

UM10338

Description of the TDA8029 I2C Demo Board

Rev. 1.0 — 11 January 2011

User manual

Document information

| Info | Content |
|-----------------|---|
| Keywords | TDA8029, I2C, Cake8029_12_D, Contact Smart Card Reader, PN533 |
| Abstract | <p>This user manual intends to describe the Cake8029_12_D. This demo board is dedicated to the TDA8029 application with I2C interface.</p> <p>The document also presents the connection between the TDA8029 board and a PN533 demo board.</p> |



Revision history

| Rev | Date | Description |
|-----|----------|---------------|
| 1.0 | 20110111 | First version |

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1. Introduction

1.1 TDA8029

The TDA8029 is a complete contact smart card reader. It embeds an electrical interface with all the security features needed to protect the smart card, a fully compliant ISO 7816 UART, and a microcontroller with complete software driving the smart card protocols.

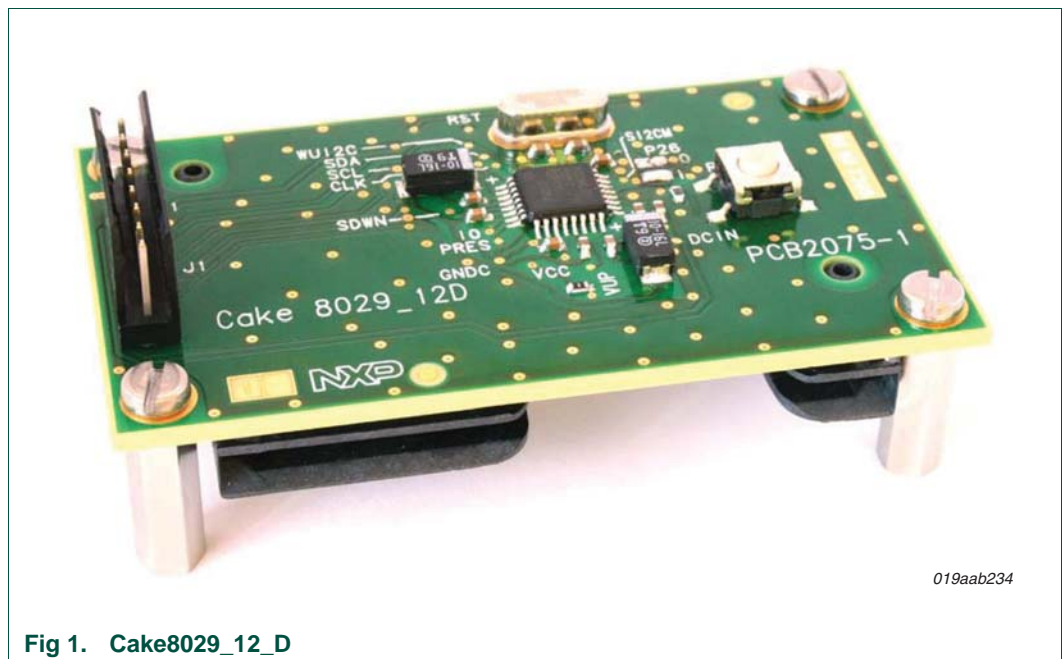
1.2 Demo Board

The Cake8029_12_D demo board is used to test the I²C interface of the TDA8029. On the board the TDA8029 is configured for this interface, and this bus is physically the only one implemented.

Therefore the board cannot be used with a serial interface.

The demo board is composed of

- The TDA8029 device
- A smart card connector
- An interface connector, for the power supply and control signals.
- Two configuration solder bridge (To choose using Energy Saving Mode or not)
- A reset switch to reset the TDA8029



2. Hardware description

The next pages show the electrical schematics, the layout and the component position of the board.

2.1 Schematics

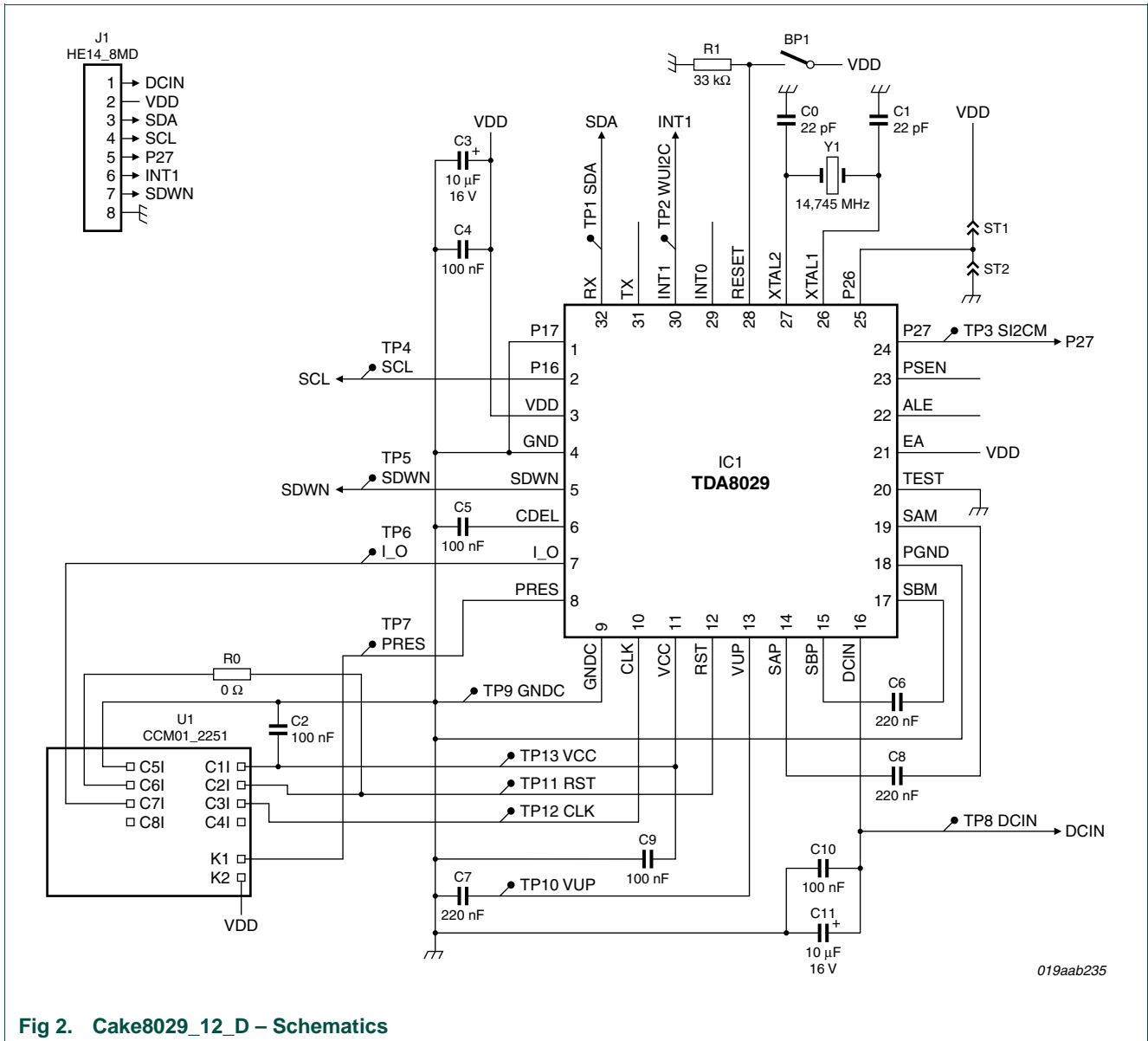


Fig 2. Cake8029_12_D – Schematics

2.2 Layout Top

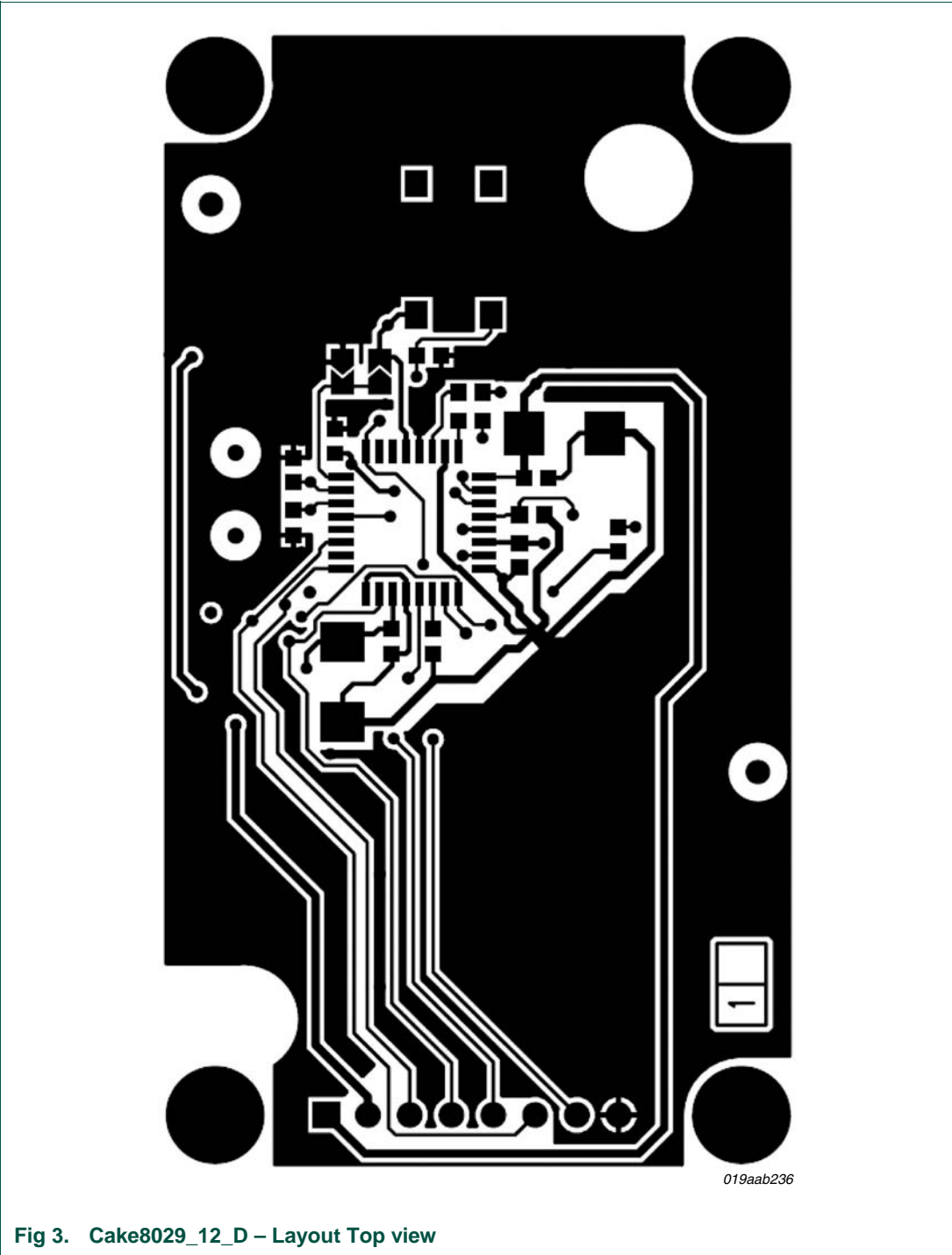


Fig 3. Cake8029_12_D – Layout Top view

2.3 Layout Bottom

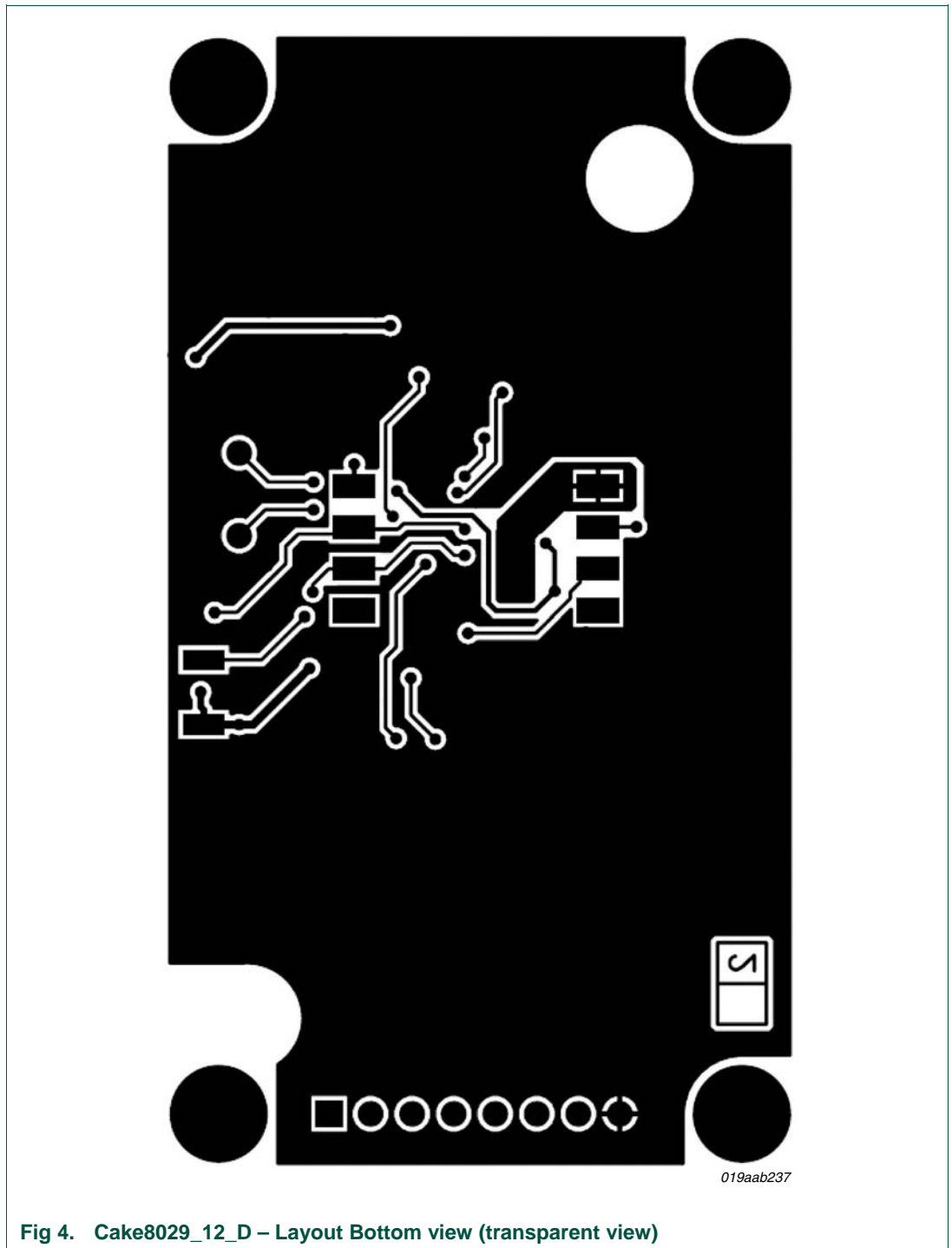
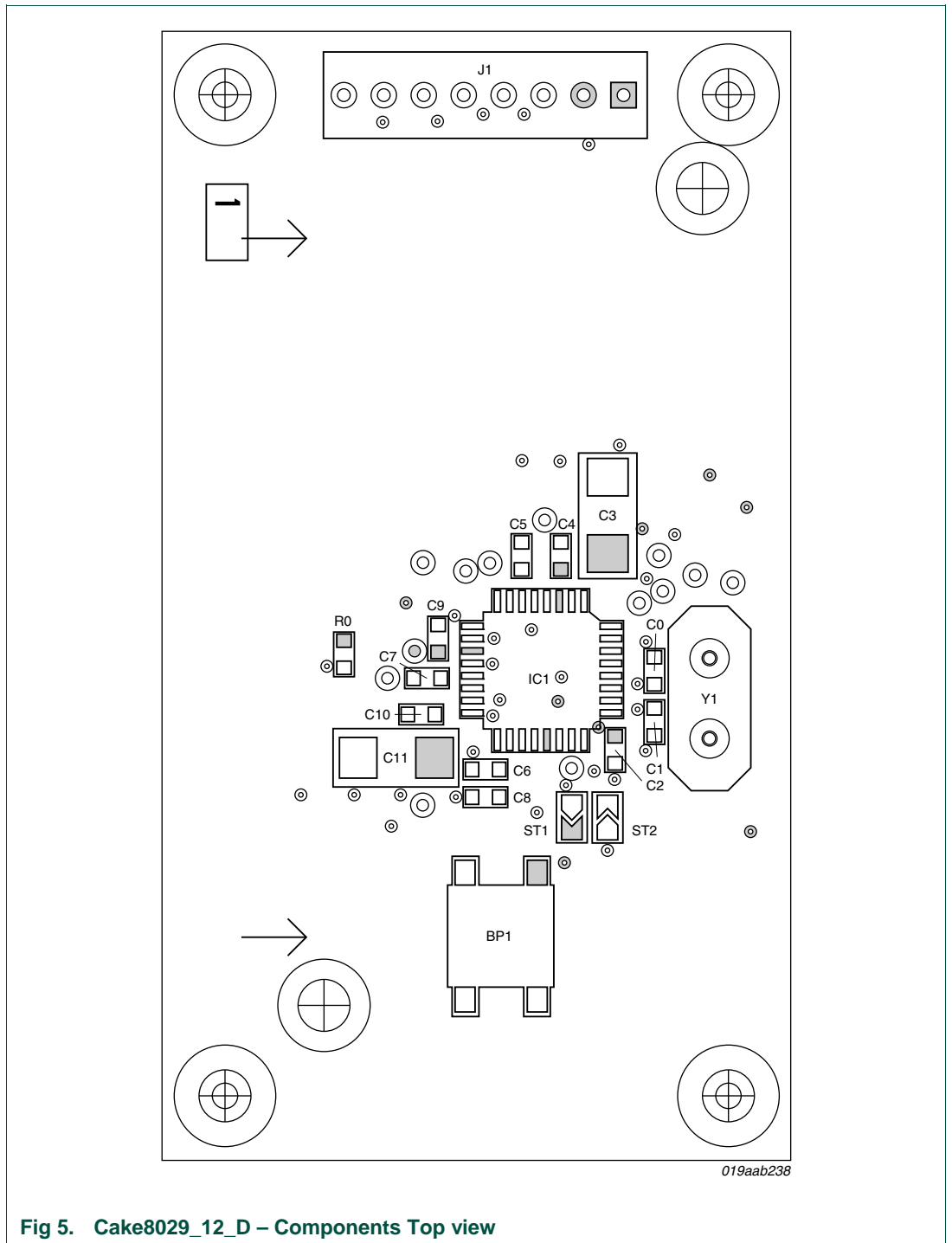


Fig 4. Cake8029_12_D – Layout Bottom view (transparent view)

2.4 Components Top



2.5 Components Bottom

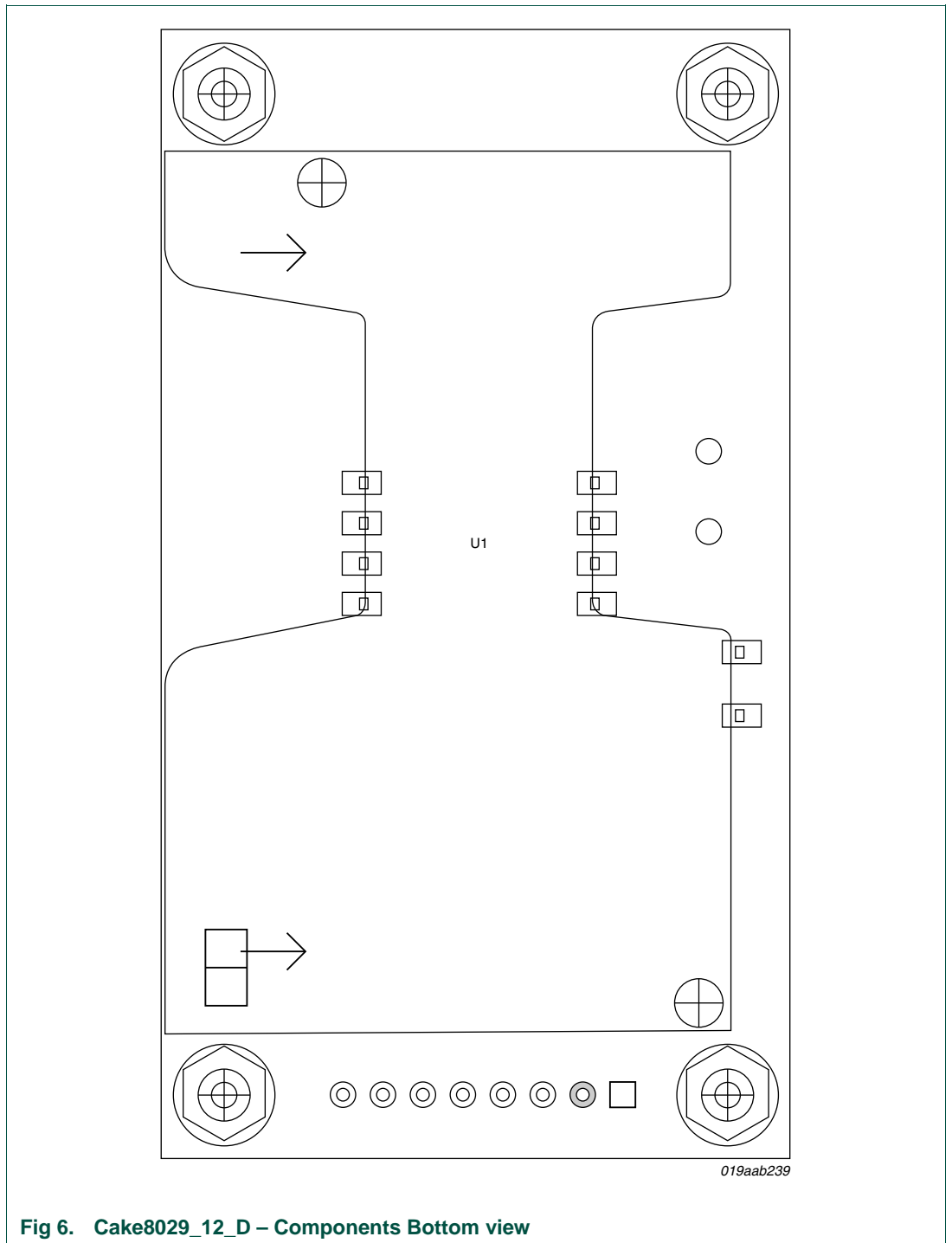


Fig 6. Cake8029_12_D – Components Bottom view

2.6 Bill of Material

| | | | |
|---|--------------|-------------|---|
| BP1 | int_b3s | B3S_1000, | OMRON:Tact,Switch,6x6,SMT |
| C0 | c0603 | 22pF, | Capacitor,CER2,0603,COG,50V,5% |
| C1 | c0603 | 22pF, | Capacitor,CER2,0603,COG,50V,5% |
| C2 | c0603 | 100nF, | Capacitor,CER2,0603,X7R,16V,10% |
| C3 | c293d_c | 10uF_16V, | Type,293D,Tantal,Capacitor,Package:C,10% |
| C4 | c0603 | 100nF, | Capacitor,CER2,0603,X7R,16V,10% |
| C5 | c0603 | 100nF, | Capacitor,CER2,0603,X7R,16V,10% |
| C6 | c0603 | 220nF, | Capacitor,CER2,0603,X7R,10V,10% |
| C7 | c0603 | 220nF, | Capacitor,CER2,0603,X7R,10V,10% |
| C8 | c0603 | 220nF, | Capacitor,CER2,0603,X7R,10V,10% |
| C9 | c0603 | 100nF, | Capacitor,CER2,0603,X7R,16V,10% |
| C10 | c0603 | 100nF, | Capacitor,CER2,0603,X7R,16V,10% |
| C11 | c293d_c | 10uF_16V, | Type,293D,Tantal,Capacitor,Package:C,10% |
| IC1 | sot358_1 | TDA8029 | |
| J1 | he14_1x8md | HE14_8MD, | HE14,Connector,1x8,Straight,Male |
| R0 | r0603 | 0, | Resistor,Package:0603,5%,1/16W |
| R1 | r0603 | 33K, | Resistor,Package:0603,5%,1/16W |
| ST2 | chevron_clos | CLOSED, | ***TO,BE,CLOSED*** |
| TP1 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP2 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP3 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP4 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP5 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP6 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP7 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP8 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP9 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP10 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP11 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP12 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| TP13 | plage.75 | PLAGE.75, | ***NOT,CONNECTED*** |
| U1 | ccm01_2251 | CCM01_2251, | CANON:Card,Read,8,Contacts,SMT |
| Y1 | hc49s | 14.745MHZ, | KONY:Quartz,Crystal,Low,Profile,Package:HC49S |
| BUBBLE01:Printed_Circuit_board:PCB2075-1 | | | |
| BUBBLE02:ACME:ETL305015_Spacer_M3x15 | | | |
| BUBBLE03:Screw_C_M3x6_Stainless_Steel | | | |
| BUBBLE04:INTER_INOX:A2M320_Lockwasher_Stainless_Steel | | | |

Fig 7. Cake8029_12_D – BOM

3. Configuration and use

3.1 Energy Saving Mode

The two configuration switch ST1 and ST2 allow to choose if the Energy Saving mode is used or not.

The connector connect the pin P26 (#25) to VDD or GND.

To use the ESM, ST1 must be soldered and ST2 open.

If the ESM is not used, ST2 must be soldered and ST1 unsoldered.

For more details on the Energy Saving Mode, refer to AN10207.

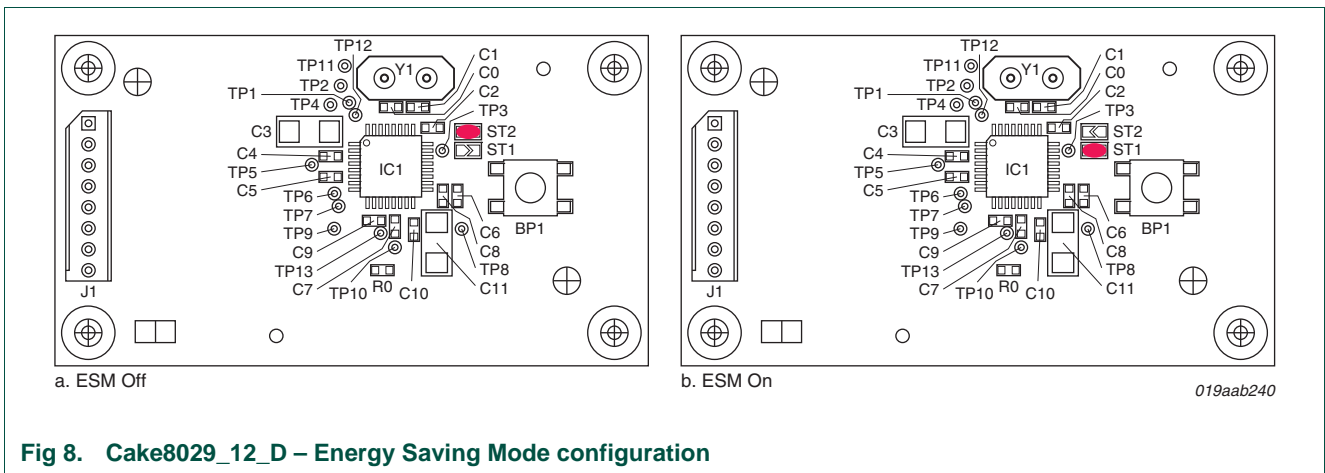


Fig 8. Cake8029_12_D – Energy Saving Mode configuration

3.2 Interface connector

All the signals and power supply must come from the J1 connector.

The pin names are given in the schematics.

For a better representation, they are described on the board on the following picture:

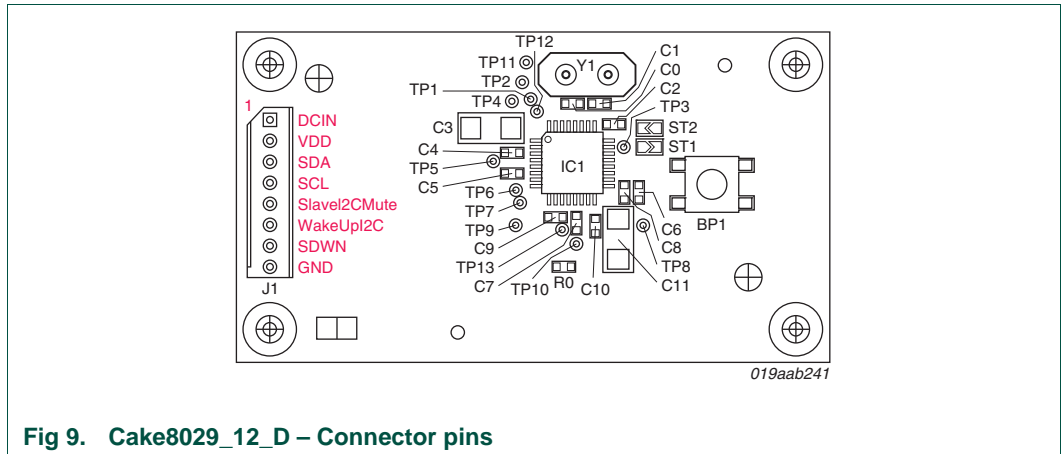


Fig 9. Cake8029_12_D – Connector pins

The next table gives a description of each pin.

Table 1. Cake8029_12_D – Connector pins description

| Pin number | Pin name | Description |
|------------|--------------|---|
| 1 | DCIN | Power supply for the DC/DC converter. Must be in the range from VDD to 6V |
| 2 | VDD | Power supply for the main chip. Must be in the range 2.7V – 6V |
| 3 | SDA | I2C bus – Data line |
| 4 | SCL | I2C bus – Clock Line |
| 5 | Slavel2CMute | I2C bus – Line used by the TDA8029 to inform the host that there is an event |
| 6 | WakeUpI2C | I2C bus – Line used by the host to wake up the TDA before sending a frame |
| 7 | SDWN | Shutdown pin. Must be HIGH to use the TDA8029 and LOW to put the TDA8029 in shutdown mode |
| 8 | GND | Power supply ground pin |

3.3 Connection to a PN533 demo board

The PN533 embeds a software to be able to drive the TDA8029.

The PN533 generic demo board (PCB1950-1) has an external connector compatible with the connector on the Cake8029_12_D.

The connection between the two boards can be achieved with a simple straight cable as represented on the next picture.

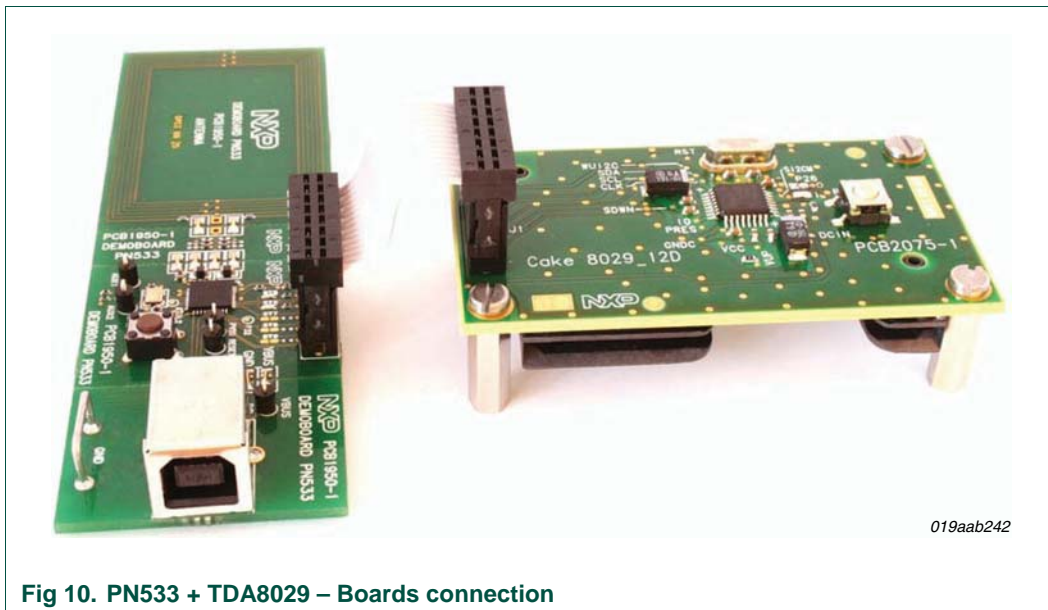


Fig 10. PN533 + TDA8029 – Boards connection

To use the board in this configuration, the connection ST1 must be closed and ST2 must be unsoldered because the PN533 uses the Energy Saving Mode of the TDA8029.

For more detail on this application, refer to the PN533 Application Note dedicated to this association: AN10758.

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