



# TDA18250AHN

Cable silicon tuner

Rev. 1 — 10 July 2013

Product short data sheet

## 1. General description

The TDA18250A is a silicon tuner designed specifically for worldwide cable and terrestrial digital Set Top Boxes (STB).

- The TDA18250A ensures a low system cost by saving external components such as:
  - Low-Noise Amplifiers
  - Surface Acoustic Wave (SAW) filters
  - RF splitter

Moreover, thanks to its 8 kV ESD capability, EIA/JESD22-A114 (HBM), on the RF input pin and the loop-through pin, the application level ESD protection can be reduced.

- The TDA18250A silicon tuner meets current and future digital cable and terrestrial TV reception with:
  - Low-power consumption
  - High linearity
  - Very low noise figure (3.8 dB typical)
  - High immunity to wireless interferers (WLAN, LTE and GSM)
- The TDA18250A ensures ease of use with:
  - Easy on-board integration
  - Efficient and effective PCB design
  - Reduced external components
  - Integrated Zero Power Loop-Through (ZPLT)

## 2. Features and benefits

- Single 3.3 V supply voltage
- RF frequency coverage up to 1 GHz
- Flexible low IF output from 3 MHz to 7.5 MHz to ease the matching with various demodulators
- RoHS compliant
- I<sup>2</sup>C-bus interface compatible with 3.3 V microcontrollers
- Strong Immunity to wireless interferers (WLAN, GSM, LTE)
- Multi-reference clock frequency compliant: 16 MHz, 24 MHz, 25 MHz, 27 MHz and 30 MHz
- Crystal oscillator output buffer to drive demodulator, SoC or slave tuner
- Slave Tuner Output (STO), integrated splitter for dual tuner applications



- Fully integrated oscillators
- LT output, both in active and Zero Power Loop-Through mode (ZPLT)
- Fully integrated IF and RF selectivity; eliminating the need for external SAW filters
- Single-ended RF input (no need for external balun)
- Enhanced ESD protection (8 kV HBM) on RF\_IN and ZPLT pins
- Alignment free
- Excellent return loss compatible with cable requirements
- Integrated RSSI function, readable through I<sup>2</sup>C-bus
- Integrated temperature sensor
- Integrated gain control

### 3. Quick reference data

**Table 1. Quick reference data**

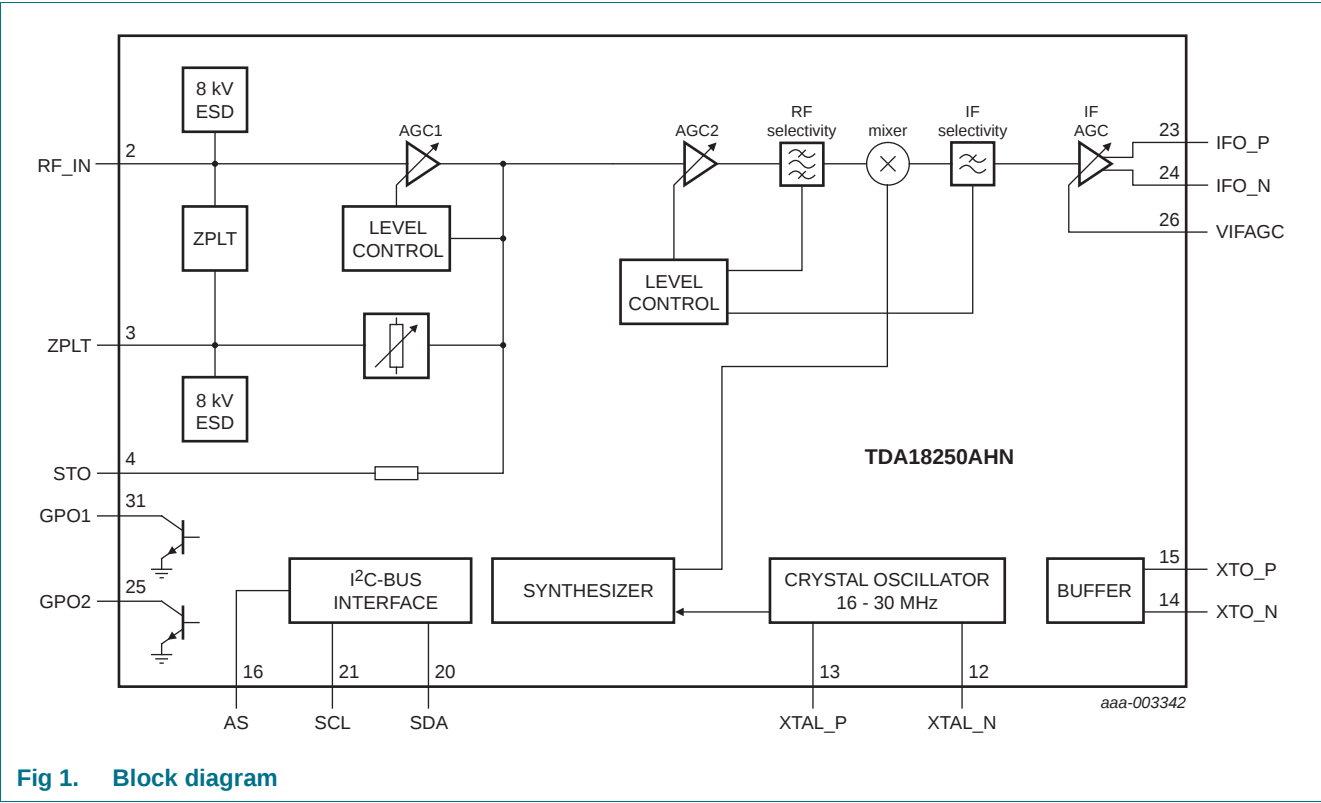
| Symbol           | Parameter           | Conditions                                        | Min | Typ   | Max  | Unit       |
|------------------|---------------------|---------------------------------------------------|-----|-------|------|------------|
| $f_{RF}$         | RF frequency        | RF input frequency range                          | 42  | -     | 1002 | MHz        |
| $NF_{tun}$       | tuner noise figure  | 75 $\Omega$ ; maximum gain                        |     |       |      |            |
|                  |                     | $f_{RF} < 862$ MHz                                | -   | 3.8   | -    | dB         |
|                  |                     | $f_{RF} \geq 862$ MHz                             | -   | 4.5   | -    | dB         |
| $\phi_{jit}$     | phase jitter        | integrated from 250 Hz to 4 MHz                   | -   | 0.4   | 0.6  | Degree     |
| $\alpha_{image}$ | image rejection     | IF = 5 MHz, RF (image) level $\geq 60$ dB $\mu$ V | -   | 62    | -    | dB         |
| $P_{i(max)}$     | maximum input power | single channel                                    | 115 | -     | -    | dB $\mu$ V |
| P                | power dissipation   |                                                   | -   | 0.740 | -    | W          |

### 4. Ordering information

**Table 2. Ordering information**

| Type number    | Package |                                                                                                    |          |
|----------------|---------|----------------------------------------------------------------------------------------------------|----------|
|                | Name    | Description                                                                                        | Version  |
| TDA18250AHN/C1 | HVQFN32 | plastic thermal enhanced very thin quad flat package; no leads; 32 terminals; body 5 × 5 × 0.85 mm | SOT617-3 |

5. Block diagram



6. Limiting values

**Table 3. Limiting values**  
*In accordance with the Absolute Maximum Rating System (IEC 60134).*

| Symbol           | Parameter                       | Conditions                                   | Min  | Max                   | Unit |
|------------------|---------------------------------|----------------------------------------------|------|-----------------------|------|
| V <sub>CC</sub>  | supply voltage                  |                                              | −0.3 | +3.60                 | V    |
| V <sub>I</sub>   | input voltage                   | V <sub>CC</sub> < 3.3 V                      | −0.3 | V <sub>CC</sub> + 0.3 | V    |
|                  |                                 | V <sub>CC</sub> > 3.3 V                      | −0.3 | +3.6                  | V    |
| V <sub>ESD</sub> | electrostatic discharge voltage | EIA/JESD22-A114 (HBM)                        | 2    | -                     | kV   |
|                  |                                 | EIA/JESD22-A114 (HBM); pins RF_IN and ZPLT   | 8    | -                     | kV   |
|                  |                                 | EIA/JESD22-C101-C (FCDM) <a href="#">[1]</a> | 1    | -                     | kV   |

[1] It withstands class IV of JEDEC standard.

## 7. Abbreviations

Table 4. Abbreviations

| Acronym | Description                               |
|---------|-------------------------------------------|
| AGC     | Automatic Gain Control                    |
| ESD     | ElectroStatic Discharge                   |
| FCDM    | Field Charge Device Model                 |
| GPO     | General Purpose Outputs                   |
| HBM     | Human Body Model                          |
| IC      | Integrated Circuit                        |
| IF      | Intermediate Frequency                    |
| JEDEC   | Joint Electron Device Engineering Council |
| LT      | Loop-Through                              |
| LTE     | Long-Term Evolution                       |
| PCB     | Printed-Circuit Board                     |
| RF      | Radio Frequency                           |
| RoHS    | Restriction of Hazardous Substances       |
| RSSI    | Received Signal Strength Indicator        |
| SAW     | Surface Acoustic Wave                     |
| SCL     | Serial CLock                              |
| SDA     | Serial DAta                               |
| SoC     | System on Chip                            |
| STB     | Set Top Box                               |
| STO     | Slave Tuner Output                        |
| WLAN    | Wireless Local Area Network               |
| Xtal    | Crystal                                   |
| ZPLT    | Zero Power Loop-Trough                    |

## 8. Revision history

Table 5. Revision history

| Document ID         | Release date | Data sheet status        | Change notice | Supersedes |
|---------------------|--------------|--------------------------|---------------|------------|
| TDA18250AHN_SDS v.1 | 20130710     | Product short data sheet | -             | -          |

## 9. Legal information

### 9.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition                                                                            |
|-----------------------------------|-------------------------------|---------------------------------------------------------------------------------------|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet    | Qualification                 | This document contains data from the preliminary specification.                       |
| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

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