



TDA18214

Silicon tuner for digital terrestrial and cable TV reception

Rev. 2 — 11 February 2013

Product short data sheet

1. General description

The TDA18214AHN and TDA18214HN are high performance silicon tuners designed for digital terrestrial and digital cable TV reception.

The TDA18214AHN and TDA18214HN support all digital TV standards and deliver a Low IF (LIF) signal to a demodulator.

The TDA18214AHN and TDA18214HN facilitate STB design by:

- Allowing on-board integration
- Drastically reducing the tuner Bill Of Material (BOM)
- Providing flexibility in system solution development
- Allowing straightforward, cost effective dual and multi-tuner applications optimization

In multi-tuner application, the TDA18214AHN is the master tuner whereas the TDA18214HN is a slave tuner.

2. Features and benefits

- Single 3.3 V supply voltage
- Worldwide multistandard digital terrestrial and digital cable capabilities
- Alignment free
- RoHS compliant
- I²C-bus interface compatible with 3.3 V microcontrollers
- Crystal oscillator output buffer
- Slave Tuner Output (STO) for multi-tuner applications (TDA18214AHN only)
- Fully integrated oscillators
- 2 programmable General-Purpose Outputs (GPO)
- Loop-Through Output (LTO)
- 1.7 MHz, 6 MHz, 7 MHz, 8 MHz and 10 MHz channel bandwidths
- LIF channel center frequency output ranging from 0.8 MHz to 7.5 MHz
- Fully integrated IF selectivity; eliminating the need for external SAW filters
- Large flexibility in the IF filtering stage to ease the matching with various demodulators circuits
- Single-ended RF input, no need for external balun
- Up to 1 GHz RF input capability
- Excellent return loss compatible with cable requirements
- Power Level Detector (PLD) embedded
- Integrated gain control



- Very fast tuning time
- Strong immunity to LTE interferers in the digital dividend bandwidth
- Strong immunity to WLAN interferers

3. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|--------------------------------------|---|------|-----|------|------------|
| f_{RF} | RF frequency | full range of RF input | 42 | - | 1002 | MHz |
| NF_{tun} | tuner noise figure | 75 Ω impedance source; maximum gain | | | | |
| | | LNA $Z_i = 1$ and RF < 870 MHz | - | 4.0 | 4.6 | dB |
| | | LNA $Z_i = 1$ and 870 MHz < RF < 1 GHz | - | 5.4 | 6 | dB |
| ϕ_{jit} | phase jitter | integrated from 250 Hz to 4 MHz | - | 0.4 | 0.6 | degree |
| α_{image} | image rejection | worst case, measured at 4 MHz IF frequency and for image levels above 60 dB μ V | 57.5 | 63 | - | dB |
| CSO | composite second-order distortion | worst interferer over RF frequency with respect to wanted carrier | [1] | - | -60 | -50 dBc |
| CTB | composite triple beat | worst interferer over RF frequency with respect to wanted carrier for frequency ≤ 550 MHz | [1] | - | -65 | -60 dBc |
| | | worst interferer over RF frequency with respect to wanted carrier for frequency > 550 MHz | [1] | - | - | -55 dBc |
| ICP_{1dB} | 1 dB input compression point | at the tuner input and minimum gain | 120 | - | - | dB μ V |

[1] Test scenario: 129 channels each 75 dB μ V.

4. Ordering information

Table 2. Ordering information

| Type number | Package | | |
|----------------|---------|--|----------|
| | Name | Description | Version |
| TDA18214AHN/C1 | HVQFN40 | plastic thermal enhanced very thin quad flat package; no leads; 40 terminals; body 6 × 6 × 0.85 mm | SOT618-6 |
| TDA18214HN/C1 | | | |

5. Block diagram

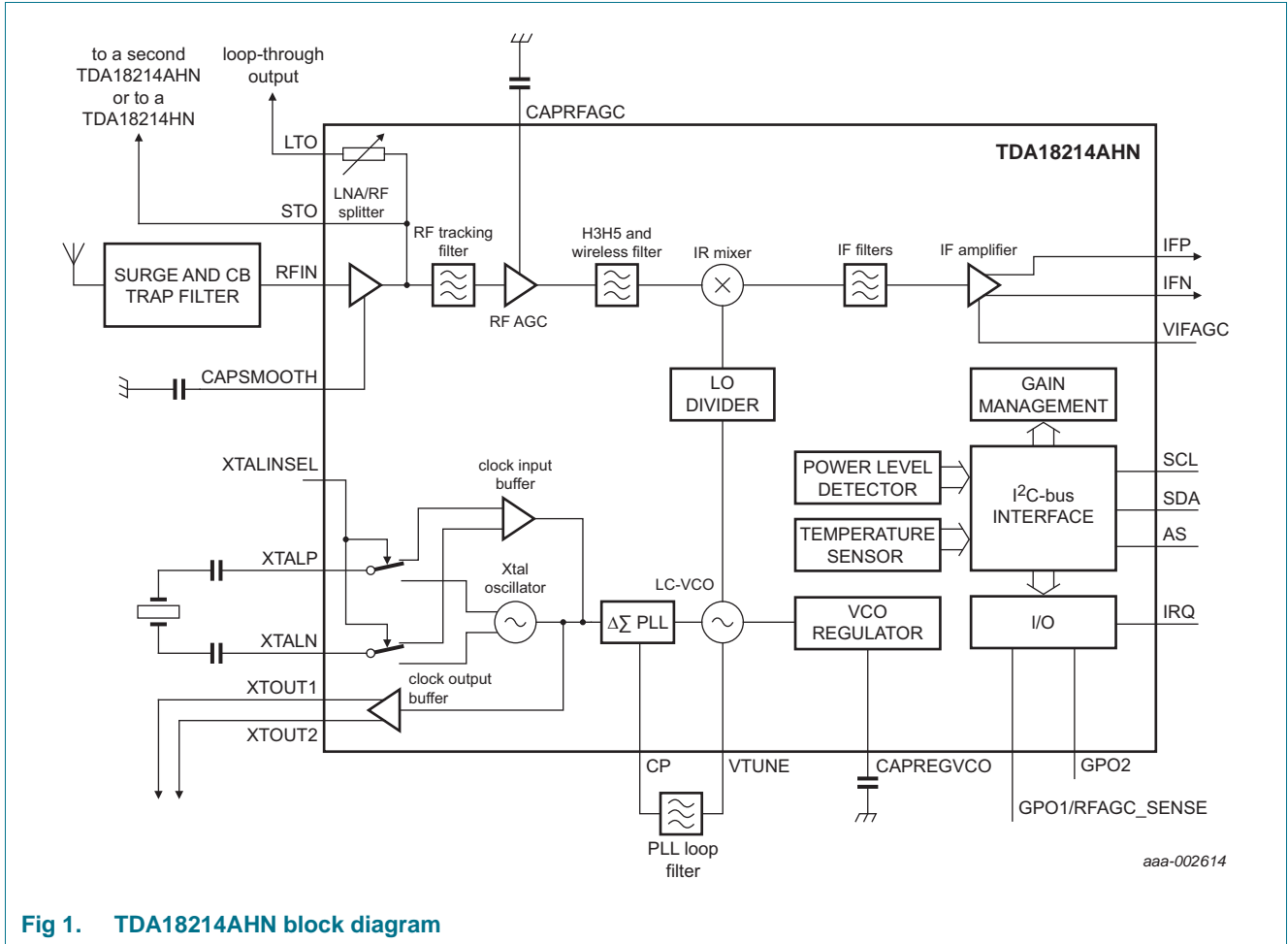


Fig 1. TDA18214AHN block diagram

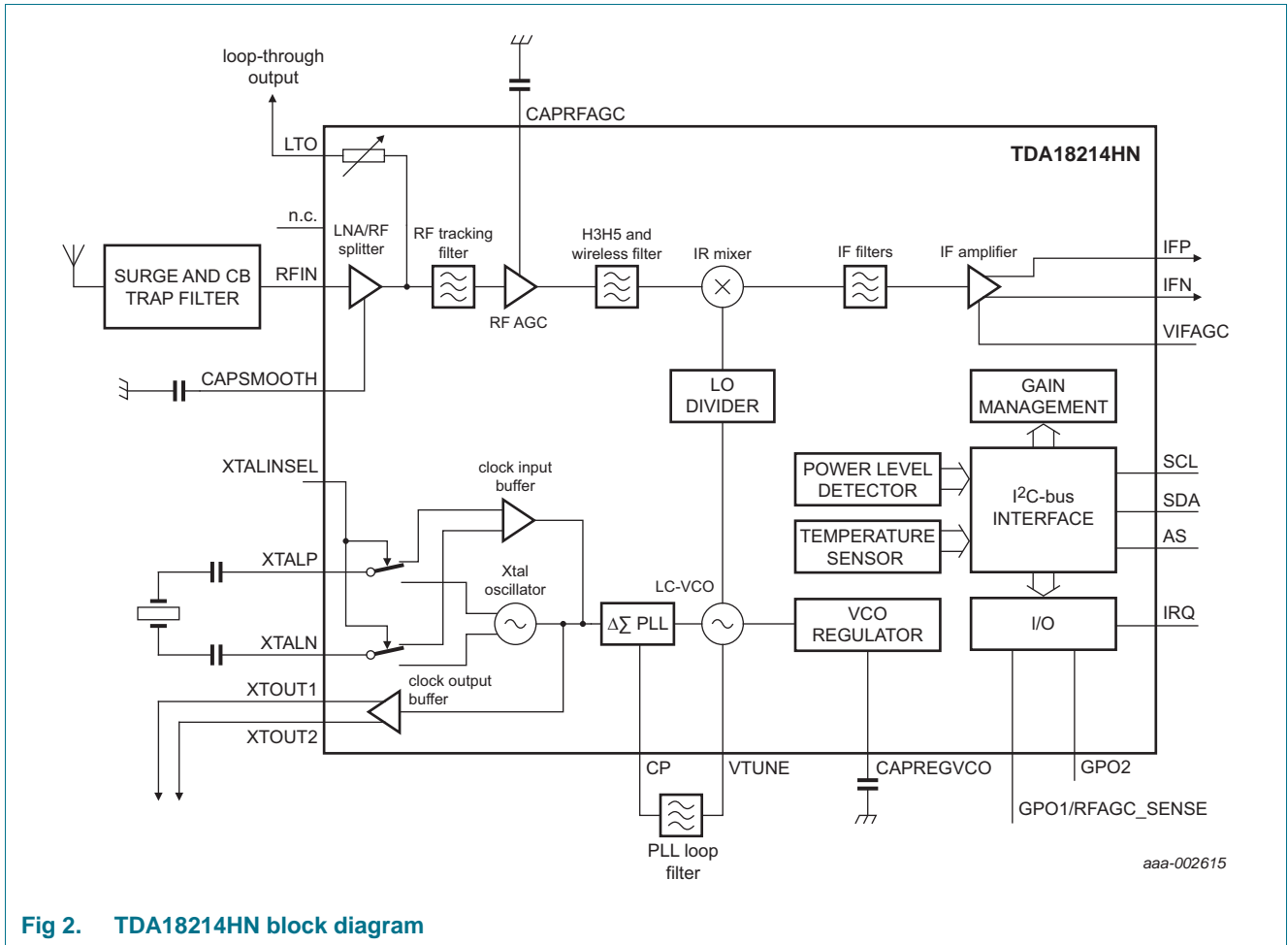


Fig 2. TDA18214HN block diagram

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 | +3.6 | V |
| V_I | input voltage | $V_{CC} < 3.3\text{ V}$ | -0.3 | $V_{CC} + 0.3$ | V |
| | | $V_{CC} > 3.3\text{ V}$ | -0.3 | +3.6 | V |
| T_{stg} | storage temperature | | -40 | +150 | °C |
| T_j | junction temperature | | - | 150 | °C |
| T_{amb} | ambient temperature | | -20 | [1] | °C |
| V_{ESD} | electrostatic discharge voltage | EIA/JESD22-A114 (HBM) | -2 | +2 | kV |
| | | EIA/JESD22-C101-C (FCDM) class III [2] | 750 | - | V |

GPO pins: GPO1/RFAGC_SENSE and GPO2

| | | | | | |
|----------|----------------|---|------|------|----|
| V_{CC} | supply voltage | $0\text{ V} < V_{pu} < 5.5\text{ V}$; $R_{pu} > 390\ \Omega$ | -0.3 | +5.5 | V |
| I_{CC} | supply current | corresponding GPO ON | -20 | 0 | mA |

- [1] The maximum allowed ambient temperature $T_{amb(max)}$ depends on the assembly conditions of the package and especially on the design of the Printed-Circuit Board (PCB) and die connection. The application mounting must be done in such a way that the maximum junction temperature is never exceeded. The junction temperature can be obtained by reading the temperature sensor bit via I²C-bus. The junction temperature: $T_j = T_{amb} + \Delta T_{j-c}$, where $\Delta T_{j-c} = power \times R_{th}$.
- [2] Class III: 500 V to 1000 V.

7. Abbreviations

Table 4. Abbreviations

| Acronym | Description |
|---------|--|
| AGC | Automatic Gain Control |
| BOM | Bill Of Material |
| FCDM | Field-induced Charged-Device Model |
| GPO | General Purpose Outputs |
| H3H5 | Harmonic 3 and Harmonic 5 |
| HBM | Human Body Model |
| IF | Intermediate Frequency |
| I/O | Input/Output |
| LC-VCO | Inductors and Capacitors - Voltage Controlled Oscillator |
| LIF | Low IF |
| LNA | Low-Noise Amplifier |
| LO | Local Oscillator |
| LTE | Long-Term Evolution |
| LTO | Loop-Through Output |
| PLD | Power Level Detector |
| PLL | Phase-Locked Loop |
| RF | Radio Frequency |
| RoHS | Restriction of Hazardous Substances |
| SAW | Surface Acoustic Wave |
| STB | Set-Top Box |
| STO | Slave Tuner Output |
| VCO | Voltage Controlled Oscillator |
| Xtal | Crystal |
| WLAN | Wireless Local Area Network |

8. Revision history

Table 5. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|------------------|--------------|------------------------------|---------------|------------------|
| TDA18214_SDS v.2 | 20130211 | Product short data sheet | - | TDA18214_SDS v.1 |
| TDA18214_SDS v.1 | 20120713 | Preliminary short data sheet | - | - |

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. |

[1] Please consult the most recently issued document before initiating or completing a design.

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11. Contents

| | | |
|-----------|------------------------------------|----------|
| 1 | General description | 1 |
| 2 | Features and benefits | 1 |
| 3 | Quick reference data | 2 |
| 4 | Ordering information | 2 |
| 5 | Block diagram | 3 |
| 6 | Limiting values | 4 |
| 7 | Abbreviations | 5 |
| 8 | Revision history | 5 |
| 9 | Legal information | 6 |
| 9.1 | Data sheet status | 6 |
| 9.2 | Definitions | 6 |
| 9.3 | Disclaimers | 6 |
| 9.4 | Licenses | 7 |
| 9.5 | Trademarks | 7 |
| 10 | Contact information | 7 |
| 11 | Contents | 8 |

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