

CMOS EXPANDABLE GATES

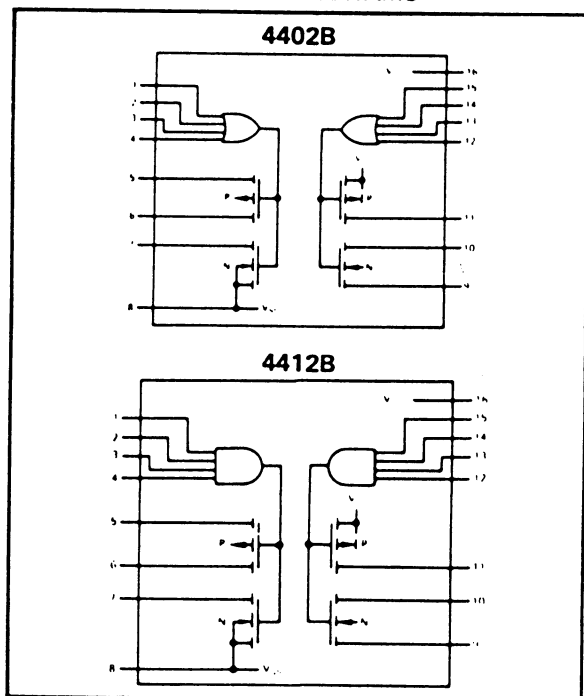
FEATURES

- ◆ Dual 4-Input Gates with Uncommitted Output Transistors
- ◆ Simplifies Construction of Combinational Logic Functions
- ◆ CMOS-to-TTL Interface Capability
- ◆ All Inputs Diode-Protected

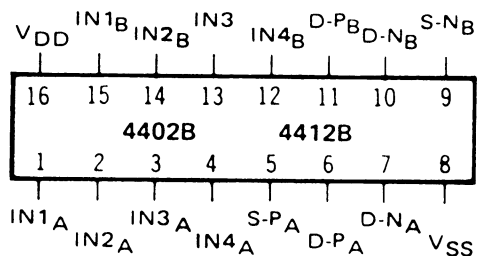
DESCRIPTION

These devices are buffered Dual 4-input NOR Gates (4402B) and NAND Gates (4412B), with uncommitted output transistors. Gate expansion, complex combinational gating, and interface circuits can be constructed from these devices.

LOGIC DIAGRAMS



CONNECTION DIAGRAM (all packages)

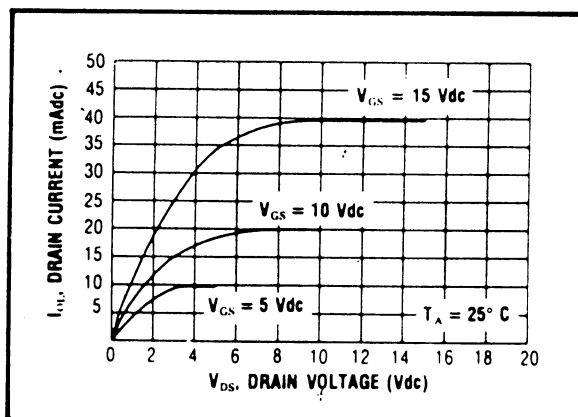


D = Drain
S = Source

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



Typical N-Channel
Sink Current Characteristics

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	—	0.05	—	0.0005	0.05	—	1.5	μA _{dc}
			—	0.10	—	0.001	0.10	—	3.0	
			—	0.20	—	0.002	0.20	—	6.0	

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

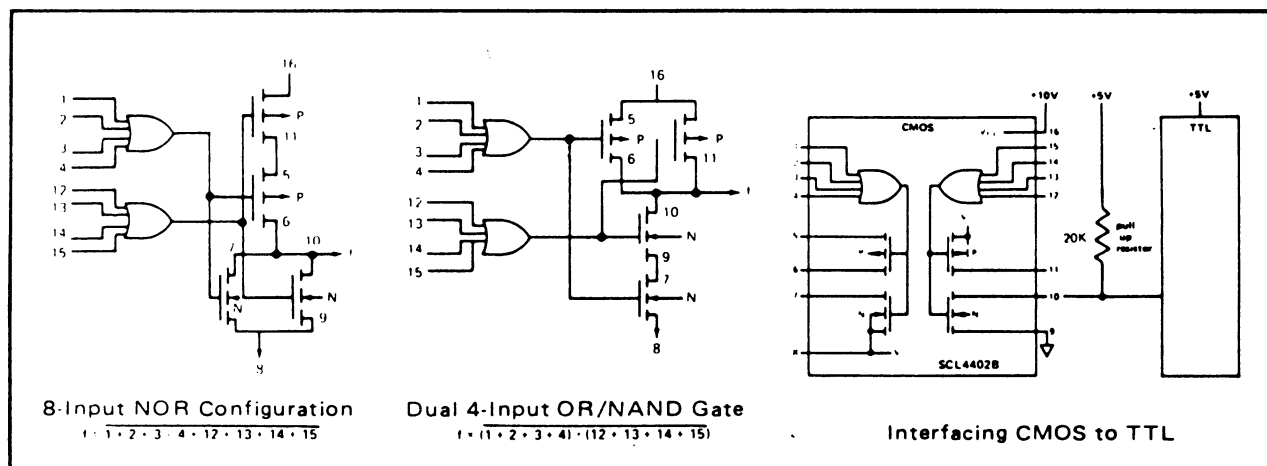
= + 85°C for E

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

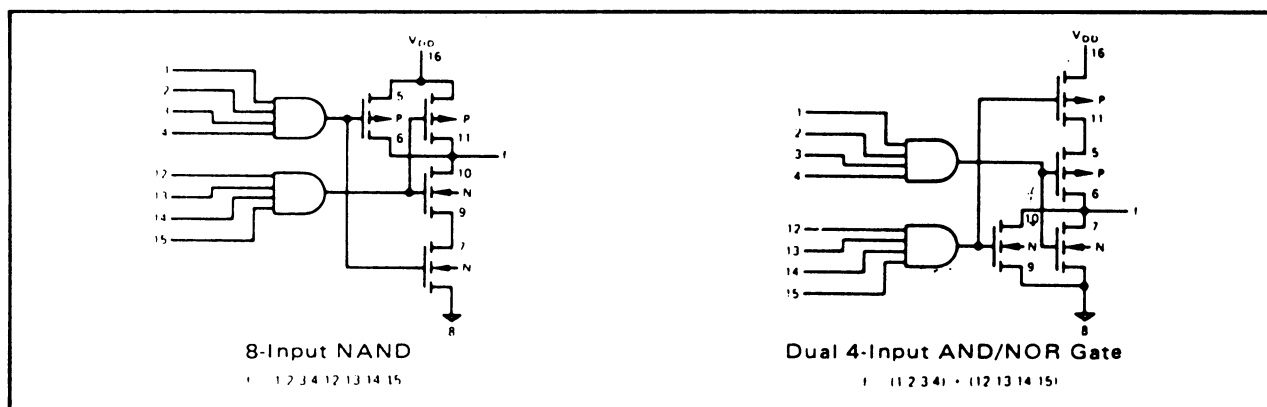
PARAMETER		V _{DD} (Vdc)	Min.	Typ.	Max.	Units
PROPAGATION DELAY TIME Connected as Dual 4-Input Gates	t _{PLH} , t _{PHL}	5	—	125	250	ns
		10	—	60	120	
		15	—	45	90	
OUTPUT TRANSITION TIME	t _{TLH} , t _{THL}	5	—	100	200	ns
		10	—	50	100	
		15	—	40	80	

APPLICATIONS INFORMATION

4402B



4412B



For additional information, see Application Note AN-102.