

# 9XXX Series

## 9015 QUAD NOR GATE

**DESCRIPTION** — The 9015 consists of three 2-input and one 4-input NOR gates. The NOR gate produces a LOW output if any of the inputs are HIGH.

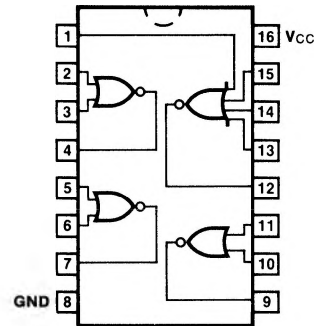
**ORDERING CODE:** See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		$V_{CC} = +5.0\text{ V} \pm 5\%$ , $T_A = 0^\circ\text{C to } +75^\circ\text{C}$	$V_{CC} = +5.0\text{ V} \pm 10\%$ , $T_A = -55^\circ\text{C to } +125^\circ\text{C}$	
Ceramic DIP (D)	A	9015DC	9015DM	6B
Flatpak (F)	A	9015FC	9015FM	4L

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

PINS	9XXX (U.L.) HIGH/LOW
Inputs	1.5/1.0
Outputs	30/8.8 (33)/(8.5)

### CONNECTION DIAGRAM PINOUT A



### DC AND AC CHARACTERISTICS OVER COMMERCIAL TEMPERATURE RANGE: $V_{CC} = +5.0\text{ V} \pm 5\%$

SYMBOL	PARAMETER	0°C		25°C		75°C		UNITS	CONDITIONS
		Min	Max	Min	Max	Min	Max		
$V_{IH}$	Input HIGH Voltage	1.9		1.8		1.6		V	Guaranteed Input HIGH Threshold
$V_{IL}$	Input LOW Voltage		0.85		0.85		0.85	V	Guaranteed Input LOW Threshold
$V_{OH}$	Output HIGH Voltage		2.4		2.4		2.4	V	$V_{CC} = 4.75\text{ V}$ , $I_{OH} = -1.2\text{ mA}$ , Inputs = $V_{IL}$
$V_{OL}$	Output LOW Voltage		0.45		0.45		0.45	V	$V_{CC} = 5.25\text{ V}$ , $I_{OL} = 16\text{ mA}$ , Inputs = $5.25\text{ V}$
			0.45		0.45		0.45		$V_{CC} = 4.75\text{ V}$ , $I_{OL} = 14.1\text{ mA}$ , Inputs = $V_{IH}$

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## DC AND AC CHARACTERISTICS OVER COMMERCIAL TEMPERATURE RANGE (Cont'd)

SYMBOL	PARAMETER	0°C		25°C		75°C		UNITS	CONDITIONS	
		Min	Max	Min	Max	Min	Max			
I <sub>IL</sub>	Input LOW Current	-1.6		-1.6		-1.6		mA	V <sub>CC</sub> = 5.25 V, V <sub>IN</sub> = .45 V 5.25 V on Other Inputs	
		-1.41		-1.41		-1.41		mA	V <sub>CC</sub> = 4.75 V, V <sub>IN</sub> = .45 V 5.25 V on Other Inputs	
I <sub>CC</sub>	Power Supply Current, each gate	ON	6.55		6.55		6.55		mA	Inputs HIGH
			8.75		8.75		8.75			Inputs HIGH (4-Input Gate Only)
		OFF	3.38		3.38		3.38		mA	Inputs LOW
			6.77		6.77		6.77			Inputs LOW (4-Input Gate Only)
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay			3.0	13			ns	C <sub>L</sub> = 15 pF Fig. 3-4	
				3.0	15					

## DC AND AC CHARACTERISTICS OVER MILITARY TEMPERATURE RANGE: V<sub>CC</sub> = +5.0 V ±10%

SYMBOL	PARAMETER	-55°		25°C		125°C		UNITS	CONDITIONS	
		Min	Max	Min	Max	Min	Max			
V <sub>IH</sub>	Input HIGH Voltage	2.0		1.7		1.4		V	Guaranteed Input HIGH Threshold	
V <sub>IL</sub>	Input LOW Voltage	0.8		0.9		0.8		V	Guaranteed Input LOW Threshold	
V <sub>OH</sub>	Output HIGH Voltage	2.4		2.4		2.4		V	V <sub>CC</sub> = 4.5 V, I <sub>OH</sub> = -1.32 mA, Inputs = V <sub>IL</sub>	
V <sub>OL</sub>	Output LOW Voltage	0.4		0.4		0.4		V	V <sub>CC</sub> = 5.5 V, Inputs = 5.5 V, I <sub>OL</sub> = 17.6 mA	
		0.4		0.4		0.4			V <sub>CC</sub> = 4.5 V, V <sub>IN</sub> = V <sub>IH</sub> , I <sub>OL</sub> = 13.6 mA	
I <sub>IL</sub>	Input LOW Current	-1.6		-1.6		-1.6		mA	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.4 V 5.5 V on Other Inputs	
		-1.24		-1.24		-1.24		mA	V <sub>CC</sub> = 4.5 V V <sub>IN</sub> = 0.4 V 5.5 V on Other Inputs	
I <sub>CC</sub>	Power Supply Current, each gate	ON	6.07		6.07		6.07		mA	Inputs HIGH
			8.14		8.14		8.14			Inputs HIGH (4-Input Gate Only)
		OFF	3.2		3.2		3.2		mA	Inputs LOW
			6.4		6.4		6.4			Inputs LOW (4-Input Gate Only)
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay			3.0	10			ns	C <sub>L</sub> = 15 pF Fig. 3-4	
				3.0	12					