

54121/74121 Monostable Multivibrator with Schmitt-Trigger Input

	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.												SN54121	JⓁ		WD
												SN74121	JⓁ	NⓁ	WD
FAIRCHILD												F54121/FM9603	DⓁ		FⓁ
												FC74121/FC9603	DⓁ	PⓁ	
MOTOROLA												MC54121	LⓁ		FⓁ
												MC74121	LⓁ	PⓁ	FⓁ
N.S.C.												DM54121	JⓁ	NⓁ	WD
												DM74121	JⓁ	NⓁ	WD
PHILIPS												FJK101/74121		Ⓛ	
SIGNETICS												S54121	FⓁ	AⓁ	WD
												N74121	FⓁ	AⓁ	WD
SIEMENS												FLK101		Ⓛ	
FUJITSU															
HITACHI															
MITSUBISHI												HD74121/HD2543	Ⓛ	PⓁ	
MITSUBISHI															
NEC												M53321		PⓁ	
TOSHIBA															
												TD34121A		PⓁ	

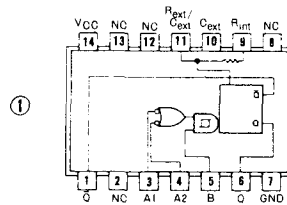
Electrical Characteristics SN54S121/SN74S121

absolute maximum ratings over operating free-air temperature range							
Supply voltage, V _{CC}	7V	Operating free-air temperature range	SN54S 55°C to 125°C SN74S 0°C to 70°C				
Input voltage	5.5V	Storage temperature range	65°C to 150°C				
recommended operating conditions							
	SN54S121	SN74S121	UNIT				
Supply voltage, V _{CC}	MIN 4.5	NOM 5	MAX 5.5	V			
High-level output current, I _{OH}			400	mA			
Low-level output current, I _{OL}			16	mA			
Rate of rise fall of input pulse, dv/dt	Schmitt input B			V/S			
Input pulse width (min)	Logic inputs, A1, A2			V·S			
External timing capacitance, C _{ext}			50	ns			
External timing capacitance, C _{ext}			1.4	30	40		
External timing capacitance, C _{ext}			0	1000	6		
Duty cycle	RT 2KΩ			67	%		
	RT MAX Per1			90	%		
Operating free-air temperature, T _A			55	125	0	70	°C

Electrical characteristics over recommended operating free-air temperature range

PARAMETER	TEST CONDITIONS †	MIN	TYP ‡	MAX	UNIT		
V _{T+}	Positive-going threshold voltage	V _{CC} =MIN	A input	1.4	2	V	
V _{T-}	Negative-going threshold voltage	V _{CC} =MIN	A input	0.8	1.4	V	
V _{T+}	Positive-going threshold voltage	V _{CC} =MIN	B input	1.55	2	V	
V _{T-}	Negative-going threshold voltage	V _{CC} =MIN	B input	0.8	1.35	V	
V _I	Input clamp voltage	V _{CC} =MIN, I _I =-12mA			-1.5	V	
V _{OH}	High-level output voltage	V _{CC} =MIN, I _{OH} =MAX		2.4	3.4	V	
V _{OL}	Low-level output voltage	V _{CC} =MIN, I _{OL} =MAX		0.2	0.4	V	
I _I	Input current at maximum input voltage	V _{CC} =MAX, V _I =5.5V			1	mA	
I _{IH}	High-level input current	V _{CC} =MAX, V _I =2.4V	A1 or A2		40	μA	
	High-level input current	V _{CC} =MAX, V _I =2.4V	B		80	μA	
I _{IL}	Low-level input current	V _{CC} =MAX, V _I =0.4V	A1 or A2		-1.6	mA	
	Low-level input current	V _{CC} =MAX, V _I =0.4V	B		-3.2	mA	
I _{OS}	Short-circuit output current †	V _{CC} =MAX	54 Family	-20	-55	mA	
	Short-circuit output current †	V _{CC} =MAX	74 Family	-18	-55	mA	
I _{CC}	Supply current	V _{CC} =MAX	Quiescent	13	25	mA	
	Supply current	V _{CC} =MAX	Triggered	23	40	mA	
t _{PLH}	Propagation delay time, low-to-high-level Q output from either A input	V _{CC} =5V, T _A =25°C, C _L =15pF, R _L =400Ω	C _T =80pF, R _{int} to V _{CC}	45	70	ns	
t _{PLH}	Propagation delay time, low-to-high-level Q output from B input			35	55	ns	
t _{PHL}	Propagation delay time, high-to-low-level Q output from either A input			50	80	ns	
t _{PHL}	Propagation delay time, high-to-low-level Q output from B input			40	65	ns	
t _{w(out)}	Pulse width obtained using internal timing resistor	V _{CC} =5V, T _A =25°C, C _L =15pF, R _L =400Ω	C _T =80pF, R _{int} to V _{CC}	70	110	150	ns
t _{w(out)}	Pulse width obtained with zero timing capacitance		C _T =0, R _{int} to V _{CC}	30	50	ns	
t _{w(out)}	Pulse width obtained using external timing resistor		C _T =100pF, R _T =10kΩ	600	700	800	ns
			C _T =1μF, R _T =10kΩ	6	7	8	ms

Pin Assignment (Top view)



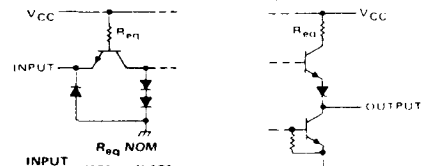
NC-No internal connection
 †121...R_{int}=2 kΩ NOM
 †121...R_{int}=4 kΩ NOM

Function Table

†121 †121 (See Note)

INPUTS		OUTPUTS	
A1	A2	B	Q
L	X	H	L
X	L	H	L
X	X	L	H
H	H	X	L
H	↓	H	↔
↓	↓	H	↔
↓	X	H	↔
X	L	↑	↔
X	L	↑	↔

schematics of inputs and outputs



EQUIVALENT OF EACH INPUT
 A1 4 kΩ
 A2 4 kΩ
 B 2 kΩ

TYPICAL OF BOTH OUTPUTS
 †121 R_{int}=130 Ω NOM
 †121 R_{int}=260 Ω NOM

NOTES : A, H=high level (steady state), L=low level (steady state), ↑=transition from low to high level, ↓=transition from high to low level, ↔=one high-level pulse, ↔=one low-level pulse, X=irrelevant (any input, including transitions).
 B. To use the internal timing resistor connect R_{int} to V_{CC}.
 C. An external timing capacitor may be connected between C_{ext} (positive) and R_{ext}/C_{ext}.
 D. For accurate repeatable pulse widths, connect an external resistor between R_{ext}/C_{ext} and V_{CC} with R_{int} open-circuited.
 E. To obtain variable pulse widths, connect external values resistance between R_{int} or R_{ext}/C_{ext} and V_{CC}.

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
 ‡ All typical values are at V_{CC}=5V, T_A=25°C.
 ● Not more than one output should be shorted at a time.