

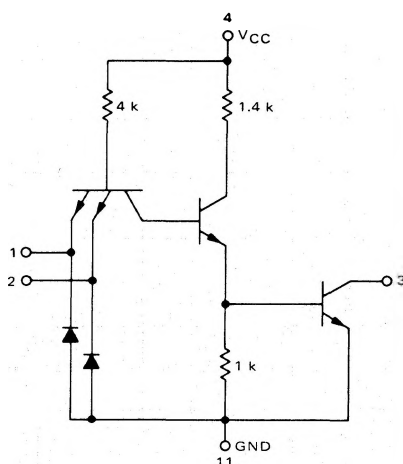
**QUAD 2-INPUT "NAND" GATE  
WITH OPEN COLLECTOR**

**MCBC5400/MCB5400F series**

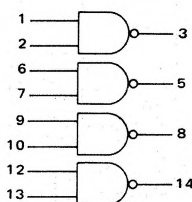
**MCBC5401\***  
**MCB5401F\***



**1/4 OF CIRCUIT SHOWN**



This device consists of four 2-input NAND gates with no output pullup network that is produced using beam lead sealed junction technology. These devices are particularly useful in highly reliable systems using hybrid beam lead assembly techniques, or standard flat package assembly techniques.



Positive Logic:  $3 = \overline{1 \cdot 2}$

Negative Logic:  $3 = 1 \cdot 2$

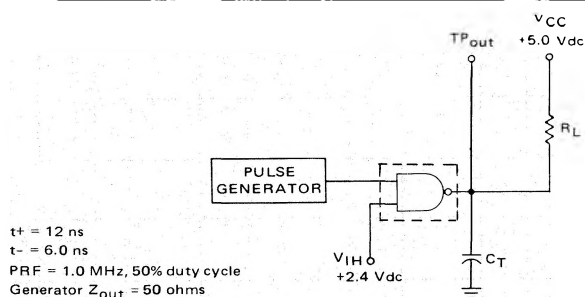
Input Loading Factor = 1  
Output Loading Factor = 10

Total Power Dissipation = 40 mW typ/pkg

Propagation Delay Time = 35 ns typ

**VOLTAGE WAVEFORMS AND DEFINITIONS**

**SWITCHING TIME TEST CIRCUIT**

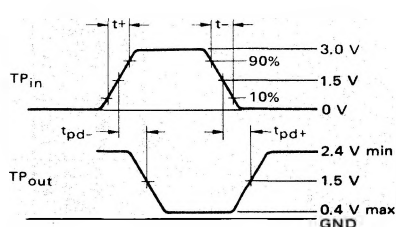


$t_+ = 12$  ns  
 $t_- = 6.0$  ns  
PRF = 1.0 MHz, 50% duty cycle  
Generator  $Z_{out} = 50$  ohms

$R_L = 400$  ohms for  $t_{pd-}$  test.  
 $4.0$  k ohms for  $t_{pd+}$  test.

$C_T = 15$  pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

High impedance probes ( $>1.0$  megohm) must be used for tests.

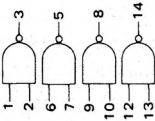


\*F suffix = 1/4" x 1/4" ceramic package (Case 651). MCBC-prefixed devices are unencapsulated. Beam numbers are the same as the pin numbers for flat-packaged devices. See General Information section for package and chip details.

# MCBC5401, MCB5401F (continued)

## ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one gate. The other gates are tested in the same manner. Further, test procedures are shown for only one input of the gate under test. To complete testing, sequence through remaining inputs.



TEST CURRENT/VOLTAGE VALUES (All Temperatures)																		
Volts																		
mA																		
			$V_{IL}$	$V_{IH}$	$V_{IHH}$	$V_{R1}$	$V_{R2}$	$V_{th1}$	$V_{th0}$	$V_{CEX}$	$V_{CC}$	$V_{CCL}$	$V_{CCH}$					
		16	0.4	2.4	5.5	4.5	5.0	2.0	0.8	5.5	5.0	4.5	5.5					
TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:																		
Characteristic	Symbol	Pin Under Test	Test Limits MCBC5401/MCB5401F -55 to +125°C		Unit	$I_{OL}$	$V_{IL}$	$V_{IH}$	$V_{IHH}$	$V_{R1}$	$V_{R2}$	$V_{th1}$	$V_{th0}$	$V_{CEX}$	$V_{CC}$	$V_{CCL}$	$V_{CCH}$	Gnd
			Min	Max														
Input Forward Current	$I_F$	1	-	-1.6	mAdc	-	1	-	-	2	-	-	-	-	-	-	4	11*
	$I_{R1}$	1	-	40	$\mu$ Adc	-	-	1	-	-	-	-	-	-	-	-	4	2,11*
	$I_{R2}$	1	-	1.0	mAdc	-	-	-	1	-	-	-	-	-	-	-	4	2,11*
Output Output Voltage	$V_{OL}$	3	-	0.4	Vdc	3	-	-	-	-	-	1,2	-	-	-	4	-	11*
	$I_{CEX}$	3	-	0.25	mAdc	-	-	-	-	1	-	-	2	3	-	4	-	11*
Power Requirements (Total Device) Power Supply Drain	$I_{PDH}$	4	-	22	mAdc	-	-	-	-	-	1,2,6,7,9, 10,12,13	-	-	-	-	-	4	11
	$I_{PDL}$	4	-	8.0	mAdc	-	-	-	-	-	-	-	-	-	-	-	4	1,2,11*
Switching Parameters Turn-On Delay	$t_{pd-}$	1,3	-	15**	ns	Pulse In	Pulse Out	1	3	-	-	-	-	-	-	-	-	11
	$t_{pd+}$	1,3	-	45**	ns	1	3	2	-	-	-	-	-	-	-	4	-	11

\*Ground inputs to gates not under test.

\*\*Tested only at 25°C.