



## SAA1029

### UNIVERSAL INDUSTRIAL LOGIC AND INTERFACE CIRCUIT

#### GENERAL DESCRIPTION

The SAA1029 is a universal bipolar logic and interface IC with high noise immunity and operational stability for industrial control applications. The most fundamental industrial control functions can be accomplished with only one SAA1029IC. Figure 1 shows the logic configuration.

The IC comprises,

- (1) Gate 1 : 4-input AND gate with 1 inverted input,
- (2) Gate 2 : 3-input AND gate with 1 inverted input and adjustable propagation delay,
- (3) Gate 3 : 2-input AND gate with 1 inverted input.

The SAA1029 can be used as direct interface with LOCMOS (CMOS) ICs for realizing more complex functions. Therefore, the output signal can be limited to the voltage level of the common output clamping pin Z.

The propagation delay of NAND gate 2 is adjustable from microseconds by using an external capacitor at pin C. This makes it possible to adapt the control frequency limits to the system, so the optimum dynamic noise » immunity can be achieved.

All the static and dynamic circuit values ( including the output voltage) are independent of the supply voltage over a wide operating range. This allows the use of a simple unstabilized power supply.

The output is held to the LOW state automatically during swithching on the power supply, so a special reset pulse can be omitted.

#### **Features**

- Simple realization of the basic industrial control functions ( logic functions, timing functions, memory functions).
- High dynamic and static noise immunity.
- High operation stability.
- Short-circuit protection of inputs and outputs to both  $V_{EE}$  and  $V_{CC}$ .
- Wide interruption results in a safe input LOW state.
- LOCMOS (CMOS) compatible.

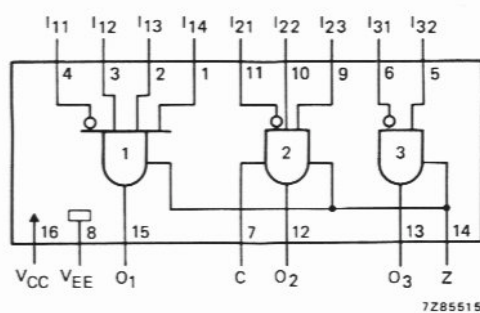
# SAA1029

## QUICK REFERENCE DATA

Supply voltage range	V <sub>CC</sub>	14 to 31,2V
Operating ambient temperature range	T <sub>amb</sub>	-30 to +85°C
Input voltage HIGH	V <sub>IH</sub>	7,5 to 44V
Output voltage HIGH (without clamping)	V <sub>OH</sub>	13 to 30V
Output voltage HIGH (without clamping at pin Z)	V <sub>OH</sub>	2,0 to (V <sub>CC</sub> - 0,7)V
Input current	I <sub>I</sub>	max. 10mA
Quiescent supply current	I <sub>CC</sub>	typ. 7,8mA

## PACKAGE OUTLINE

16-lead DIL ; plastic (SOT38).



Logic equations:  
 $O_1 = \overline{I_{11}} \cdot \overline{I_{12}} \cdot \overline{I_{13}} \cdot \overline{I_{14}}$   
 $O_2 = \overline{I_{21}} \cdot \overline{I_{22}} \cdot \overline{I_{23}}$   
 $O_3 = \overline{I_{31}} \cdot \overline{I_{32}}$

Fig. 1 Logic diagram.

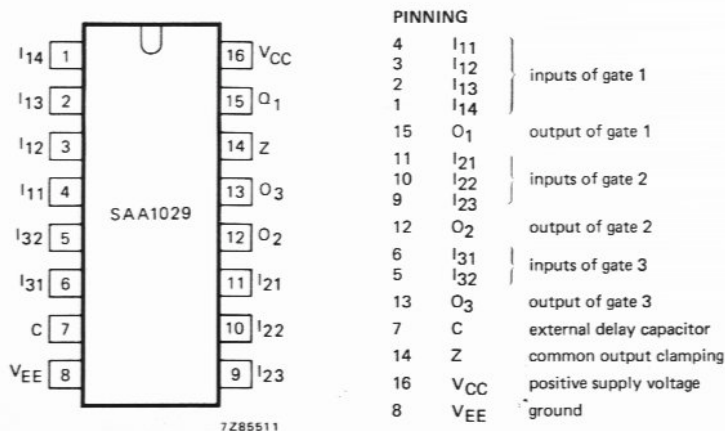


Fig. 2 Pinning diagram.

# SAA1029

**CHARACTERISTICS** : At Tamb : -10 to +85°C/ Vcc 14V to 32V

PARAMETER	CONDITIONS	SYMB	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGE		VCC	14		32	V
OUTPUT CLAMPING VOLTAGE	VZ=VCC-1	VZ	0		30	V
INPUT VOLTAGE LOW		VIL	-0,15		+5	V
INPUT VOLTAGE HIGH		VIH	+7,5		+44	V
CURRENT CONSUMPTION	VCC :30V	ICC	6,5		12	mA
INPUT CURRENT	VCC :24V	IIL :IIH	0,1	0,15	0,3	mA
OUTPUT VOLTAGE HIGH	VCC :14V -IoH :3 mA	VoH	12	12,8		V
OUTPUT VOLTAGE LOW	VCC :30V -IoL :1,6 mA	VoL		0,9	1,4	V
OUTPUT SHORT-CIRCUIT CURRENT						
LOW SIGNAL		10SL		6		mA
HIGH SIGNAL		10SH		10	18	mA
PROPAGATION DELAYS	Tamb :25°C VCC24V					
GATE 2						
HIGH TO LOW	C :33nF	tPHL	1,5	2,6	4	mD
LOW TO HIGH	C :33nF	tPLH	5,5	8,5	12	mS
GATE 1,2,3						
HIGH TO LOW	C :0nF	tPHL	1	2,1	9	MD
LOW TO HIGH	C :0nF	tPLH	1	4,4	9	MD