9005 • 9008
9006

EXTENDABLE AND-OR-INVERT GATES
EXTENDER (9006)

DESCRIPTION: — The 9005 and 9008 are AND-OR-INVERT gates which may be OR extended with the use of the 9006.

ORDERING CODE: See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE V_{CC} = +5.0 V ±5%, T_A = 0°C to +75°C	MILITARY GRADE V_{CC} = +5.0 V ±10%, T_A = -55°C to +125°C	PKG TYPE
Ceramic DIP (D)	A	9005DC	9005DM	6A
	B	9006DC	9006DM	
	C	9008DC	9008DM	
Flatpak (F)	A	9005FC	9005FM	3I
	B	9006FC	9006FM	
	C	9008FC	9008FM	

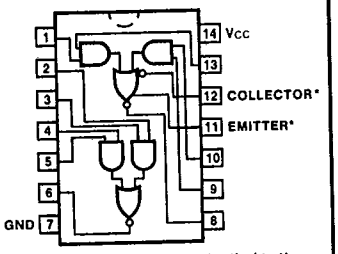
INPUT LOADING/FAN-OUT: See Section 3 for U.L. definitions

PINS	9005 (U.L.) HIGH/LOW	9006 (U.L.) HIGH/LOW	9008 (U.L.) HIGH/LOW
Non-extendable Gate Inputs	1.5/1.0		
Extendable Gate Inputs	2.25/1.5	2.25/1.5 *	2.25/1.5
All Inputs			30/8.8
Outputs	30/8.8 (33)/(8.5)		(33)/(8.5)

*Outputs on 9006 have open-emitter and collector

CONNECTION DIAGRAMS

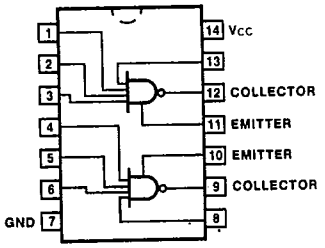
PINOUT A



*Four extenders (9006) may be tied to these terminals

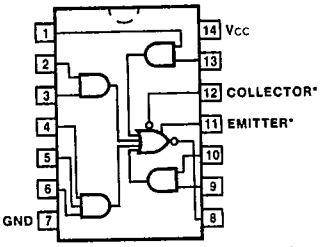
V_{CC} = Pin 14
GND = Pin 7

PINOUT B



V_{CC} = Pin 14
GND = Pin 7

PINOUT C



*Four extender (9006) may be tied to these terminals

V_{CC} = Pin 14
GND = Pin 7

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DC AND AC CHARACTERISTICS OVER COMMERCIAL TEMPERATURE RANGE: V_{CC} = +5.0 V ±5%

SYMBOL	PARAMETER	0°C Min	0°C Max	25°C Min	25°C Max	75°C Min	75°C Max	UNITS	CONDITIONS
V_{IH}	Input HIGH Voltage	1.9		1.8		1.6		V	Guaranteed Input HIGH Threshold Voltage
V_{IL}	Input LOW Voltage		0.85		0.85		0.85	V	Guaranteed Input LOW Threshold Voltage
V_{OL}	Output LOW Voltage		0.45		0.45		0.45	V	V_{CC} = 5.25 V, I_{OL} = 16 mA,
			0.45		0.45		0.45	V	V_{CC} = 4.75 V, I_{OL} = 14.1 mA
I_{IL}	Input LOW Current 9005 Non-Extendable Gate	-1.6		-1.6		-1.6		mA	V_{CC} = Max; V_{IN} = .45 V, 5.25 V on Other Inputs
		-1.41		-1.41		-1.41			V_{CC} = Min
	Input LOW Current Extendable Gates and Extender	-2.4		-2.4		-2.4		mA	V_{CC} = Max
		-2.12		-2.12		-2.12			V_{CC} = Min
I_{CC}	Power Supply Current, ON								
	9005 Non-Extendable Gate		7.7		7.7		7.7	mA	All Inputs Open
	9005 Extendable Gate		13.6		13.6		13.6		
	9008		17.7		17.7		17.7		
	Power Supply Current, OFF								
	9005 Non-Extendable Gate		3.4		3.4		3.4	mA	All Inputs Except Extender Inputs Gnd
	9005 Extendable Gate		5.1		5.1		5.1		
	9008		10.2		10.2		10.2		
ΔI_{CC}	Extra Current Drain when one 9006 Extender is attached to a 9005 Gate ON		2.05		2.05		2.05	mA	All Inputs HIGH
	Extra Current Drain when one 9006 Extender is attached to a 9005 gate OFF		2.54		2.54		2.54	mA	All Inputs Gnd

DC AND AC CHARACTERISTICS OVER MILITARY TEMPERATURE RANGE: V_{CC} = +5.0 V ±10%

SYMBOL	PARAMETER	-55°C Min	-55°C Max	25°C Min	25°C Max	125°C Min	125°C Max	UNITS	CONDITIONS
V_{IH}	Input HIGH Voltage	2.0		1.7		1.4		V	Guaranteed Input HIGH Threshold Voltage
V_{IL}	Input LOW Voltage		0.8		0.9		0.8	V	Guaranteed Input LOW Threshold Voltage
V_{OL}	Output LOW Voltage		0.4		0.4		0.4	V	V_{CC} = 5.5 V, I_{OL} = 17.6 mA
			0.4		0.4		0.4	V	V_{CC} = 4.5 V, I_{OL} = 13.6 mA
I_{IL}	Input LOW Current 9005 Non-extendable Gate	-1.6		-1.6		-1.6		mA	V_{CC} = Max; V_{IN} = .4 V, 5.5 V on Other Inputs
		-1.24		-1.24		-1.24			V_{CC} = Min
	Input LOW Current Extendable Gate and Extender	-2.4		-2.4		-2.4		mA	V_{CC} = Max
		-1.86		-1.86		-1.86			V_{CC} = Min

NOTE:
Output characteristics above apply to a 9005 (both gates) or a 9008.
Input characteristics above apply to a 9005 (both gates) or a 9008 using either the internal gates or an external 9006 extender.

DC AND AC CHARACTERISTICS OVER MILITARY TEMPERATURE RANGE: V_{CC} = +5.0 V ±10% (Cont'd)

SYMBOL	PARAMETER	-55°C Min	-55°C Max	25°C Min	25°C Max	125°C Min	125°C Max	UNITS	CONDITIONS
I_{CC}	Power Supply Current, ON 9005 Non-extendable Gate 9005 Extendable Gate 9008		6.5 11.3 12.5		6.5 11.3 12.5		6.5 11.3 12.5	mA	All Inputs Open
I_{CC}	Power Supply Current, OFF 9005 Non-extendable Gate 9005 Extendable Gate 9008		3.1 4.7 9.4		3.1 4.7 9.4		3.1 4.7 9.4	mA	All Inputs Except Extender Inputs Gnd
ΔI_{CC}	Extra Current Drain from one 9006 Extender Gate ON		1.61		1.61		1.61	mA	All Inputs HIGH
ΔI_{CC}	Extra Current Drain from one 9006 Extender Gate OFF		2.35		2.35		2.35	mA	All Inputs Gnd 9006 Attached to a 9005

NOTE:
Output characteristics apply to a 9005 (both gates) or a 9008.
Input characteristics apply to a 9005 (both gates) or a 9008 using either the internal gates or an external 9006 extender.

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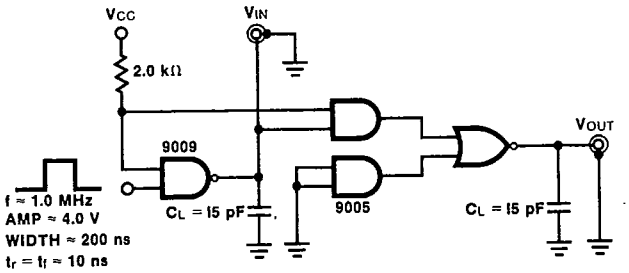
SWITCHING CHARACTERISTICS (T_A = 25°C)

SYMBOL	LIMITS Min	LIMITS Max	UNITS	TEST CONDITIONS
t_{PLH} t_{PHL}	3.0 3.0	12 14	ns	V_{CC} = 5.0 V, C_L = 15 pF 9005 Non-extendable Gate Only, See Figure a
t_{PLH} t_{PHL}	3.0 3.0	15 12	ns	V_{CC} = 5.0 V, C_L = 15 pF, C_N = 5.0 pF 9005 Extendable Gate and 9008, See Figure b
Δt_{PLH}	-2.0	4.0	ns	9006 Only The 9006 is tested by measuring its propagation time through the 9005. The delay readings shall not exceed the 9005 readings by the specified amount. See Figure c
Δt_{PHL}	-2.0	4.0		

SWITCHING CHARACTERISTICS
TEST CIRCUITS

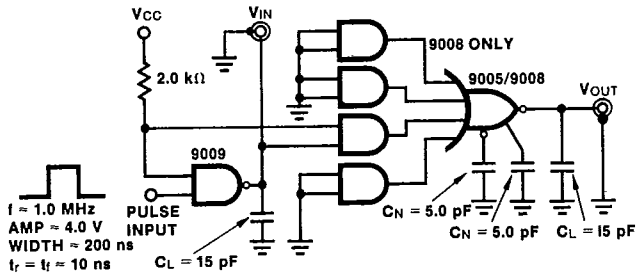


Note: Capacitance includes probe and jig capacitance

Fig. a 9005 Non-Extendable Gate

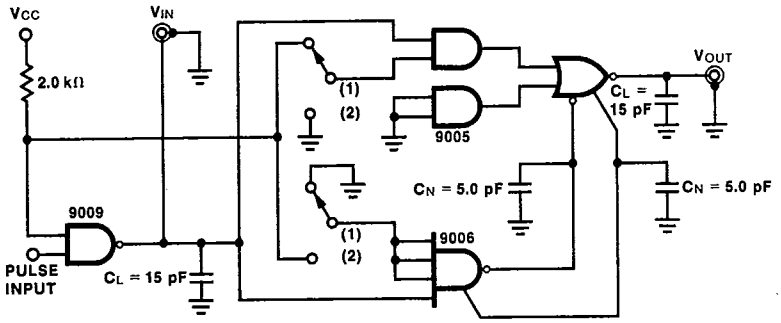
SWITCHING CHARACTERISTICS (Cont'd)

TEST CIRCUITS



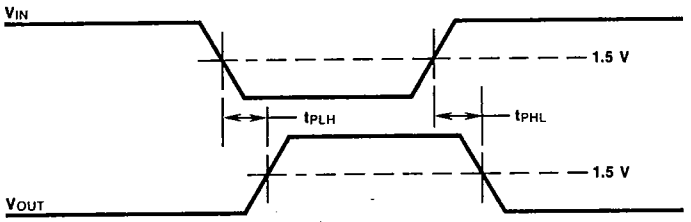
Note: Capacitance includes probe and jig capacitance

Fig. b 9005 or 9008 Extendable Gate



Note: Capacitance includes probe and jig capacitance

Fig. c 9006 Extender



NOTES:
With switch in postion (1) measure delay of 9005. With switch in position (2) measure delay (9005) + Δdelay (9006). Capacitances include probe and jig capacitances.

Fig. d Switching Waveform