



M I C R O T U N E ®

MT2131 SINGLE-CHIP TERRESTRIAL TUNER

PRODUCT BRIEF

The MT2131 is a high-performance single-chip tuner for ATSC and Digital Cable-Ready ATSC television receivers and set-top boxes.



MT2131 Single-Chip Tuner

PRELIMINARY

RF SILICON AND SUBSYSTEMS SOLUTIONS
FOR BROADBAND COMMUNICATIONS AND AUTOMOTIVE ELECTRONICS

The MicroTuner™ MT2131 is an advanced single-chip terrestrial tuner, optimized for integrated digital televisions and ATSC set-top boxes.

The MT2131 receives frequencies in the 48 MHz to 1 GHz range and converts a selected channel to a standard intermediate frequency (IF) between 30 MHz and 57 MHz.

The MT2131's dual-conversion architecture yields consistent ATSC A/74 and FCC Digital Cable-Ready (DCR) compliant performance without any manual adjustments. This is achieved via the combination of MicroTune's ClearTune technology and an autonomous automatic gain control (AGC).

The integrated LNA delivers excellent sensitivity. The innovative gain control and power detector circuits provide superb terrestrial performance.

The MT2131 has an on-chip amplifier for Forward Data Channel (FDC) applications to reduce the total Bill of Materials (BOM) cost for a DCR television receiver. It supports multiple standards including ATSC, QAM, and NTSC. In addition, the MT2131 provides excellent in-band flatness, as well as consistent gain characteristics across the complete reception band for use in digital/analog televisions, terrestrial set-top boxes and high-performance PC-TV applications.

APPLICATIONS

- NTSC/ATSC front-ends
- ATSC-only front-ends and set-top boxes
- Digital Cable-Ready (DCR) ATSC integrated digital televisions
- ATSC PVRs
- PC-TVs
- DVD recorders

FEATURES

- 48 MHz to 1 GHz input frequency range
- Integrated front-end bandpass filtering
- Integrated RF power detectors and closed-loop AGC
- Programmable RF AGC
- Single-ended RF input
- On-chip low-noise amplifier provides excellent terrestrial sensitivity
- Integrated IF variable gain amplifier for direct connection to digital demodulators
- Fully compatible with ATSC, QAM, and NTSC performance requirements.
- Integrated FDC low-pass filter and buffer amplifier
- Capable of driving multiple IF filters
- Compatible with 3.3 V and 5 V serial bus
- 48 pin, 7 mm X 7 mm QFN package

M I C R O T U N E

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RECOMMENDED OPERATING CONDITIONS

| PARAMETER | MIN | TYP | MAX | UNIT |
|---|------|-----|------|------|
| Second intermediate center frequency (programmable) | 30 | | 57 | MHz |
| Supply voltage 5V | 4.75 | 5.0 | 5.25 | V |
| Supply voltage 3.3V | 3.15 | 3.3 | 3.45 | V |
| Supply voltage ripple | | | 15 | mV |
| Operating junction temperature | | | 125 | °C |
| VGA output load impedance | 300 | | | Ω |
| Serial control clock | | | 400 | kHz |

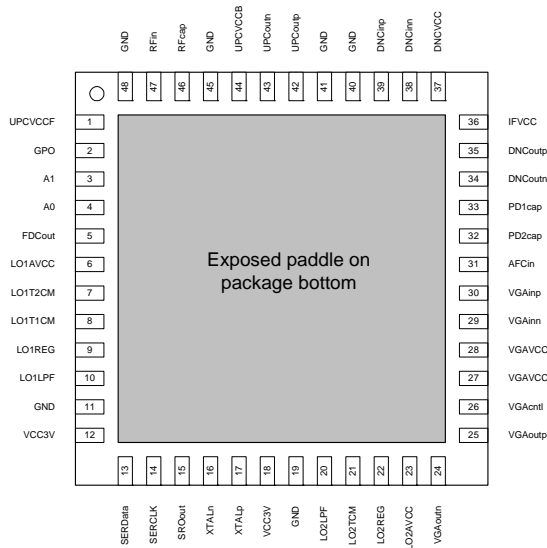
ABSOLUTE RATINGS

| PARAMETER | MIN | MAX | UNIT |
|---|------|----------|------|
| Supply voltage 5V | | 6 | V |
| Supply voltage 3.3V | | 3.6 | V |
| Storage temperature range | -50 | +150 | °C |
| Lead-free temperature (soldering 4 seconds) | | +260 | °C |
| Input voltage | -0.3 | VCC +0.3 | V |

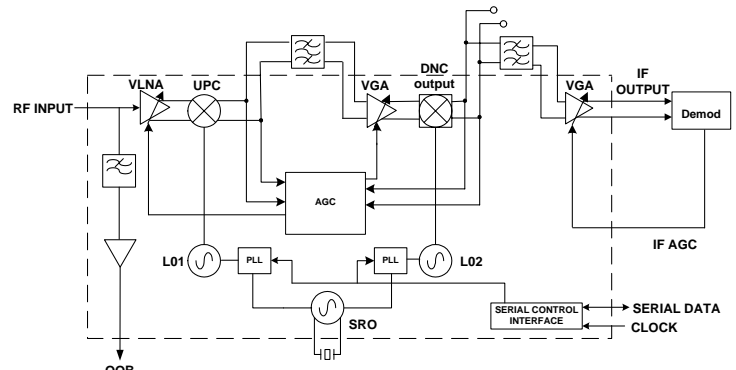
TUNER ELECTRICAL CHARACTERISTICS

| PARAMETER | MIN | TYP | MAX | UNIT |
|-------------------------------------|-----|-----|------|--------|
| Power Supply | | | | |
| Active current 5V | | 240 | | mA |
| Active current 3.3V | | 95 | | mA |
| RF Signal Path | | | | |
| Input frequency range | 48 | | 1000 | MHz |
| Noise figure (Off-Air mode) | | 6 | | dB |
| Voltage gain | | 42 | | dB |
| RF AGC range | | 55 | | dB |
| Image rejection | | 70 | | dBc |
| LO phase noise (10 kHz) | | 84 | | dBc/Hz |
| LO phase noise (100 kHz) | | 104 | | dBc/Hz |
| LO step size | | 50 | | kHz |
| IF VGA | | | | |
| Frequency range | 30 | | 57 | MHz |
| Maximum output voltage | | | 2.0 | Vp-p |
| Maximum voltage gain | | 60 | | dB |
| IF AGC range | | 46 | | dB |
| Out-of-Band Amplifier (FDCA) | | | | |
| Frequency range | 50 | | 130 | MHz |
| Maximum voltage gain | | 12 | | dB |
| Supply current 5V | | 30 | | mA |

PRELIMINARY



MT2131 Pin Diagram



MT2131 Block Diagram



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