

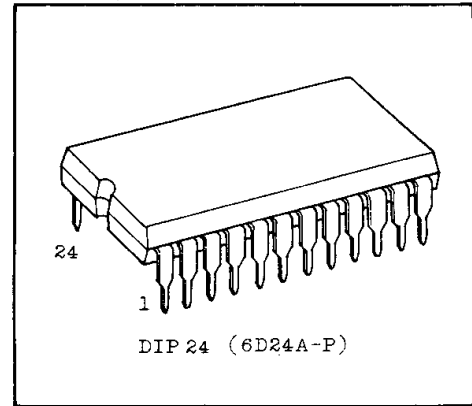
# TC4514BP, TC4515BP

C<sup>2</sup>MOS DIGITAL INTEGRATED CIRCUIT  
SILICON MONOLITHIC

TC4514BP 4-BIT LATCH/4-T0-16 LINE DECODER (Output Active High Option)  
TC4515BP 4-BIT LATCH/4-T0-16 LINE DECODER (Output Active Low Option)

TC4514BP and TC4515BP are decoders which convert 4 bit binary input signal to hexadecimal output signal and these have the decode inhibit input and the latch function.

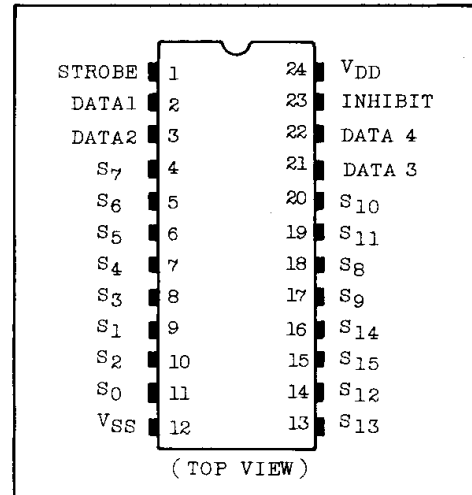
TC4514BP gives "H" level only to the selected output among 16 outputs and TC4515BP gives "L" only to the selected output. When INHIBIT input is "H", the selected output does not exist making all the outputs "L" for TC4514BP and all the outputs "H" for TC4515BP. When STROBE input is "H", the output corresponding to DATA 1 through DATA 4 are selected and latched by the transition of STROBE from "H" to "L".



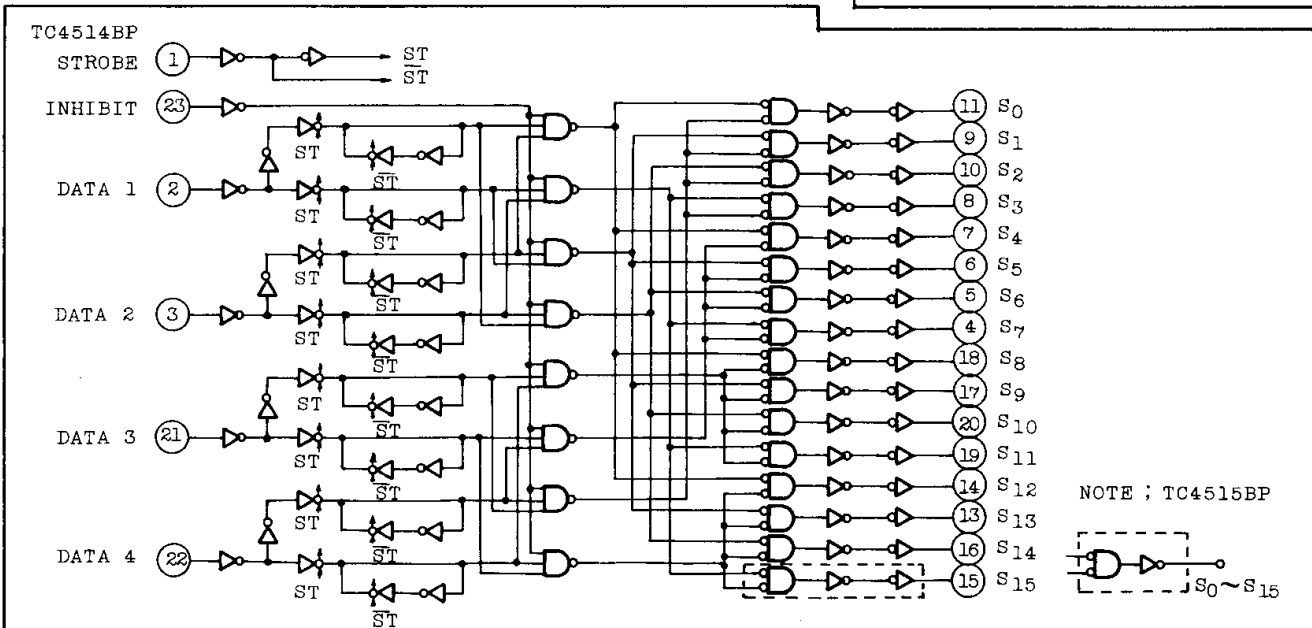
## ABSOLUTE MAXIMUM RATINGS

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>	-65 ~ 150	°C
Lead Temp./Time	T <sub>sol</sub>	260°C · 10sec	

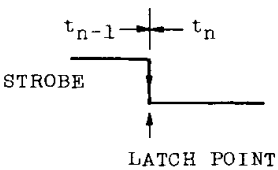
## PIN ASSIGNMENT



## LOGIC DIAGRAM



TRUTH TABLE

INHIBIT	DATA INPUT				SELECTED OUTPUT TC4514BP - "H" TC4515BP - "L"	<ul style="list-style-type: none"> <li>◦ STROBE="H" ; See Truth table</li> <li>◦ STROBE="L" ; Outputs hold the data when STROBE goes "LOW"</li> </ul>
	DATA1	DATA2	DATA3	DATA4		
L	L	L	L	L	S0	
L	H	L	L	L	S1	
L	L	H	L	L	S2	
L	H	H	L	L	S3	
L	L	L	H	L	S4	
L	H	L	H	L	S5	
L	L	H	H	L	S6	
L	H	H	H	L	S7	
L	L	L	L	H	S8	
L	H	L	L	H	S9	
L	L	H	L	H	S10	
L	H	H	L	H	S11	
L	L	L	H	H	S12	
L	H	L	H	H	S13	
L	L	H	H	H	S14	
L	H	H	H	H	S15	
H	*	*	*	*	TC4514BP-ALL OUTPUTS "L" TC4515BP-ALL OUTPUTS "H"	◦ * Don't care

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	
			10	-	0.05	-	0.00	0.05	-	0.05	
			15	-	0.05	-	0.00	0.05	-	0.05	

# TC4514BP, TC4515BP

## 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.		
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	-	1.13	-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	
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.

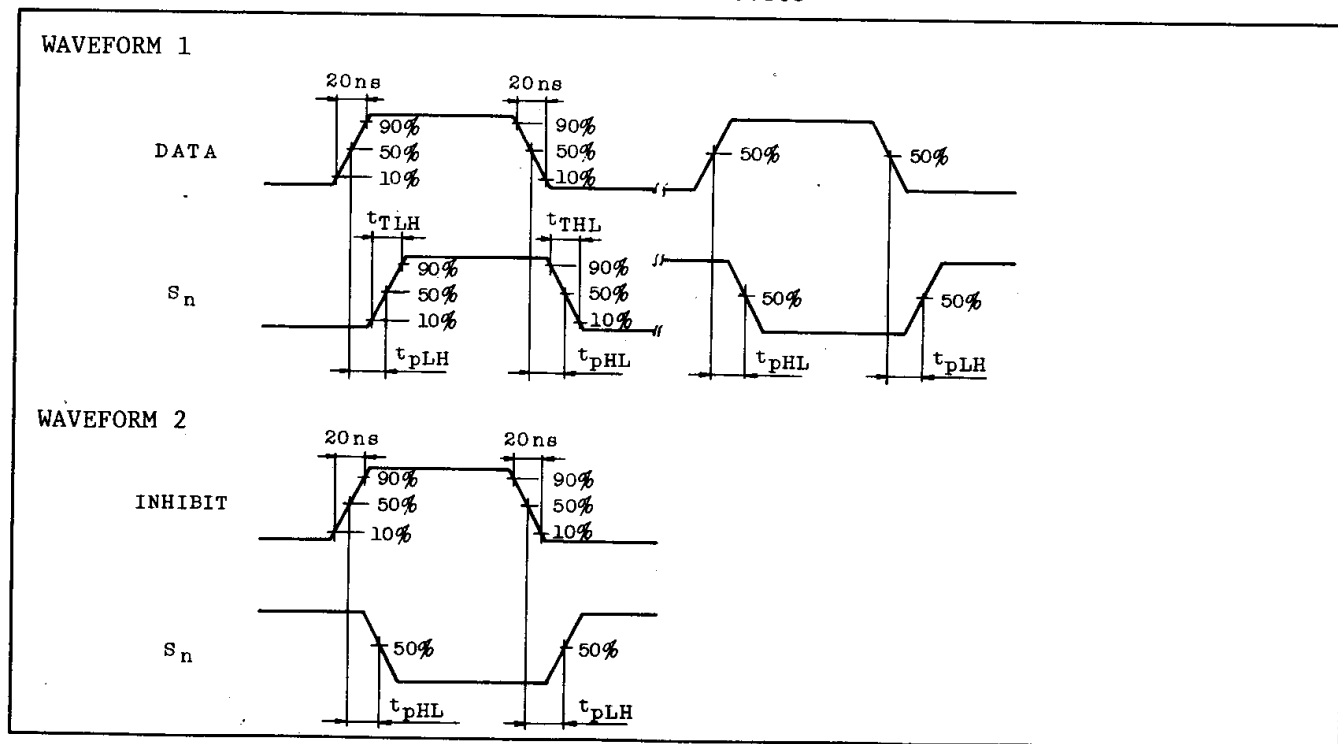
## DYNAMIC ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C, V<sub>SS</sub>=0V, C<sub>L</sub>=50pF)

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	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	VDD (V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (High to Low)	$t_{THL}$		5	-	80	200	ns
			10	-	50	100	
			15	-	40	80	
Propagation Delay Time (STROBE, DATA - Sn)	$t_{pLH}$		5	-	260	970	ns
	$t_{pHL}$		10	-	110	370	
			15	-	80	270	
Propagation Delay Time (INHIBIT - Sn)	$t_{pLH}$		5	-	150	500	ns
	$t_{pHL}$		10	-	65	220	
			15	-	50	170	
Min. Pulse Width (STROBE)	$t_{WH}$		5	-	40	250	ns
			10	-	20	100	
			15	-	15	75	
Min. Hold Time (DATA - STROBE)	$t_{SU}$		5	-	20	150	ns
			10	-	10	70	
			15	-	5	40	
Input Capacitance	$C_{IN}$			-	5	7.5	pF

### WAVEFORMS FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS



# TC4514BP, TC4515BP

## WAVEFORMS FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

WAVEFORM 3

