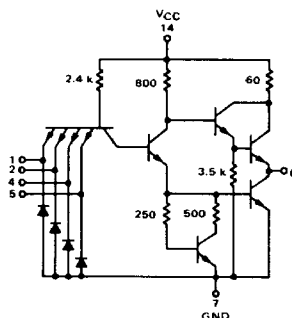


DUAL 4-INPUT "NAND" GATE

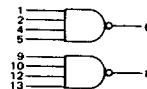
MTTL III MC3100/3000 series

MC3110F • MC3010F
MC3110L • MC3010L,P
 (54H20J) (74H20J,N)

1/2 OF CIRCUIT SHOWN



This device consists of two 4-input NAND gates. These gates may be cross-coupled to form a set-reset flip-flop.



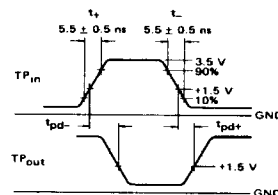
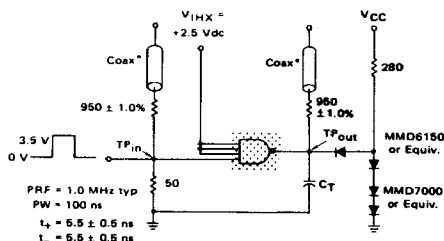
Positive Logic: $6 = 1 \cdot 2 \cdot 4 \cdot 5$
 Negative Logic: $6 = 1 + 2 + 4 + 5$

Input Loading Factor = 1
 Output Loading Factor = 10

Total Power Dissipation = 44 mW typ/pkg
 Propagation Delay Time = 6.0 ns typ

SWITCHING TIME TEST CIRCUIT

VOLTAGE WAVEFORMS AND DEFINITIONS



*The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

$C_T = 25 \text{ pF}$ = total parasitic capacitance, which includes probe, wiring, and load capacitances.

See General Information section for packaging.

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ELECTRICAL CHARACTERISTICS

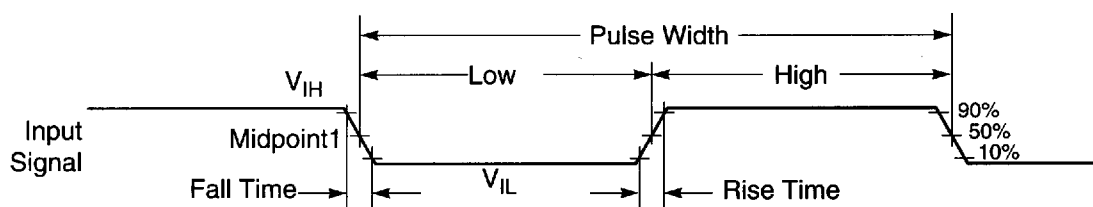
Test procedures are shown for only one input of this device. To complete testing, sequence through remaining inputs in the same manner.



Characteristic		Symbol	Pin Under Test	MC3115 Test Limits						MC3015 Test Limits						TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW												Good			
				-55°C		+25°C		+125°C		0°C		+25°C		+75°C		mA	TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW						TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW						Good		
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	I_{CC}	I_{DD}		I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}		V_{CC}	V_{CC}
Input Forward Current	I_F	1	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	mA	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Input Leakage Current	I_{IL}	1	-	50	-	50	-	50	-	50	-	50	-	50	μ A	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Breakdown Voltage	BV_{IN}	1	-	-	5.5	-	-	-	-	-	-	-	-	-	V	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Clamp Voltage	V_{IN}	1	-	-	-1.5	-	-	-	-	-	-	-	-	-	V	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Output Voltage	V_{OL}	8	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	V	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Output Voltage	V_{OH}	8	2.4	-	2.4	-	2.4	-	2.5	-	2.5	-	2.5	-	V	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Short-Circuit Current	I_{SC}	8	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	mA	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Power Requirements																															
Total Device Power	P_{max}	14	-	-	6.5	-	-	-	-	-	-	-	-	-	mW	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Supply Current	I_{CC}	14	-	9.0	-	9.0	-	9.0	-	9.0	-	9.0	-	9.0	mA	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Power Supply Transient	I_{PST}	14	-	4.25	-	4.25	-	4.25	-	4.25	-	4.25	-	4.25	mA	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Switching Time	t_{ON}	14	-	-	-	-	-	-	-	-	-	-	-	-	ns	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7
Turn-On Delay	t_{ON}	14	-	-	-	-	-	-	-	-	-	-	-	-	ns	I_{CC}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	I_{DD}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	7

AC ELECTRICAL CHARACTERISTICS

The timing waveforms in the AC Electrical Characteristics are tested with a V_{IL} maximum of 0.5 V and a V_{IH} minimum of 2.4 V for all pins, except EXTAL, RESET, MODA, MODB, and MODC. These pins are tested using the input levels set forth in the DC Electrical Characteristics. AC timing specifications that are referenced to a device input signal are measured in production with respect to the 50% point of the respective input signal's transition. DSP56002 output levels are measured with the production test machine V_{OL} and V_{OH} reference levels set at 0.8 V and 2.0 V, respectively.



Note: The midpoint is $V_{IL} + (V_{IH} - V_{IL})/2$.

AA0179

Figure 2-1 Signal Measurement Reference