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TDA18275

Hybrid (analog and digital) silicon tuner for terrestrial and cable TV reception

Rev. 2 — 14 October 2013 Product short data sheet

1. General description

The TDA18275 is a high performance silicon tuner designed for terrestrial and cable TV reception for both analog and digital broadcasts.

The TDA18275 supports all analog and digital TV standards and delivers a Low IF (LIF) signal to a demodulator for analog TV and/or a channel demodulator for digital TV.

The TDA18275 facilitates TV design by:

- Allowing on-board integration
- Drastically reducing the tuner Bill Of Material (BOM)
- Providing flexibility in system solution development

2. Features and benefits

- Single 3.3 V supply voltage
- Worldwide multistandard terrestrial and cable capabilities
- Alignment free
- RoHS compliant
- I²C-bus interface compatible with 3.3 V microcontrollers
- Fully integrated oscillators
- Fully integrated RF selectivity (no need for RF tracking filters coils)
- 2 programmable General-Purpose Outputs (GPO)
- Dual IF output ports
- 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
- Excellent return loss compatible with cable requirements
- Power Level Detector (PLD) embedded
- Integrated gain control
- Self-AGC synchronization mode (VSync) for analog reception
- Very fast tuning time
- Strong immunity to LTE interferers in the digital dividend bandwidth
- Strong immunity to WLAN interferers (802.11 a/b/g/n)

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; RF < 870 MHz		-	3.3	3.8	dB
		75 Ω impedance source; maximum gain; 870 MHz ≤ RF ≤ 1002 MHz		-	3.9	4.5	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 dBμV		-	65	-	dB
CSO	composite second-order distortion	worst interferer over RF frequency with respect to wanted carrier	[1]	-	–70	–65	dBc
CTB	composite triple beat			-	–70	–65	dBc
ICP_{1dB}	1 dB input compression point	at the tuner input and minimum gain		120	-	-	dBμV

[1] Test scenario: standard NTSC M/N.

4. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
TDA18275HN/C1	HVQFN32	plastic thermal enhanced very thin quad flat package; no leads; 32 terminals; body 5 × 5 × 0.85 mm	SOT617-11

5. Block diagram

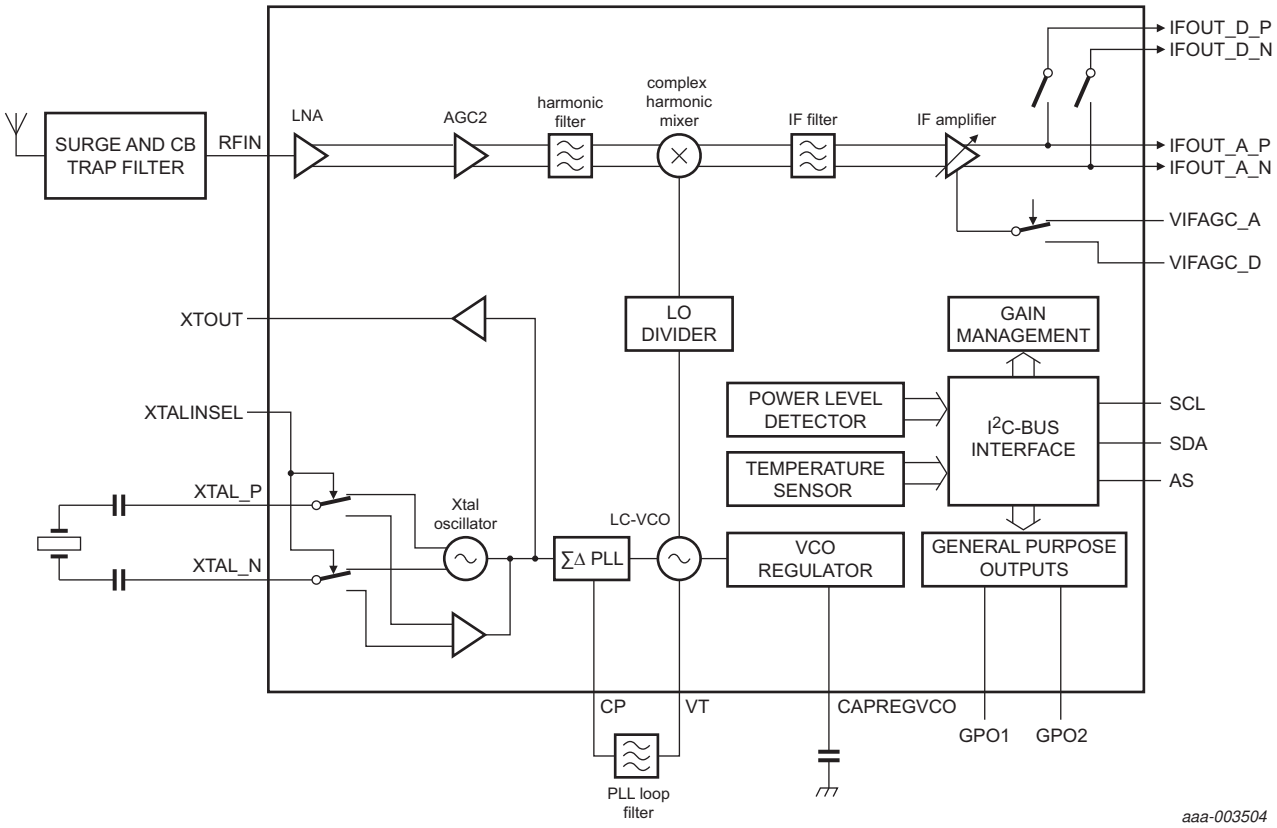

Fig 1. Block diagram

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 V	−0.3	V_{CC} + 0.3	V
		V_{CC} > 3.3 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]	1000	-	V
GPO pins: GPO1 and GPO2					
V_{CC}	supply voltage	0 V < V_{pu} < 5.5 V; R_{pu} > 390 Ω	−0.3	+5.5	V
I_{CC}	supply current	corresponding GPO ON	−20	0	mA
V_{ESD}	electrostatic discharge voltage	EIA/JESD22-A114 (HBM)	−650	+650	V
		EIA/JESD22-C101-C (FCDM) class IV[2]	1000	-	V

[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^2C-bus. The junction temperature: $T_j = T_{amb} + \Delta T_{j\text{-}c}$. where $\Delta T_{j\text{-}c}$ = power × R_{th}.

[2] Class IV: ≥ 1000 V.

7. Abbreviations

Table 4. Abbreviations

Acronym	Description
AGC	Automatic Gain Control
AS	Address Selection
BOM	Bill Of Material
CB	Citizen Band
ESD	ElectroStatic Discharge
FCDM	Field-induced Charged-Device Model
GPO	General Purpose Outputs
HBM	Human Body Model
IF	Intermediate Frequency
LC-VCO	Inductors and Capacitors - Voltage Controlled Oscillator
LIF	Low IF
LNA	Low-Noise Amplifier
LO	Local Oscillator
LTE	Long-Term Evolution
NF	Noise Figure
NTSC	National Television System Committee
PCB	Printed-Circuit Board
PLD	Power Level Detector
PLL	Phase-Locked Loop
RF	Radio Frequency
RoHS	Restriction of Hazardous Substances
SAW	Surface Acoustic Wave
VCO	Voltage Controlled Oscillator
VSync	Vertical Synchronization
Xtal	Crystal
WLAN	Wireless Local Area Network

8. Revision history

Table 5. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
TDA18275_SDS v.2	20131014	Product short data sheet	-	TDA18275_SDS v.1
Modifications:	• Table 1: updated.			
TDA18275_SDS v.1	20130710	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.

[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.

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11. Contents

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