



# TDA18214

Silicon tuner for digital terrestrial and cable TV reception

Rev. 1 — 13 July 2012

Preliminary 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 <sub>1dB</sub>	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

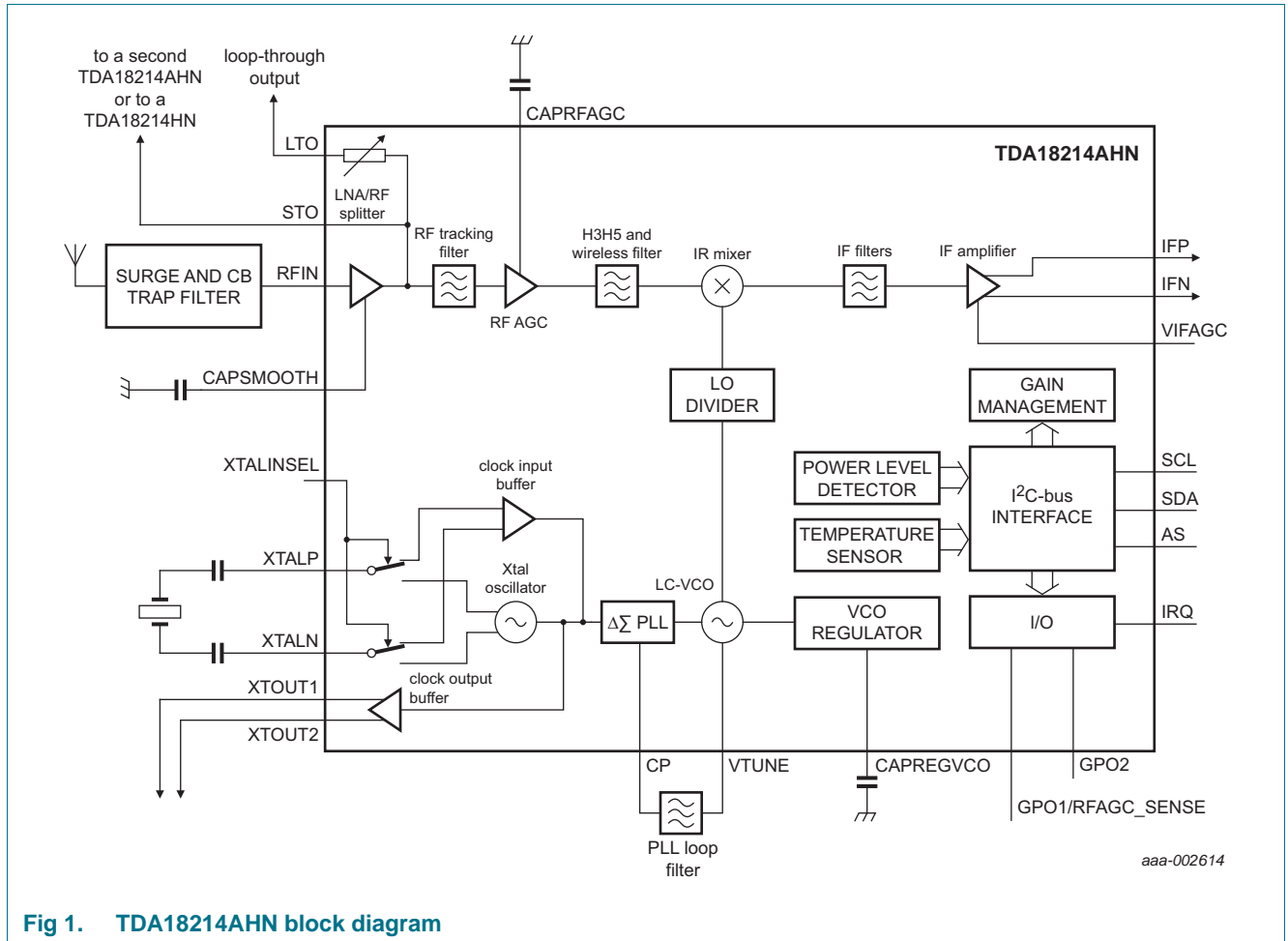


Fig 1. TDA18214AHN block diagram

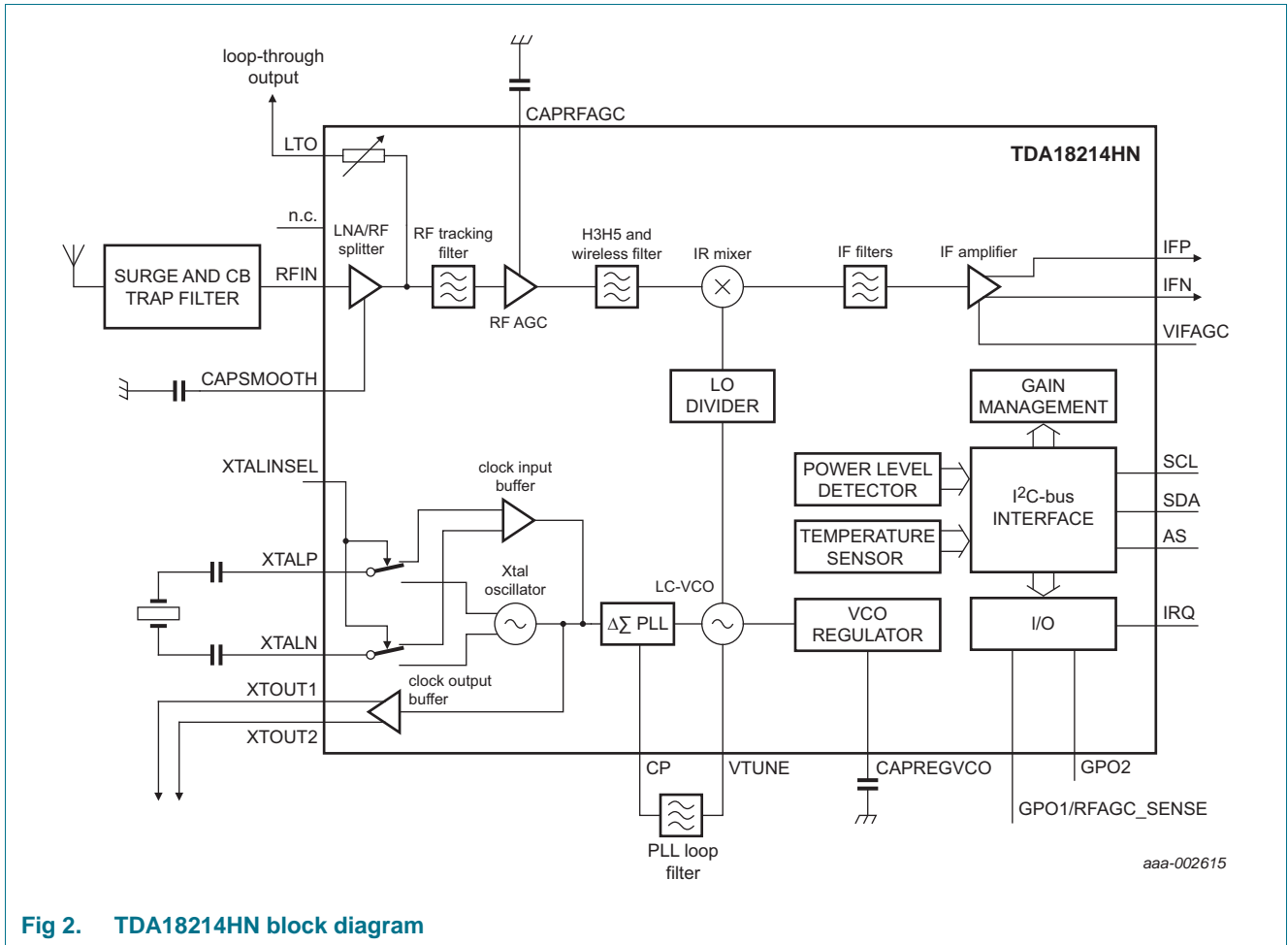


Fig 2. TDA18214HN block diagram

## 6. Limiting values

Table 3. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	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  $T_{\text{amb(max)}}$  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:  $T_j = T_{\text{amb}} + \Delta T_{j-c}$ , where  $\Delta T_{j-c} = \text{power} \times R_{th}$ .
- [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.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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## 11. Contents

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

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