

### CMOS HEX INVERTER

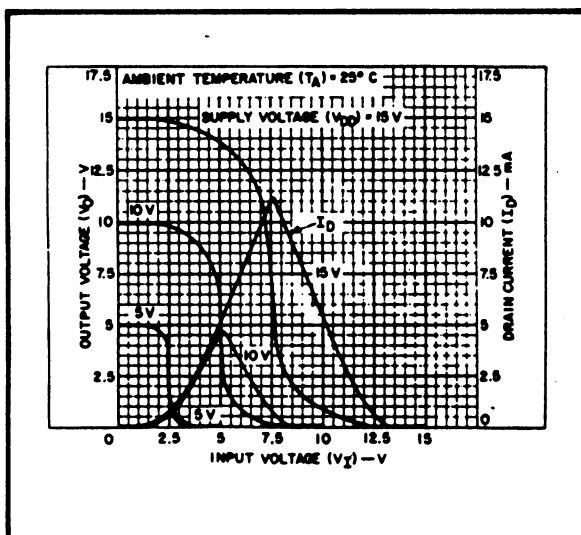
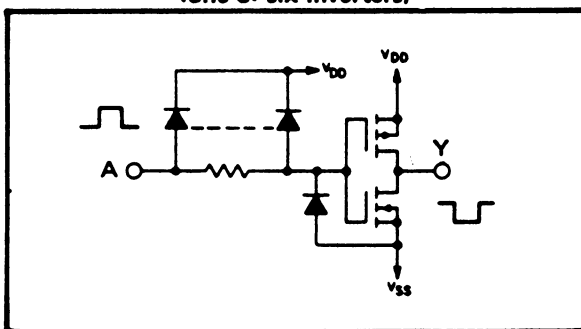
#### FEATURES

- ◆ All Inputs Fully Diode-Protected
- ◆ Pin Compatible with 4009B, 4049B
- ◆ Fully "B"-Series Compatible

#### DESCRIPTION

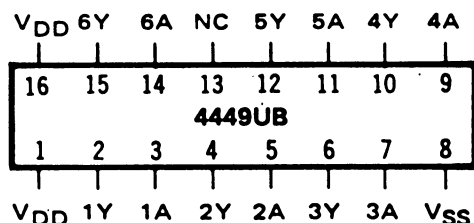
The 4449UB consists of six CMOS inverter circuits. It is pin-compatible with the 4009UB, 4049UB, and equivalent device types. In systems which do not require the high output current and level-shifting capabilities of the buffers, the 4449 can be substituted directly with no change in board layout. The device is particularly useful for quasi-linear circuits, such as oscillators and multivibrators.

#### SCHEMATIC DIAGRAM (one of six inverters)



Typical current and voltage transfer characteristics.

#### CONNECTION DIAGRAM (all packages)

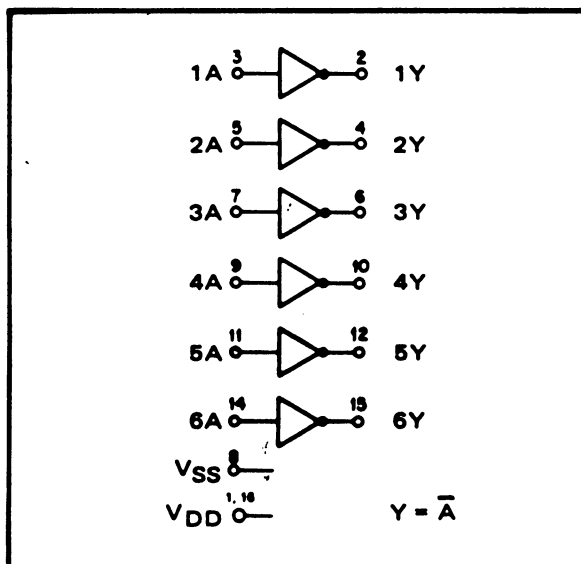


#### RECOMMENDED OPERATING CONDITIONS

For maximum reliability:

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

#### LOGIC DIAGRAM



## ELECTRICAL CHARACTERISTICS

### STATIC CHARACTERISTICS <sup>1</sup>

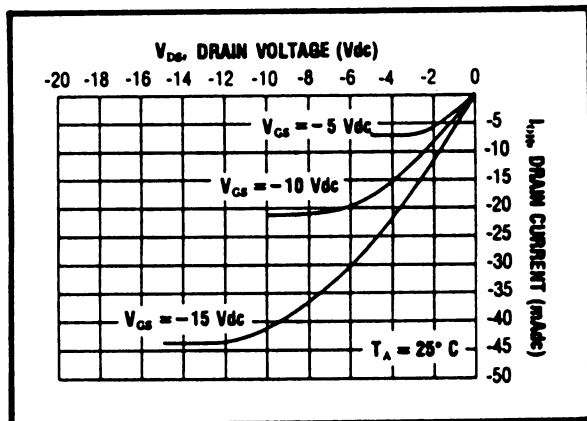
PARAMETER	V <sub>DD</sub> (Vdc)	CONDITIONS	T <sub>LOW</sub> <sup>2</sup>		+25°C			T <sub>HIGH</sub> <sup>2</sup>		Units
			Min.	Max.	Min.	Typ.	Max.	Min.	Max.	
QUIESCENT DEVICE CURRENT	I <sub>DD</sub>	V <sub>IN</sub> = V <sub>SS</sub> or V <sub>DD</sub> All valid input combinations	—	0.05	—	0.0005	0.05	—	1.5	μAdc
			—	0.10	—	0.001	0.10	—	3.0	
			—	0.20	—	0.002	0.20	—	6.0	

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

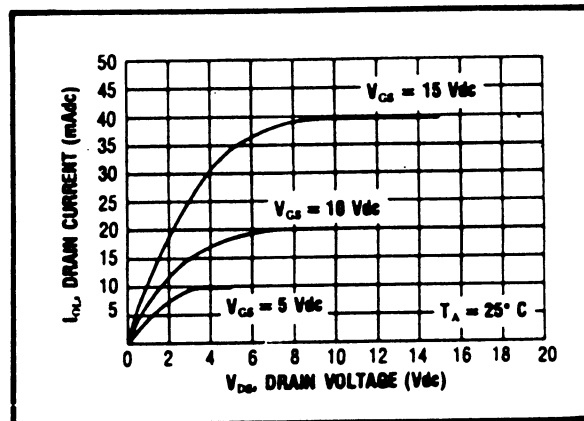
<sup>2</sup> T<sub>LOW</sub> = -55°C for C  
 = -40°C for E  
 T<sub>HIGH</sub> = +125°C for C  
 = + 85°C for E

### DYNAMIC CHARACTERISTICS (C<sub>L</sub> = 50pF, T<sub>A</sub> = 25°C)

PARAMETER	V <sub>DD</sub> (Vdc)	Min.	Typ.	Max.	Units
PROPAGATION DELAY TIME	t <sub>PLH</sub> , t <sub>PHL</sub>	5	—	60	ns
		10	—	30	
		15	—	25	
OUTPUT TRANSITION TIME	t <sub>TLH</sub> , t <sub>THL</sub>	5	—	100	ns
		10	—	50	
		15	—	40	

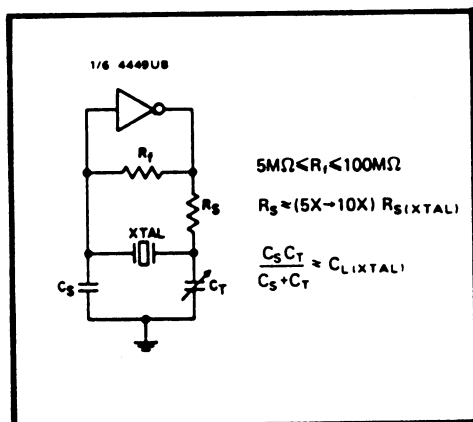


Typical P-Channel Source Current Characteristics

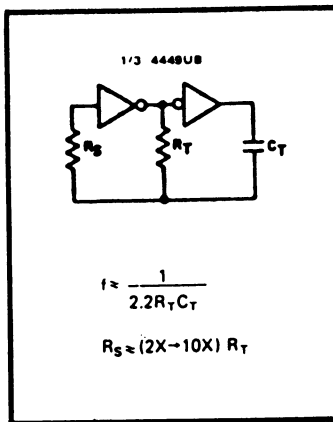


Typical N-Channel Sink Current Characteristics

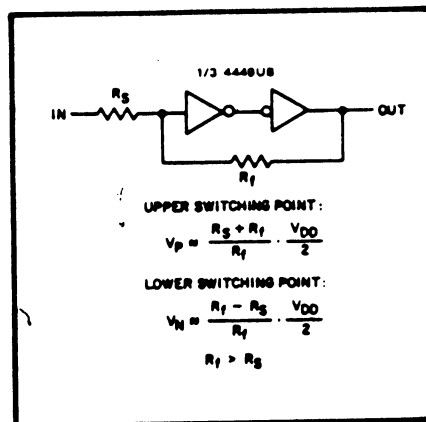
### APPLICATIONS INFORMATION



Typical crystal oscillator circuit



Typical RC oscillator circuit



Input pulse shaping circuit (Schmitt trigger)