

DATA SHEET

SAA1300

Tuner switching circuit

Product specification
File under Integrated Circuits, IC12

June 1987

Tuner switching circuit

SAA1300



The SAA1300 is for switching on and off the supply lines of various circuit parts via an I²C bus signal. Furthermore, it can be used to supply current for switching diodes in radio and television tuners. It contains 5 output stages, which are capable of supplying up to 85 mA in the ON state or sinking up to -100 μA in the OFF state.

Current limiting and short-circuit protection are included. The output stages are driven by a shift register/latch combination which is loaded via data from the I²C bus. A power-on reset of the latches ensures the OFF state of the output stages (OUT 2 to OUT 5) without data reception from the I²C bus. A subaddressing system allows the connection of up to three circuits on the same I²C bus lines; one of the outputs (OUT 1, pin 7) can also be used as an input to select the device via a simple internal A/D converter.

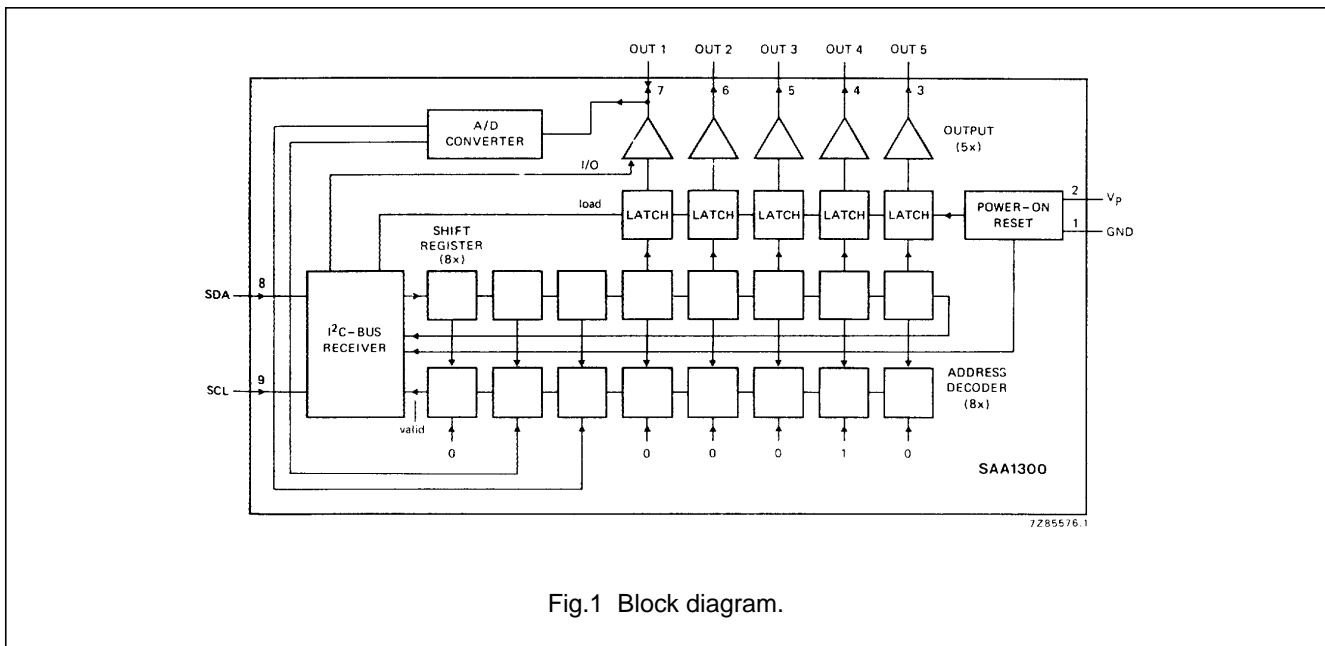


Fig.1 Block diagram.

PACKAGE OUTLINE

9-lead SIL; plastic (SOT142); SOT142-1; 1996 September 05.

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PINNING

| PIN NO. | SYMBOL | FUNCTION | |
|---------|----------------|--------------------------------|----------------------|
| 1 | GND | ground | |
| 2 | V _P | positive supply | |
| 3 | OUT 5 | outputs | |
| 4 | OUT 4 | | |
| 5 | OUT 3 | | |
| 6 | OUT 2 | | |
| 7 | OUT 1 | output and subaddressing input | |
| 8 | SDA | serial data line | I ² C bus |
| 9 | SCL | serial clock line | |

I²C BUS INFORMATION

Address, first byte

0 1 0 0 0 A B 0 where,

| A | B | FUNCTION | CONDITION |
|---|---|-----------------|--|
| 0 | 0 | general address | OUT 1 = output |
| 0 | 1 | OUT 1 = input | address accepted if V _{OUT 1} = V _{OUT L} (LOW) |
| 1 | 0 | OUT 1 = input | address accepted if V _{OUT 1} = V _{OUT H} (HIGH) |
| 1 | 1 | OUT 1 = input | address accepted if V _{OUT 1} = V _{OUT M} (MEDIUM) |

Data, second byte

OUT 5, OUT 4, OUT 3, OUT 2, OUT 1, X, X, X

The I/O output stage (OUT 1) is switched as an input stage after a power-on reset. It depends on the contents of the first data transmission whether the output stage is switched as an output or remains as an input.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| | | | | |
|--|------------------|------|----------------|----|
| Supply voltage | V _P | max. | 13,2 | V |
| Input voltage range at SDA, SCL | V _I | | -0,5 to + 6,0 | V |
| Input voltage range at OUT 1 | V _I | | -0,5 to + 12,5 | V |
| Output voltage range at OUT 1 to OUT 5 | V _O | | -0,5 to + 12,5 | V |
| Input current at SDA, SCL | I _I | max. | 20 | mA |
| Input current at OUT 1 | I _I | max. | 20 | mA |
| Total power dissipation | P _{tot} | max. | 825 | mW |
| Storage temperature range | T _{stg} | | -40 to + 125 | °C |
| Operating ambient temperature ranges | T _{amb} | | -20 to + 80 | °C |

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CHARACTERISTICS

$V_P = 8\text{ V}$; $T_{\text{amb}} = 24\text{ }^\circ\text{C}$; unless otherwise specified

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--|----------------------|-------------|------|------------|---------------|
| Supply (pin 2) | | | | | |
| Supply voltage range | V_P | 4 | 8 | 12 | V |
| Supply current | | | | | |
| 5 outputs LOW | I_{PL} | 5 | 10 | 15 | mA |
| 5 outputs HIGH | I_{PH} | 30 | 50 | 70 | mA |
| Power on reset level output stage in "OFF" condition | V_{PR} | – | 3,5 | 3,8 | V |
| Maximum power dissipation ⁽¹⁾ | P_{max} | – | 650 | – | mW |
| Inputs SDA, SCL (pins 8 and 9) | | | | | |
| Input voltage HIGH | V_{IH} | 3,0 | – | 5,5 | V |
| Input voltage LOW | V_{IL} | 0 | – | 1,5 | V |
| Input current HIGH | $-I_{IH}$ | – | – | 10 | μA |
| Input current LOW | I_{IH} | – | – | 0,4 | μA |
| Acknowledge sink current | I_{ACK} | 2,5 | – | – | mA |
| Maximum input frequency | $f_{i\text{ max}}$ | 100 | – | – | kHz |
| Outputs OUT 1 to OUT 5 (pins 3 to 7) | | | | | |
| Maximum output current; source: "ON" | I_{Oso} | +85 | – | +150 | mA |
| Maximum output current; source: "ON" | | | | | |
| $T_{\text{amb}} = 80\text{ }^\circ\text{C}$ | I_{Oso} | 60 | – | – | mA |
| Output voltage HIGH | | | | | |
| at $I_{Oso} = 85\text{ mA}$ | V_{OH} | $V_P - 2$ | – | – | V |
| Output current; sink "OFF" | I_{Osi} | –100 | –300 | – | μA |
| Output voltage LOW | | | | | |
| at $I_{Osi} = -100\text{ }\mu\text{A}$ | V_{OL} | – | – | 100 | mV |
| Output voltage MEDIUM | | | | | |
| at $I_O = 10\text{ mA}$ | V_{OM} | $V_P - 0,5$ | – | – | V |
| OUT 1 used as subaddressing input | | | | | |
| Input voltage HIGH (code 1 0) | $V_{\text{OUT } 1H}$ | $0,72 V_P$ | – | V_P | V |
| Input voltage MEDIUM (code 1 1) | $V_{\text{OUT } 1M}$ | $0,39 V_P$ | – | $0,61 V_P$ | V |
| Input voltage LOW (code 0 1) | $V_{\text{OUT } 1L}$ | 0 | – | $0,28 V_P$ | V |

Note

1. Outputs must not be driven simultaneously at maximum source current.

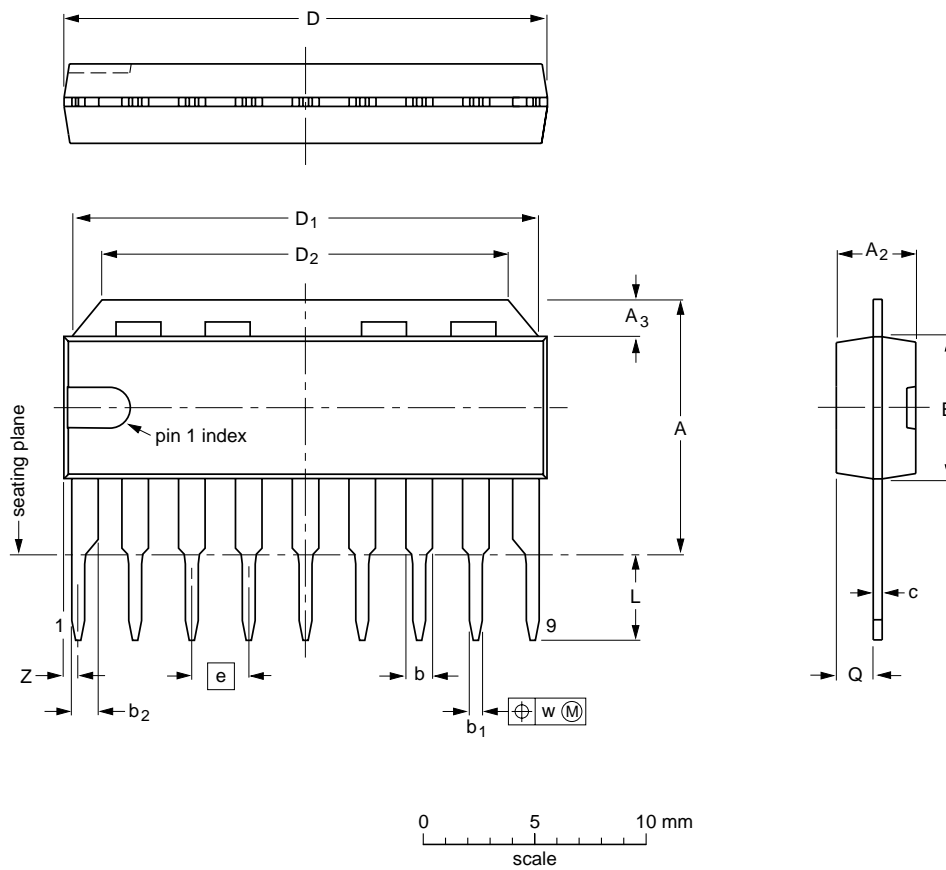
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PACKAGE OUTLINE

SIL9MP: plastic single in-line medium power package; 9 leads

SOT142-1



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₂ max. | A ₃ | b | b ₁ | b ₂ | c | D ⁽¹⁾ | D ₁ | D ₂ | E ⁽¹⁾ | e | L | Q | w | Z ⁽¹⁾ max. |
|------|----------|---------------------|----------------|--------------|----------------|----------------|--------------|------------------|----------------|----------------|------------------|------|------------|--------------|------|-----------------------|
| mm | 12 11 | 3.7 | 1.8 1.4 | 1.40 1.14 | 0.67 0.50 | 1.40 1.14 | 0.48 0.38 | 21.8 21.4 | 21.4 20.7 | 18.6 18.2 | 6.48 6.20 | 2.54 | 3.9 3.4 | 1.75 1.55 | 0.25 | 1.0 |

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|--|---------------------|----------------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT142-1 | | | | | | 95-02-09 97-12-16 |

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SOLDERING**Introduction**

There is no soldering method that is ideal for all IC packages. Wave soldering is often preferred when through-hole and surface mounted components are mixed on one printed-circuit board. However, wave soldering is not always suitable for surface mounted ICs, or for printed-circuits with high population densities. In these situations reflow soldering is often used.

This text gives a very brief insight to a complex technology. A more in-depth account of soldering ICs can be found in our "IC Package Databook" (order code 9398 652 90011).

Soldering by dipping or by wave

The maximum permissible temperature of the solder is 260 °C; solder at this temperature must not be in contact

with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds.

The device may be mounted up to the seating plane, but the temperature of the plastic body must not exceed the specified maximum storage temperature ($T_{stg\ max}$). If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature within the permissible limit.

Repairing soldered joints

Apply a low voltage soldering iron (less than 24 V) to the lead(s) of the package, below the seating plane or not more than 2 mm above it. If the temperature of the soldering iron bit is less than 300 °C it may remain in contact for up to 10 seconds. If the bit temperature is between 300 and 400 °C, contact may be up to 5 seconds.

DEFINITIONS

| | |
|---|---|
| Data sheet status | |
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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Purchase of Philips I²C components conveys a license under the Philips' I²C patent to use the components in the I²C system provided the system conforms to the I²C specification defined by Philips. This specification can be ordered using the code 9398 393 40011.