

CMOS DUAL MONOSTABLE MULTIVIBRATOR

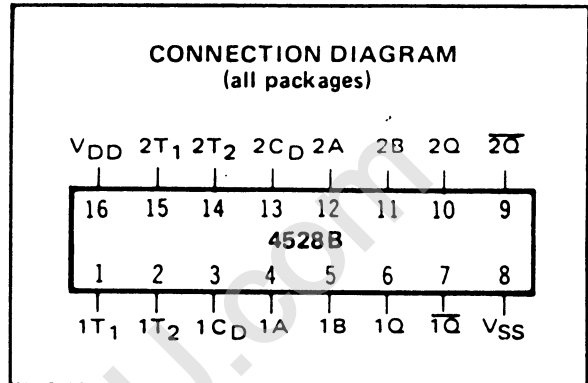
FEATURES

- ◆ Two Independent Multivibrators on One Chip
- ◆ Triggerable from Leading- or Trailing-Edge Pulse
- ◆ Retriggerable
- ◆ Resettable
- ◆ Q and \bar{Q} Buffered Outputs Available
- ◆ Wide Range of Output Pulse Widths

DESCRIPTION

The 4528B Dual Multivibrator provides stable retriggerable/resettable one-shot operation for any fixed-voltage timing application. Timing for the circuit is controlled by an external resistor-capacitor combination (R_x - C_x). Adjustment of these components permits generation of output pulse widths from nanoseconds to minutes. Leading-edge and trailing-edge Trigger inputs are provided, and both positive-going and negative-going pulses are available from complementary outputs.

Timing pulses may be terminated at any time by applying a low logic level to the Reset input C_D .



RECOMMENDED OPERATING CONDITIONS

For maximum reliability:

DC Supply Voltage	$V_{DD} - V_{SS}$	3 to 15	Vdc
Operating Temperature	T_A		
C		-55 to +125	°C
E		-40 to +85	°C

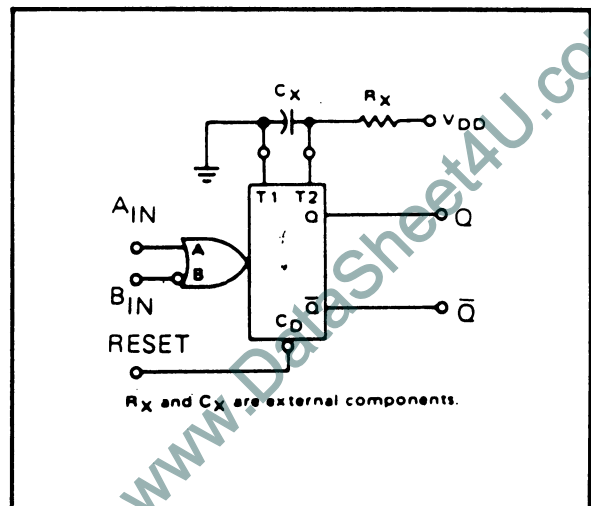
FUNCTION TABLE

INPUTS			OUTPUTS	
C_D	A	B	Q	\bar{Q}
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	↑	H	⎓	⎓
H	L	↓	⎓	⎓

- H = High Level (Steady State)
- L = Low Level (Steady State)
- ↑ = Transition, Low-to-High
- ↓ = Transition, High-to-Low
- X = Irrelevant (Inc. Transitions)
- ⎓ = One High-Level Pulse
- ⎓ = One Low-Level Pulse

BLOCK DIAGRAM

(one of two devices)



ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS¹

PARAMETER	V _{DD} (Vdc)	CONDITIONS	T _{LOW} ²		+25°C			T _{HIGH} ²		Units
			Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
QUIESCENT DEVICE CURRENT	I _{DD}	V _{IN} = V _{SS} or V _{DD} All valid input combinations	-	5	-	0.05	5	-	150	μAdc
			-	10	-	0.1	10	-	300	
			-	20	-	0.2	20	-	600	

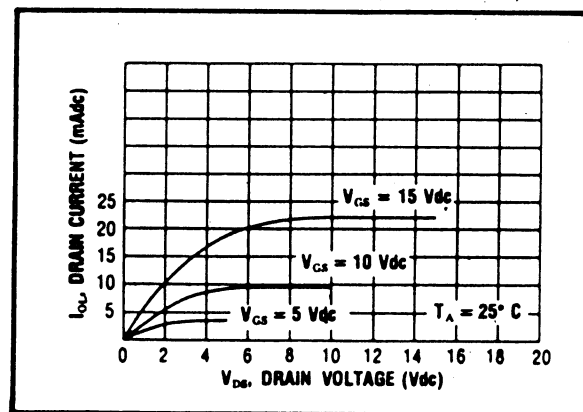
NOTES: ¹ Remaining Static Electrical Characteristics are listed under "4000B Series Family Specifications".

² T_{LOW} = -55°C for C
= -40°C for E

T_{HIGH} = +125°C for C
= +85°C for E

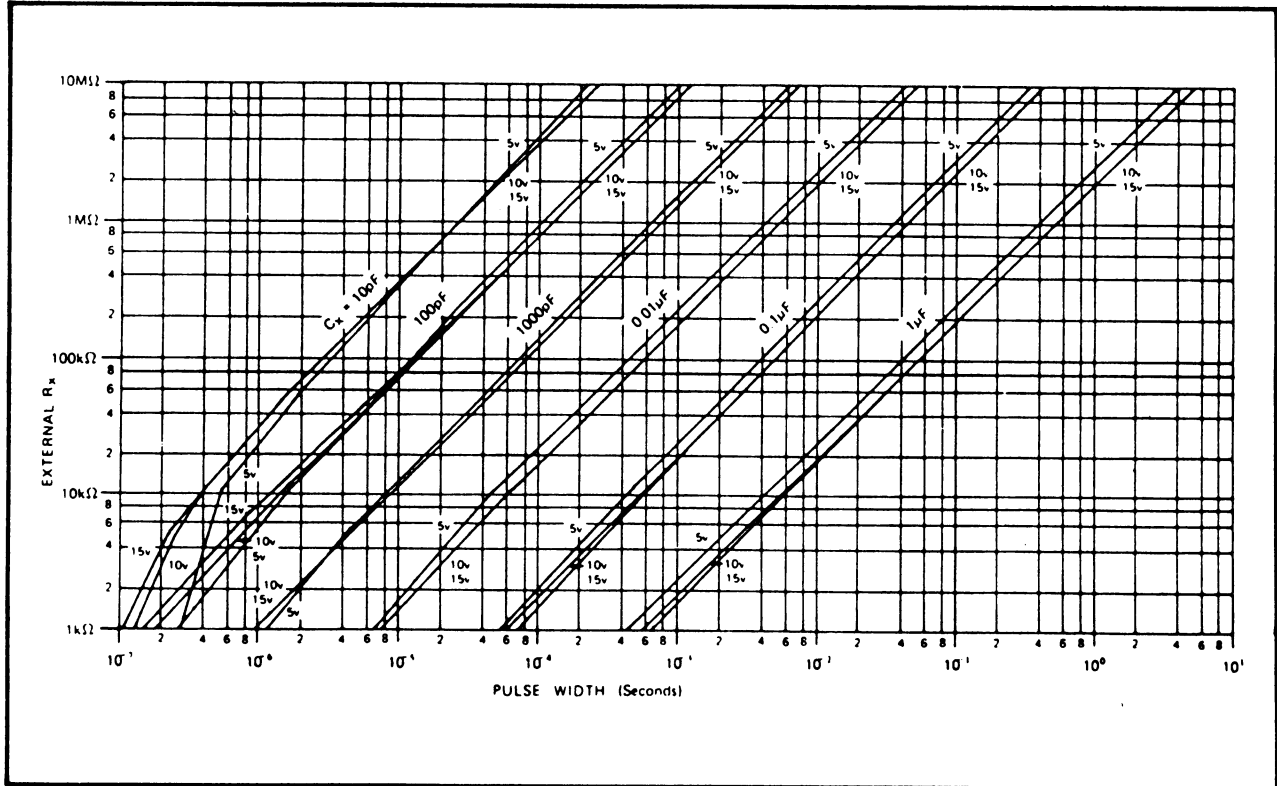
DYNAMIC CHARACTERISTICS (C_L = 50pF, T_A = 25°C)

PARAMETER	C _x (pF)	R _x (kΩ)	V _{DD} (Vdc)	Min.	Typ.	Max.	Units			
PROPAGATION DELAY TIME	t _{PLH} , t _{PHL}	15	5	5	-	270	540			
				10	-	90	180			
				15	-	70	140			
		From C _D	1000	10	5	-	510	1020		
					10	-	170	340		
					15	-	120	240		
OUTPUT TRANSITION TIME	t _{TLH} , t _{THL}	15	5	5	-	270	540			
				10	-	90	180			
				15	-	70	140			
				Note: \bar{Q} Output	1000	10	5	-	550	1100
							10	-	300	600
							15	-	250	500
MINIMUM INPUT PULSE WIDTH A or B Input	PW _{in}	-	-	5	-	70	140			
				10	-	30	60			
				15	-	25	50			
				OUTPUT PULSE WIDTH MATCH Same package	1000	10	5	-	± 7.5	± 15
							10	-	± 10	± 20
							15	-	± 10	± 20
Different packages	1000	10	5	-	-	± 50				
			10	-	-	± 50				
			15	-	-	± 50				

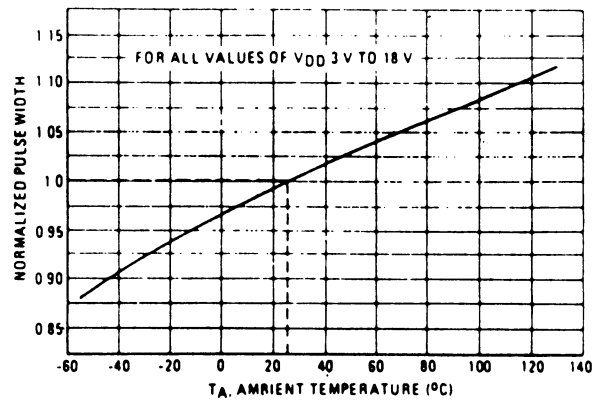
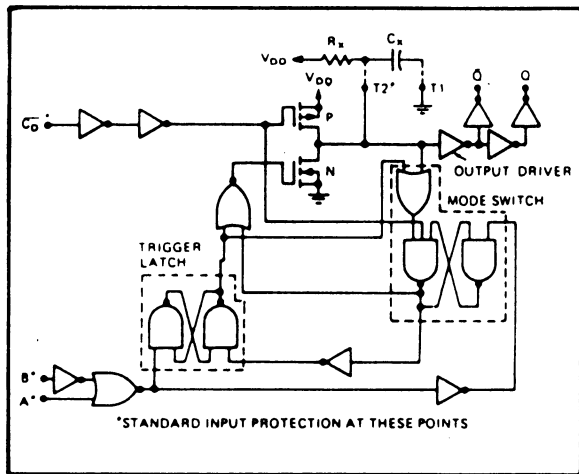


Typical N-Channel
Sink Current Characteristics

4528B PULSE WIDTH VS. R_X , C_X , V_{DD}



LOGIC DIAGRAM



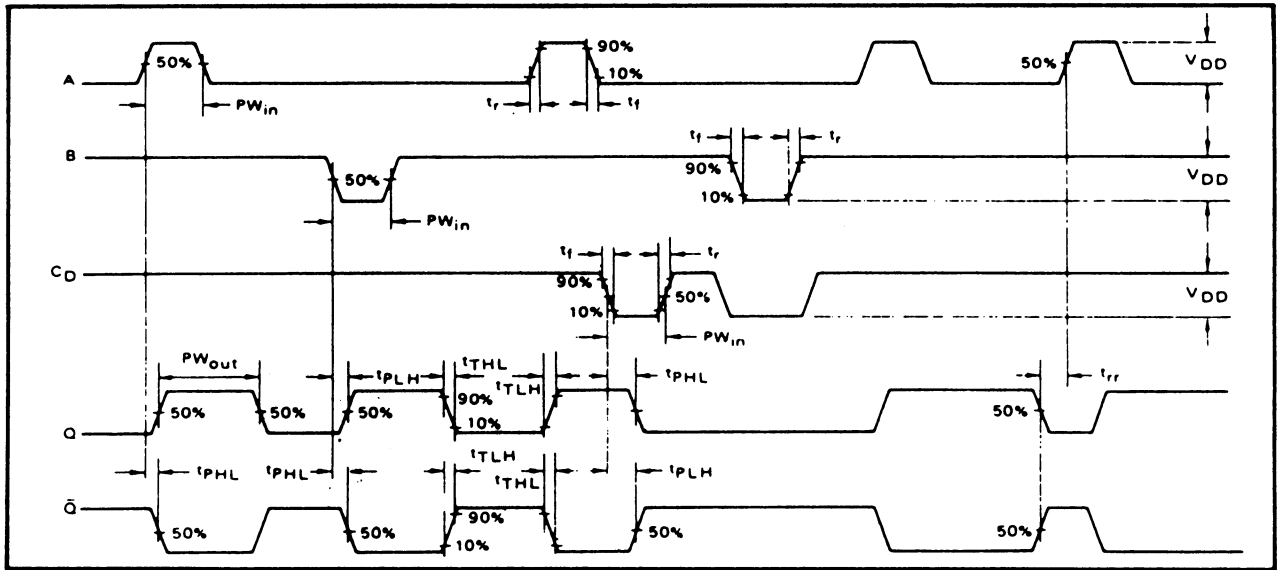
Normalized Pulse Width versus Temperature

Notes:

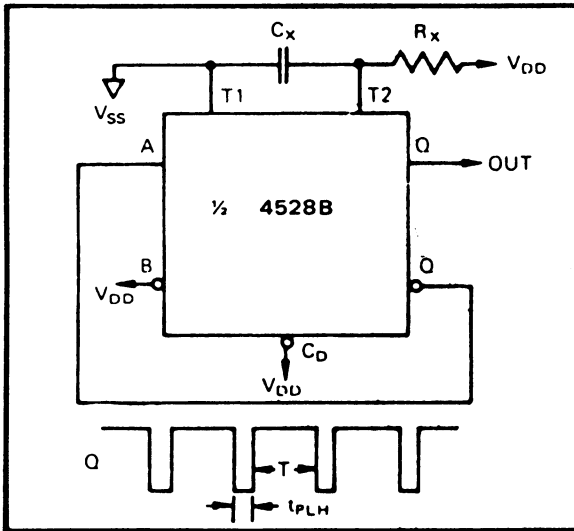
There is no effective maximum limit on R_X ; recommended minimum value for R_X is 1K Ω . There are no restrictions on the value of C_X .

For proper operation all unused inputs should be tied to a logic level. The mode point (T2) of a unused half of device should be tied high through an external resistor to V_{DD} .

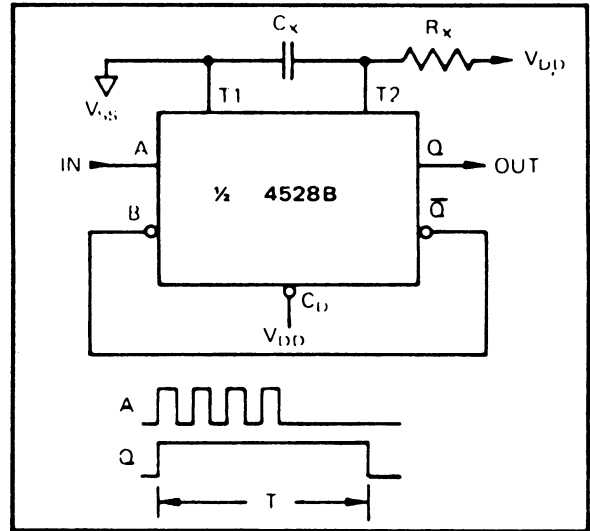
AC TEST WAVEFORMS



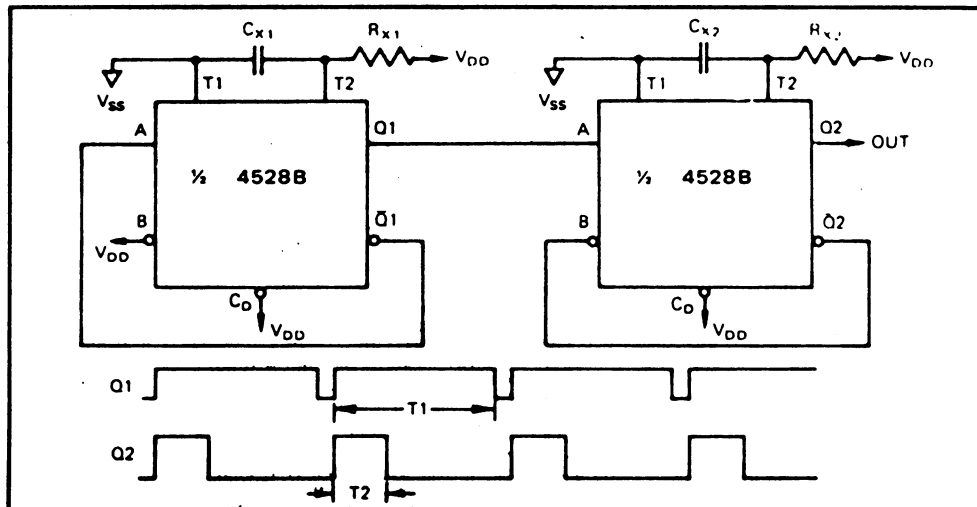
APPLICATIONS INFORMATION



Astable Operation



Connection for Non-Retriggerable Operation



Astable Multivibrator with Adjustable Period and Duty Cycle