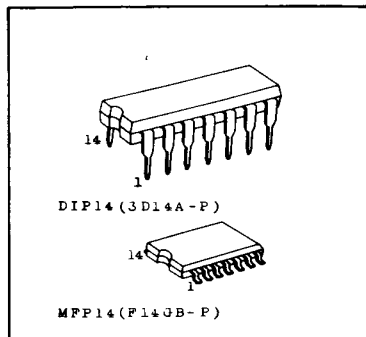
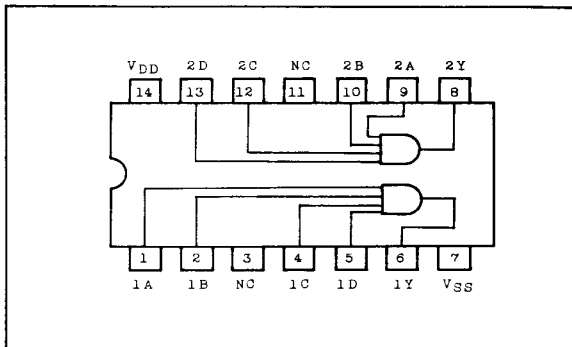


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C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

TC40H021 DUAL 4-INPUT AND GATE

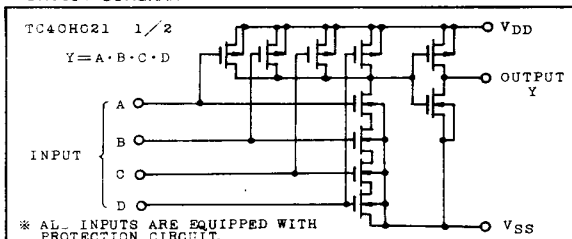
PIN CONNECTION

**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 _{DD} +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	

TRUTH TABLE

INPUTS				OUTPUT
A	B	C	D	Y
L	L	L	L	L
H	L	L	L	L
L	H	L	L	L
H	H	L	L	L
L	L	H	L	L
H	L	H	L	L
L	H	H	L	L
H	H	H	L	L
L	L	L	H	L
H	L	L	H	L
L	H	L	H	L
H	H	L	H	L
L	L	H	H	L
H	L	H	H	L
L	H	H	H	L
H	H	H	H	H

CIRCUIT DIAGRAM**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

TOSHIBA

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ELECTRICAL CHARACTERISTICS ($V_{SS}=0.0V$)

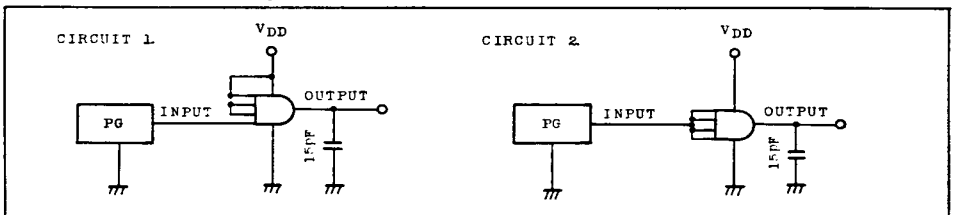
CHARACTERISTIC	SYMBOL	TEST CONDITION	V _{DD} (V)	-40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High Level Output Voltage	V _{OH}	I _{OUT} < 1μA V _{IN} =V _{DD}	5	4.95	-	4.95	5.0	-	4.95	-	V
Low Level Output Voltage	V _{OL}	I _{OUT} < 1μA V _{IN} =V _{SS} , V _{DD}	5	-	0.05	-	0.0	0.05	-	0.05	
High Level Output Current	I _{OH}	V _{OH} =4.6V V _{IN} =V _{DD}	5	-0.52	-	-0.44	-	-	-0.36	-	mA
Low Level Output Current	I _{OL}	V _{OL} =0.4V V _{IN} =V _{SS} , V _{DD}	5	1.4	-	1.1	-	-	0.8	-	
Input Voltage	Level "H"	V _{IH}	5	4.0	-	4.0	-	-	4.0	-	V
	Level "L"	V _{IL}									
Input Current	Level "H"	I _{IH}	8	-	0.3	-	10 ⁻⁵	0.3	-	1.0	μA
	Level "L"	I _{IL}									
Quiescent Supply Current	I _{DD}	*V _{IN} =V _{SS} , V _{DD}	5	-	2.0	-	10 ⁻³	2.0	-	10.0	μA

* All valid input combinations.

SWITCHING CHARACTERISTICS ($T_a=25^\circ C$, $V_{SS}=0.0V$, $C_L=15pF$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V _{DD} (V)	MIN.	TYP.	MAX.	UNIT	
Output Rise Time	t _{or}	Circuit 1	5	-	22	40	ns	
Output Fall Time	t _{of}	Circuit 1	5	-	18	30		
Propagation Delay Time	(Low-High)	t _{PLH}	Circuit 1	5	-	19	30	ns
	(High-Low)	t _{pHL}						
Propagation Delay Time	(Low-High)	t _{pLH}	Circuit 2	5	-	20	30	
	(High-Low)	t _{pHL}						
Input Capacitance	C _{IN}			-	5	-	pF	

SWITCHING TIME TEST CIRCUIT



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SWITCHING TIME TEST WAVEFORM

