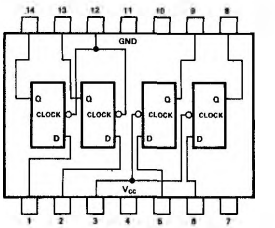
DESCRIPTION

The S5477Q/N7477Q is a monolithic, quadruple, bistable latch with Q outputs. Information present at a data (D) input is transferred to the Q output when the clock is high, and the Q output will follow the data input as long as the clock remains high. When the clock goes low, the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the clock is permitted to go high.

This latch is ideally suited for use as temporary storage for binary information between processing units and input/output or indicator units.

PIN CONFIGURATIONS

W PACKAGE



TRUTH TABLE

LOGIC

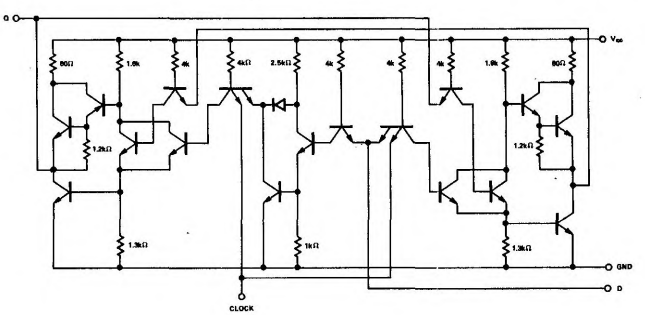
(Each Latch)	
t_n	t_{n+1}
D	Q
1	1
0	0

NOTES:
1. t_n = bit time before clock pulse.
2. t_{n+1} = bit time after clock pulse.
3. These voltages are with respect to network ground terminal.

RECOMMENDED OPERATING CONDITIONS

		MIN	NOM	MAX	UNIT
Supply Voltage V_{CC} (See Note 3):	S5477 Circuits	4.5	5	5.5	V
	N7477 Circuits	4.75	5	5.25	V
Normalized Fan-Out from each Output, N				10	
Operating Free-Air Temperature Range, T_A:	S5477 Circuits	-55	25	125	°C
	N7477 Circuits	0	25	70	°C

SCHEMATIC (each latch)



ELECTRICAL CHARACTERISTICS (over recommended operating free-air temperature range unless otherwise noted)

PARAMETER		TEST CONDITIONS*			MIN	TYP**	MAX	UNIT
$V_{in(1)}$	Input voltage required to ensure logical 1 level at any input terminal	V_{CC} = MIN			2			V
$V_{in(0)}$	Input voltage required to ensure logical 0 level at any input terminal	V_{CC} = MIN					0.8	V
$V_{out(1)}$	Logical 1 output voltage	V_{CC} = MIN,	I_{load} = −400μA		2.4			V
$V_{out(0)}$	Logical 0 output voltage	V_{CC} = MIN,	I_{sink} = 16mA				0.4	V
$I_{in(0)}$	Logical 0 level input current at D	V_{CC} = MAX,	V_{in} = 0.4V				−3.2	mA
$I_{in(0)}$	Logical 0 level input current at clock	V_{CC} = MAX,					−6.4	mA
$I_{in(1)}$	Logical 1 level input current at D	V_{CC} = MAX,	V_{in} = 2.4V				80	μA
		V_{CC} = MAX,	V_{in} = 5.5V				1	mA
$I_{in(1)}$	Logical 1 level input current at clock	V_{CC} = MAX, V_{in} = 2.4V,					160	μA
		V_{CC} = MAX,	V_{in} = 5.5V				1	mA
I_{OS}	Short circuit output current†	V_{CC} = MAX, V_{out} = 0		S5477	−20		−75	mA
				N7477	−18		−75	mA
I_{CC}	Supply current	V_{CC} = MAX,		S5477		32	46	mA
				N7477		32	53	mA

SWITCHING CHARACTERISTICS, V_{CC} = 5V, T_A = 25°C, N = 10

PARAMETER		TEST CONDITIONS NOTE A		MIN	TYP	MAX	UNIT
t_{setup1}	Minimum logical 1 level input setup time at D input	C_L = 15pF,	R_L = 400Ω		7	20	ns
t_{setup0}	Minimum logical 0 level input setup time at D input	C_L = 15pF,	R_L = 400Ω		14	20	ns
t_{hold1}	Maximum logical 1 level input hold time required at D input	C_L = 15pF,	R_L = 400Ω	0	15¶		ns
t_{hold0}	Maximum logical 0 level input hold time required at D input	C_L = 15pF,	R_L = 400Ω	0	6¶		ns
$t_{pd1(D-Q)}$	Propagation delay time to logical 1 level from D input to Q output	C_L = 15pF,	R_L = 400Ω		16	30	ns
$t_{pd0(D-Q)}$	Propagation delay time to logical 0 level from D input to Q output	C_L = 15pF,	R_L = 400Ω		14	25	ns
$t_{pd1(C-Q)}$	Propagation delay time to logical 1 level from clock input to Q output	C_L = 15pF,	R_L = 400Ω		16	30	ns
$t_{pd0(C-Q)}$	Propagation delay time to logical 0 level from clock input to Q output	C_L = 15pF,	R_L = 400Ω		7	15	ns

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable circuit type.

** All typical values are at V_{CC} = 5V, T_A = 25°C.

† Not more than one output should be shorted at a time.

¶ These typical times indicate that period occurring prior to the fall of clock pulse (t_0) below 1.5V when data at the D input will still be recognized and stored.

NOTE A: AC Test circuit, voltage waveforms and switching times are given on page 2-76