1. General description

The TDA18273HN is a high performance Silicon Tuner designed for terrestrial and cable TV reception for both analog and digital signals.

The TDA18273HN 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.

2. Features and benefits

- Fully integrated IF selectivity; eliminating the need for external SAW filters
- Worldwide multistandard terrestrial and cable
- Fully integrated oscillators
- Alignment free
- Single 3.3 V supply voltage
- Power level detector
- Integrated wideband gain control
- Crystal oscillator output buffer (16 MHz) for single crystal applications
- \( ^2 \)C-bus interface compatible with 3.3 V microcontrollers
- Self AGC synchronization mode (VSYNC)
- Very fast tuning time
- LIF channel center frequency output ranging from 3 MHz to 5 MHz
- 1.7 MHz, 6 MHz, 7 MHz, 8 MHz and 10 MHz channel bandwidths
- Ready for DVB-T2 and DVB-C2
- RoHS compliant
- Strong immunity to spurious and field interferences

3. Quick reference data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f_{RF} )</td>
<td>RF frequency</td>
<td>full range of RF input</td>
<td>42</td>
<td>-</td>
<td>870</td>
<td>MHz</td>
</tr>
<tr>
<td>( NF_{tun} )</td>
<td>tuner noise figure</td>
<td>75 ( \Omega ) source; maximum gain</td>
<td>-</td>
<td>4.0</td>
<td>4.6</td>
<td>dB</td>
</tr>
<tr>
<td>( \phi_{jit} )</td>
<td>phase jitter</td>
<td>UHF; integrated from 250 Hz to 4 MHz</td>
<td>-</td>
<td>0.4</td>
<td>0.6</td>
<td>degree</td>
</tr>
</tbody>
</table>
Table 1. Quick reference data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_{\text{Image}}$</td>
<td>image rejection</td>
<td>worst case for image rejection, at 4 MHz IF frequency and for image levels above 60 dBµV</td>
<td>57.5</td>
<td>63</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td>CSO</td>
<td>composite second-order distortion</td>
<td>worst interferer over RF frequency with respect to wanted carrier</td>
<td>[1]</td>
<td>-60</td>
<td>-55</td>
<td>dBc</td>
</tr>
<tr>
<td>CTB</td>
<td>composite triple beat</td>
<td>worst interferer over RF frequency with respect to wanted carrier for frequency ≤ 550 MHz</td>
<td>-</td>
<td>-65</td>
<td>-60</td>
<td>dBc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>worst interferer over RF frequency with respect to wanted carrier for frequency &gt; 550 MHz</td>
<td>-</td>
<td>-</td>
<td>-55</td>
<td>dBc</td>
</tr>
<tr>
<td>$I_{\text{ICP1dB}}$</td>
<td>1 dB input compression point</td>
<td>at tuner input and minimum gain</td>
<td>122</td>
<td>-</td>
<td>-</td>
<td>dBµV</td>
</tr>
</tbody>
</table>

[1] Channel loading assumptions: 129 channels at 75 dBµV each.

4. Ordering information

Table 2. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDA18273HN/C1</td>
<td>HVQFN40</td>
<td>plastic thermal enhanced very thin quad flat package; no leads; 40 terminals; body 6 x 6 x 0.85 mm</td>
<td>SOT618-1</td>
<td></td>
</tr>
</tbody>
</table>
5. Block diagram

Hybrid (analog and digital) Silicon Tuner for terrestrial and cable TV

NXP Semiconductors

TDAA18273HN
6. Limiting values

Table 3. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{CC}</td>
<td>supply voltage</td>
<td>V_{CC} &lt; 3.3 V</td>
<td>-0.3</td>
<td>V_{CC} + 0.3 V</td>
<td>V</td>
</tr>
<tr>
<td>V_{CC}</td>
<td>supply voltage</td>
<td>V_{CC} &gt; 3.3 V</td>
<td>-0.3</td>
<td>+3.6 V</td>
<td>V</td>
</tr>
<tr>
<td>V_{I}</td>
<td>input voltage</td>
<td>V_{CC} &lt; 3.3 V</td>
<td>-0.3</td>
<td>V_{CC} + 0.3 V</td>
<td>V</td>
</tr>
<tr>
<td>V_{CC}</td>
<td>supply voltage</td>
<td>V_{CC} &gt; 3.3 V</td>
<td>-0.3</td>
<td>+3.6 V</td>
<td>V</td>
</tr>
<tr>
<td>T_{stg}</td>
<td>storage temperature</td>
<td>-40</td>
<td>+150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>T_{j}</td>
<td>junction temperature</td>
<td>-125</td>
<td></td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>T_{amb}</td>
<td>ambient temperature</td>
<td>-20</td>
<td>125</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>V_{ESD}</td>
<td>electrostatic discharge voltage</td>
<td>EIA/JESD22-A114 (HBM)</td>
<td>-2</td>
<td>+2</td>
<td>kV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EIA/JESD22-C101-C (FCDM) class III[2]</td>
<td>750</td>
<td>-</td>
<td>V</td>
</tr>
</tbody>
</table>

[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 PC-bus. The junction temperature: T_{j} = T_{amb} + \Delta T_{j-c}, where \Delta T_{j-c} = power \times R_{th}.

[2] Class III: 500 V to 1000 V.

7. Abbreviations

Table 4. Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AGC</td>
<td>Automatic Gain Control</td>
</tr>
<tr>
<td>AGCK</td>
<td>Automatic Gain Control step Killer</td>
</tr>
<tr>
<td>CB</td>
<td>Citizen Band</td>
</tr>
<tr>
<td>DVB</td>
<td>Digital Video Broadcasting</td>
</tr>
<tr>
<td>DVB-T/T2/C/C2/H</td>
<td>DVB-Terrestrial/Terrestrial second generation/Cable/Handheld</td>
</tr>
<tr>
<td>FCDM</td>
<td>Field-Induced Charged-Device Model</td>
</tr>
<tr>
<td>FRAC-N</td>
<td>Fractional-N</td>
</tr>
<tr>
<td>HBM</td>
<td>Human Body Model</td>
</tr>
<tr>
<td>IF</td>
<td>Intermediate Frequency</td>
</tr>
<tr>
<td>IR</td>
<td>Image Rejection</td>
</tr>
<tr>
<td>LC-VCO</td>
<td>Inductors and Capacitors - Voltage Controlled Oscillator</td>
</tr>
<tr>
<td>LNA</td>
<td>Low-Noise Amplifier</td>
</tr>
<tr>
<td>LO</td>
<td>Local Oscillator</td>
</tr>
<tr>
<td>PCB</td>
<td>Printed-Circuit Board</td>
</tr>
<tr>
<td>PLD</td>
<td>Power Level Detector</td>
</tr>
<tr>
<td>RF</td>
<td>Radio Frequency</td>
</tr>
<tr>
<td>RoHS</td>
<td>Restriction of Hazardous Substances</td>
</tr>
<tr>
<td>SAW</td>
<td>Surface Acoustic Wave</td>
</tr>
<tr>
<td>UHF</td>
<td>Ultra High Frequency</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
</tr>
<tr>
<td>VHF</td>
<td>Very High Frequency</td>
</tr>
<tr>
<td>VSYNC</td>
<td>Vertical SYNChronization</td>
</tr>
<tr>
<td>Xtal</td>
<td>Crystal</td>
</tr>
</tbody>
</table>
8. Revision history

Table 5. Revision history

<table>
<thead>
<tr>
<th>Document ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<tr>
<td>TDA18273HN_SDS v.3</td>
<td>20110510</td>
<td>Product short data sheet</td>
<td>-</td>
<td>TDA18273HN_SDS v.2</td>
</tr>
<tr>
<td>TDA18273HN_SDS v.2[1]</td>
<td>20101215</td>
<td>Preliminary short data sheet</td>
<td>-</td>
<td>-</td>
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[1] Revision 1 is not available.
9. Legal information

9.1 Data sheet status

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Objective [short] data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

[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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Silicon Tuner — is a trademark of NXP B.V.

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

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