

TC4502BP

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

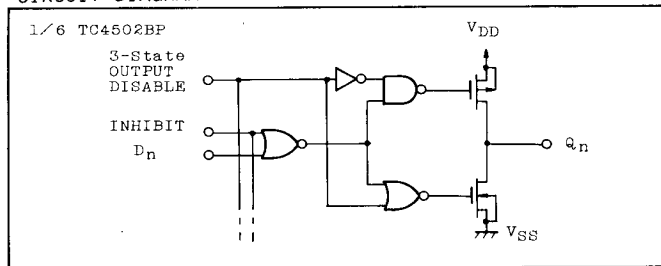
TC4502BP STROBED HEX INVERTER/BUFFER

The TC4502BP is a strobed hex inverter/buffer with 3-state output. When DISABLE input is set to "H" level, six outputs become high impedance independently of the other inputs/when DISABLE input is set to "L" level and INHIBIT input "H" level, all the outputs go to "L" level. Further, since each output is capable of directly driving one standard TTL, the TC4502BP is suited for a bus interface, a data transmission circuit, a multiplexer, etc.

MAXIMUM RATINGS

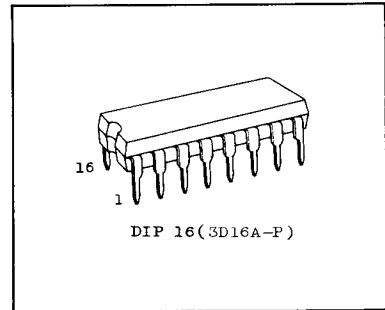
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V _{DD}	V _{SS} -0.5 ~ V _{SS} +20	V
Input Voltage	V _{IN}	V _{SS} -0.5 ~ V _{DD} +0.5	V
Output Voltage	V _{OUT}	V _{SS} -0.5 ~ V _{DD} +0.5	V
DC Input Current	I _{IN}	±10	mA
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _A	-40 ~ 85	°C
Storage Temperature Range	T _{stg}	-65 ~ 150	°C
Lead Temp./Time	T _{sol}	260°C · 10 sec	

CIRCUIT DIAGRAM

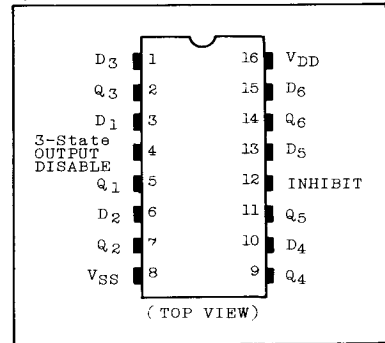


TRUTH TABLE

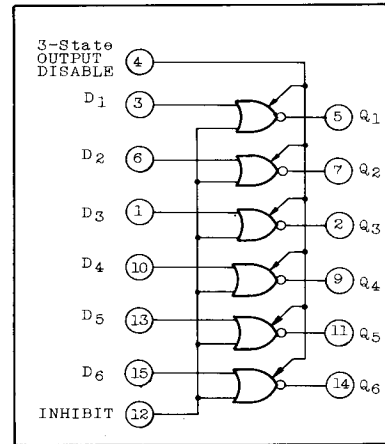
INPUTS			OUTPUT	HZ: High impedance * : Don't care
DISABLE	INHIBIT	D _n	Q _n	
H	*	*	HZ	
L	H	*	L	
L	L	L	H	
L	L	H	L	



PIN ASSIGNMENT



LOGIC DIAGRAM



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

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

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

CHARACTERISTIC	SYM-BOL	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	5.00	-	4.95	-	V	
			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 V _{IN} =V _{SS} , V _{DD}	5	-	0.05	-	0.00	0.05	-	0.05	V	
			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 V _{OH} =2.5V V _{OH} =9.5V V _{OH} =13.5V V _{IN} =V _{SS} , V _{DD}	5	-0.73	-	-0.65	-1.4	-	-0.58	-	mA	
			5	-2.4	-	-2.1	-1.3	-	-1.9	-		
			10	-1.8	-	-1.65	-3.2	-	-1.35	-		
			15	-4.8	-	-4.3	-1.1	-	-3.5	-		
Output Low Current	I _{OL}	V _{OL} =0.4V V _{OL} =0.5V V _{OL} =1.5V V _{IN} =V _{SS} , V _{DD}	5	3.8	-	3.2	7.3	-	2.9	-	mA	
			10	9.6	-	8.0	1.7	-	6.6	-		
			15	25.0	-	24.0	5.7	-	20.0	-		
Input High Voltage	V _{IH}	V _{OUT} =0.5V, 4.5V V _{OUT} =1.0V, 9.0V V _{OUT} =1.5V, 13.5V I _{OUT} < 1μA	5	3.5	-	3.5	2.75	-	3.5	-	V	
			10	7.0	-	7.0	5.5	-	7.0	-		
			15	11.0	-	11.0	8.25	-	11.0	-		
Input Low Voltage	V _{IL}	V _{OUT} =0.5V, 4.5V V _{OUT} =1.0V, 9.0V V _{OUT} =1.5V, 13.5V I _{OUT} < 1μA	5	-	1.5	-	2.25	1.5	-	1.5	V	
			10	-	3.0	-	4.5	3.0	-	3.0		
			15	-	4.0	-	6.75	4.0	-	4.0		
Input Current	"H" Level	I _{IH}	V _{IH} =0V	18	-	0.1	-	10 ⁻⁵	0.1	-	1.0	μA
	"L" Level	I _{IL}	V _{IL} =0V	18	-	-0.1	-	-10 ⁻⁵	-0.1	-	-1.0	

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

CHARACTERISTIC		SYM-BOL	TEST CONDITION	V _{DD} (V)	-40°C		25°C			85°C		UNIT
					MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
3-State Output Leakage Current	"H" Level	I _{DH}	V _{OUT} =18V	18	-	0.4	-	10 ⁻⁴	0.4	-	12	μA
	"L" Level	I _{DL}	V _{OUT} =0V	18	-	-0.4	-	-10 ⁻⁴	-0.4	-	-12	
Quiescent Device Current		I _{DD}	V _{IN} =V _{SS} , V _{DD} *	5	-	1	-	0.002	1	-	30	μA
				10	-	2	-	0.004	2	-	60	
				15	-	4	-	0.008	4	-	120	

* All valid input combinations.

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	V _{DD} (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (Low to High)	t _{TLH}		5	-	80	200	ns
			10	-	40	100	
			15	-	30	80	
Output Transition Time (High to Low)	t _{THL}		5	-	35	80	ns
			10	-	15	40	
			15	-	10	30	
Propagation Delay Time (DATA, INHIBIT - Q)	t _{pLH}		5	-	200	400	ns
			10	-	80	180	
			15	-	60	130	
Propagation Delay Time (DATA, INHIBIT - Q)	t _{pHL}		5	-	135	270	ns
			10	-	55	110	
			15	-	40	80	
Three State Disable Time (DISABLE - Q)	t _{pHZ}	R _L =1kΩ	5	-	65	120	ns
			10	-	30	60	
			15	-	25	50	
Three State Disable Time (DISABLE - Q)	t _{pZH}	R _L =1kΩ	5	-	80	220	ns
			10	-	30	100	
			15	-	20	80	
Three State Disable Time (DISABLE - Q)	t _{pLZ}	R _L =1kΩ	5	-	100	250	ns
			10	-	50	130	
			15	-	40	110	

DYNAMIC ELECTRICAL CHARACTERISTICS (Ta=25°C, VSS=0V, CL=50pF)

CHARACTERISTIC	SYMBOL	TEST CONDITION	VDD(V)	MIN.	TYP.	MAX.	UNIT
Three State Disable Time (DISABLE - Q)	t _{pZL}	R _L =1kΩ	5	-	80	250	ns
			10	-	30	110	
			15	-	20	80	
Input Capacitance	C _{IN}			-	5	7.5	pF

WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

