R&E INTERNATIONAL, INC.

CMOS DUAL MONOSTABLE MULTIVIBRATOR

FEATURES

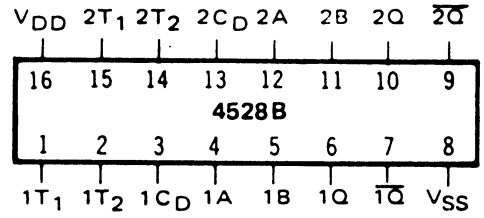
- Two Independent Multivibrators on One Chip
- Triggerable from Leading- or Trailing-Edge Pulse
- Retriggerable
- Resettable
- Q and $\overline{Q}$ Buffered Outputs Available
- Wide Range of Output Pulse Widths

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.

CONNECTION DIAGRAM
(all packages)



RECOMMENDED OPERATING CONDITIONS

For maximum reliability:

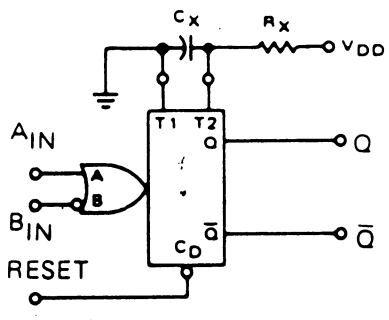
DC Supply Voltage	V_{DD} - V_{SS}	3 to 15	Vdc
Operating Temperature	T_A		
C		-55 to +125	°C
E		-40 to +85	°C

FUNCTION TABLE

INPUTS			OUTPUTS	
C_D	A	B	Q	$\overline{Q}$
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)



R_X and C_X are external components.

ELECTRICAL CHARACTERISTICS

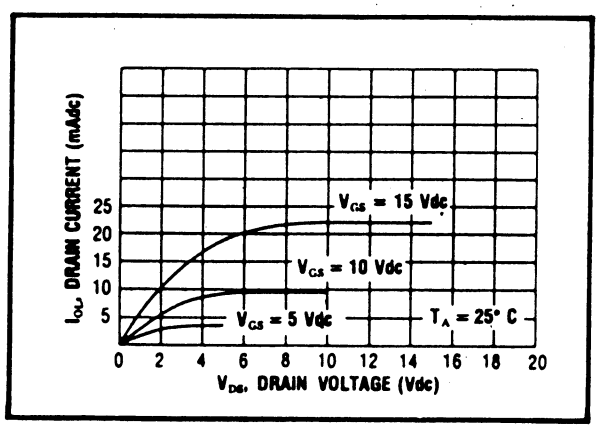
STATIC CHARACTERISTICS [1]

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}	5	$V_{IN} = V_{SS}$ or V_{DD}	–	5	–	0.05	5	–	150	μAdc
		10	All valid input	–	10	–	0.1	10	–	300	
		20	combinations	–	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

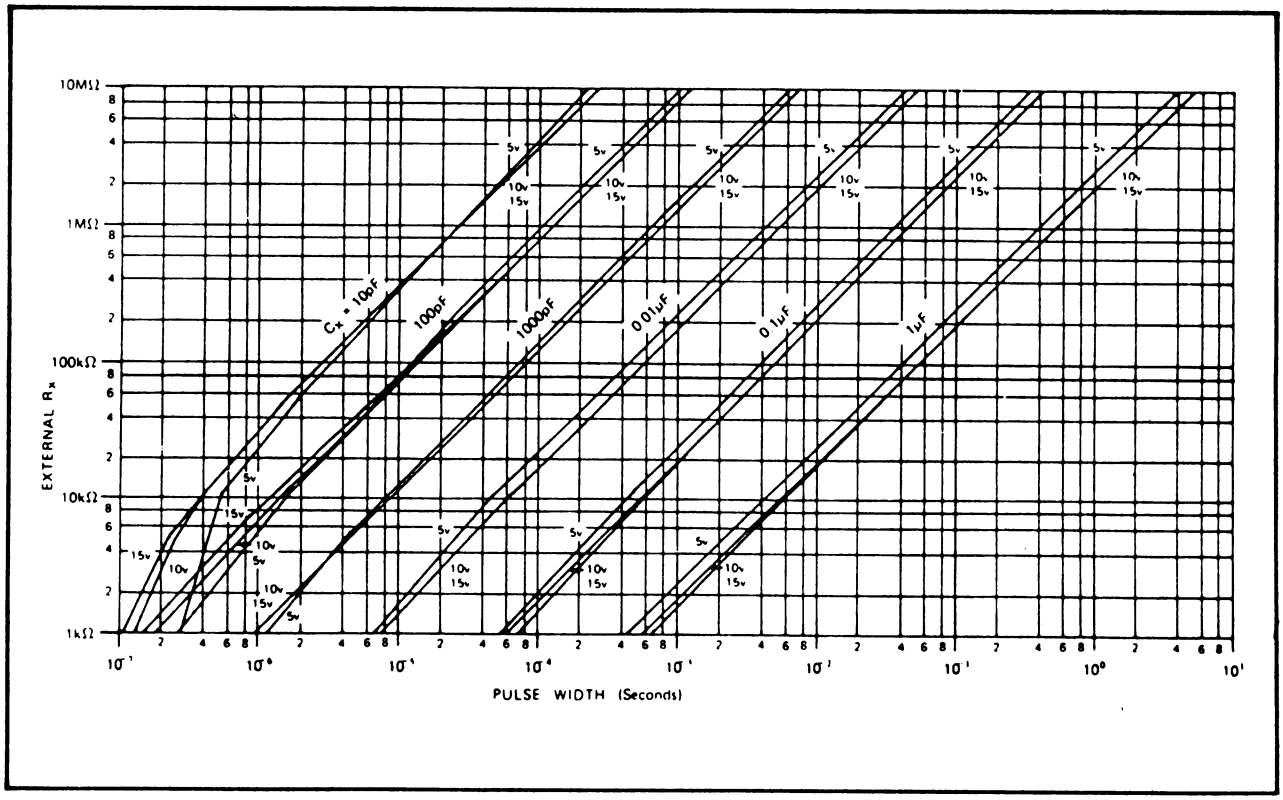
DYNAMIC CHARACTERISTICS (C_L = 50pF, T_A = 25°C)

PARAMETER		Cx (pF)	Rx (kΩ)	V_{DD} (Vdc)	Min.	Typ.	Max.	Units
PROPAGATION DELAY TIME	t_{PLH}, t_{PHL}							
From A or B		15	5	5	–	270	540	ns
				10	–	90	180	
				15	–	70	140	
		1000	10	5	–	510	1020	ns
				10	–	170	340	
				15	–	120	240	
From C_D		15	5	5	–	270	540	ns
				10	–	90	180	
				15	–	70	140	
		1000	10	5	–	550	1100	ns
				10	–	300	600	
				15	–	250	500	
OUTPUT TRANSITION TIME	t_{TLH}, t_{THL}							
		–	–	5	–	130	260	ns
				10	–	65	130	
				15	–	50	100	
Note: $\overline{Q}$ Output	t_{TLH}							
		15	5	5	–	130	260	ns
				10	–	65	130	
				15	–	50	100	
		1000	10	5	–	270	540	ns
				10	–	240	480	
				15	–	220	440	
MINIMUM INPUT PULSE WIDTH A or B Input	PW_{in}							
		–	–	5	–	70	140	ns
				10	–	30	60	
				15	–	25	50	
OUTPUT PULSE WIDTH MATCH	ΔPW_{out}							
Same package		1000	10	5	–	± 7.5	±15	%
				10	–	±10	±20	
				15	–	±10	±20	
Different packages		1000	10	5	–	–	±50	%
				10	–	–	±50	
				15	–	–	±50	

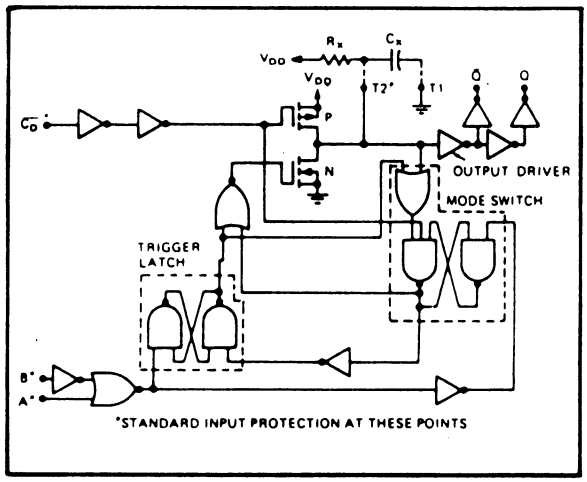


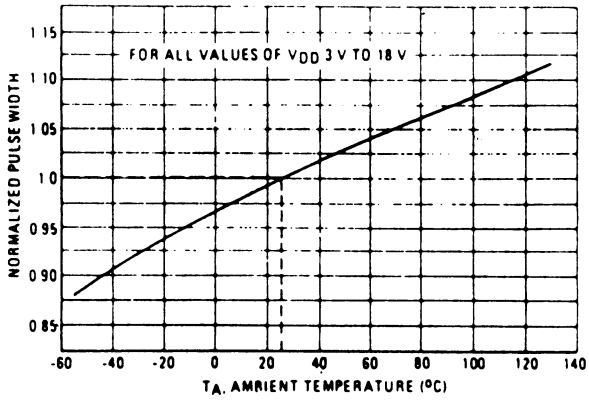
Typical N-Channel
Sink Current Characteristics

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



LOGIC DIAGRAM





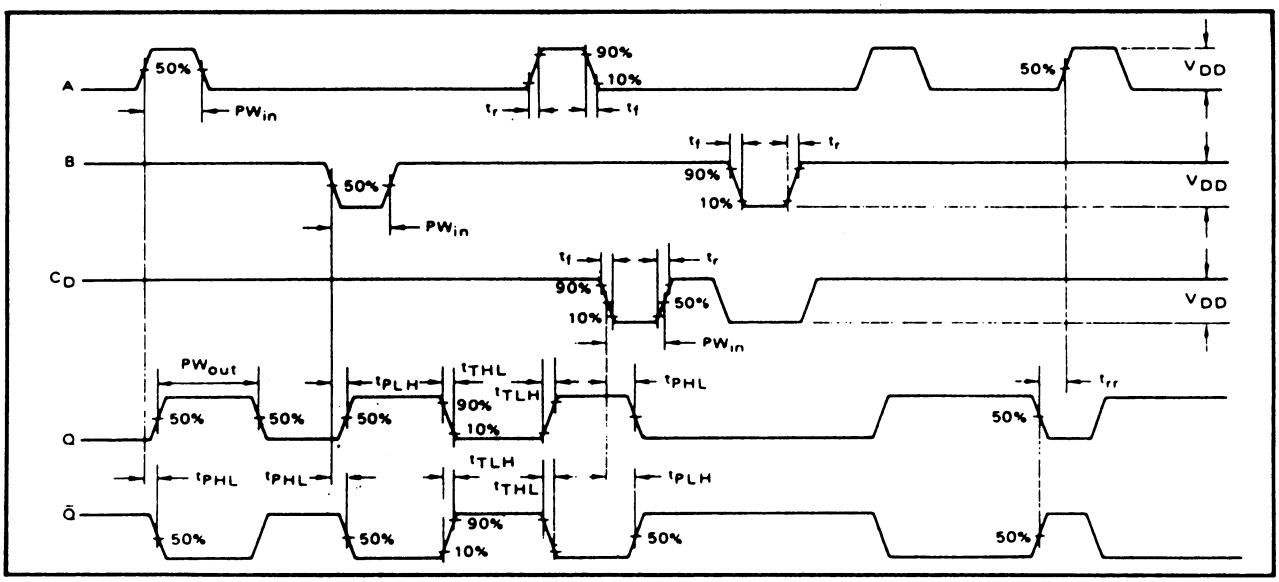
Normalized Pulse Width versus Temperature

Notes:

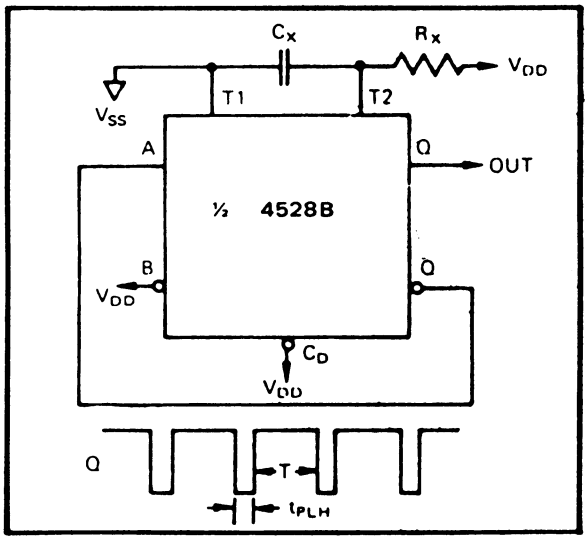
There is no effective maximum limit on R_X; recommended minimum value for R_X is 1KΩ. There are no restrictions on the value of C_X.

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}.

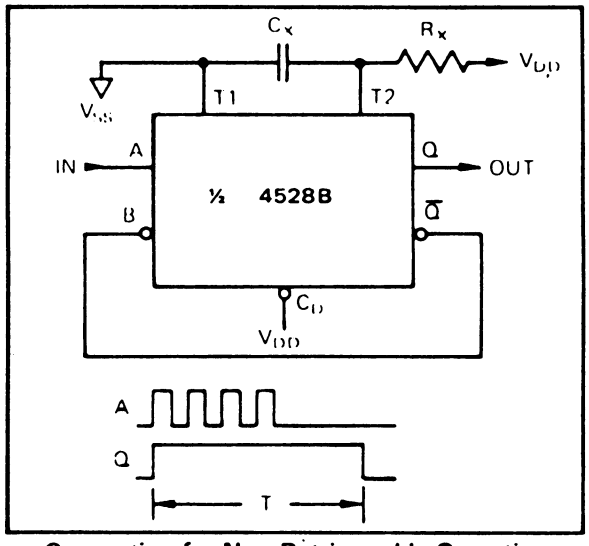
AC TEST WAVEFORMS



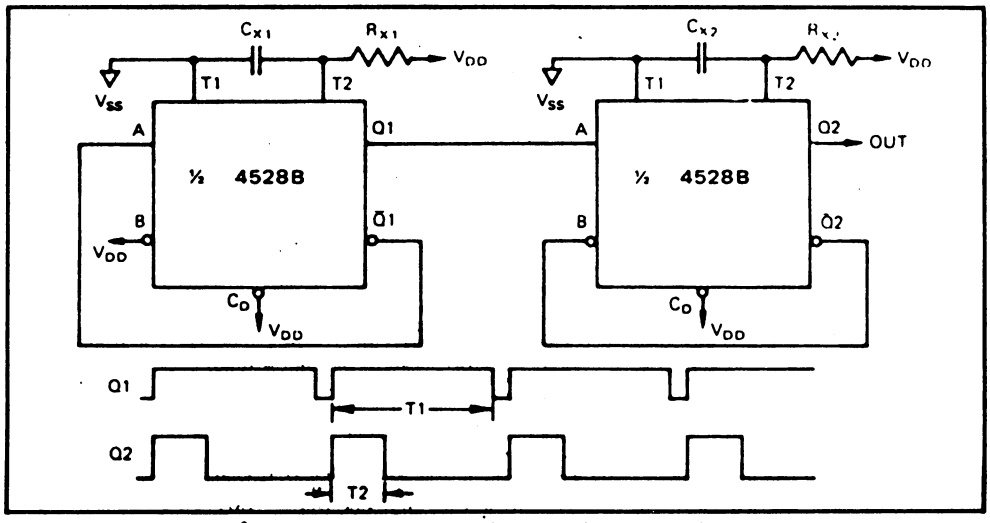
APPLICATIONS INFORMATION



Astable Operation



Connection for Non-Retriggerable Operation



Astable Multivibrator with Adjustable Period and Duty Cycle