



TDA18250HN

Cable Silicon Tuner

Rev. 6 — 22 December 2011

Product short data sheet

1. General description

The TDA18250 is a silicon tuner IC designed specifically for high definition cable Set-Top Boxes (STB) supporting single streaming.

Used in conjunction with a digital channel demodulator, the TDA18250 covers all worldwide digital cable standards.

- The TDA18250 ensures a low system cost as:
 - Costly components such as low-noise amplifiers, Surface Acoustic Wave (SAW) filters are eliminated from the system BOM
- The TDA18250 high-performance silicon tuner meets today's digital cable TV reception needs with:
 - Low power consumption
 - High linearity
 - Low noise figure
- The TDA18250 ensures ease of use with:
 - Easy on-board integration
 - Efficient and effective PCB design
 - Reduced external components

2. Features and benefits

- RF frequency coverage up to 1002 MHz
- Integrated wideband gain control
- LOW IF (LIF) output
- Single 3.3 V power supply
- Low power consumption
- Multistandard cable receptions
- Fully integrated IF selectivity, eliminating the need for external SAW filters
- RF Loop-Through (LT)
- Enhanced RF and IF filters to increase selectivity and adjacent channels filtering
- Alignment free
- Fully integrated oscillators:
 - ◆ No external oscillator components for reduced cost
 - ◆ 16 MHz crystal oscillator output buffer for single crystal applications
- Supports 2 tuner functions specifically aimed for PVR boxes:
 - ◆ 1 × RF output to drive slave tuner



- I²C-bus provides:
 - ◆ 3.3 V microcontroller compatibility
 - ◆ Received Signal Strength Indicator (RSSI) data access
 - ◆ Die temperature sensor data access
- Lead-free (Pb) manufacturing

3. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f_{RF}	RF frequency	edge	42	-	1002	MHz
$P_{i(max)}$	maximum input power		-	106	-	dB μ V
NF_{tun}	tuner noise figure	maximum gain				
		f_{RF} from 42 MHz to 862 MHz	-	5	6	dB
		$f_{RF} > 862$ MHz	-	5.5	-	dB
ϕ_n	phase noise	worst case in the RF frequency range				
		10 kHz	-	-85	-	dBc/Hz
		100 kHz	-	-105	-	dBc/Hz
P	power dissipation		-	0.91	-	W
α_{image}	image rejection		50	62	-	dB

4. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
TDA18250HN/C1	HVQFN48	plastic thermal enhanced very thin quad flat package; no leads; 48 terminals; body 7 × 7 × 0.85 mm	SOT619-1

5. Block diagram

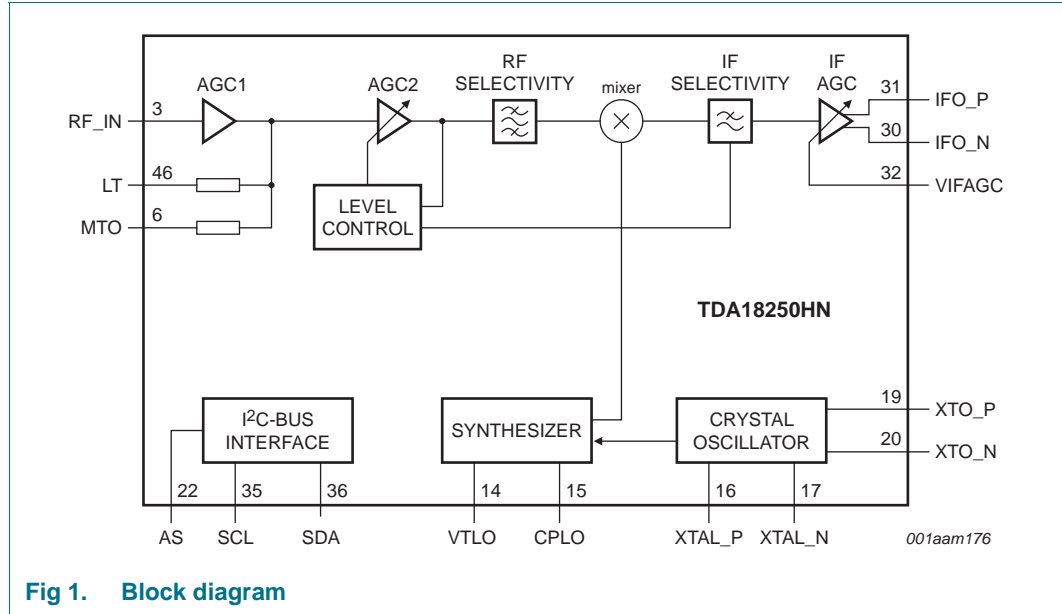


Fig 1. Block diagram

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	+3.6	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
V_{ESD}	electrostatic discharge voltage	EIA/JESD22-A114 (HBM)	2	-	kV
		EIA/JESD22-C101-C (FCDM) [1]	1.5	-	kV

[1] It withstands class IV of JEDEC standard.

7. Abbreviations

Table 4. Abbreviations

Acronym	Description
AGC	Automatic Gain Control
BOM	Bill Of Materials
FCDM	Field-induced Charged Device Model
HBM	Human Body Model
IC	Integrated Circuit
IF	Intermediate Frequency
JEDEC	Joint Electron Device Engineering Council
LIF	LOW IF

Table 4. Abbreviations ...continued

Acronym	Description
LT	Loop-Through
PCB	Printed-Circuit Board
PVR	Personal Video Recorder
RF	Radio Frequency
RSSI	Received Signal Strength Indicator
SAW	Surface Acoustic Wave
SCL	Serial CLock
SDA	Serial DAta
STB	Set-Top Box

8. Revision history

Table 5. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
TDA18250HN_SDS v.6	20111222	Product short data sheet	-	TDA18250HN_SDS v.5
Modifications:	<ul style="list-style-type: none"> • Section 1: updated • Section 2: updated • Table 1: updated 			
TDA18250HN_SDS v.5	20110615	Product short data sheet	-	TDA18250HN_SDS v.4
TDA18250HN_SDS v.4	20110504	Preliminary short data sheet	-	TDA18250HN_SDS v.3
TDA18250HN_SDS v.3	20110413	Preliminary short data sheet	-	TDA18250HN_SDS v.2
TDA18250HN_SDS v.2	20110114	Preliminary short data sheet	-	TDA18250HN_SDS v.1
TDA18250HN_SDS v.1	20100812	Objective 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.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

9.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

9.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or

malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b)

whenever customer uses the product for automotive applications beyond NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

9.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

I²C-bus — logo is a trademark of NXP B.V.

10. Contact information

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

11. Tables

Table 1. Quick reference data	2	Table 4. Abbreviations	3
Table 2. Ordering information	2	Table 5. Revision history	4
Table 3. Limiting values	3		

12. Figures

Fig 1. Block diagram	3
----------------------------	---

13. 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	3
7	Abbreviations	3
8	Revision history	4
9	Legal information	5
9.1	Data sheet status	5
9.2	Definitions	5
9.3	Disclaimers	5
9.4	Trademarks	6
10	Contact information	6
11	Tables	7
12	Figures	7
13	Contents	8

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

© NXP B.V. 2011.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 22 December 2011

Document identifier: TDA18250HN_SDS