

M54HC266
M74HC266

041970

HS-C²MOS™
INTEGRATED
CIRCUITS

QUAD EXCLUSIVE NOR GATE

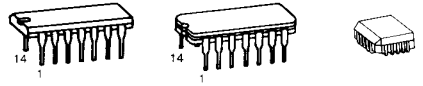
DESCRIPTION

The M54/74HC266 is a high speed CMOS QUAD EXCLUSIVE NOR GATE fabricated in silicon gate CMOS technology. It has the same high speed performance of LSTTL combined with true CMOS low power consumption.

Input and output buffers ensure high noise immunity and stable output.

All inputs are equipped with protection circuits against static discharge or transient excess voltage.

PRELIMINARY DATA



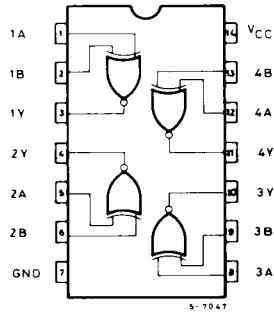
B1 Plastic Package **F1** Ceramic Package **C1** Chip Carrier

ORDERING NUMBERS: M54HC266 F1
M74HC266 B1
M74HC266 F1
M74HC266 C1

FEATURES

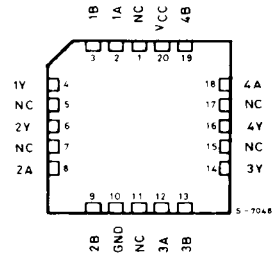
- High Speed
 $t_{PD} = 13 \text{ ns}$ (Typ.) at $V_{CC} = 5V$
- Low Power Dissipation
 $I_{CC} = 1 \mu A$ (Max.) at $T_A = 25^\circ C$
- High Noise Immunity
 $V_{NIH} = V_{NIL} = 28\% V_{CC}$ (Min.)
- Output Drive Capability
10 LSTTL Loads
- Symmetrical Output Impedance
 $|I_{OH}| = I_{OL} = 4 \text{ mA}$ (Min.)
- Balanced Propagation Delays
 $t_{PLH} = t_{PHL}$
- Wide Operating Voltage Range
 $V_{CC} \text{ (opr)} = 2V \text{ to } 6V$
- Pin and Function compatible with 54/74LS266

PIN CONNECTIONS
(top view)



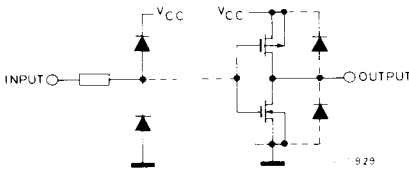
Dual in line

CHIP CARRIER

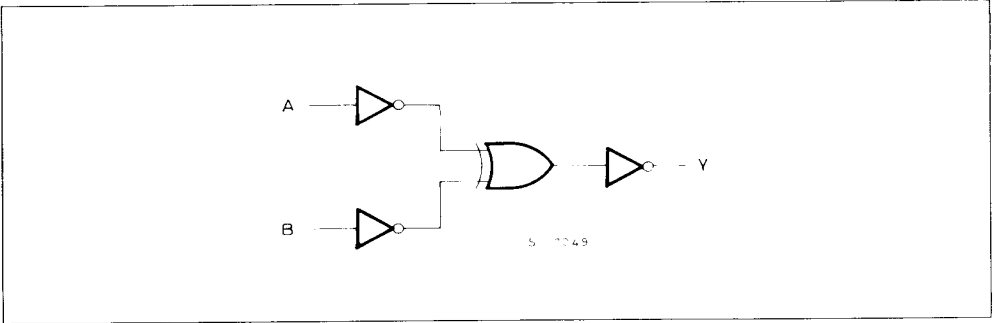


NC = No Internal Connection

INPUT AND OUTPUT EQUIVALENT CIRCUIT



LOGIC DIAGRAM (PER GATE)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	- 0.5 to 7	V
V _I	DC Input Voltage	- 0.5 to V _{CC} + 0.5	V
V _O	DC Output Voltage	- 0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current	± 20	mA
I _{OK}	DC Output Diode Current	± 20	mA
I _O	DC Output Source Sink Current Per Output Pin	± 25	mA
I _{CC} or I _{GND}	DC V _{CC} or Ground Current	± 50	mA
P _D	Power Dissipation	500 (*)	mW
T _{stg}	Storage Temperature	- 65 to 150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

(*) 500 mW: ≅ 65°C derate to 300 mW by 10 mW/°C: 65°C to 85°C.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Limit	Unit
V _{CC}	Supply Voltage	2 to 6	V
V _I	Input Voltage	0 to V _{CC}	V
V _O	Output Voltage	0 to V _{CC}	V
T _A	Operating Temperature 74HC Series 54HC Series	- 40 to 85 - 55 to 125	°C
t _r , t _f	Input Rise and Fall Time	V _{CC} { 2 V 0 to 1000 4.5V 0 to 500 6 V 0 to 400	ns

M54HC266 M74HC266

DC SPECIFICATIONS

Symbol	Parameter	V _{CC}	Test Condition		T _A = 25°C 54HC and 74HC			- 40 to 85°C 74HC		- 55 to 125°C 54HC		Unit	
					Min.	Typ.	Max.	Min.	Max.	Min.	Max.		
V _{IH}	High Level Input Voltage	2.0			1.5	—	—	1.5	—	1.5	—	V	
		4.5			3.15	—	—	3.15	—	3.15	—		
		6.0			4.2	—	—	4.2	—	4.2	—		
V _{IL}	Low Level Input Voltage	2.0			—	—	0.5	—	0.5	—	0.5	V	
		4.5			—	—	1.35	—	1.35	—	1.35		—
		6.0			—	—	1.8	—	1.8	—	1.8		—
V _{OH}	High Level Output Voltage	2.0	V _I	I _O	1.9	2.0	—	1.9	—	1.9	—	V	
		4.5	V _{IH}	-20 μA	4.4	4.5	—	4.4	—	4.4	—		
		6.0	or		5.9	6.0	—	5.9	—	5.9	—		
		4.5	V _{IL}	-4.0 mA	4.18	4.31	—	4.13	—	4.10	—		
6.0		-5.2 mA	5.68	5.8	—	5.63	—	5.60	—				
V _{OL}	Low Level Output Voltage	2.0	V _{IH} or V _{IL}	20 μA	—	0	0.1	—	0.1	—	0.1	V	
		4.5			—	0	0.1	—	0.1	—	0.1		
		6.0			—	0	0.1	—	0.1	—	0.1		
		4.5			4.0 mA	—	0.17	0.26	—	0.33	—		0.40
		6.0			5.2 mA	—	0.18	0.26	—	0.33	—		0.40
I _I	Input Leakage Current	6.0	V _I = V _{CC} or GND		—	—	±0.1	—	±1		±1	μA	
I _{CC}	Quiescent Supply Current	6.0	V _I = V _{CC} or GND		—	—	1	—	10		20	μA	

AC ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, T_A = 25°C, C_L = 15pF, Input t_r = t_f = 6ns)

Symbol	Parameter	54HC and 74HC			Unit
		MIN.	TYP.	MAX.	
t _{TLH} t _{THL}	Output Transition Time		4	8	ns
t _{PLH} t _{PHL}	Propagation Delay Time		11	18	ns

AC ELECTRICAL CHARACTERISTICS ($C_L = 50\text{pF}$, Input $t_r = t_f = 6\text{ns}$)

Symbol	Parameter	V_{CC}	Test Condition	$T_A = 25^\circ\text{C}$ 54HC and 74HC			$-40 \text{ to } 85^\circ\text{C}$ 74HC		$-55 \text{ to } 125^\circ\text{C}$ 54HC		Unit
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t_{TLH} t_{THL}	Output Transition Time	2.0		—	22	75	—	90		ns	
		4.5		—	8	15	—	18			
		6.0		—	7	13	—	16			
t_{PLH} t_{PHL}	Propagation Delay Time	2.0		—	63	105	—	130		ns	
		4.5		—	13	21	—	26			
		6.0		—	11	18	—	22			
C_{IN}	Input Capacitance			—	5	10	—	10		pF	
$C_{PD} (*)$	Power Dissipation Capacitance			—	34	—	—	—			

Note (*) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the following equation.

$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/4 \text{ (per Gate)}$$