HEX INVERTER

MC3109F · MC3009F
MC3109L · MC3009L,P

(54H05J)   **(74H05J,N)**

CIRCUIT SCHEMATIC
1/6 OF CIRCUIT SHOWN
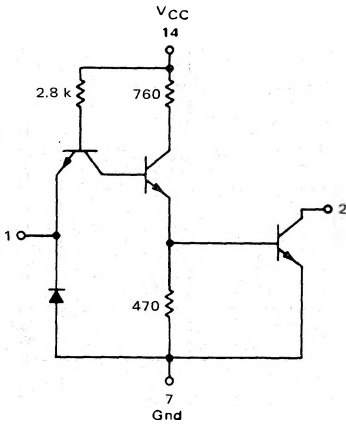
This device consists of six independent inverting gates with no output pullup circuits. It can be used where the Wired-OR function is required, or for driving discrete components.
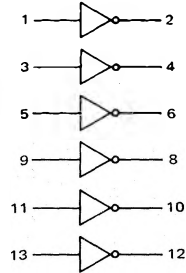
Positive Logic: $2 = \overline{1}$

Input Loading Factor = 1
Output Loading Factor = 10
Total Power Dissipation = 90 mW typ/pkg
Propagation Delay Time = 8 ns typ

Pin numbers for the 54H05F/74H05F device are shown in the chart. These devices are available on special request.

DEVICE	PIN NUMBERS													
MC3109FL/3009F,L,P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
54H05F/74H05F	1	14	3	2	5	6	11	8	7	10	9	12	13	4

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS
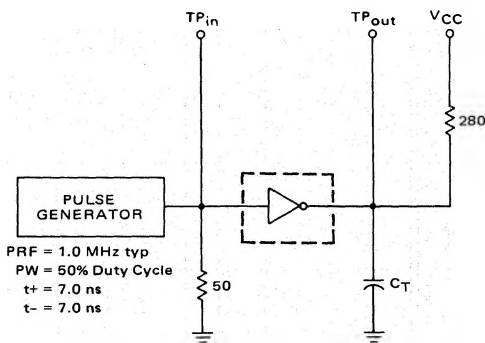
PRF = 1.0 MHz typ
PW = 50% Duty Cycle
t+ = 7.0 ns
t- = 7.0 ns
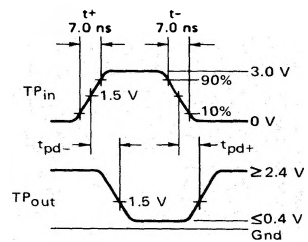
C_T = 25 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

See General Information section for packaging.

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one inverter. The other inverters are tested in the same manner.

Inverter pin assignments (inputs → outputs): 1→2, 3→4, 5→6, 9→8, 11→10, 13→12

Test Limits

Characteristic	Symbol	Pin Under Test	MC3109 −55°C Min	Max	+25°C Min	Max	+125°C Min	Max	MC3009 0°C Min	Max	+25°C Min	Max	+75°C Min	Max	Unit
Input Forward Current	I_F	1	-	−2.0	-	−2.0	-	−2.0	-	−2.0	-	−2.0	-	−2.0	mAdc
Leakage Current	I_R	1	-	50	-	50	-	50	-	50	-	50	-	50	µAdc
Breakdown Voltage	BV_{in}	1	5.5	-	5.5	-	-	-	-	-	5.5	-	-	-	Vdc
Clamp Voltage	V_D	1	-	−1.5	-	−1.5	-	−1.5	-	-	-	−1.5	-	-	Vdc
Output Output Voltage	V_{OL}	2	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	Vdc
Output Leakage Current	I_{CEX}	2	-	250	-	250	-	250	-	250	-	250	-	250	µAdc
Power Requirements (Total Device) Maximum Power Supply Current	I_{max}	14	-	-	-	37.5	-	-	-	-	-	37.5	-	-	mAdc
Power Supply Drain	I_{PDH}	14	-	58	-	58	-	58	-	58	-	58	-	58	mAdc
	I_{PDL}	14	-	26	-	26	-	26	-	26	-	26	-	26	mAdc
Switching Parameters Turn-On Delay	t_{pd-}	1,2	-	-	-	15	-	-	-	-	-	15	-	-	ns
Turn-Off Delay	t_{pd+}	1,2	-	-	-	18	-	-	-	-	-	18	-	-	ns

TEST CURRENT / VOLTAGE VALUES

@ Test Temperature	I_{OL} (mA)	I_{in}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{RH}	V_{CEX}	V_{max}	V_{CC}	V_{CCL}	V_{CCH}	Gnd
MC3109 −55°C	20	-	-	1.1	2.0	0.4	2.4	4.0	5.5	-	5.0	4.5	5.5	7*
+25°C	20	1.0	−10	1.1	1.8	0.4	2.4	4.0	5.5	7.0	5.0	4.5	5.5	7*
+125°C	20	-	-	0.8	1.8	0.4	2.4	4.0	5.5	-	5.0	4.5	5.5	7*
MC3009 0°C	20	1.0	−10	1.1	2.0	0.4	2.5	4.0	5.5	7.0	5.0	4.75	5.25	7*
+25°C	20	-	-	1.1	1.8	0.4	2.5	4.0	5.5	-	5.0	4.75	5.25	7*
+75°C	20	-	-	0.9	1.8	0.4	2.5	4.0	5.5	7.0	5.0	4.75	5.25	7*

TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:

Characteristic	Symbol	I_{OL}	I_{in}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{RH}	V_{CEX}	V_{max}	V_{CC}	V_{CCL}	V_{CCH}	Gnd
Forward Current	I_F	-	-	-	-	-	1	-	-	-	-	-	-	14*	7*
Leakage Current	I_R	-	1	-	-	-	-	1	-	-	-	-	-	14	7*
Breakdown Voltage	BV_{in}	-	1	-	-	-	-	-	-	-	-	-	-	14	7*
Clamp Voltage	V_D	-	-	1	-	-	-	-	-	-	-	-	-	-	7*
Output Voltage	V_{OL}	2	-	-	-	1	-	-	-	-	-	-	14	-	7*
Output Leakage Current	I_{CEX}	2	-	-	1	-	-	-	-	2	-	-	14	-	7*
Maximum Power Supply Current	I_{max}	-	-	-	-	-	-	-	-	-	14	-	-	-	1,3,5,7,9,11,13
Power Supply Drain	I_{PDH}	-	-	-	-	-	-	-	1,3,5,7,9,11,13	-	-	-	-	14	7
	I_{PDL}	-	-	-	-	-	-	-	-	-	-	-	-	14	1,3,5,7,9,11,13
Turn-On Delay	t_{pd-}	Pulse In 1	Pulse Out 2	-	-	-	-	-	-	-	-	14	-	-	7*
Turn-Off Delay	t_{pd+}	Pulse In 1	Pulse Out 2	-	-	-	-	-	-	-	-	14	-	-	7*