



Series 9000

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DM9002C quad 2-input NAND gate
DM9003C triple 3-input NAND gate
DM9004C dual 4-input NAND gate
DM9005C dual AND-OR-INVERT gate/expander
DM9006C dual 4-input expander
DM9008C 2-2-2-3-input AND-OR-INVERT gate
DM9009C dual 4-input NAND gate/buffer
DM9012C quad 2-input NAND gate(open collector)
DM9016C hex inverter

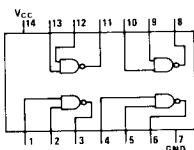
general description

The above gate functions are commercial temperature range (0°C to +75°C) plug-in equivalents for

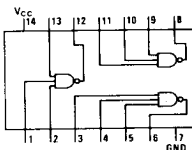
the DM9000 Series devices. The "C" designation is used in place of the earlier "-59X" suffix.

connection diagrams (Dual-In-Line and Flat Packages)

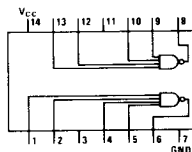
DM9002C



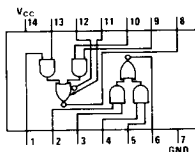
DM9003C



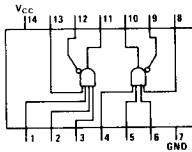
DM9004C



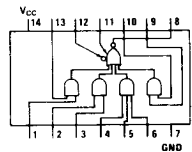
DM9005C



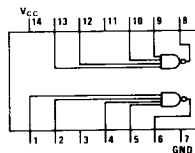
DM9006C



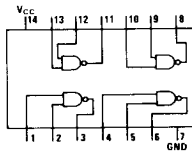
DM9008C



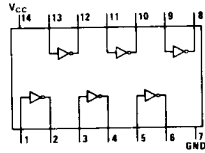
DM9009C



DM9012C



DM9016C



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absolute maximum ratings

Supply Voltage	7V
Input Voltage	5.5V
Operating Temperature Range	0°C to +75°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10 sec)	300°C

electrical characteristics

DM90002C, DM9003C, DM9004C, DM9012C, DM9016C (Note 1)

PARAMETER	CONDITIONS	MIN	MAX	UNITS
Logical "1" Input Voltage	$V_{CC} = 4.75V$	1.6		V
Logical "0" Input Voltage	$V_{CC} = 4.75V$		.85	V
Logical "1" Output Voltage Except DM9012C	$V_{CC} = 4.75V, I_{OUT} = -1.2\text{ mA}, V_{IN} = .85V$	2.4		V
Logical "0" Output Voltage	$V_{CC} = 4.75V, I_{OUT} = +14.1\text{ mA}, V_{IN} = 1.6V$ $V_{CC} = 5.25V, I_{OUT} = +16\text{ mA}, V_{IN} = 5.25V$		.45 .45	V V
Logical "1" Output Current (DM9012C)	$V_{CC} = 4.75V, V_{OUT} = 5.5V, V_{IN} = .85V$		250	μA
Logical "1" Input Current	$V_{CC} = 5.25V, V_{IN} = 4.5V$		60	μA
Logical "0" Input Current	$V_{CC} = 5.25V, V_{IN} = .45V$ $V_{CC} = 4.75V, V_{IN} = .45V$		-1.6 -1.41	mA mA
Supply Current – Logical "0" Output (each gate)	$V_{CC} = 5.0V$		6.1	mA
Supply Current – Logical "1" Output (each gate)	$V_{CC} = 5.0V$		1.7	mA
Propagation Delay Time to a Logical "1" Except DM9012C	$V_{CC} = 5.0V, C_L = 15\text{ pF}, T_A = 25^\circ C$	3.0	13	ns
DM9012C	$V_{CC} = 5.0V, C_L = 15\text{ pF}, R_L = 4\text{ k}\Omega$	3.0	45	ns
Propagation Delay Time to a Logical "0" Except DM9012C	$V_{CC} = 5.0V, C_L = 15\text{ pF}, T_A = 25^\circ C$	3.0	15	ns
DM9012C	$V_{CC} = 5.0V, C_L = 15\text{ pF}, R_L = 400\Omega, T_A = 25^\circ C$	3.0	15	ns

DM9005C, DM9006C, DM9008C (Note 1)

PARAMETER	CONDITIONS	MIN	MAX	UNITS
Logical "1" Input Voltage	$V_{CC} = 4.75V$	1.6		V
Logical "0" Input Voltage	$V_{CC} = 4.75V$		.85	V
Logical "1" Output Voltage	$V_{CC} = 4.75V, I_{OUT} = -1.2\text{ mA}, V_{IN} = .85V$	2.4		V
Logical "0" Output Voltage	$V_{CC} = 4.75V, I_{OUT} = 14.1\text{ mA}, V_{IN} = 1.6V$ $V_{CC} = 4.75V, I_{OUT} = 16\text{ mA}, V_{IN} = 5.25V$		.45 .45	V V
Logical "1" Input Current Except DM9005C Non-Extendable Gate	$V_{CC} = 4.75V, V_{IN} = 4.5V$		90	μA
DM9005C Non-Extendable Gate	$V_{CC} = 4.75V, V_{IN} = 4.5V$		60	μA
Logical "0" Input Current Except DM9005C Non-Extendable Gate	$V_{CC} = 4.75V, V_{IN} = .45V$ $V_{CC} = 5.25V, V_{IN} = .45V$ $V_{CC} = 4.75V, V_{IN} = .45V$ $V_{CC} = 5.25V, V_{IN} = .45V$		-2.12 -2.4 -1.41 -1.6	mA mA mA mA
Supply Current – Logical "0" Output DM9005C Non-Extendable Gate	$V_{CC} = 5.0V$		7.7	mA
DM9005C Extendable Gate	$V_{CC} = 5.0V$		13.6	mA
DM9008C	$V_{CC} = 5.0V$		17.7	mA

Note 1: All devices are guaranteed across the 0°C to +75°C temperature range except where specified differently.

electrical characteristics (con't)

DM9005C, DM9006C, DM9008C (con't)

PARAMETER	CONDITIONS	MIN	MAX	UNITS
Supply Current – Logical “1” Output DM9005C Non-Extendable Gate DM9005C Extendable Gate DM9008C	$V_{CC} = 5.0V$ $V_{CC} = 5.0V$ $V_{CC} = 5.0V$		3.4 5.1 10.2	mA mA mA
ΔSupply Current Additional Supply Current when one DM9006C Extender is connected to a DM9005C Gate in the Logical “0” State Additional in the Logical “1” State	$V_{CC} = 5.0V$ $V_{CC} = 5.0V$		2.05 2.54	mA mA
Propagation Delay Time to a Logical “1” DM9005C Non-Extendable Gate Only DM9005C Extendable Gate, and DM9008C DM9006C (Note 2)	$V_{CC} = 5.0V, C_L = 15 \text{ pF},$ $T_A = 25^\circ\text{C}$ $C_N = 5.0 \text{ pF}$	 3.0 3.0	 12 15	 ns ns
Propagation Delay Time to a Logical “0” DM9005C Non-Extendable Gate Only DM9005C Extendable Gate, and DM9008C DM9008C DM9006C (Note 2)	$V_{CC} = 5.0V, C_L = 15 \text{ pF},$ $T_A = 25^\circ\text{C}$ $C_N = 5.0 \text{ pF}$	 3.0 3.0 -2.0	 14 12 4.0	 ns ns ns

DM9009C (Note 1)

PARAMETER	CONDITIONS	MIN	MAX	UNITS
Logical “1” Input Voltage	$V_{CC} = 4.75V$	1.6		V
Logical “0” Input Voltage	$V_{CC} = 4.75V$		.85	V
Logical “1” Output Voltage	$V_{CC} = 4.75V, I_{OUT} = -3.6 \text{ mA},$ $V_{IN} = .85V$	2.4		V
Logical “0” Output Voltage	$V_{CC} = 4.75V, I_{OUT} = 42.3 \text{ mA},$ $V_{IN} = 1.6V$		.45	V
	$V_{CC} = 5.25V, I_{OUT} = 48 \text{ mA},$ $V_{IN} = 5.25V$		.45	V
Logical “1” Input Current	$V_{CC} = 5.25V, V_{IN} = 4.5V$		120	μA
Logical “0” Input Current	$V_{CC} = 5.25V, V_{IN} = .45V$ $V_{CC} = 4.75V, V_{IN} = .45V$		-3.2 -2.82	mA mA
Supply Current – Logical “0” Output	$V_{CC} = 5.0V, V_{IN} = 4.5V$		14.6	mA
Supply Current – Logical “1” Output	$V_{CC} = 5.0V, V_{IN} = GND$		3.4	mA
Propagation Delay to a Logical “1”	$V_{CC} = 5.0V, C_L = 15 \text{ pF}, T_A = 25^\circ\text{C}$	3.0	17	ns
Propagation Delay to a Logical “0”	$V_{CC} = 5.0V, C_L = 15 \text{ pF}, T_A = 25^\circ\text{C}$	2.0	13	ns

Note 1: All devices are guaranteed across the 0°C to $+75^\circ\text{C}$ temperature range except where specified differently.**Note 2:** The DM9006C is tested by measuring its propagation delay through the DM9005C. The delay readings shall not exceed the DM9005C reading by the specified amount.