

TC4043BP

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

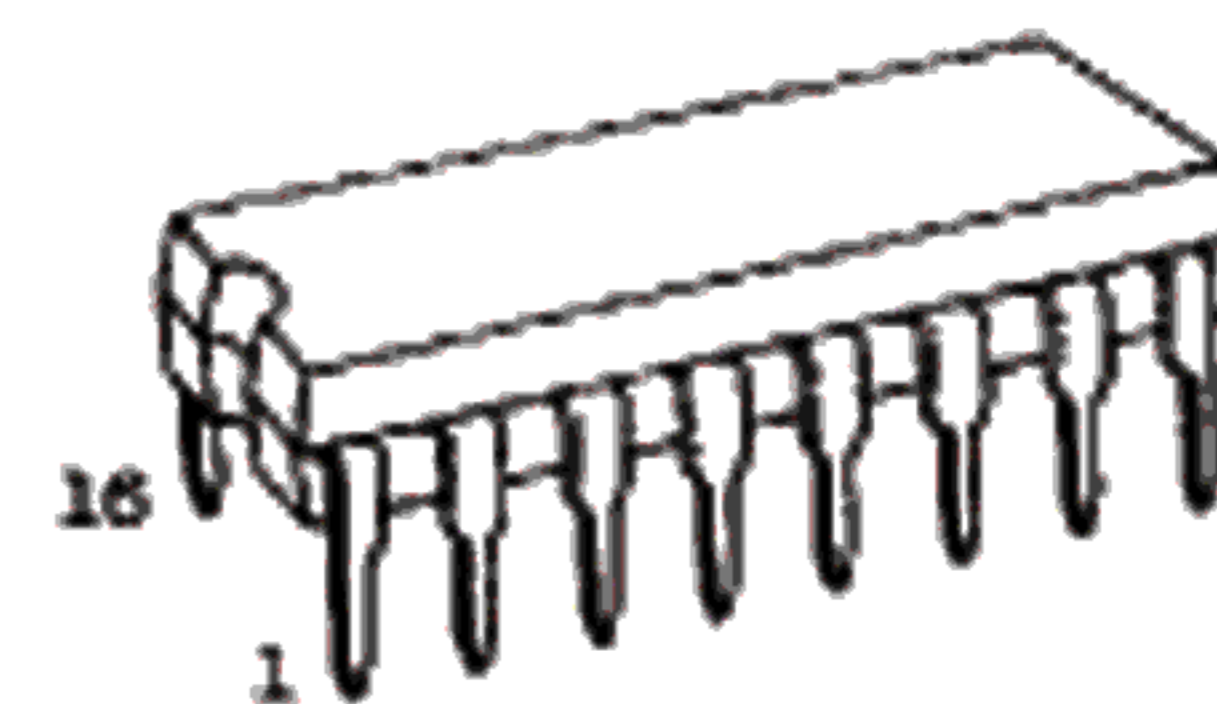
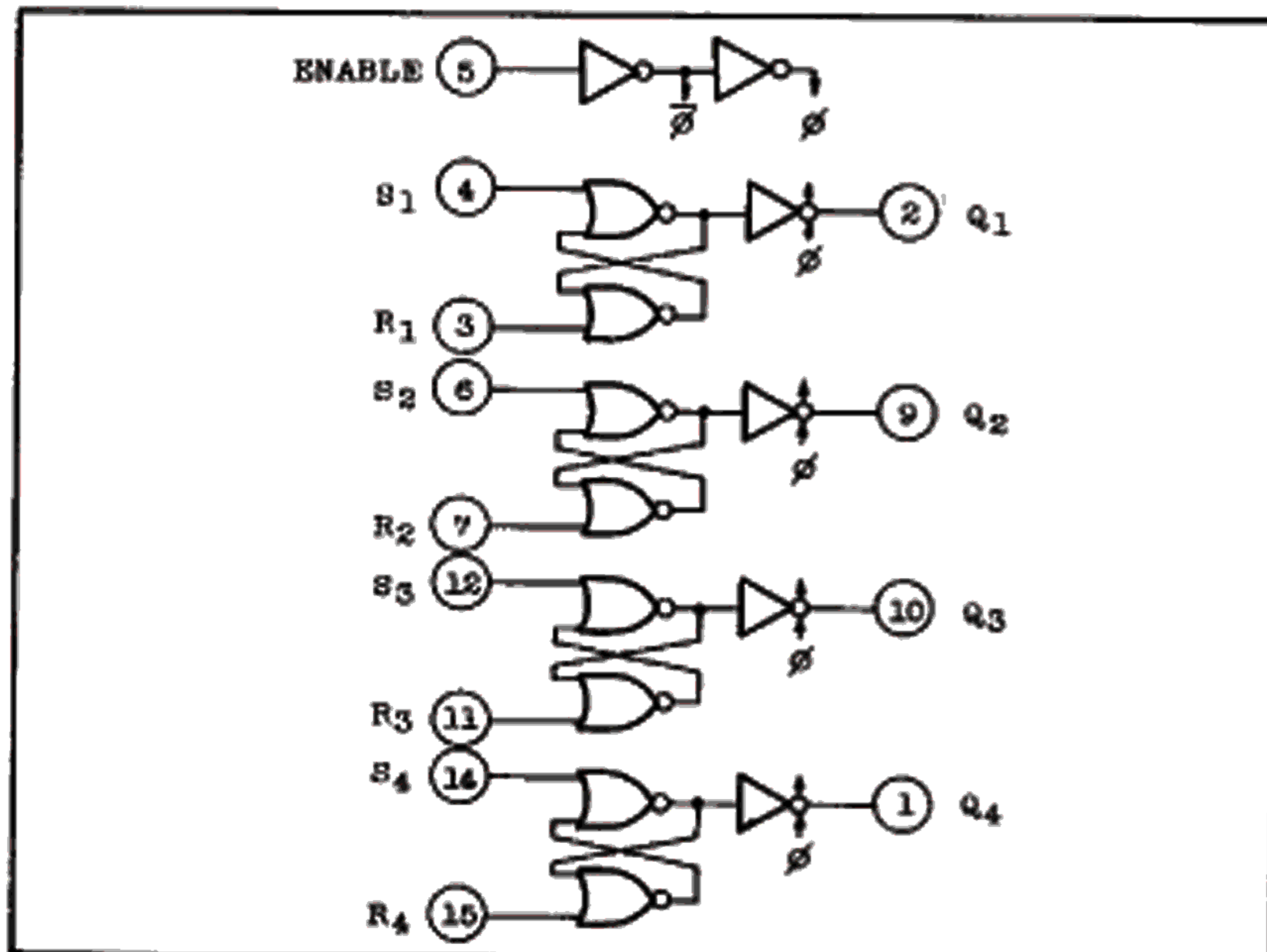
TC4043BP QUAD 3-STATE R/S LATCH (Quad NOR R/S Latch)

TC4043BP is the latches composed by four independent R/S flip-flop circuits. TC4043BP fabricated with NOR gates is suitable for data processing of four bits configuration. Four output lines can have high impedance regardless of the contents of latches by means of common ENABLE input to make connection to the bus lines easy.

ABSOLUTE MAXIMUM RATINGS

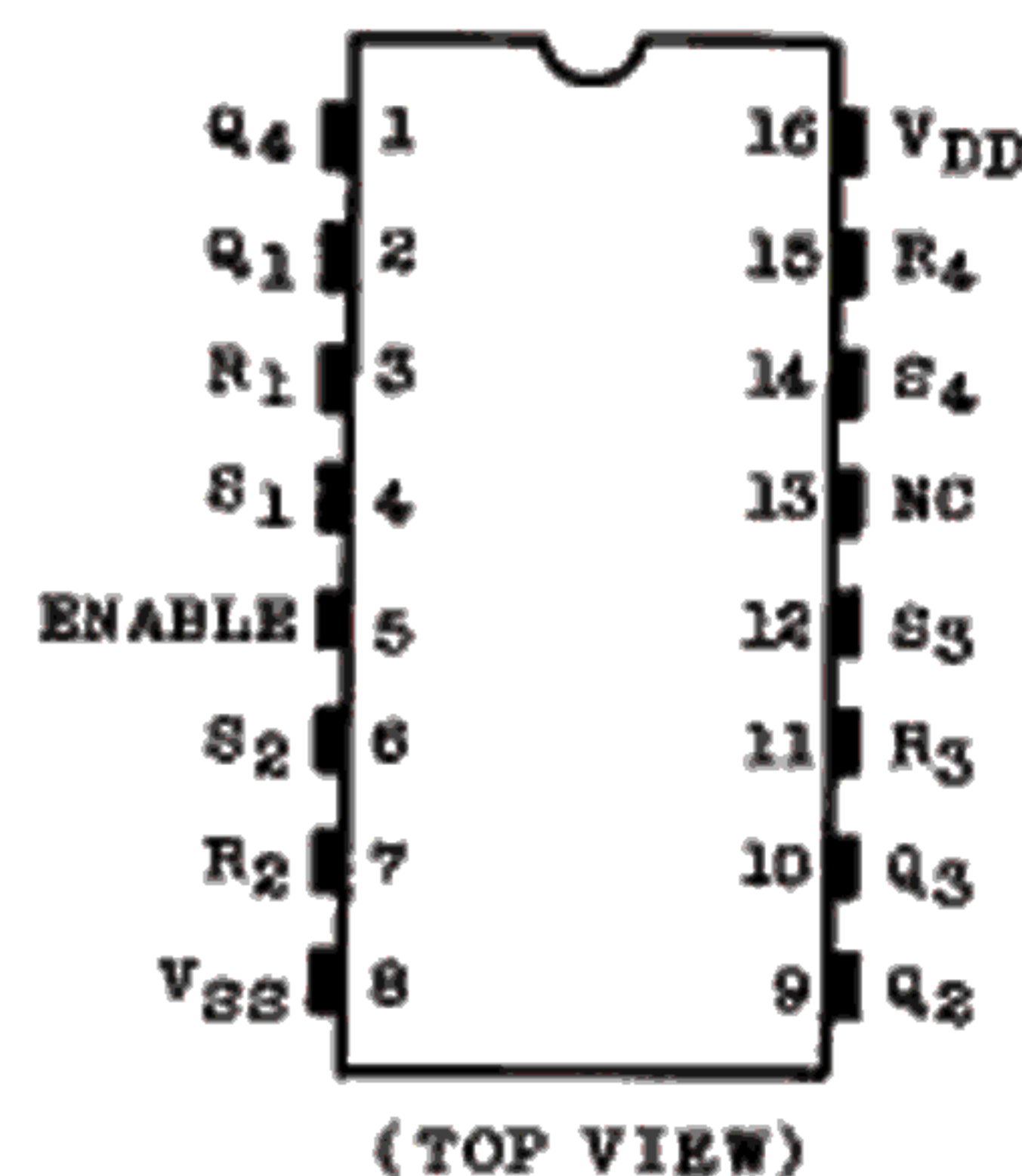
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V _{DD}	V _{SS} -0.5 ~ V _{SS} +20	V
Input Voltage	V _{IN}	V _{SS} -0.5 ~ V _{DD} +0.5	V
Output Voltage	V _{OUT}	V _{SS} -0.5 ~ V _{DD} +0.5	V
DC Input Current	I _{IN}	±10	mA
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _A	-40 ~ 85	°C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

LOGIC DIAGRAM



DIP16 (3D16A-P)

PIN ASSIGNMENT



TRUTH TABLE

S	R	E	Q
*	*	L	HZ
L	L	H	No Change
L	H	H	L
H	L	H	H
H	H	H	H

* : Don't Care
HZ : High Impedance

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	-0.61	-	-0.51	-1.0	-	-0.42	-	mA	
			5	-2.5	-	-2.1	-4.0	-	-1.7	-		
			10	-1.5	-	-1.3	-2.2	-	-1.1	-		
			15	-4.0	-	-3.4	-9.0	-	-2.8	-		
			5	0.61	-	0.51	1.5	-	0.42	-		
Output Low Current	I _{OL}	V _{OL} =0.4V V _{OL} =0.5V V _{OL} =1.5V V _{IN} =V _{SS} , V _{DD}	10	1.5	-	1.3	3.8	-	1.1	-		
			15	4.0	-	3.4	15.0	-	2.8	-		
			5	3.5	-	3.5	2.75	-	3.5	-		
			10	7.0	-	7.0	5.5	-	7.0	-		
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	15	11.0	-	11.0	8.25	-	11.0	-	V	
			5	-	1.5	-	2.25	1.5	-	1.5		
			10	-	3.0	-	4.5	3.0	-	3.0		
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	15	-	4.0	-	6.75	4.0	-	4.0		
			5	-	1.5	-	2.25	1.5	-	1.5		
			10	-	3.0	-	4.5	3.0	-	3.0		
Input Current	"H" Level	I _{IH}	V _{IH} =18V	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	

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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 _{OH} =18V	18	-	0.4	-	10 ⁻⁴	0.4	-	12	μA
	"L" Level	I _{DL}	V _{OL} =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
			10	-	50	100	
			15	-	40	80	
Output Transition Time (High to Low)	t _{THL}		5	-	80	200	ns
			10	-	50	100	
			15	-	40	80	
Propagation Delay Time (SET, RESET - Q)	t _{pLH} t _{pHL}		5	-	150	300	ns
			10	-	60	140	
			15	-	40	100	
3-State Propagation Delay Time (ENABLE - Q)	t _{pHZ} t _{pZH}	R _L =1kΩ	5	-	60	230	ns
			10	-	25	110	
			15	-	20	80	
3-State Propagation Delay Time (ENABLE - Q)	t _{pLZ} t _{pZL}	R _L =1kΩ	5	-	80	180	ns
			10	-	35	100	
			15	-	25	70	
Min. Pulse Width (SET, RESET)	t _{WH}		5	-	30	160	ns
			10	-	15	80	
			15	-	10	40	
Input Capacitance	C _{IN}			-	5	7.5	pF

WAVEFORMS FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

