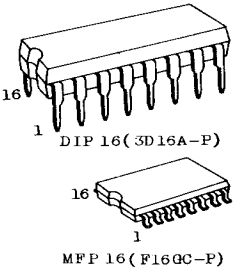
TC5012BP/BF

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

TC5012BP/TC5012BF HEX NON-INVERTING 3-STATE BUFFER

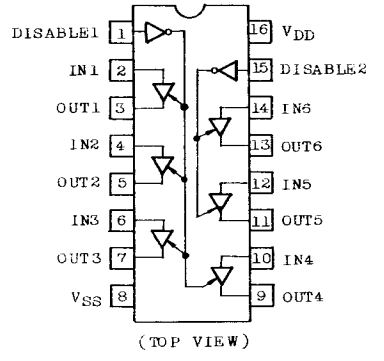
TC5012BP/BF contains six circuits of non-inverting buffers having three state output. Since DISABLE inputs to disable the outputs are provided separately, one common for four circuits and another common for other two circuits, this is suitable for controlling four bit data lines. Large output current enables to directly control one TTL input.



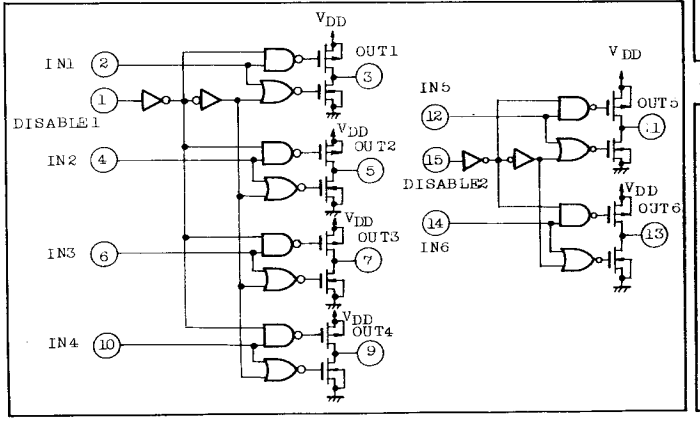
ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{DD}	$V_{SS}-0.5 \sim V_{SS}+20$	V
Input Voltage	V_{IN}	$V_{SS}-0.5 \sim V_{DD}+0.5$	V
Output Voltage	V_{OUT}	$V_{SS}-0.5 \sim V_{DD}+0.5$	V
DC Input Current	I_{IN}	±10	mA
Power Dissipation	P_D	300(DIP)/180(MFP)	mW
Operating Temperature Range	T_A	-40 ~ 85	°C
Storage Temperature Range	T_{stg}	-65 ~ 150	°C
Lead Temp./Time	T_{sol}	260°C · 10 sec	

PIN ASSIGNMENT



CIRCUIT DIAGRAM



TRUTH TABLE

DISABLE INPUT	INPUT	OUTPUT
L	L	L
L	H	H
H	*	HZ

* : DON'T CARE

HZ : HIGH IMPEDANCE

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

CHARACTERISTIC	SYMBOL		MIN.	TYP.	MAX.	UNITS
DC Supply Voltage	V_{DD}		3	-	18	V
Input Voltage	V_{IN}		0	-	V_{DD}	V

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD} (V)	-40°C MIN.	-40°C MAX.	25°C MIN.	25°C TYP.	25°C MAX.	85°C MIN.	85°C MAX.	UNITS
High-Level Output Voltage	V_{OH}	$\|I_{OUT}\|$<1μA	5	4.95	-	4.95	5.00	-	4.95	-	V
		V_{IN}=V_{SS}, V_{DD}	10	9.95	-	9.95	10.00	-	9.95	-	
			15	14.95	-	14.95	15.00	-	14.95	-	
Low-Level Output Voltage	V_{OL}	$\|I_{OUT}\|$<1μA	5	-	0.05	-	0.00	0.05	-	0.05	
		V_{IN}=V_{SS}, V_{DD}	10	-	0.05	-	0.00	0.05	-	0.05	
			15	-	0.05	-	0.00	0.05	-	0.05	
Output High Current	I_{OH}	V_{OH}=4.6V	5	-	-	-		-	-	-	mA
		V_{OH}=2.5V V_{OH}=9.5V	5	-1.4	-	-1.25		-	-1.0	-	
		V_{OH}=13.5V	10	-1.4	-	-1.25		-	-3.0	-	
		V_{IN}=V_{SS}, V_{DD}	15	-4.0	-	-3.75		-	-3.0	-	
Output Low Current	I_{OL}	V_{OL}=0.4V	5	3.5	-	3.2		-	2.5	-	
		V_{OL}=0.5V V_{OL}=1.5V	10	6.0	-	5.0		-	3.6	-	
		V_{IN}=V_{SS}, V_{DD}	15	26.0	-	24.0		-	18.0	-	
Input High Voltage	V_{IH}	V_{OUT}=0.5V, 4.5V	5	3.5	-	3.5	2.75	-	3.5	-	V
		V_{OUT}=1.0V, 9.0V V_{OUT}=1.5V,13.5V	10	7.0	-	7.0	5.5	-	7.0	-	
		$\|I_{OUT}\|$<1μA	15	11.0	-	11.0	8.25	-	11.0	-	
Input Low Voltage	V_{IL}	V_{OUT}=0.5V, 4.5V	5	-	1.5	-	2.25	1.5	-	1.5	
		V_{OUT}=1.0V, 9.0V V_{OUT}=1.5V,13.5V	10	-	3.0	-	4.5	3.0	-	3.0	
		$\|I_{OUT}\|$<1μA	15	-	4.0	-	6.75	4.0	-	4.0	
Input Current "H" Level	I_{IH}	V_{IH}=18V	18	-	0.3	-	10^{-5}	0.3	-	1.0	μA
Input Current "L" Level	I_{IL}	V_{IL}=0V	18	-	-0.3	-	-10^{-5}	-0.3	-	-1.0	
3-State Output Leakage Current "H" Level	I_{DH}	V_{OUT}=18V	18	-	0.5	-	10^{-4}	0.5	-	30	
3-State Output Leakage Current "L" Level	I_{DL}	V_{OUT}=0V	18	-	-0.5	-	-10^{-4}	-0.5	-	-30	
Quiescent Device Current	I_{DD}	V_{IN}=V_{SS},V_{DD} *	5	-	4.0	-	0.002	4.0	-	30	
			10	-	8.0	-	0.004	8.0	-	60	
			15	-	16.0	-	0.008	16.0	-	120	

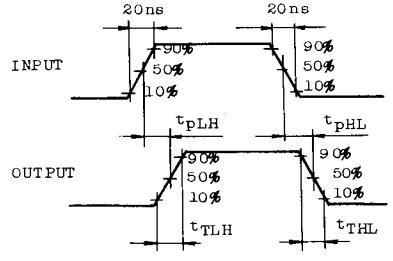
* All valid input combinations.

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD}(V)	MIN.	TYP.	MAX.	UNITS
Output Transition Time (Low to High)	t_{TLH}		5	-	130	400	ns
			10	-	65	200	
			15	-	50	100	
Output Transition Time (High to Low)	t_{THL}		5	-	70	200	
			10	-	40	100	
			15	-	35	80	
Propagation Delay Time (IN - OUT)	t_{pLH}		5	-	320	430	
			10	-	150	220	
			15	-	110	200	
Propagation Delay Time (IN - OUT)	t_{pHL}		5	-	280	380	
			10	-	130	220	
			15	-	100	200	
Three State Disable Time (DISABLE - OUT)	t_{pHZ}	R_L=1kΩ	5	-	320	500	
			10	-	280	450	
			15	-	250	400	
Three State Disable Time (DISABLE - OUT)	t_{pLZ}	R_L=1kΩ	5	-	420	600	
			10	-	320	500	
			15	-	270	450	
Three State Disable Time (DISABLE - OUT)	t_{pZH}	R_L=1kΩ	5	-	280	400	
			10	-	140	200	
			15	-	120	180	
Three State Disable Time (DISABLE - OUT)	t_{pZL}	R_L=1kΩ	5	-	300	450	
			10	-	150	225	
			15	-	130	200	
Input Capacitance	C_{IN}			-	7.5	15	pF

WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

WAVEFORM 1



WAVEFORM 2