

Description

A universal hybrid TV tuner with an integrated PAL/SECAM/NTSC analog TV demodulator, the Si2177 supports digital and analog reception for all worldwide terrestrial and cable TV standards. By combining Silicon Laboratories' proven digital low-IF architecture with a 5th-generation RF front-end, the Si2177 maintains the highest performance that exceeds that of MOPLL-based tuners, including industry-leading 2nd order distortion performance. Pin- and API-compatibility to the previous generation minimize customers' development effort.

The Si2177 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 2nd 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 Si2177 rises to the challenge, delivering industry-leading integrated phase noise. Additionally, a software-selectable cable mode offers optimized return loss.

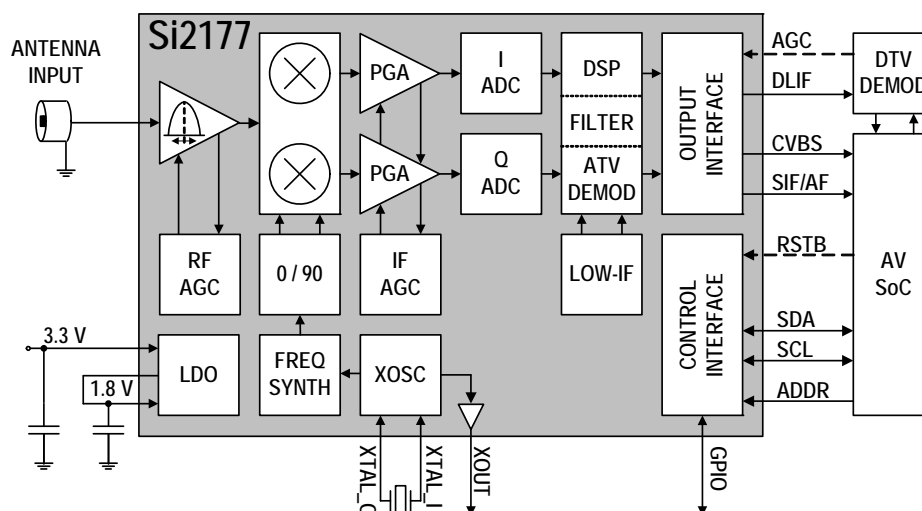
The Si2177 delivers exceptional picture quality and a higher number of received stations when compared to other solutions. Incorporating worldwide field experience from four prior tuner generations in mass production, the Si2177 delivers the highest tolerance to real-world reception conditions.

Features

- Worldwide hybrid TV tuner
 - Analog TV: NTSC, PAL/SECAM
 - Digital TV: ATSC/QAM, DVB-T2/T/C2/C, ISDB-T/C, DTMB
- Analog TV Demodulator
 - Superior Video SNR
 - Overmodulation and ICPM tolerant
- Industry-leading margin to A/74, NorDig, D-Book, C-Book, ARIB, EN55020, OpenCable™ specifications
- Lowest BOM for a silicon hybrid 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
- Flexible output interface
 - Combined ALIF/DLIF output to SoC
 - Optional DLIF output to external demodulator
- Standard CMOS process technology
- 4x4 mm, 28-pin QFN package
- RoHS compliant

Applications

- Hybrid 1/2-NIM, 3/4-NIM, and full-NIM tuner module
- iDTV (Integrated Digital TV)
- Hybrid terrestrial and cable STB
- Hybrid PVR, DVD and Blu-Ray disc recorder
- PC-TV accessories



Selected Electrical Specifications

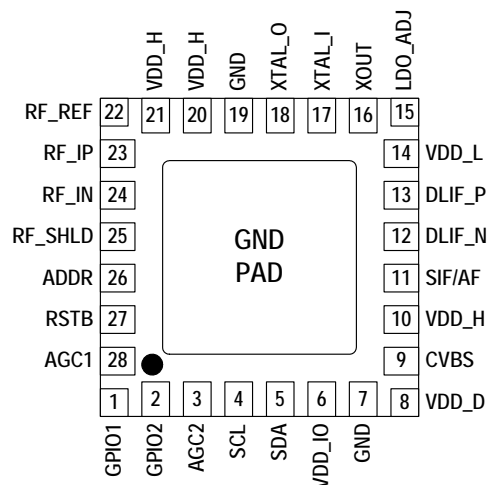
($V_{DD_H}=3.3$ V, $V_{DD_L}=1.8$ V, $V_{DD_D}=1.8$ V, $T_A=25$ °C)

| Parameter | Test Condition | Typ | Unit |
|---|---|---------------------------|---------------|
| Supply voltage | | 1.8 and 3.3, or only 3.3 | V |
| Total Power Consumption | ATV Mode, XOUT Disabled | 496 | 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, $N\pm 18$, ± 36 | +5 | dBm |
| Inband IIP3* | VHF-H, $N\pm 1$, ± 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 (-47) | °rms (dBc) |
| ATV Receiver Sensitivity | 30 dB video SNR; M/N B/G, D/K I L/L' | -67.5 -67 -66 -68 | dBm |
| ATV Receiver Unweighted Video SNR | +1 dBm input level; M/N B/G, D/K I L/L' | 55.5 55 53.5 56.5 | dB |
| *Note: Measured at the F-connector input of the Si2157-EVB and includes all connector, PCB, and front-end circuit losses. | | | |

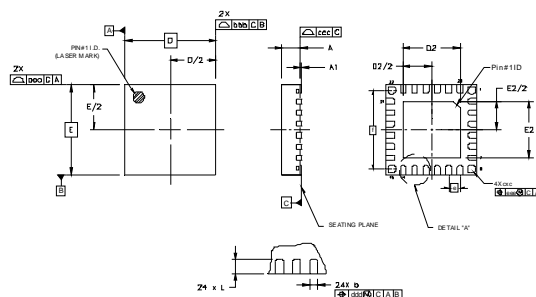
Selection Guide

| Part # | Description |
|--------|---|
| Si2177 | Worldwide hybrid TV tuner with analog TV demodulator for NTSC, PAL/SECAM, 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 |