DTL Circuits Summary

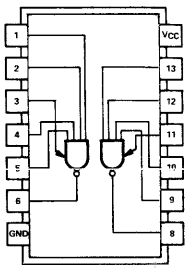
DTL
SMALL-SCALE INTEGRATION (SSI)

Function	Operating Temperature Ranges		Packages*		
	−55°C to 125°C	0°C to 75°C	Dual-In-Line		Flat
GATES WITH 6-kΩ PULL-UP RESISTORS					
Expandable Dual 4-Input NAND Gates	SN15930	SN15830	J	N	U
Quadruple 2-Input NAND Gates	SN15946	SN15846	J	N	U
Triple 3-Input NAND Gates	SN15962	SN15862	J	N	U
Dual 5-Input NAND Gates	SN151900	SN151800	J	N	U
Expandable 8-Input NAND Gates	SN151902	SN151802	J	N	U
10-Input NAND Gates	SN151904	SN151804	J	N	U
Quadruple 2-Input AND Gates	SN151906	SN151806	J	N	U
Quadruple 2-Input OR Gates	SN151908	SN151808	J	N	U
Quadruple 2-Input NOR Gates	SN151910	SN151810	J	N	U
Quadruple 2-Input Exclusive-OR Gates	SN151912	SN151812	J	N	U
GATES WITH 2-kΩ PULL-UP RESISTORS					
Quadruple 2-Input NAND Gates	SN15949	SN15849	J	N	U
Expandable Dual 4-Input NAND Gates	SN15961	SN15861	J	N	U
Triple 3-Input NAND Gates	SN15963	SN15863	J	N	U
Dual 5-Input NAND Gates	SN151901	SN151801	J	N	U
Expandable 8-Input NAND Gates	SN151903	SN151803	J	N	U
10-Input NAND Gates	SN151905	SN151805	J	N	U
Quadruple 2-Input AND Gates	SN151907	SN151807	J	N	U
Quadruple 2-Input OR Gates	SN151909	SN151809	J	N	U
Quadruple 2-Input NOR Gates	SN151911	SN151811	J	N	U
POWER/BUFFER GATES					
Expandable Dual 4-Input NAND Buffer Gates	SN15932	SN15832	J	N	U
Expandable Dual 4-Input NAND Power Gates	SN15944	SN15844	J	N	U
Quadruple 2-Input NAND Buffer Gates	SN15957	SN15857	J	N	U
Quadruple 2-Input NAND Power Gates	SN15958	SN15858	J	N	U
HEX INVERTERS					
6-kΩ Pull-Up Resistors	SN15934	SN15834	J	N	U
Expandable (Open-Base) or Translator Inputs	SN15935	SN15835	J	N	U
6-kΩ Pull-Up Resistors	SN15936	SN15836	J	N	U
2-kΩ Pull-Up Resistors	SN15937	SN15837	J	N	U
Open-Collector Outputs	SN15938	SN15838	J	N	U
EXPANDERS					
Dual 4-Input Expanders	SN15933	SN15833	J	N	U
FLIP-FLOPS					
Gated J-K/R-S (6-kΩ Pull-Up Resistors)	SN15931	SN15831	J	N	U
Gated J-K/R-S (6-kΩ Pull-Up Resistors)	SN15945	SN15845	J	N	U
Gated J-K/R-S (2-kΩ Pull-Up Resistors)	SN15948	SN15848	J	N	U
Pulse-Triggered Binary (Active Pull-Up)	SN15950	SN15850	J	N	U
Dual J-K, Individual Clocks and Presets (6-kΩ Pull-Up Resistors)	SN159093	SN158093	J	N	U
Dual J-K, Individual Clocks and Presets (2-kΩ Pull-Up Resistors)	SN159094	SN158094	J	N	U
Dual J-K, Common Clocks and Clears (2-kΩ Pull-Up Resistors)	SN159097	SN158097	J	N	U
Dual J-K, Common Clocks and Clears (6-kΩ Pull-Up Resistors)	SN159099	SN158099	J	N	U
MONOSTABLE MULTIVIBRATORS					
Gated, Negative-Edge-Triggered	SN15951	SN15851	J	N	U

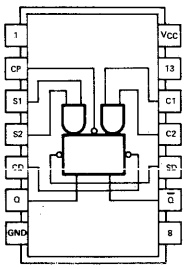
*For outline drawings of all packages, see Section 1.

—SEE ORDERING INSTRUCTIONS PAGE 1-1—

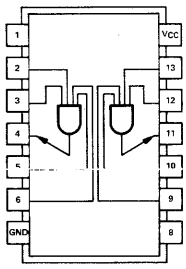
SN15830, SN15832, SN15844, SN15861, SN15930, SN15932, SN15944, SN15961



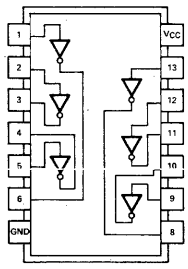
SN15831, SN15845, SN15848, SN15931, SN15945, SN15948, (See Truth Tables 1 and 2)



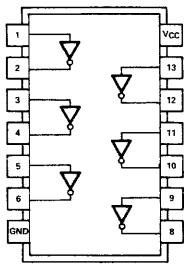
SN15833, SN15933



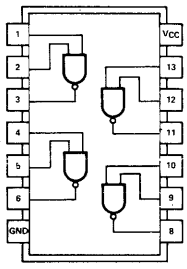
SN15834, SN15934



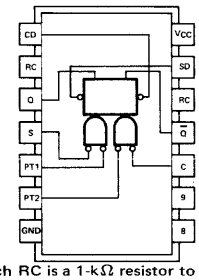
SN15835, SN15836, SN15837, SN15838, SN15935, SN15936, SN15937, SN15938



SN15846, SN15849, SN15946, SN15949

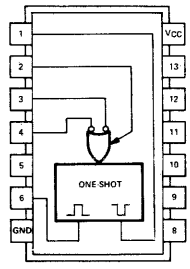


SN15850, SN15950 (See Truth Tables 3 and 4)



Each RC is a 1-kΩ resistor to V_{CC}.

SN15851, SN15951 (See Notes A, B, and C)



TRUTH TABLE 1
R-S MODE

t_n				t_{n+1}
S1	S2	C1	C2	Q
L	X	L	X	Qn
L	X	X	L	Qn
X	L	L	X	Qn
X	L	X	L	Qn
L	X	H	H	L
X	L	H	H	L
H	H	L	X	H
H	H	X	L	H
H	H	H	H	Indeterminate

TRUTH TABLE 2
J-K MODE

t_n		t_{n+1}
S1	C1	Q
L	L	Qn
L	H	L
H	L	H
H	H	$\overline{Q}n$

TRUTH TABLE 3
SYNCHRONOUS

t_n PULSE INPUT				t_{n+1} OUTPUT	
S	C	PT1	PT2	Q	$\overline{Q}$
H	X	X	H	Qn	$\overline{Q}n$
X	H	H	X	Qn	$\overline{Q}n$
L	H	L	X	H	L
L	X	L	H	H	L
H	L	X	L	L	H
X	L	H	L	L	H
L	L	L	L	Indeterminate	

TRUTH TABLE 4
ASYNCHRONOUS

DIRECT INPUT		OUTPUT	
SD	CD	Q	$\overline{Q}$
H	H	Qn	$\overline{Q}n$
L	H	L	H
H	L	H	L
L	L	H	H

NOTES: 1. t_n = bit time before clock pulse.
2. t_{n+1} = bit time after clock pulse.
3. H = high, L = low, X = irrelevant.
4. For operation in the J-K mode connect S2 to Q and C2 to $\overline{Q}$.

NOTES: 5. Logical levels shown for pulse inputs PT1 and PT2 indicate that a transition to that level has just occured.
6. Truth tables reflect individual conditions at the input. Either direct input may be used to inhibit its corresponding pulse input.

NOTES: A. External timing resistor may be connected between pins 14 and 10 to control pulse width.
B. External timing capacitor may be connected between pins 10 and 11 to control pulse width.
C. Input sensitivity can be decreased by adding a capacitor from pin 5 to ground.

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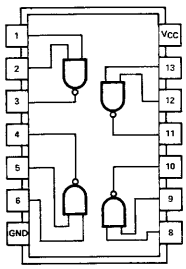
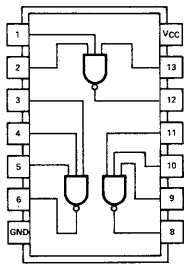
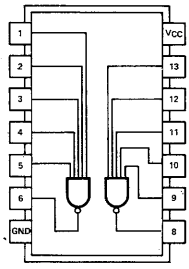
SN15857, SN15858,
SN15957, SN15958



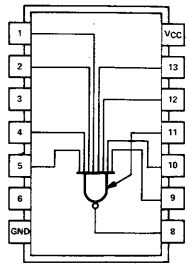
SN15862, SN15863,
SN15962, SN15963



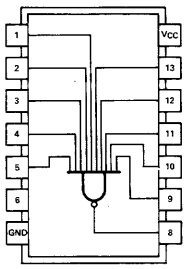
SN151800, SN151801,
SN151900, SN151901



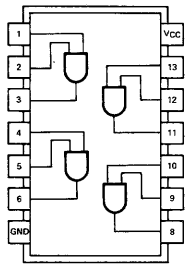
SN151802, SN151803,
SN151902, SN151903



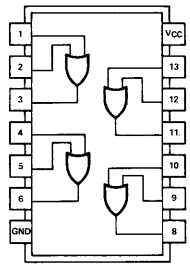
SN151804, SN151805,
SN151904, SN151905



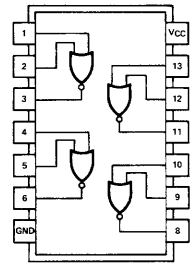
SN151806, SN151807,
SN151906, SN151907



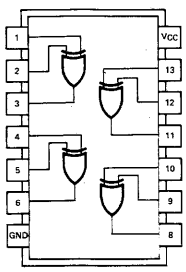
SN151808, SN151809,
SN151908, SN151909



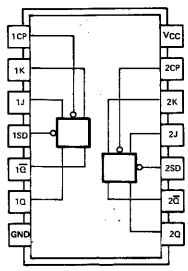
SN151810, SN151811,
SN151910, SN151911



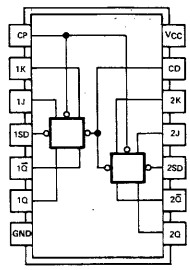
SN151812,
SN151912



SN158093, SN158094,
SN159093, SN159094
(See Truth Table 5)



SN158097, SN158099,
SN159097, SN159099
(See Truth Table 5)



TRUTH TABLE 5

t_n		t_{n+1}
J	K	Q
L	L	Qn
L	H	L
H	L	H
H	H	$\overline{Q}n$

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SERIES 15830 GATES, EXPANDER, AND ONE-SHOT

electrical and switching characteristics (unless otherwise noted, V_{CC} = 5 V)

PARAMETER	CONDITIONS	T_A(°C)	SN15830, SN15834, SN15836, SN15846, SN15862, SN151800, SN151802, SN151804		SN15832, SN15857		SN15833		SN15835		SN15837, SN15849, SN15861, SN15863, SN151801, SN151803, SN151805		SN15838		SN15844, SN15858		SN15851		SN151806		SN151807		SN151808		SN151809		SN151810		SN151811		SN151812		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V_{OL}	I_O = I_{OL} MIN	0 and 25		0.45		0.45				0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45	V
		75		0.5		0.5				0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
V_{OH}	I_O = I_{OH} MIN	0 and 25	2.6		2.6				2.6		3.8		6(1,2)		6(1,2)		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		V
		75	2.5		2.5				2.5		3.7						2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		
V_{IL}		0		1.2		1.2				2.1		1.2		1.2		1.2				1.2		1.2		1.2		1.2		1.2		1.2		1.2	V
		25		1.1		1.1				1.92		1.1		1.1		1.1		See Note A		1.1		1.1		1.1		1.1		1.1		1.1		1.1	
		75		0.95		0.95				1.7		0.95		0.95		0.95				0.95		0.95		0.95		0.95		0.95		0.96		0.96	
V_{IH}		0	2		2						2		2		2				2		2		2		2		2		2		2		V
		25	1.9		1.9						1.9		1.9		1.9		See Note A		1.9		1.9		1.9		1.9		1.9		1.9		1.9		
		75	1.8		1.8						1.8		1.8		1.8				1.8		1.8		1.8		1.8		1.8		1.8		1.8		
I_{OL}	V_O = V_{OL} MAX	0 and 25	12		36				12		10.5		12		40		15		12		11		12		11		12		11		12		mA
		75	11.4		34				11.4		10.2		11.4		36		14.5		11.4		10.4		11.4		10.4		11.4		10.4		11.4		
I_{OH}	V_O = V_{OH} MIN	0	−0.12		−2.0				−0.12		−0.12						−0.18		−0.12		−0.5		−0.12		−0.5		−0.12		−0.5		−0.12		mA
		25	−0.12		−2.5				−0.12		−0.12						−0.18		−0.12		−0.5		−0.12		−0.5		−0.12		−0.5		−0.12		
		75	−0.12		−3.0				−0.12		−0.12						−0.18		−0.12		−0.5		−0.12		−0.5		−0.12		−0.5		−0.12		
I_{OS}	V_O = 0 V	0		−1.3		−15				−1.3										−1.3		−3.9		−1.3		−3.9		−1.3		−3.9		−1.3	mA
		25		−1.3		−16				−1.3		−3.68								−1.3		−3.9		−1.3		−3.9		−1.3		−3.9		−1.3	
		75		−1.25		−14				−1.25										−1.25		−3.75		−1.25		−3.75		−1.25		−3.75		−1.25	
I_{IL}	V_I = V_{OL} MAX	0 and 25		−1.4		−1.4				−1.4(3)		−1.4		−1.4		−1.4	−1.35	−2.8		−1.4		−1.4		−1.4		−1.4		−1.4		−1.4		−2.8	mA
		75		−1.33		−1.33				−1.33(3)		−1.33		−1.33		−1.33	−1.25	−2.63		−1.33		−1.33		−1.33		−1.33		−1.33		−1.33		−2.67	
I_{IH}	V_I = 4 V	0 and 25		5		5	5					5		5		5		5		5		5		5		5		5		5		10	μA
		75		10		10	10					10		10		10		10		10		10		10		10		10		10		20	
V_F	I_F = 2 mA	0					0.75	0.9																									V
		25					0.68	0.82																									
		75					0.6	0.75																									
I_{CCL}	AVG. PER GATE	25		4		15				4		4		4		12		12		5.75		7.75		7.25		9.38		5.5		7.65		9.75	mA
I_{CCH}	AVG. PER GATE, V_{CC} = 8 V	25		4		4				4		4		4		4		(4) 26.7		9.75		9.75		14.25		14.25		5.62		4.87		13.25	mA
t_{PHL}		25	10	30	15	40			10	30	10	30	10	30	10	35	5	50	15	65	15	65	15	65	15	65	10	30	10	30	25	80	ns
t_{PLH}		25	25	80	25	80			25	80	15	60	25	80	15	50	5	50	25	80	15	65	25	90	15	75	25	90	15	75	25	80	ns

(1) 25°C only.
(2) For the SN15838, SN15844, and SN15858, V_{OH} is measured at 5 mA.
(3) V_I = 1.35 V at T_A at 0°C, 1.27 V at T_A = 25°C, and 1.25 V at T_A = 70°C.
(4) For the SN15851, total quiescent values of I_{CC} are given for V_{CC} = 5 V and V_{CC} = 8 V.

NOTE A: This monostable multivibrator is triggered with a negative-going transition ≥ 1 volt having a fall time ≤ 25 ns/volt.

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SERIES 15930 GATES, EXPANDER, AND ONE-SHOT

electrical and switching characteristics (unless otherwise noted, V_{CC} = 5 V)

PARAMETER	CONDITIONS	T_A(°C)	SN15930 SN15934 SN15936 SN15946 SN15962 SN151900 SN151902 SN151904		SN15932 SN15957		SN15933		SN15935		SN15937 SN15949 SN15961 SN15963 SN151901 SN151903 SN151905		SN15938		SN15944 SN15958		SN15951		SN151906		SN151907		SN151908		SN151909		SN151910		SN151911		SN151912		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V_{OL}	$I_O = I_{OL}$ MIN	−55 and 25		0.4		0.4				0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4	V
		125		0.45		0.45				0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45	
V_{OH}	$I_O = I_{OH}$ MIN	−55	2.5		2.5				2.5		3.8								2.5		2.5		2.5		2.5		2.5		2.5		2.5		
		25	2.6		2.6				2.6		3.8		6[1,2]		6[1,2]		2.6		2.6		2.6		2.6		2.6		2.6		2.6		2.6		V
		125	2.5		2.5				2.5		3.7						2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		
V_{IL}		−55		1.4		1.4				2.38		1.4		1.4		1.4				1.4		1.4		1.4		1.4		1.4		1.4		1.4	
		25		1.1		1.1				1.92		1.1		1.1		1.1	See Note A			1.1		1.1		1.1		1.1		1.1		1.1		1.1	V
		125		0.8		0.8				1.45		0.8		0.8		0.8				0.8		0.8		0.8		0.8		0.8		0.8		0.8	
V_{IH}		−55	2.1		2.1						2.1		2.1		2.1				2.1		2.1		2.1		2.1		2.1		2.1		2.1		
		25	1.9		1.9						1.9		1.9		1.9		See Note A		2		2		2		2		2		2		2		2	V
		125	1.7		1.7						1.7		1.7		1.7				2		2		2		2		2		2		2		
I_{OL}	$V_O = V_{OL}$ MAX	−55	11.4		34				11.4		10		11.4		36		15		11.4		10.4		11.4		10.4		11.4		10.4		11.4		
		25	12		36				12		10.6		12		40		15		12		11		12		11		12		11		12		mA
		125	10.8		32				10.8		9.5		10.8		36		14		10.8		9.8		10.8		9.8		10.8		9.8		10.8		
I_{OH}	$V_O = V_{OH}$ MIN	−55	−0.12		−2				−0.12		−0.12						−0.18		−0.12		−0.5		−0.12		−0.5		−0.12		−0.5		−0.12		
		25	−0.12		−2.5				−0.12		−0.12						−0.18		−0.12		−0.5		−0.12		−0.5		−0.12		−0.5		−0.12		mA
		125	−0.12		−3				−0.12		−0.12						−0.18		−0.12		−0.5		−0.12		−0.5		−0.12		−0.5		−0.12		
I_{OS}	V_O = 0 V	−55 and 25		−1.34	−18					−1.34	−2.1[1]	−3.7								−1.34		−4		−1.34		−4		−1.34		−4		−1.34	mA
		125		−1.3	−16					−1.3		−3.28								−1.3		−3.9		−1.3		−3.9		−1.3		−3		−1.3	
I_{IL}	V_I = 0 V	−55 and 25		−1.6		−1.6				−1.6[3]		−1.6		−1.6		−1.6	−1.6	−3.1		−1.6		−1.6		−1.6		−1.6		−1.6		−1.6		−3.2	mA
		125		−1.5		−1.5				−1.5[3]		−1.5		−1.5		−1.5	−1.4	−3		−1.5		−1.5		−1.5		−1.5		−1.5		−1.5		−3	
I_{IH}	V_I = 4 V	−55 and 25		2		2		2				2		2		2		2		2		2		2		2		2		2		4	μA
		125		5		5		5				5		5		5		5		5		5		5		5		5		5		10	
V_F	I_F = 2 mA	−55					0.85	0.98																									V
		25					0.7	0.82																									
		125					0.5	0.65																									
I_{CCL}	AVG. PER GATE	25		3.25		13.3				3.25		3.25		3.25		10		9 (4)		4.88		7.25		6.25		8.38		5		6.9		8.5	mA
I_{CCH}	AVG. PER GATE, V_{CC} = 8 V	25		2.75		3				2.75		2.75		2.75		3		20		8.5		8.5		12.5		12.5		4.87		4.87		11.25	mA
t_{PHL}		25	10	30	15	40			10	30	10	30	10	30	10	35	5	50	15	65	15	65	15	65	15	65	10	30	10	30	25	80	ns
t_{PLH}		25	25	80	25	80			25	80	15	60	25	80	15	50	5	50	25	80	15	65	25	90	15	75	25	90	15	75	25	80	ns

(1) 25°C only.
(2) For the SN15938, SN15944, and SN15958, V_{OH} is measured at 5 mA.
(3) V_I = 0.98 V at T_A = −55°C, 0.82 V at T_A = 25°C, and 0.65 V at T_A = 125°C.
(4) For the SN15951, total quiescent values of I_{CC} are given for V_{CC} = 5 V and V_{CC} = 8 V.

NOTE A: This monostable multivibrator is triggered with a negative-going transition ≥ 1 volt having a fall time ≤ 25 ns/volt.

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electrical and switching characteristics (unless otherwise noted, V_{CC} = 5)

PARAMETER	CONDITIONS		T_A(°C)	SN15831		SN15845		SN15848		SN15850		SN158093		SN158094		SN158097		SN158099		UNIT
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V_{OL}	$I_O = I_{OL}$ MIN		0 and 25		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45	V
			75		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
V_{OH}	$I_O = I_{OH}$ MIN		0 and 25	2.6		2.6		3.8		2.6		2.6		3.8		3.8		2.6		V
			75	2.5		2.5		3.7		2.5		2.5		3.7		3.7		2.5		
V_{IL}			0		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2	V
			25		1.1		1.1		1.1		1.1		1.1		1.1		1.1		1.1	
			75		0.95		0.95		0.95		0.95		0.95		0.95		0.95		0.95	
V_{IH}			0	2		2		2		2		2		2		2		2		V
			25	1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		
			75	1.8		1.8		1.8		1.8		1.8		1.8		1.8		1.8		
I_{OL}	$V_O = V_{OL}$ MAX		0 and 25	10.5		16.8		15.4		12		16.8		15.4		15.4		16.8		mA
			75	10.2		16		14.6		11.4		16		14.6		14.6		16		
I_{OH}	$V_O = V_{OH}$ MIN		0, 25, and 75	−0.12		−0.12		−0.12		−1.5		−0.12		−0.12		−0.12		−0.12		mA
I_{OS}	V_O = 0 V		0			−0.59	−1.41	−1.77	−4.2	−13.7	−29									mA
			25			−0.59	−1.41	−1.77	−4.2	−13.7	−29		−2.36		−5.15		−5.15		−2.36	
			75			−0.55	−1.38	−1.6	−4	−12.6	−28									
I_{IL}	$V_I = V_{OL}$ MAX	DATA INPUTS	0 and 25		−1.05		−0.95		−0.95		−2.1		−0.95		−0.95		−0.95		−0.95	mA
			75		−1		−0.9		−0.9		−2		−0.9		−0.9		−0.9		−0.9	
		CLOCK INPUT	0 and 25		−2.8		−2.8		−2.24				−2.8		−2.8		−5.6		−5.6	mA
			75		−2.67		−2.67		−2.13				−2.67		−2.67		−5.34		−5.34	
		PRESET or CLEAR INPUT	0 and 25		−0.95		−2.1		−2.1		−1.6		−2.8		−2.8	(1)	−2.8	(1)	−2.8	mA
			75		−0.9		−2		−2		−1.52		−2.67		−2.67		−2.67		−2.67	
I_{IH}	V_I = 4 V	DATA INPUTS	0 and 25		5		5		5		5		5		5		5		5	μA
			75		10		10		10		10		10		10		10		10	
		CLOCK INPUT	0 and 25		30		20		20				20		20		40		40	μA
			75		40		30		30				30		30		60		60	
		PRESET or CLEAR INPUT	0 and 25		5		5		5		5		5		5	(1)	5	(1)	5	μA
			75		10		10		10		10		10		10		10		10	
I_{CC}			25		14		16		17.5		9.3		32		35		35		32	mA
	V_{CC} = 8 V		25		18		18.5		22.5		19.6		37		45		45		37	mA
t_{PHL}	FROM CLOCK TO OUTPUT		25	35	75	15	75	15	65	5	32	15	75	15	65	15	65	15	75	ns
t_{PLH}	FROM CLOCK TO OUTPUT		25	35	75	25	75	25	75	5	25	25	75	25	75	25	75	25	75	ns

(1) Double the limit for the common clear input.

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electrical and switching characteristics (unless otherwise noted, V_{CC} = 5)

PARAMETER	CONDITIONS		T_A(°C)	SN15931		SN15945		SN15948		SN15950		SN159093		SN159094		SN159097		SN159099		UNIT
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V_{OL}	$I_O = I_{OL}$ MIN		−55 and 25		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4	V
			125		0.45		0.45		0.45		0.45		0.45		0.45		0.45		0.45	
V_{OH}	$I_O = I_{OH}$ MIN		−55	2.5		2.5		3.8		3.8		2.5		3.8		3.8		2.5		V
			25	2.6		2.6		3.8		3.8		2.6		3.8		3.8		2.6		
			125	2.5		2.5		3.7		3.7		2.5		3.7		3.7		2.5		
V_{IL}			−55		1.1		1.4		1.4		1.4		1.4		1.4		1.4		1.4	V
			25		0.95		1.1		1.1		1.1		1.1		1.1		1.1		1.1	
			125		0.75		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
V_{IH}			−55	2.1		2.1		2.1		2.1		2.1		2.1		2.1		2.1		V
			25	1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		
			125	1.7		1.7		1.7		1.7		1.7		1.7		1.7		1.7		
I_{OL}	$V_O = V_{OL}$ MAX		−55	10		14.6		13		11.4		14.6		13		13		14.6		mA
			25	10.6		15.2		13.6		12		15.2		13.6		13.6		15.2		
			125	9.5		13.8		12.3		10.8		13.8		12.3		12.3		13.8		
I_{OH}	$V_O = V_{OH}$ MIN		−55	−0.12		−0.12		−0.12		−1.5		−0.12		−0.12		−0.12		−0.12		mA
			25	−0.12		−0.12		−0.12		−1.5		−0.12		−0.12		−0.12		−0.12		
			125	−0.12		−0.12		−0.12		−1.5		−0.12		−0.12		−0.12		−0.12		
I_{OS}	V_O = 0 V		−55 and 25			−0.7	−1.33	−2.1	−3.96	−15.7	−27	−0.7(1)	−2.4(1)	−2.1(1)	−5(1)	−2.1(1)	5(1)	−0.7(1)	−2.4(1)	mA
			125			−0.62	−1.3	−1.86	−3.54	−14.6	−26									
I_{IL}	V_I = 0 V	DATA INPUTS	−55 and 25		−1.07		−1.07		−1.07		−2.4		−1.07		−1.07		−1.07		−1.07	mA
			125		−1		−1		−1		−2.25		−1		−1		−1		−1	
		CLOCK INPUT	−55 and 25		−3.4		−3.2		−2.56				−3.2		−3.2		−6.4		−6.4	mA
			125		−3		−2.8		−2.2				−3		−3		−6.0		−6.0	
		PRESET or CLEAR INPUT	−55		−1.2		−2.4		−2.4		−1.82		−3.2		−3.2	(2)	−3.2	(2)	−3.2	mA
			25		−1.2		−2.4		−2.4		−1.82		−3.2		−3.2		−3.2		−3.2	
			125		−1.1		−2.1		−2.1		−1.62		−3.0		−3.0		−3.0		−3.0	
I_{IH}	V_I = 4 V	DATA INPUTS	−55 and 25		2		2		2		2		2		2		2		2	μA
			125		5		5		5		5		5		5		5		5	
		CLOCK INPUT	−55 and 25		20		10		10				10		10		20		20	μA
			125		30		20		20				20		20		40		40	
		PRESET or CLEAR INPUT	−55 and 25		2		2		2		2		2		2	(2)	2	(2)	2	μA
			125		5		5		5		5		5		5		5		5	
			25		11		14		16.2		8.7		28		32		32		28	mA
I_{CC}	V_{CC} = 8 V		25		14.5		17		21.6		18.4		34		42		42		34	mA
t_{PHL}	FROM CLOCK TO OUTPUT		25		35	75	15	75	15	65	5	32	15	75	15	65	15	65	15	75	ns
t_{PLH}	FROM CLOCK TO OUTPUT		25		35	75	25	75	25	75	5	25	25	75	25	75	25	75	25	75	ns

(1) 25°C only.
(2) Double the limit shown for common clear inputs.

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