TDA18274

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

Rev. 1 — 11 February 2013 Product short data sheet

1. General description

The TDA18274 is a high performance silicon tuner designed for terrestrial and cable TV reception for both analog and digital signals.

The TDA18274 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 TDA18274 facilitates TV design by:

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

2. Features and benefits

- Single 3.3 V supply voltage
- Worldwide multistandard terrestrial and cable capabilities
- Alignment free
- RoHS compliant
- I^2C-bus interface compatible with 3.3 V microcontrollers
- Crystal oscillator output buffer as well as Slave Tuner Output (STO) for multiple tuner applications
- Fully integrated oscillators
- Fully integrated RF selectivity (no need for RF tracking filters coils) (TDA18274HD only)
- 2 programmable General-Purpose Outputs (GPO)
- 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
- 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

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 dBμV		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	-	-	dBμV

[1] Test scenario: 129 channels each 75 dBμV.

4. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
TDA18274HN/C1	HVQFN40	plastic thermal enhanced very thin quad flat package; no leads; 40 terminals; body 6 × 6 × 0.85 mm	SOT618-6
TDA18274HD/C1	HLQFN48R	plastic thermal enhanced very thin quad flat package; no leads; 48 terminals; body 7 × 7 × 1.15 mm	SOT995-2

5. Block diagram

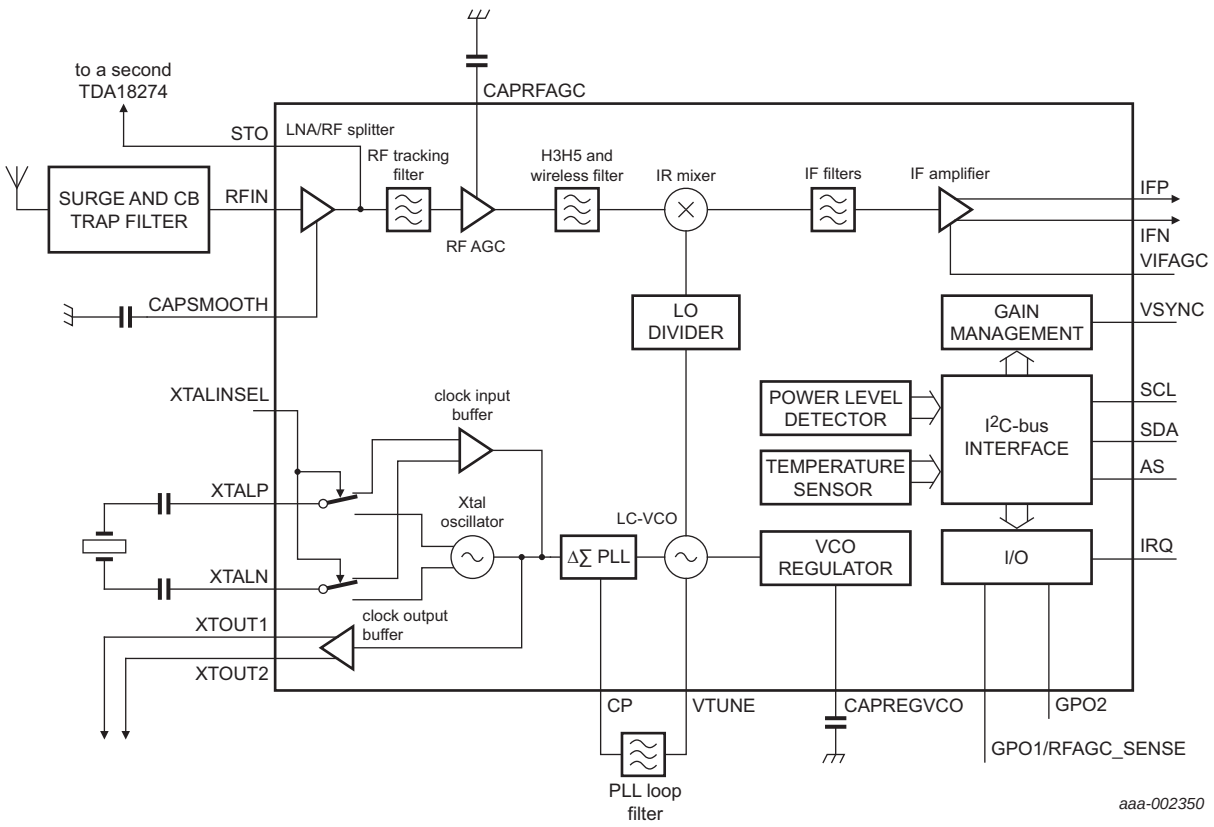

Fig 1. Block diagram

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]	750	-	V
GPO pins: GPO1/RFAGC_SENSE 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

[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: $T_j = T_{amb} + \Delta T_{j-c}$. where ΔT_{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
TDA18274_SDS v.1	20130211	Product 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".

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11. Contents

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