.0	
Input Current	"H" Level	I_{IH}	V_{IN}=8.0V	8	-	0.3	-	10^{-5}	0.3	-	1.0	μA
	"L" Level	I_{IL}	V_{IN}=0.0V	8	-	-0.3	-	-10^{-5}	-0.3	-	-1.0	
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}	*$V_{IN}=V_{SS}, V_{DD}$	8	-	5.0	-	0.005	5.0	-	25	μA

*All valid input combinations.

SWITCHING CHARACTERISTICS (Ta=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_{OR}		-	15	30	-	15	30	-	15	30	
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	
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	
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	
Input Capacitance		C_{IN}		-	5	-	-	5	-	-	5	-	pF
Output Capacitance		C_{OUT}		-	16	-	-	16	-	-	16	-	

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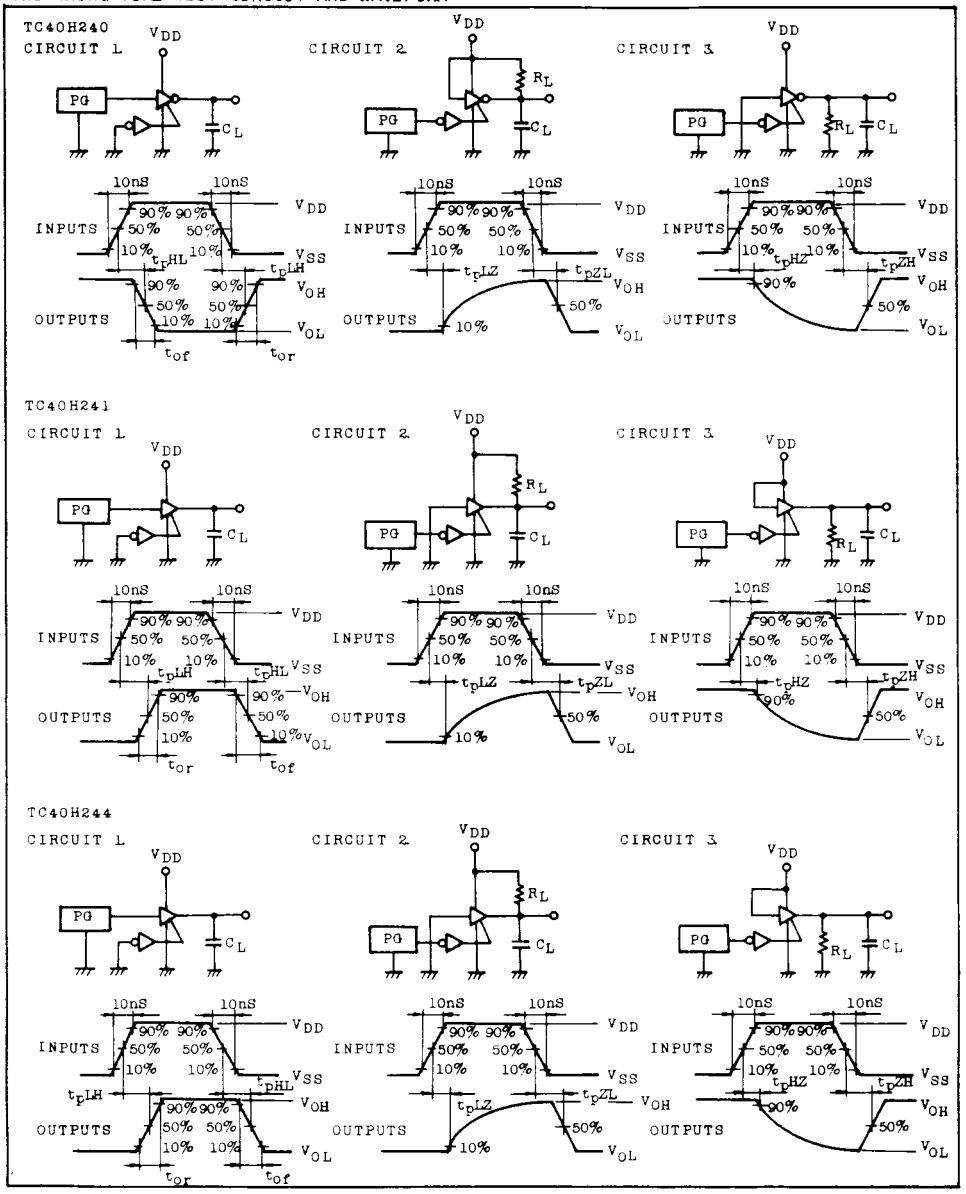
SWITCHING TIME TEST CIRCUIT AND WAVEFORM



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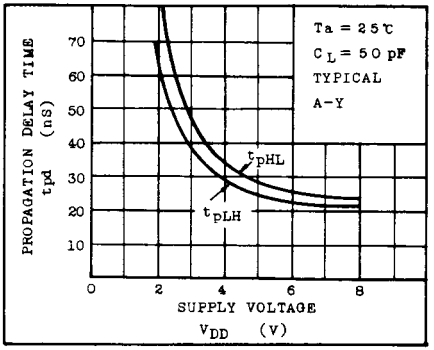
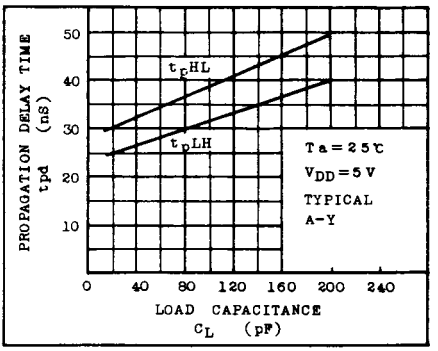
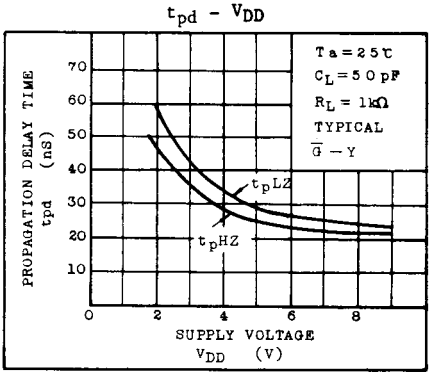
t_{pd} - V_{DD}



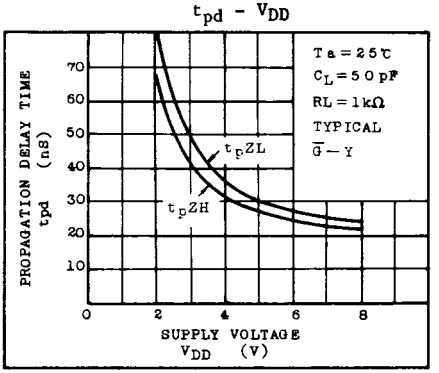
t_{pd} - C_L



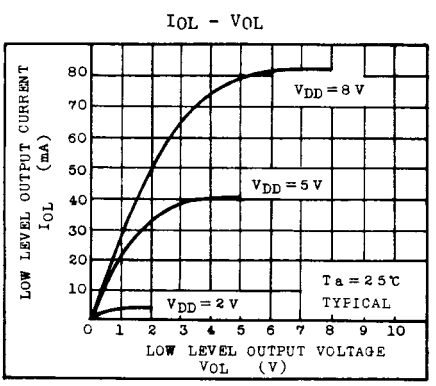
t_{pd} - V_{DD}



t_{pd} - V_{DD}



I_{OL} - V_{OL}



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