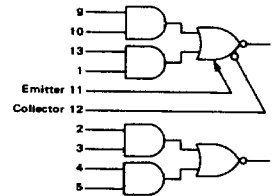# MC3120F · MC3020F
MC3120L · MC3020L,P
(54H50J)   (74H50J,N)

1/2 OF CIRCUIT SHOWN †

† Other half of circuit omits expander inputs.

One side of this dual device consists of two 2-input AND gates ORed together and driving an output inverter. The other side consists of two 2-input gates ORed together, driving an output inverter, and the ORing nodes are available for expansion. Up to four AND gates can be ORed together using the MC3030 expander. Care should be taken to minimize the amount of capacitance on the expander terminals in order to maintain switching speeds.

Positive Logic:
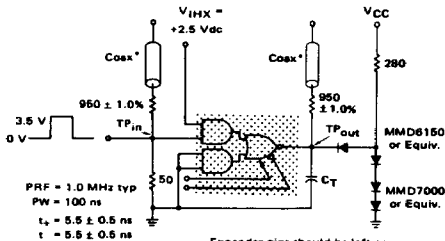$$8 = (9 \cdot 10) + (13 \cdot 1) + (Expanders)$$

Negative Logic:
$$8 = \overline{(9 + 10) \cdot (13 + 1) \cdot (Expanders)}$$

Input Loading Factor = 1
Output Loading Factor = 10

Total Power Dissipation = 62.5 mW typ/pkg
Propagation Delay Time = 6.0 ns typ

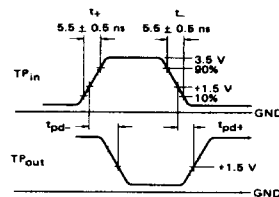### SWITCHING TIME TEST CIRCUIT

Expander pins should be left open when measuring switching times.

*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.

$C_T = 25$ pF ≈ total parasitic capacitance, which includes probe, wiring, and load capacitances.

PRF = 1.0 MHz typ
PW = 100 ns
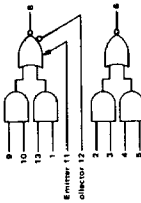$t_+ = 5.5 \pm 0.5$ ns
$t_- = 5.5 \pm 0.5$ ns

VOLTAGE WAVEFORMS AND DEFINITIONS

See General Information section for packaging.

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one gate. The other gate is 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.
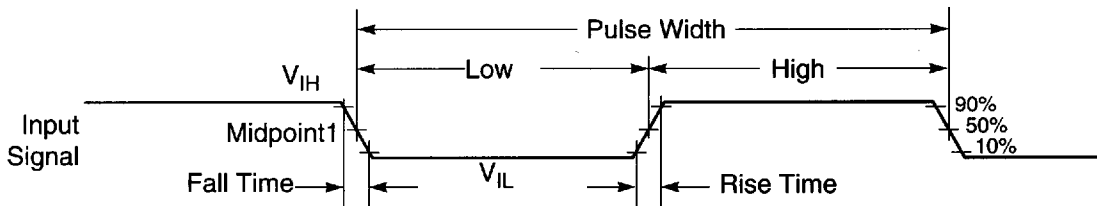

Characteristic	Symbol	Pin Under Test	MC3120 @ Test Temperature	Unit
Input Forward Current	I_F	1	–2.0	mAdc
Leakage Current	I_R	1	50	μAdc
Breakdown Voltage	BV_{in}	1	5.5	Vdc
Clamp Voltage	V_D	1	–1.5	Vdc
Output Output Voltage	V_{OL} / V_{OH}	8	0.4 / 2.4	Vdc
Short-Circuit Current	I_{SC}	8	–100 / –40	Vdc
Base-Emitter Voltage	$V_{BE\ max}$ / $V_{BE\ min}$	11	0.95 / 0.65	Vdc
Power Requirements (Total Device) Maximum Power Supply Current	I_{max}	14	24	mAdc
Power Supply Drain	I_{PDH}	14	22	mAdc
	I_{PDL}	14	14	mAdc
Switching Parameters Turn-On Delay	t_{pd+}	1, 8	13	ns
Turn-Off Delay	t_{pd-}	1, 8	12	ns

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, $\overline{RESET}$, 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