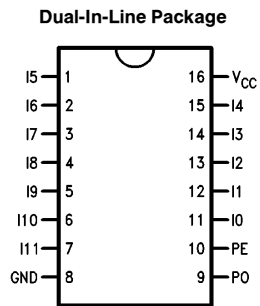


# 9348 12-Input Parity Checker/Generator

## General Description

The 9348 is a 12-input parity checker/generator generating odd and even parity outputs. It can be used in high speed error detection applications.

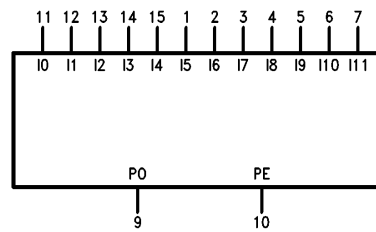
## Connection Diagram



TL/F/9795-1

**Order Number 9348DMQB or 9348FMQB**  
**See NS Package Number J16A or W16A**

## Logic Symbol



V<sub>CC</sub> = Pin 16  
 GND = Pin 8

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Pin Names	Description
I0-I11	Parity Inputs
PO	Odd Parity Output
PE	Even Parity Output

## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
Military	−55°C to +125°C
Storage Temperature Range	−65°C to +150°C

Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

## Recommended Operating Conditions

Symbol	Parameter	9348			Units
		Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	V
V <sub>IH</sub>	High Level Input Voltage	2			V
V <sub>IL</sub>	Low Level Input Voltage			0.8	V
I <sub>OH</sub>	High Level Output Current			−0.8	mA
I <sub>OL</sub>	Low Level Output Current			16	mA
T <sub>A</sub>	Free Air Operating Temperature	−55		125	°C

## Electrical Characteristics

Over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = −12 mA			−1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max, V <sub>IL</sub> = Max	2.4			V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IH</sub> = Min			0.4	V
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V			1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4V			80	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			−3.2	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	−20		−70	mA
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = Max			82	mA

Note 1: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

Note 2: Not more than one output should be shorted at a time.

## Switching Characteristics

V<sub>CC</sub> = +5.0V, T<sub>A</sub> = +25°C (See Section 1 for waveforms and load configuration)

Symbol	Parameter	Conditions	C <sub>L</sub> = 15 pF R <sub>L</sub> = 400Ω		Units
			Min	Max	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay I4 to PO	I2, I3, I7, I8 = GND; Other Inputs (except I4) HIGH		46 42	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay I4 to PE	I2, I3, I7, I8 = GND; Other Inputs (except I4) HIGH		51 48	ns
t <sub>PLH</sub>	Propagation Delay I3 to PO	I7 = HIGH; Other Inputs (except I3) = GND		27	ns
t <sub>PHL</sub>	Propagation Delay I4 to PO	All Inputs (except I4) = GND		25	ns

## Functional Description

The 9348 is a 12-input parity generator. It provides odd and even parity for up to 12 data bits. The Even Parity output (PE) will be HIGH if an even number of logic ones are present on the inputs. The Odd Parity output (PO) will be HIGH if an odd number of logic ones are present on the inputs. The logic equations for the outputs are shown below.

$$PO = I_0 \oplus I_1 \oplus I_2 \oplus I_3 \oplus I_4 \oplus I_5 \oplus I_6 \oplus I_7 \oplus I_8 \oplus I_9 \oplus I_{10} \oplus I_{11}$$

$$PE = I_0 \oplus I_1 \oplus I_2 \oplus I_3 \oplus I_4 \oplus I_5 \oplus I_6 \oplus I_7 \oplus I_8 \oplus I_9 \oplus I_{10} \oplus I_{11}$$

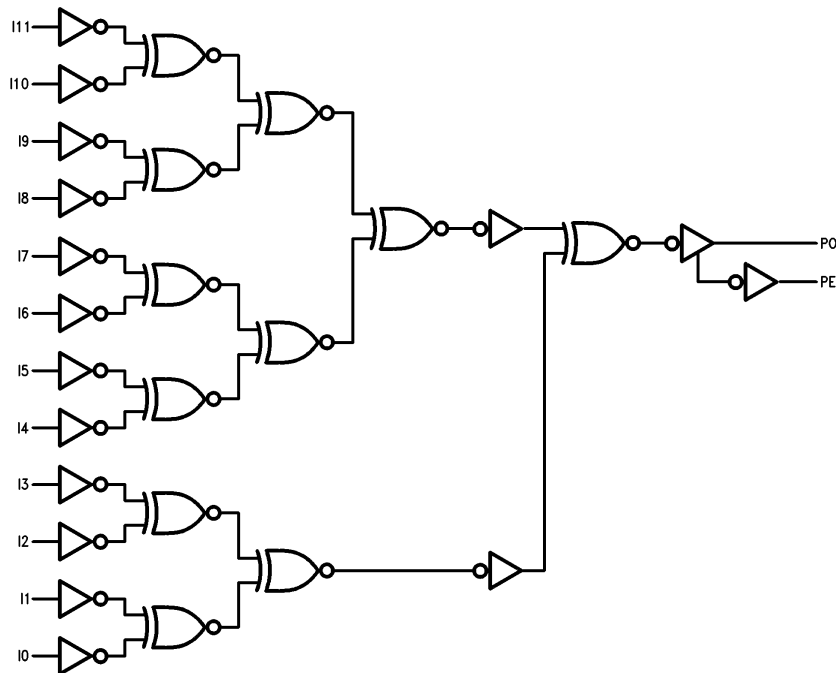
**Note:** Less through delay is encountered from the I<sub>0</sub>, I<sub>1</sub>, I<sub>2</sub> and I<sub>3</sub> inputs than I<sub>4</sub> thru I<sub>11</sub> inputs. Therefore, if some signals are slower than others, the slower signals should be applied to these four inputs for maximum speed.

## Truth Table

Inputs		Outputs	
I <sub>0</sub> -I <sub>11</sub>		PO	PE
All Twelve	Inputs LOW	L	H
Any One	Inputs HIGH	H	L
Any Two	Inputs HIGH	L	H
Any Three	Inputs HIGH	H	L
Any Four	Inputs HIGH	L	H
Any Five	Inputs HIGH	H	L
Any Six	Inputs HIGH	L	H
Any Seven	Inputs HIGH	H	L
Any Eight	Inputs HIGH	L	H
Any Nine	Inputs HIGH	H	L
Any Ten	Inputs HIGH	L	H
Any Eleven	Inputs HIGH	H	L
Any Twelve	Inputs HIGH	L	H

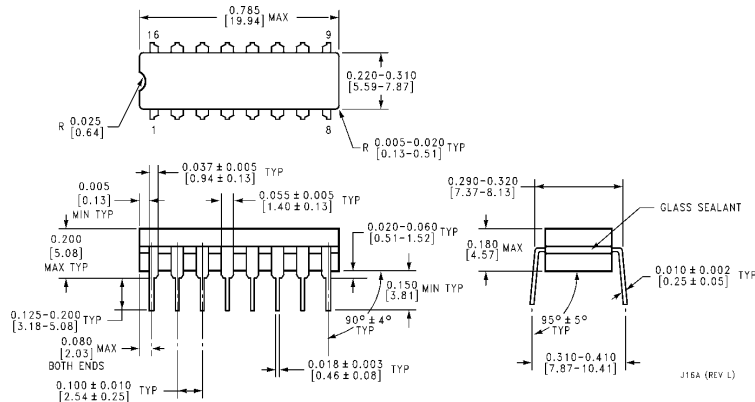
H = HIGH Voltage Level  
L = LOW Voltage Level

## Logic Diagram

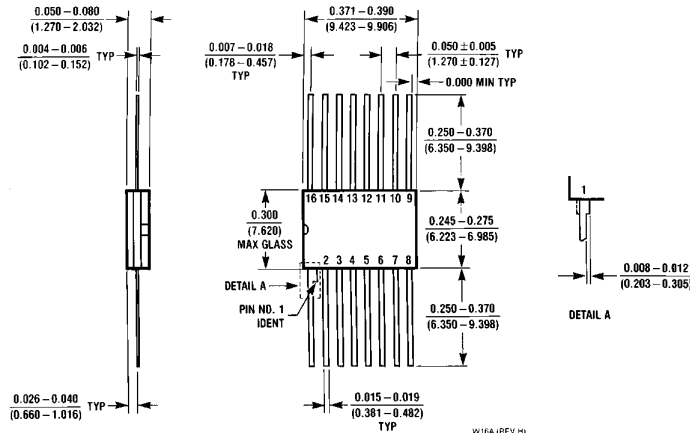


TL/F/9795-3

**Physical Dimensions** inches (millimeters)



**16-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number 9348DMQB**  
**NS Package Number J16A**



**16-Lead Ceramic Flat Package (W)**  
**Order Number 9348FMQB**  
**NS Package Number W16A**

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**National Semiconductor Corporation**  
 1111 West Bardin Road  
 Arlington, TX 76017  
 Tel: 1(800) 272-9959  
 Fax: 1(800) 737-7018

**National Semiconductor Europe**  
 Fax: (+49) 0-180-530 85 86  
 Email: [cnjwge@tevm2.nsc.com](mailto:cnjwge@tevm2.nsc.com)  
 Deutsch Tel: (+49) 0-180-530 85 85  
 English Tel: (+49) 0-180-532 78 32  
 Français Tel: (+49) 0-180-532 93 58  
 Italiano Tel: (+49) 0-180-534 16 80

**National Semiconductor Hong Kong Ltd.**  
 19th Floor, Straight Block,  
 Ocean Centre, 5 Canton Rd.  
 Tsimshatsui, Kowloon  
 Hong Kong  
 Tel: (852) 2737-1600  
 Fax: (852) 2736-9960

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 Tel: 81-043-299-2309  
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