# 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
- ◼ I²C-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$^2$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 |
| $\varphi_{jit}$ | 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 $\times$ 5 $\times$ 0.85 mm | SOT617-3 |

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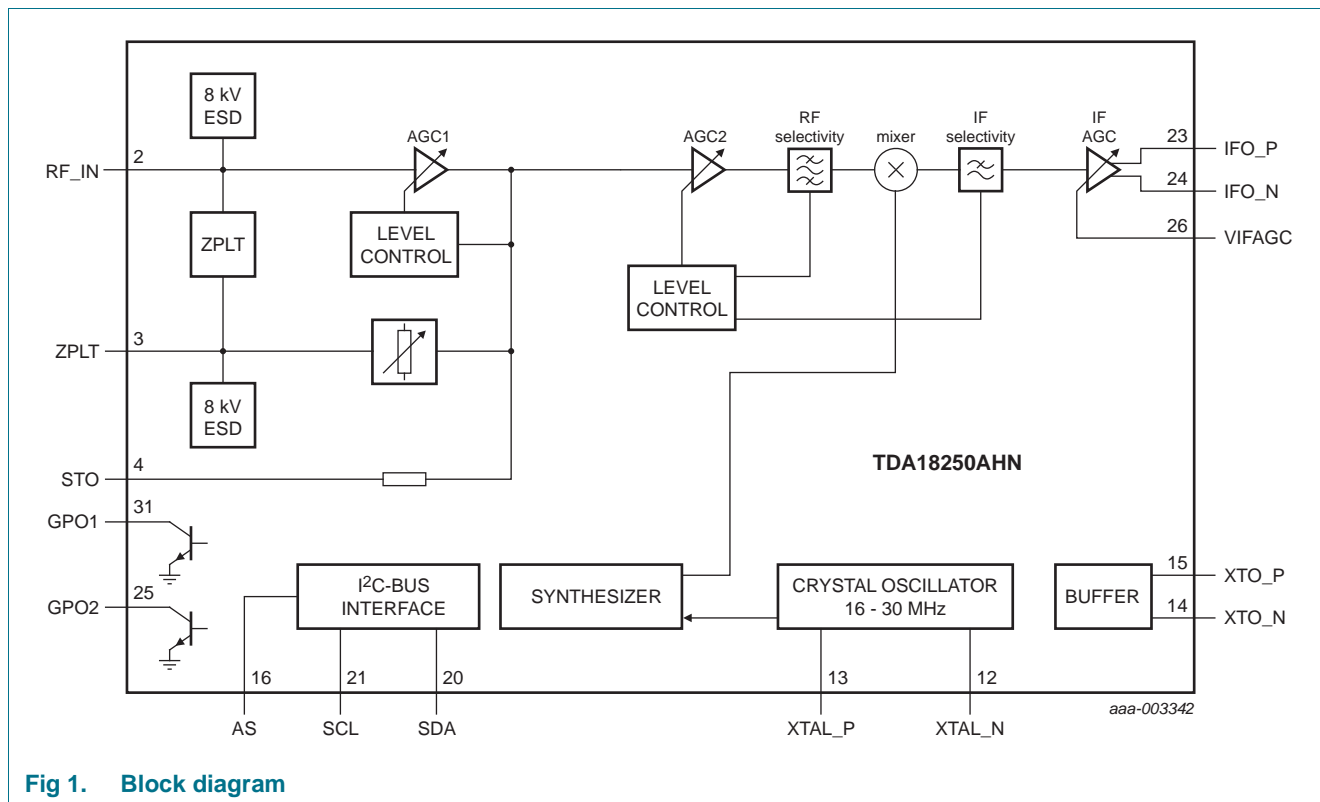
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## 5. Block diagram



**Fig 1.    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 |
|--------|-----------|-----------|-----|-----|------|
| $V_{CC}$ | supply voltage | | −0.3 | +3.60 | V |
| $V_I$ | input voltage | $V_{CC} < 3.3$ V | −0.3 | $V_{CC} + 0.3$ | V |
| | | $V_{CC} > 3.3$ V | −0.3 | +3.6 | V |
| $V_{ESD}$ | 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) [1] | 1 | - | kV |

[1]    It withstands class IV of JEDEC standard.

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## 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 | - | - |

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## 9. Legal information

### 9.1 Data sheet status

| Document status[1][2] | Product status[3] | 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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[2] The term 'short data sheet' is explained in section "Definitions".

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