

### Description

A universal digital TV tuner, the Si2147 supports digital reception for all worldwide terrestrial and cable TV standards. By combining Silicon Laboratories' proven digital low-IF architecture with a 5<sup>th</sup>-generation RF front-end, the Si2147 maintains the highest performance that exceeds that of MOPLL-based tuners, including industry-leading 2<sup>nd</sup> order distortion performance. Pin- and API-compatibility to the previous generation minimize customers' development effort.

The Si2147 delivers unprecedented integration with no external balun, tracking filters, LNAs, SAW filters, or inductive power supply filtering. While other solutions may also eliminate the balun, they suffer degradation in NF and 2<sup>nd</sup> order distortion compromising reception. Silicon Laboratories' proprietary and field-proven architecture delivers not only an optimized BOM but also world-class system performance. Options for single or dual supply and internal power-on reset are included. A harmonic rejection mixer delivers outstanding immunity to Wi-Fi and LTE interference, replacing the need for external filtering.

For advanced digital terrestrial TV reception, DVB-T2 and DVB-C2 constellations demand outstanding phase noise specifications, and the Si2147 rises to the challenge, delivering industry-leading integrated phase noise. Additionally, a software-selectable cable mode offers optimized return loss.

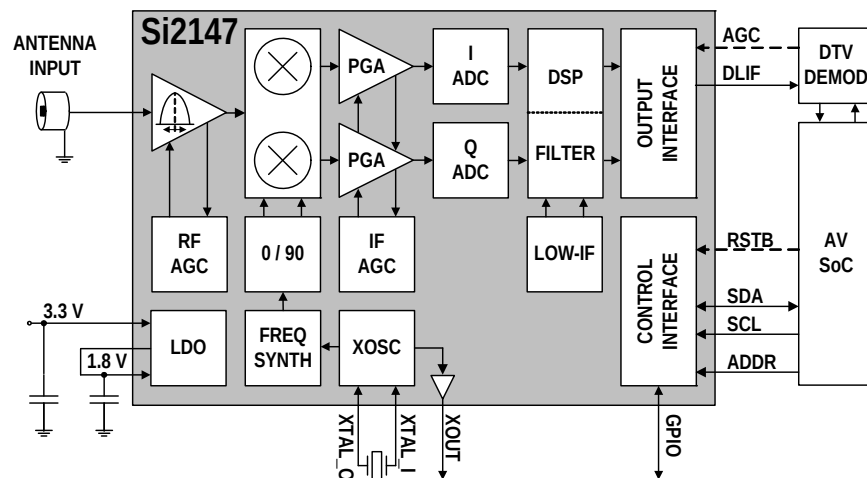
The Si2147 delivers exceptional picture quality and a higher number of received stations when compared to other solutions. Incorporating worldwide field experience from four prior tuner generations in mass production, the Si2147 delivers the highest tolerance to real-world reception conditions.

### Features

- Worldwide digital TV tuner
  - ATSC/QAM, DVB-T2/T/C2/C, ISDB-T/C, DTMB
- Industry-leading margin to A/74, NorDig, D-Book, C-Book, ARIB, EN55020, OpenCable™ specifications
- Lowest BOM for a silicon digital TV tuner
  - No balun
  - No SAW filters or wire-wound inductors
  - Integrated LNAs and complete tracking filters
- Best-in-class real-world reception
  - Exceeds discrete MOPLL-based tuners
  - Industry-leading phase noise performance
  - High immunity to Wi-Fi and LTE interference
- Low power consumption
  - 3.3 V and 1.8 V power supplies
  - Single-supply option for 3.3 V-only operation
- Integrated power-on reset circuit
- Low-IF output to SoC or demodulator
- Standard CMOS process technology
- 4x4 mm, 28-pin QFN package
- RoHS compliant

### Applications

- Digital ½-NIM tuner module
- iDTV (Integrated Digital TV)
- Digital terrestrial and cable STB
- Digital PVR, DVD and Blu-Ray disc recorder
- PC-TV accessories



### Selected Electrical Specifications

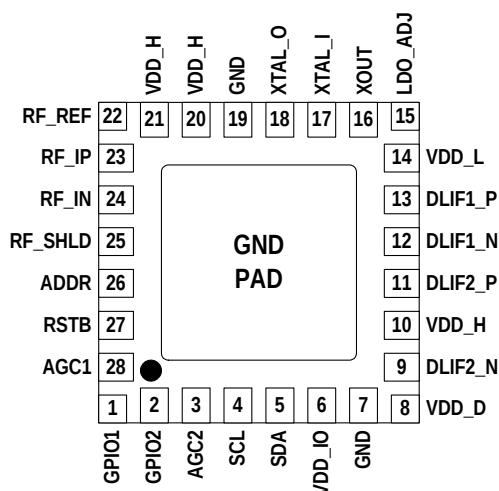
( $V_{DD\_H}=3.3$  V,  $V_{DD\_L}=1.8$  V,  $V_{DD\_D}=1.8$  V,  $T_A=25$  °C)

| Parameter                                                                                                                 | Test Condition                   | Typ                          | Unit          |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------|---------------|
| Supply voltage                                                                                                            |                                  | 1.8 and 3.3, or only 3.3     | V             |
| Total Power Consumption                                                                                                   | XOUT Disabled                    | 484                          | mW            |
| RF Input Frequency Range                                                                                                  |                                  | 42 to 870                    | MHz           |
| NF, terrestrial*                                                                                                          | VHF-L                            | 4.0                          | dB            |
|                                                                                                                           | VHF-H                            | 3.7                          | dB            |
|                                                                                                                           | UHF                              | 3.8                          | dB            |
| Return Loss*                                                                                                              | Terrestrial mode                 | 3                            | dB            |
|                                                                                                                           | Cable mode                       | 9                            | dB            |
| Wideband IIP3*                                                                                                            | VHF-H, $N\pm 18$ , $\pm 36$      | +5                           | dBm           |
| Inband IIP3*                                                                                                              | VHF-H, $N\pm 1$ , $\pm 2$        | -6                           | dBm           |
| LO Phase Noise at 860 MHz                                                                                                 | 1 kHz   10 kHz   100 kHz   1 MHz | -100   -100   -105   -132    | dBc/Hz        |
| LO Integrated Phase Noise at 860 MHz                                                                                      | DSB: 125 Hz to 4 MHz             | 0.25<br>(-47)                | °rms<br>(dBc) |
| DLIF Output Center Frequency                                                                                              | channel BW=6 MHz   7 MHz   8 MHz | 4 to 7   4.5 to 6.5   5 to 6 | MHz           |
| DLIF Differential Output Voltage                                                                                          | Programmable                     | 0.5 to 2.0                   | Vppd          |
| *Note: Measured at the F-connector input of the Si2147 EVB and includes all connector, PCB, and front-end circuit losses. |                                  |                              |               |

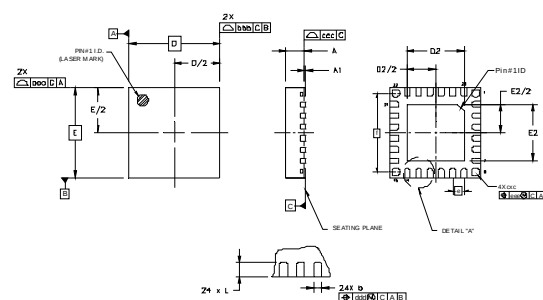
### Selection Guide

| Part # | Description                                                            |
|--------|------------------------------------------------------------------------|
| Si2147 | Worldwide digital TV tuner for ATSC/QAM, DVB-T2/T/C2/C, ISDB-T/C, DTMB |

### Pin Assignments



### 4x4 mm QFN-28 Package Information



| Symbol | Min      | Nom  | Max  | Unit |
|--------|----------|------|------|------|
| A      | 0.80     | 0.85 | 0.90 | mm   |
| D, E   | 4.00 BSC |      |      | mm   |
| e      | 0.50 BSC |      |      | mm   |
| f      | 3.50 BSC |      |      | mm   |