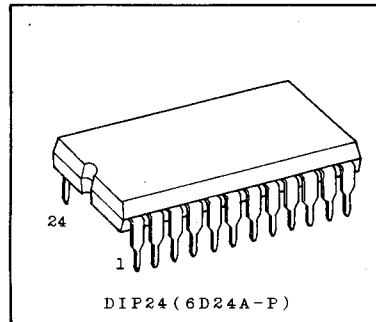


## TC4508BP DUAL 4-BIT LATCH

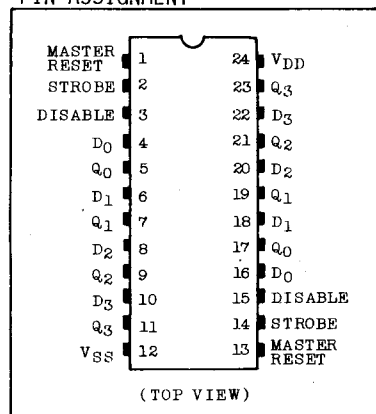
TC4508BP contains two independent circuits of latches having output disable function and clear function. When STROBE input is "H", the data input appears at the output as it is and if STROBE input is changed from "H" to "L", the output retains the data input existed at the time of falling edge of STROBE. When STROBE is "L", the outputs are not affected by DATA inputs. If RESET input is set to "H", Q outputs are cleared to "L" level regardless of STROBE. If DISABLE input is set to "H", Q outputs have high impedance regardless of other inputs.



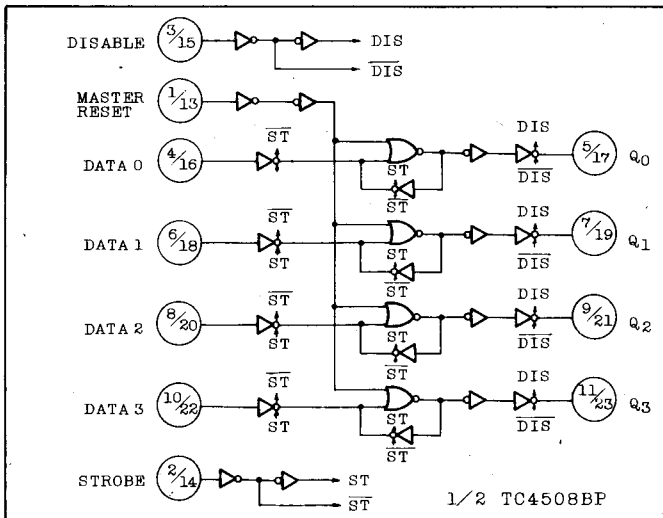
### ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V <sub>DD</sub>	V <sub>SS</sub> -0.5~V <sub>SS</sub> +20	V
Input Voltage	V <sub>IN</sub>	V <sub>SS</sub> -0.5~V <sub>DD</sub> +0.5	V
Output Voltage	V <sub>OUT</sub>	V <sub>SS</sub> -0.5~V <sub>DD</sub> +0.5	V
DC Input Current	I <sub>IN</sub>	±10	mA
Power Dissipation	P <sub>D</sub>	300	mW
Operating Temperature Range	T <sub>A</sub>	-40~85	°C
Storage Temperature Range	T <sub>stg</sub>	-60~150	°C
Lead Temp./Time	T <sub>sol</sub>	260°C · 10sec	

### PIN ASSIGNMENT



### LOGIC DIAGRAM



### TRUTH TABLE

RESET	STROBE	DISABLE	DATA INPUTS				OUTPUTS			
			D <sub>0</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Q <sub>0</sub>	Q <sub>1</sub>	Q <sub>2</sub>	Q <sub>3</sub>
*	*	H	*	*	*	*	HZ			
H	*	L	*	*	*	*	L	L	L	L
L	L	L	*	*	*	*	LATCHED			
L	H	L	A	B	C	D	A	B	C	D

\* : Don't Care  
HZ : High Impedance

## RECOMMENDED OPERATING CONDITIONS (V<sub>SS</sub>=0V)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
DC Supply Voltage	V <sub>DD</sub>	3	-	18	V
Input Voltage	V <sub>IN</sub>	0	-	V <sub>DD</sub>	V

## STATIC ELECTRICAL CHARACTERISTICS (V<sub>SS</sub>=0V)

CHARACTERISTIC	SYM-BOL	TEST CONDITION	V <sub>DD</sub> (V)	-40°C		25°C			85°C		UNIT	
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
High-Level Output Voltage	V <sub>OH</sub>	I <sub>OUT</sub>   < 1μA V <sub>IN</sub> =V <sub>SS</sub> , V <sub>DD</sub>	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 <sub>OL</sub>	I <sub>OUT</sub>   < 1μA V <sub>IN</sub> =V <sub>SS</sub> , V <sub>DD</sub>	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 <sub>OH</sub>	V <sub>OH</sub> =4.6V	5	-0.61	-	-0.51	-1.0	-	-0.42	-	mA	
		V <sub>OH</sub> =2.5V	5	-2.5	-	-2.1	-4.0	-	-1.7	-		
		V <sub>OH</sub> =9.5V	10	-1.5	-	-1.3	-2.2	-	-1.1	-		
		V <sub>OH</sub> =13.5V	15	-4.0	-	-3.4	-9.0	-	-2.8	-		
		V <sub>IN</sub> =V <sub>SS</sub> , V <sub>DD</sub>										
Output Low Current	I <sub>OL</sub>	V <sub>OL</sub> =0.4V	5	0.61	-	0.51	1.5	-	0.42	-	mA	
		V <sub>OL</sub> =0.5V	10	1.5	-	1.3	3.8	-	1.1	-		
		V <sub>OL</sub> =1.5V	15	4.0	-	3.4	15.0	-	2.8	-		
		V <sub>IN</sub> =V <sub>SS</sub> , V <sub>DD</sub>										
Input High Voltage	V <sub>IH</sub>	V <sub>OUT</sub> =0.5V, 4.5V	5	3.5	-	3.5	2.75	-	3.5	-	V	
		V <sub>OUT</sub> =1.0V, 9.0V	10	7.0	-	7.0	5.5	-	7.0	-		
		V <sub>OUT</sub> =1.5V, 13.5V	15	11.0	-	11.0	8.25	-	11.0	-		
		I <sub>OUT</sub>   < 1μA										
Input Low Voltage	V <sub>IL</sub>	V <sub>OUT</sub> =0.5V, 4.5V	5	-	1.5	-	2.25	1.5	-	1.5	V	
		V <sub>OUT</sub> =1.0V, 9.0V	10	-	3.0	-	4.5	3.0	-	3.0		
		V <sub>OUT</sub> =1.5V, 13.5V	15	-	4.0	-	6.75	4.0	-	4.0		
		I <sub>OUT</sub>   < 1μA										
Input Current	"H" Level	I <sub>IH</sub>	V <sub>IH</sub> =18V	18	-	0.1	-	10 <sup>-5</sup>	0.1	-	1.0	μA
	"L" Level	I <sub>IL</sub>	V <sub>IL</sub> =0V	18	-	-0.1	-	-10 <sup>-5</sup>	-0.1	-	-1.0	

STATIC ELECTRICAL CHARACTERISTICS (V<sub>SS</sub>=0V)

CHARACTERISTIC	SYM-BOL	TEST CONDITION	V <sub>DD</sub> (V)	-40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
3-State Output Leakage Current	"H" Level	I <sub>DH</sub> V <sub>OUT</sub> =18V	18	-	0.4	-	10 <sup>-4</sup>	0.4	-	12	μA
	"L" Level	I <sub>DL</sub> V <sub>OUT</sub> =0V	18	-	-0.4	-	-10 <sup>-4</sup>	-0.4	-	-12	
Quiescent Device Current	I <sub>DD</sub>	V <sub>IN</sub> =V <sub>SS</sub> , V <sub>DD</sub> *	5	-	5	-	0.005	5	-	150	μA
			10	-	10	-	0.010	10	-	300	
			15	-	20	-	0.015	20	-	600	

\* All valid input combinations.

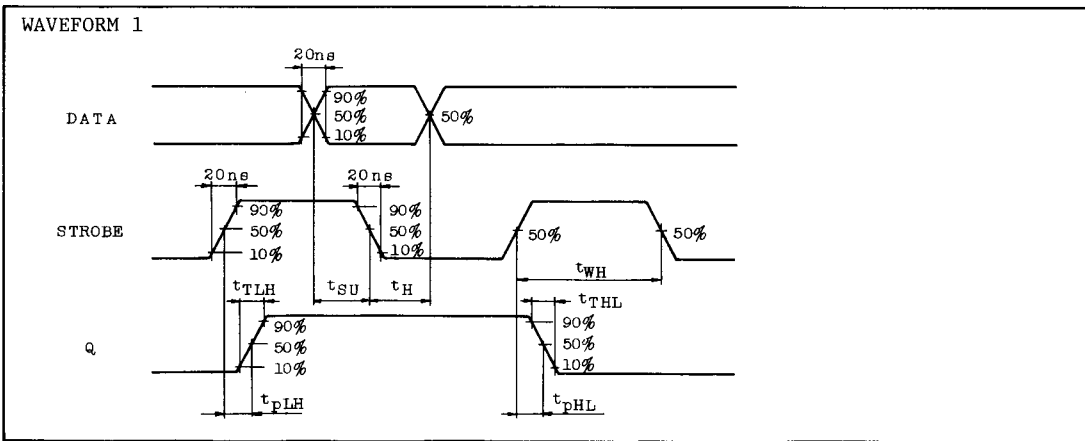
DYNAMIC ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C, V<sub>SS</sub>=0V, C<sub>L</sub>=50pF)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>DD</sub> (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (Low to High)	t <sub>TLH</sub>		5	-	80	200	ns
			10	-	50	100	
			15	-	40	80	
Output Transition Time (High to Low)	t <sub>THL</sub>		5	-	80	200	ns
			10	-	50	100	
			15	-	40	80	
Propagation Delay Time (STROBE - Q)	t <sub>pLH</sub> t <sub>pHL</sub>		5	-	180	360	ns
			10	-	75	150	
			15	-	55	110	
Propagation Delay Time (DATA - Q)	t <sub>pLH</sub> t <sub>pHL</sub>		5	-	160	320	ns
			10	-	65	130	
			15	-	45	90	
Propagation Delay Time (RESET - Q)	t <sub>pLH</sub> t <sub>pHL</sub>		5	-	160	320	ns
			10	-	65	130	
			15	-	45	90	
Three State Disable Time (DISABLE - Q)	t <sub>pHZ</sub>	R <sub>L</sub> =1kΩ	5	-	45	170	ns
			10	-	25	100	
			15	-	20	70	
Three State Disable Time (DISABLE - Q)	t <sub>pZH</sub>	R <sub>L</sub> =1kΩ	5	-	55	170	ns
			10	-	25	100	
			15	-	15	70	

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

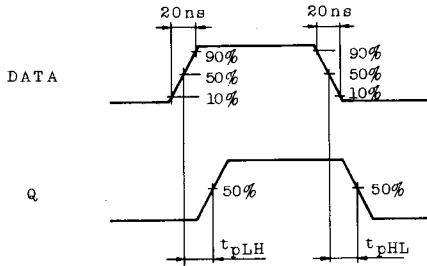
CHARACTERISTIC	SYMBOL	TEST CONDITION	VDD(V)	MIN.	TYP.	MAX.	UNIT
Three State Disable Time (DISABLE - Q)	t <sub>pLZ</sub>	R <sub>L</sub> =1kΩ	5	-	50	130	ns
			10	-	30	80	
			15	-	25	60	
Three State Disable Time (DISABLE - Q)	t <sub>pZL</sub>	R <sub>L</sub> =1kΩ	5	-	70	170	ns
			10	-	30	100	
			15	-	20	70	
Min. Pulse Width (RESET)	t <sub>WH</sub>		5	-	50	200	ns
			10	-	20	100	
			15	-	15	70	
Min. Pulse Width (STROBE)	t <sub>WH</sub>		5	-	40	140	ns
			10	-	20	70	
			15	-	15	40	
Min. Set-up Time (DATA - STROBE)	t <sub>SU</sub>		5	-	30	60	ns
			10	-	15	30	
			15	-	10	20	
Min. Hold Time (DATA - STROBE)	t <sub>H</sub>		5	-	-10	10	ns
			10	-	-5	10	
			15	-	0	10	
Input Capacitance	C <sub>IN</sub>			-	5	7.5	pF

## WAVEFORMS FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

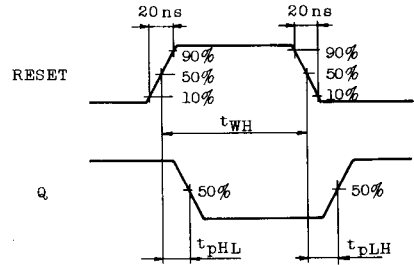


WAVEFORMS FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

WAVEFORM 2



WAVEFORM 3



WAVEFORM 4

