



# 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

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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

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- Single 3.3 V supply voltage
- Worldwide multistandard terrestrial and cable capabilities
- Alignment free
- RoHS compliant
- I<sup>2</sup>C-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 $\Omega$ impedance source;<br>maximum gain;<br>RF < 870 MHz                               | -                     | 3.3 | 3.8  | dB         |
|                    |                                      | 75 $\Omega$ impedance source;<br>maximum gain;<br>870 MHz $\leq$ RF $\leq$ 1002 MHz          | -                     | 3.9 | 4.5  | dB         |
| $\phi_{jit}$       | phase jitter                         | integrated from 250 Hz to<br>4 MHz                                                           | -                     | 0.4 | 0.6  | degree     |
| $\alpha_{image}$   | image rejection                      | worst case, measured at<br>4 MHz IF frequency and for<br>image levels above<br>60 dB $\mu$ V | -                     | 65  | -    | dB         |
| CSO                | composite<br>second-order distortion | worst interferer over RF<br>frequency with respect to<br>wanted carrier                      | <a href="#">[1]</a> - | -70 | -65  | dBc        |
| CTB                | composite triple beat                |                                                                                              | -                     | -70 | -65  | dBc        |
| ICP <sub>1dB</sub> | 1 dB input<br>compression point      | at the tuner input and<br>minimum gain                                                       | 120                   | -   | -    | dB $\mu$ V |

[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

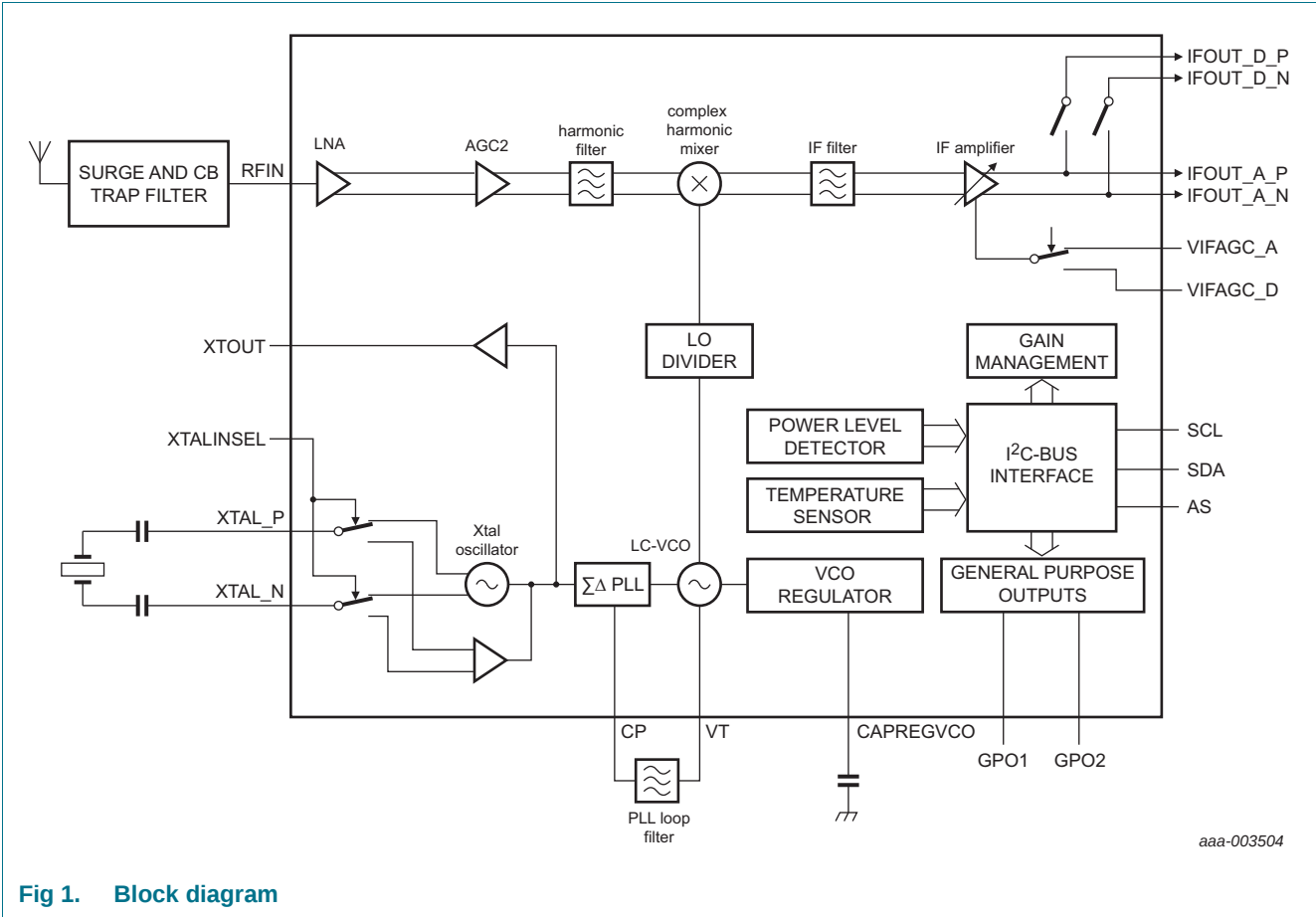


Fig 1. Block diagram

## 6. Limiting values

**Table 3. Limiting values**

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

| Symbol                                | Parameter                       | Conditions                                             | Min  | Max                   | Unit |
|---------------------------------------|---------------------------------|--------------------------------------------------------|------|-----------------------|------|
| V <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> | 1000 | -                     | V    |
| GPO pins: <b>GPO1</b> and <b>GPO2</b> |                                 |                                                        |      |                       |      |
| 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   |
| V <sub>ESD</sub>                      | electrostatic discharge voltage | EIA/JESD22-A114 (HBM)                                  | −650 | +650                  | V    |
|                                       |                                 | EIA/JESD22-C101-C (FCDM) class IV <a href="#">[2]</a>  | 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<sup>2</sup>C-bus. The junction temperature:  $T_j = T_{amb} + \Delta T_{j-c}$ , where  $\Delta T_{j-c} = \text{power} \times R_{th}$ .

[2] Class IV:  $\geq 1000\text{ V}$ .

## 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:   | <ul style="list-style-type: none"> <li>• <a href="#">Table 1</a>: updated.</li> </ul> |                              |               |                  |
| TDA18275_SDS v.1 | 20130710                                                                              | 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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