

# Gates, Series 54/74

### DM5402/DM7402 (SN5402/SN7402) quad two-input NOR gate

### general description

The DM5402/DM7402 is a quad 2-input NOR gate utilizing TTL (Transistor-Transistor Logic) to achieve high speed at nominal power dissipation. It is completely compatible with other Series 54/74 devices.

#### Features include:

- Input Clamping Diodes
- Typical Noise Immunity

■ Guaranteed Noise Immunity

400 mV

■ Fan-out

10

Allowable Power Supply Variation

DM5402 DM7402 4.5V to 5.5V 4.75V to 5.25V

Average Propagation Delay 12 ns (with 50 pF)

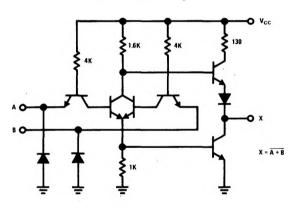
■ Average Power Dissipation

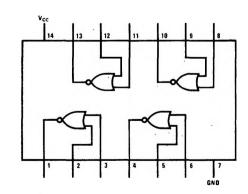
14 mW per gate

### schematic and connection diagrams

#### DM5402/DM7402 (each gate)

1 V





# absolute maximum ratings

V<sub>CC</sub>
Input Voltage
Operating Temperature Range
DM7402
DM5402
Storage Temperature Range
Lead Temperature (Soldering, 10 sec)

0°C to 70°C -55°C to +125°C -65°C to +150°C 300°C

7V **5**.5V

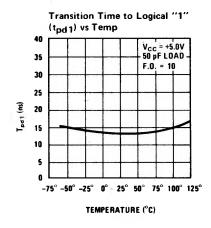
# electrical characteristics (Note 1)

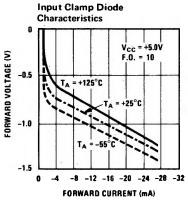
PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
Input Diode Clamp Voltage		V <sub>CC</sub> = 5.0V T <sub>A</sub> = 25°C I <sub>IN</sub> = -12 mA		-1.0	-1.5	٧
Logical "1" Input Voltage	DM5402 DM7402	$V_{CC} = 4.5V$ $V_{CC} = 4.75V$	2.0			V
Logical "0" Input Voltage	DM5402 DM7402	$V_{CC} = 4.5V$ $V_{CC} = 4.75V$			0.8	v
Logical "1" Output Voltage	DM5402 DM7402	$V_{CC} = 4.5V$ $V_{CC} = 4.75V$ $V_{IN} = 0.8V$ , $I_{OUT} = -400 \mu A$	2.4			v
Logical "0" Output Voltage		$V_{CC} = 4.5V$ $V_{CC} = 2.0V$ $V_{CC} = 16 \text{ m}$	1		0.4	V
Logical "1" Input Current	DM5402 DM7402	$\frac{V_{CC} = 5.5V}{V_{CC} = 5.25V} V_{IN} = 2.4V$			40	μА _
Logical "1" Input Current	DM5402 DM7402	$V_{CC} = 5.5V$ $V_{CC} = 5.25V$ $V_{IN} = 5.5V$	1		1	mA
Logical "0" Input Current	DM5402 DM7402	$V_{CC} = 5.5V$ $V_{CC} = 5.25V$ $V_{IN} = 0.4V$	1	-1.0	-1.6	mA
Output Short Circuit Current (Note 2)	DM5402 DM7402	$V_{CC} = 5.5V$ $V_{CC} = 5.25V$ $V_{OUT} = 0$	-20 -18	-32	-55	mA
Supply Current-Logical "0" (each gate)	DM5402 DM7402	$V_{CC} = 5.5V$ $V_{CC} = 5.25V$ $V_{IN} = 5.0V$		3.6	6.3	mA
Supply Current-Logical "1" (each gate)		$V_{CC} = 5.5V$ $V_{CC} = 5.25V$ $V_{IN} = 0V$		2.0	3.6	mA
Propagation Delay to a Logical "0", t <sub>pd0</sub>		V <sub>CC</sub> = 5.0V T <sub>A</sub> = 25°C N = 10 C = 50 pF	3	9	15	ns
Propagation Delay to a Logical "1", t <sub>pd1</sub>		V <sub>CC</sub> = 5.0V T <sub>A</sub> = 25°C N = 10 C = 50 pF	5	13	22	ns

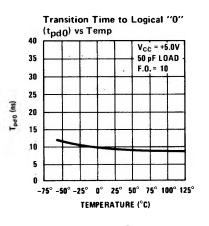
Note 1: Min/max limits apply across the guaranteed temperature range of 0°C to 70°C for the DM7402 and  $-55^{\circ}$ C to +125°C for the DM5402 unless otherwise specified. All typicals are given for  $V_{CC}$  = 5.0V and  $T_{A}$  = 25°C.

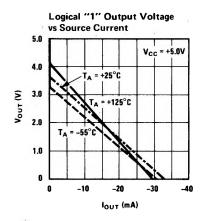
Note 2: Only one output at a time should be short circuited.

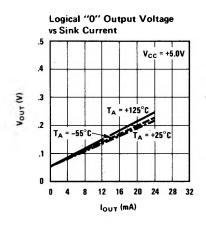
# typical performance characteristics



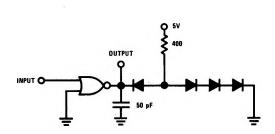








#### ac test circuit



# switching time waveform

