

# 9XXX Series

## 9015 QUAD NOR GATE

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**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.

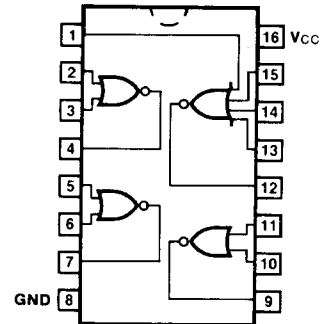
**ORDERING CODE:** See Section 9

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 V
			0.45		0.45		0.45		$V_{CC} = 4.75\text{ V}$ , $I_{OL} = 14.1\text{ mA}$ , Inputs = $V_{IH}$

## 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					
I <sub>CC</sub>	Power Supply Current, each gate		ON		6.55		6.55		mA	Inputs HIGH Inputs HIGH (4-Input Gate Only)		
					8.75		8.75					
			OFF		3.38		3.38		3.38		mA	Inputs LOW Inputs LOW (4-Input Gate Only)
					6.77		6.77		6.77			
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay				3.0 13		3.0 15		ns	C <sub>L</sub> = 15 pF Fig. 3-4		

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

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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			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		mA	Inputs HIGH Inputs HIGH (4-Input Gate Only)		
					8.14		8.14					
			OFF		3.2		3.2		3.2		mA	Inputs LOW Inputs LOW (4-Input Gate Only)
					6.4		6.4		6.4			
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay				3.0 10		3.0 12		ns	C <sub>L</sub> = 15 pF Fig. 3-4		