



# TDA18214

Silicon tuner for digital terrestrial and cable TV reception

Rev. 2 — 11 February 2013

Product short data sheet

## 1. General description

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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

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- Single 3.3 V supply voltage
- Worldwide multistandard digital terrestrial and digital cable capabilities
- Alignment free
- RoHS compliant
- I<sup>2</sup>C-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 $\Omega$ 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
$\phi_{jit}$	phase jitter	integrated from 250 Hz to 4 MHz	-	0.4	0.6	degree
$\alpha_{image}$	image rejection	worst case, measured at 4 MHz IF frequency and for image levels above 60 dB $\mu$ 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 $\leq 550$ 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 $\mu$ V

[1] Test scenario: 129 channels each 75 dB $\mu$ 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

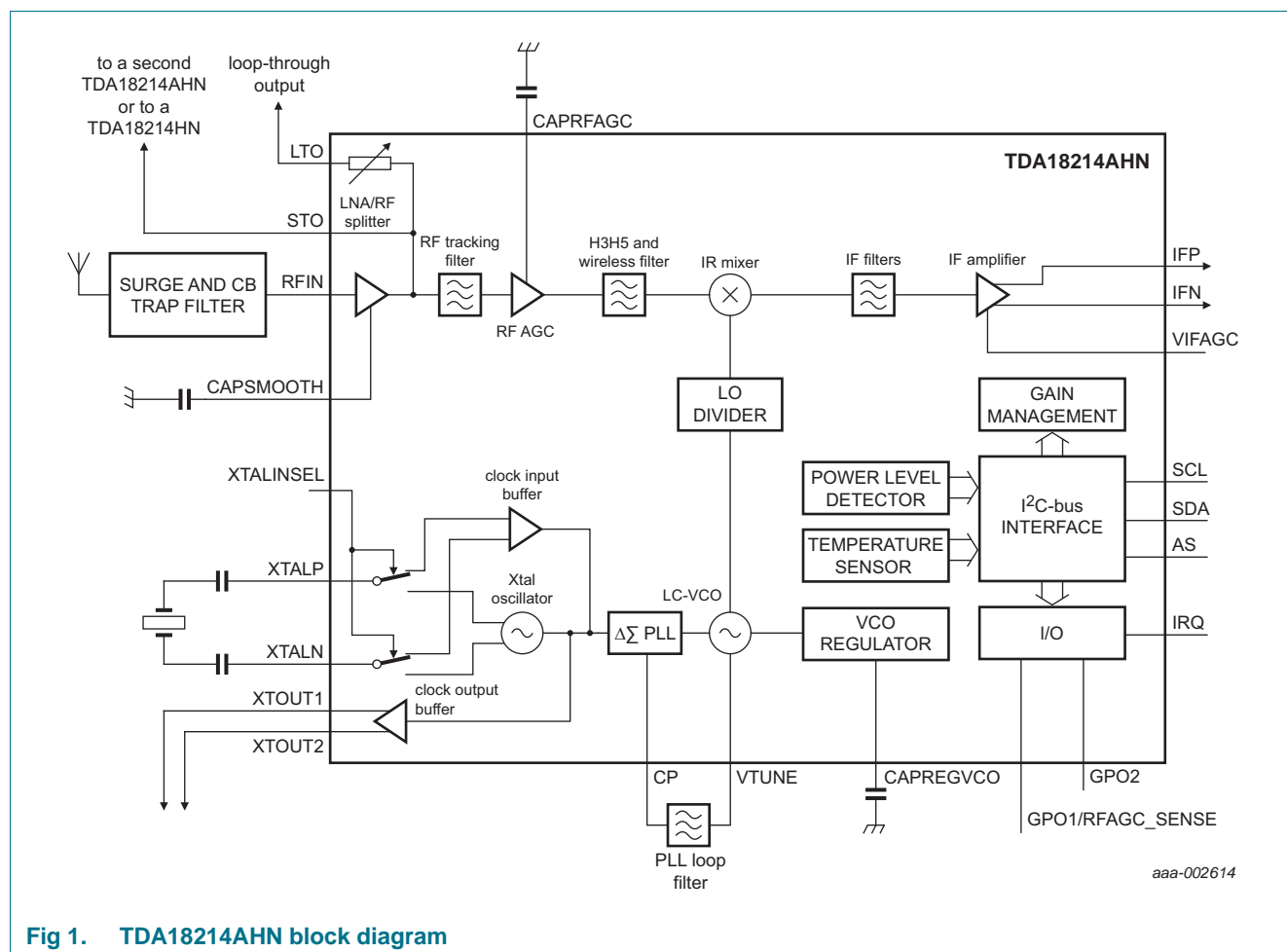
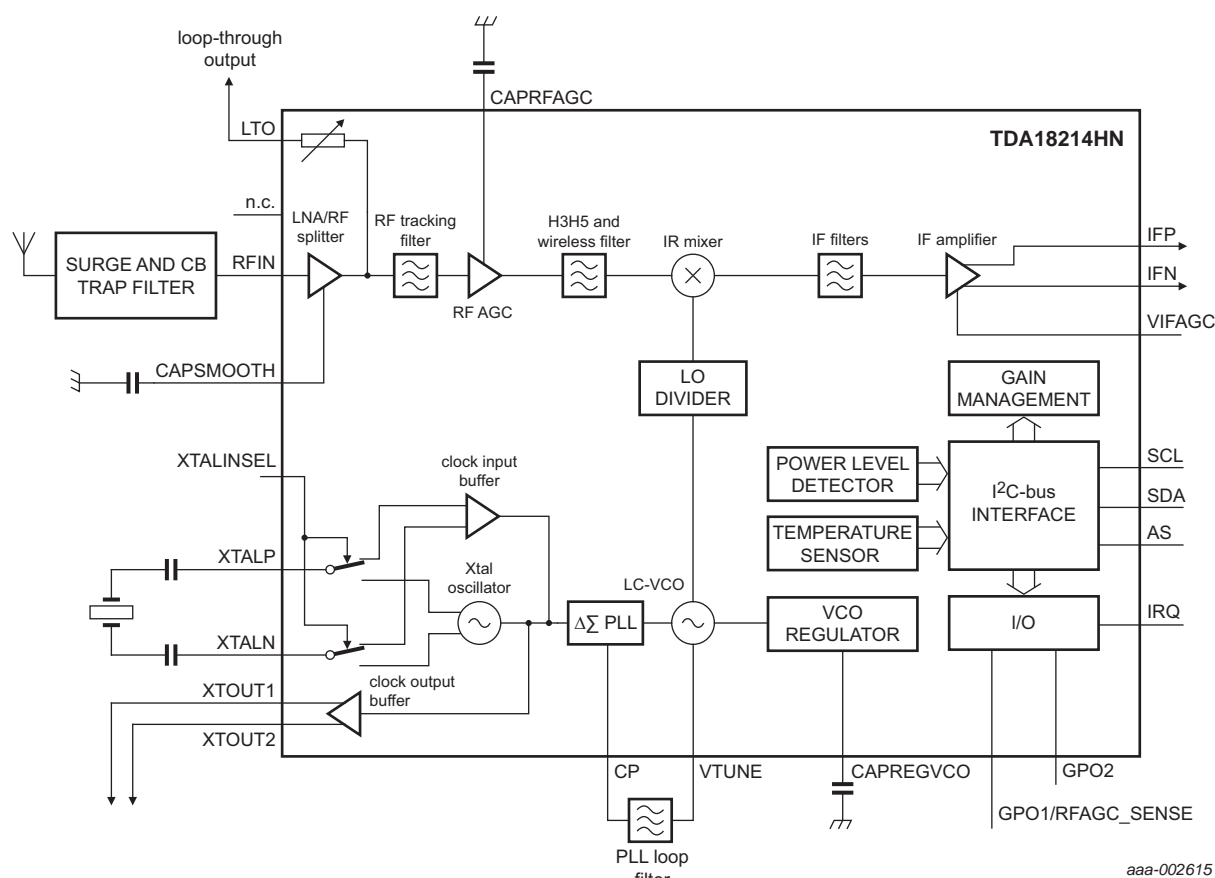


Fig 1. TDA18214AHN block diagram



**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 <sub>CC</sub>	supply voltage		−0.3	+3.6	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
T <sub>stg</sub>	storage temperature		−40	+150	°C
T <sub>j</sub>	junction temperature		-	150	°C
T <sub>amb</sub>	ambient temperature		−20	<a href="#">[1]</a>	°C
V <sub>ESD</sub>	electrostatic discharge voltage	EIA/JESD22-A114 (HBM)	−2	+2	kV
		EIA/JESD22-C101-C (FCDM) class III <a href="#">[2]</a>	750	-	V

**GPO pins: GPO1/RFAGC SENSE and GPO2**

V <sub>CC</sub>	supply voltage	0 V < V <sub>pu</sub> < 5.5 V; R <sub>pu</sub> > 390 Ω	−0.3	+5.5	V
I <sub>CC</sub>	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 I<sup>2</sup>C-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 <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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