

9601 Monostable Multivibrator

	Schottky TTL				High-Speed TTL				Low-Power Schottky TTL				Standard TTL				Low-Power TTL					
	Device Type		Package		Device Type		Package		Device Type		Package		Device Type		Package		Device Type		Package			
			C	P			M	CF			C	P			M	CF			C	P	M	CF
T. I.																						
FAIRCHILD													SN29601	J	N	Q						
MOTOROLA													FM9601	D	Q	F	Q					
N. S. C.													FC9601	D	P	Q	F	Q				
PHILIPS													MC9601	L	Q	F	Q					
SIGNETICS													MC8601	L	P	Q	F	Q				
SIEMENS													DM9601	J	N	Q	W	Q				
FUJITSU													DM8601	J	N	Q	W	Q				
HITACHI																						
MITSUBISHI																						
NEC																						
TOSHIBA																						

Electrical Characteristics SN29601

absolute maximum ratings over operating free-air temperature range

Supply voltage, V <sub>CC</sub> (see Notes 1 and 2)	8 V	Operating free-air temperature range	0°C to 75°C
Input voltage	5.5 V	Storage temperature range	-65°C to 150°C
Intermittent voltage (see Note 3)	5.5 V	Steady-state input current range	-30 mA to 5 mA
		Low-level output current	50 mA

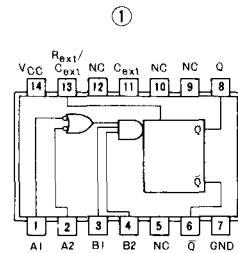
recommended operating conditions

	SN29601			UNIT
	MIN	NOM	MAX	
Supply voltage, V <sub>CC</sub>	4.75	5	5.25	V
Normalized fan-out from each output, N	High logic level		20	
	Low logic level		10	
Input data setup time, t <sub>setup</sub>	40			ns
Input data hold time, t <sub>hold</sub>	40			ns
Width of clear pulse, t <sub>w(clear)</sub>	40			ns
External timing resistance	5		50	kΩ
External capacitance	No restriction			
Wiring capacitance at R <sub>ext</sub> /C <sub>ext</sub> terminal			50	pF
Operating free-air temperature, T <sub>A</sub>	0		75	°C

electrical characteristics over operating free-air temperature range

PARAMETER	TEST CONDITIONS†	MIN	TYP‡	MAX	UNIT		
V <sub>IH</sub>	High-level input voltage	2			V		
V <sub>IL</sub>	Low-level input voltage			0.8	V		
V <sub>I</sub>	Input clamp voltage	V <sub>CC</sub> - MIN.	I <sub>I</sub> = -12 mA	-1.5	V		
V <sub>OH</sub>	High-level output voltage	V <sub>CC</sub> - MIN.	I <sub>OH</sub> = -800 μA	2.4	3.4	V	
V <sub>OL</sub>	Low-level output voltage	V <sub>CC</sub> - MIN.	I <sub>OL</sub> = 16 mA	0.2	0.4	V	
I <sub>I</sub>	Input current at maximum input voltage	V <sub>CC</sub> = MAX.	V <sub>I</sub> = 5.5 V	1	mA		
I <sub>IH</sub>	High-level input current	V <sub>CC</sub> = MAX.	V <sub>I</sub> = 2.4 V	40	μA		
				80	μA		
I <sub>IL</sub>	Low-level input current	V <sub>CC</sub> = MAX.	V <sub>I</sub> = 0.4 V	-1.6	mA		
				-3.2	mA		
I <sub>OS</sub>	Short-circuit output current	V <sub>CC</sub> = MAX.	See Note 4	-10	-40	mA	
I <sub>CC</sub>	Supply current (quiescent or triggered)	V <sub>CC</sub> = MAX.	See Notes 5 and 6	23	28	mA	
t <sub>PLH</sub>	from either A input to Q output	V <sub>CC</sub> = 5 V.	T <sub>A</sub> = 25°C.	22	33	ns	
t <sub>PLH</sub>	from either B input to Q output	C <sub>ext</sub> = 0.	R <sub>ext</sub> = 5 kΩ.	19	28	ns	
t <sub>PHL</sub>	from either A input to Q output	C <sub>L</sub> = 15 pF.	R <sub>L</sub> = 400 Ω.	30	40	ns	
t <sub>PHL</sub>	from either B input to Q output			27	36	ns	
t <sub>w(min)</sub>	Minimum width of Q output pulse			45	65	ns	
t <sub>w</sub>	Width of Q output pulse	V <sub>CC</sub> = 5 V.	T <sub>A</sub> = 25°C.	3.08	3.42	3.76	μs
		C <sub>ext</sub> = 1000 pF.	R <sub>ext</sub> = 10 kΩ.				
		C <sub>L</sub> = 15 pF.	R <sub>L</sub> = 400 Ω.				

Pin Assignment (Top View)



positive logic: see function table (See Note A)  
NC—No internal connection.

Function Table (See Note B)

INPUTS				OUTPUTS	
A1	A2	B1	B2	Q	Q̄
H	H	X	X	L	H
X	X	L	X	L	H
X	X	X	L	L	H
L	X	H	H	L	H
L	X	↑	H	↑L	↓L
L	X	H	↑	↑L	↓L
X	L	H	H	L	H
X	L	↑	H	↑L	↓L
X	L	H	↑	↑L	↓L
H	↓	H	H	↑L	↓L
↓	↓	H	H	↑L	↓L
↓	H	H	H	↑L	↓L

NOTES:

- Voltage values, except intermittent voltage, are with respect to network ground terminal.
- The maximum V<sub>CC</sub> value of 8 volts is not the primary factor in determining the maximum V<sub>CC</sub> which may be applied to a number of interconnected devices. The voltage at a high output at any input may not go above 5.5 volts. This effectively limits the system V<sub>CC</sub> to approximately 7 volts.
- This is the voltage between two emitters of a multiple-emitter transistor. This rating applies between inputs that go directly into the same AND or NAND gate in the functional block diagram.
- Ground C<sub>ext</sub> to measure V<sub>OH</sub> at 0, V<sub>OL</sub> at 0, or I<sub>OS</sub> at 0. C<sub>ext</sub> is open to measure V<sub>OH</sub> at 0, V<sub>OL</sub> at 0, or I<sub>OS</sub> at 0.
- Quiescent I<sub>CC</sub> is measured (after clearing) with 2.4 V applied to all clear and A inputs, B inputs grounded, C<sub>ext</sub> = 0.02 μF, R<sub>ext</sub> = 25 kΩ, R<sub>int</sub> and all outputs open.
- I<sub>CC</sub> is measured in the triggered state with 2.4 V applied to all clear and B inputs, A inputs grounded, C<sub>ext</sub> = 0.02 μF, R<sub>ext</sub> = 25 kΩ, R<sub>int</sub> and all outputs open.
- An external timing capacitor may be connected between C<sub>ext</sub> and R<sub>ext</sub>/C<sub>ext</sub> (positive).
- H = high level (steady state), L = low level (steady state), ↑ = transition from low to high level, ↓ = transition from high to low level, ↑L = one high-level pulse, ↓L = one low-level pulse, X = irrelevant (any input, including transitions).

† For conditions shown as MIN or MAX, use the value specified under recommended operating conditions.  
‡ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.  
♦ Not more than one output should be shorted at a time.  
■ t<sub>PLH</sub> = propagation delay time, low-to-high-level output.  
■ t<sub>PHL</sub> = propagation delay time, high-to-low-level output.  
○ These conditions are recommended for use at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.