

CMOS EXPANDABLE 4-WIDE, 2-INPUT AND-OR INVERT GATE

FEATURES

- Medium-speed operation — $t_{pHL} = 90$ ns;
 $t_{pLH} = 140$ ns (typ.) at 10 V
- INHIBIT and ENABLE inputs
- Buffered outputs
- 100% tested for quiescent current at 15 V
- Maximum input leakage current of $1\mu A$ over full package-temperature range; 100 nA at 15 V and 25°C
- Noise margin (over full package temperature range):
 - 1 V at $V_{DD} = 5$ V
 - 2 V at $V_{DD} = 10$ V
 - 2.5 V at $V_{DD} = 15$ V
- Standardized, symmetrical output characteristics
- 5-V, 10-V, and 15-V parametric ratings
- Meets all requirements of JEDEC Tentative Standard No. 13A, "Standard Specifications for Description of 'B' Series CMOS Devices"

DESCRIPTION

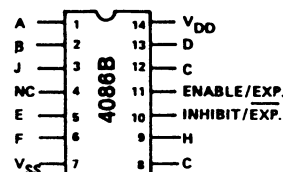
The 4086B contains one 4-wide 2-input AND-OR-INVERT gate with an INHIBIT/ $\overline{EXP}$ input and an ENABLE/EXP input. For a 4-wide A-O-I-function INHIBIT/EXP is tied to V_{SS} and ENABLE/EXP to V_{DD} . See Fig. 2 and its associated explanation for applications where a capability greater than 4-wide is required.

RECOMMENDED OPERATING CONDITIONS

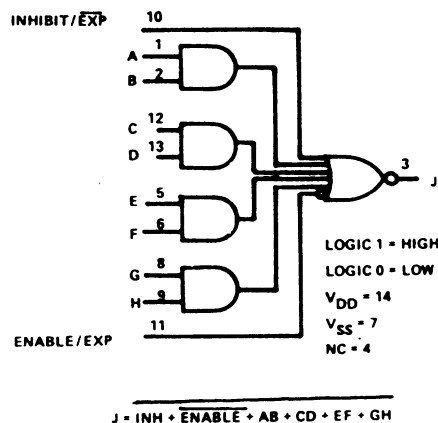
For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIMITS		UNITS
	Min.	Max.	
Supply Voltage Range (For T_A = Full Package Temperature Range)	3	18	V

CONNECTION DIAGRAM



TOPVIEW



FUNCTIONAL DIAGRAM

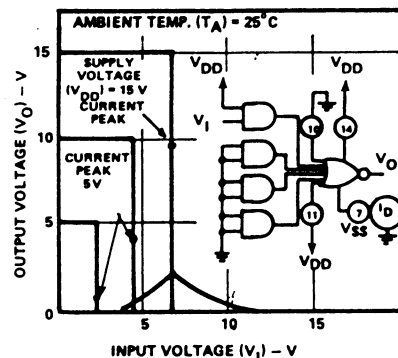


FIGURE 1
TYPICAL VOLTAGE AND CURRENT
TRANSFER CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS¹

PARAMETER	V _{DD} (V _{DC})	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

ABSOLUTE MAXIMUM RATINGS

DC SUPPLY-VOLTAGE RANGE, (V_{DD})

(Voltages referenced to V_{SS} Terminal) -0.5 to +18 V

INPUT VOLTAGE RANGE,

ALL INPUTS -0.5 to V_{DD} + 0.5 V

DC INPUT CURRENT,

ANY ONE INPUT ±10 mA

POWER DISSIPATION PER PACKAGE (P_D):

For T_A = -40 to +60°C
(PACKAGE TYPE E) 500 mW

For T_A = +60 to +85°C
(PACKAGE TYPE E) Derate Linearly

at 12 mW/°C to 200 mW

For T_A = -55 to +100°C
(PACKAGE TYPES D, C, F) 500 mW

For T_A = +100 to +125°C
(PACKAGE TYPES D, C, F) Derate

Linearly at 12 mW/°C to 200 mW

DEVICE DISSIPATION

PER OUTPUT TRANSISTOR

For T_A = FULL PACKAGE-TEMPERATURE RANGE (All Package Types). 100 mW

OPERATING TEMPERATURE RANGE (T_A):

PACKAGE TYPE C -55 to +125°C

PACKAGE TYPE E -40 to +85°C

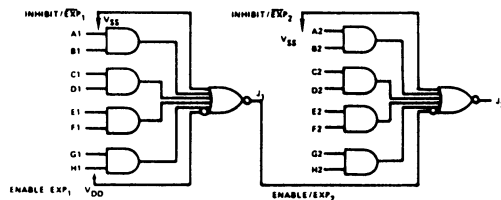
STORAGE TEMPERATURE

RANGE (T_{stg}) -65 to +150°C

LEAD TEMPERATURE (DURING SOLDERING):

At distance 1/16 ± 1/32 inch (1.59 ± 0.79 mm)
from case for 10 s max. +265°C

Fig. 3 shows two 4086's utilized to obtain an 8-wide 2-input A-O-I function. The output (J1) of one 4086 is fed directly to the ENABLE/EXP2 line of the second 4086. In a similar fashion, any NAND gate output can be fed directly into the ENABLE/EXP input to obtain a 5-wide A-O-I function. In addition, any AND gate output can be fed directly into the INHIBIT/EXP input with the same result.

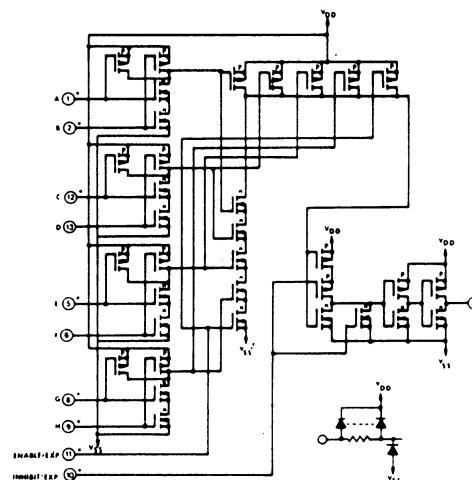


J1: A1B1, C1D1, E1F1, G1H1, A2B2, C2D2, E2F2, G2H2
TWO 4086B'S CONNECTED
AS AN 8-WIDE 2-INPUT A-O-I GATE

DYNAMIC ELECTRICAL CHARACTERISTICS

(T_A = 25°C; Input t_r, t_f = 20 ns, C_L = 50 pF, R_L = 200K(Ω))

CHARACTERISTIC	CONDITIONS	LIMITS		UNIT
	V _{DD} (V)	TYP.	MAX.	
Propagation Delay Time (Data)	5	275	450	ns
	10	90	180	
	15	60	120	
High-to-Low Level, t _{PHL}	5	350	700	ns
	10	140	280	
	15	100	200	
Low-to-High Level, t _{PLH}	5	150	300	ns
	10	60	120	
	15	40	80	
Propagation Delay Time (Inhibit) High-to-Low Level t _{PHL(INH)}	5	250	500	ns
	10	100	200	
	15	70	140	
Low-to-High Level t _{PLH(INH)}	5	100	200	ns
	10	50	100	
	15	40	80	
Transition Time t _{THL} - t _{TLH}	Any Input	5	7.5	pF



*ALL INPUTS PROTECTED BY
STANDARD CMOS PROTECTION
NETWORK