

Description

The Si2141 is the industry's most advanced digital TV tuner supporting all worldwide terrestrial and cable TV standards for digital TV reception. Leveraging five generations of field-proven digital TV tuner technology, the Si2141 delivers the same or better RF performance as Skyworks' Si2147 digital TV tuner while further reducing footprint size and bill of materials cost.

Available in an industry-leading 3x3 mm QFN package, the Si2141 eliminates the need for an external balun, LNAs, SAW filters, and inductive power supply filtering to deliver the lowest-cost, most design-friendly and area-efficient solution available today. While competing solutions may also eliminate the balun, they suffer degradation in NF and second-order distortion, compromising reception. A fully-integrated 1.8 V LDO enables single supply operation, while a dual supply option offers additional system flexibility. Increased immunity to LTE interference and a harmonic rejection mixer with outstanding immunity to Wi-Fi interference eliminate the need for external filtering.

For advanced digital broadcast standards with high-order constellations, such as DVB-T2 and DVB-C2, the superior integrated phase noise of the Si2141 provides several dB of improved reception performance compared to competing solutions. Additionally, a software-selectable cable mode offers optimized return loss.

The Si2141 delivers exceptional picture quality and a higher number of received stations when compared to other silicon tuners. Incorporating worldwide field experience from five prior digital tuner generations in mass production, the Si2141 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
1.7 MHz, 6 MHz, 7 MHz, 8 MHz, and 10 MHz
channel bandwidths
- Industry-leading margin to A/74, NorDig, D-Book, C-Book, ARIB, EN55020, OpenCable™, DTMB
- 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
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
Integrated 1.8 V LDO for 3.3 V single-supply operation
- Single LIF output to SoC and/or demodulator
- Standard CMOS process technology
- Smallest footprint for a silicon digital TV tuner
3x3 mm, RoHS-compliant 24-pin QFN

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

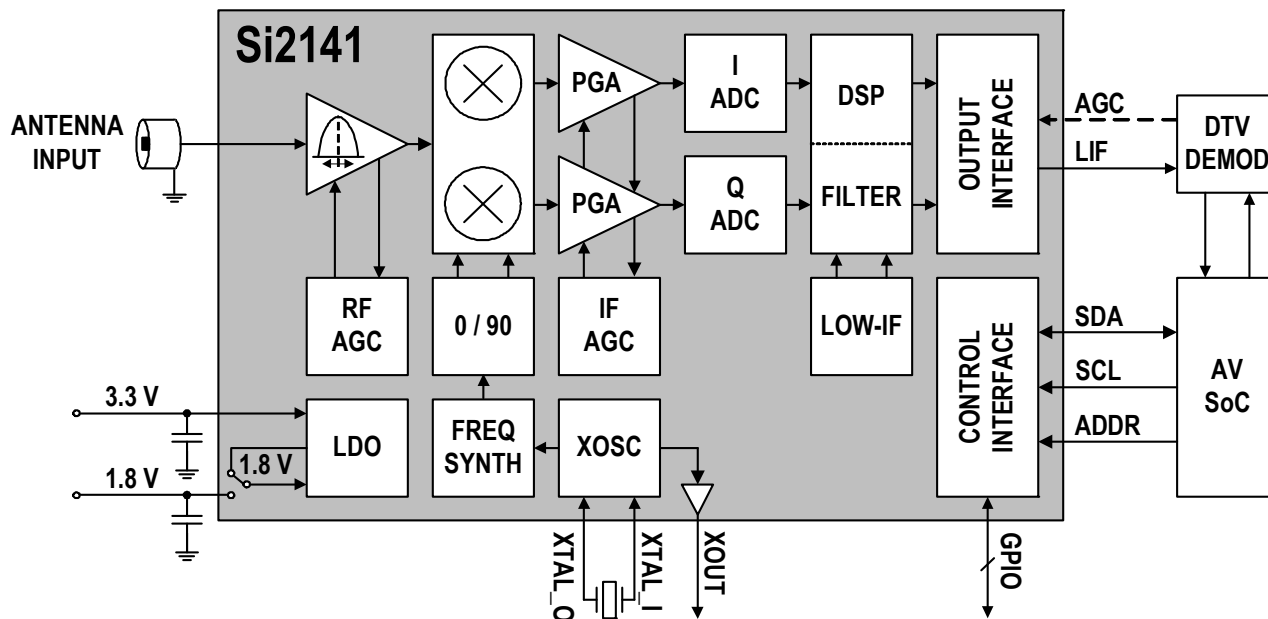
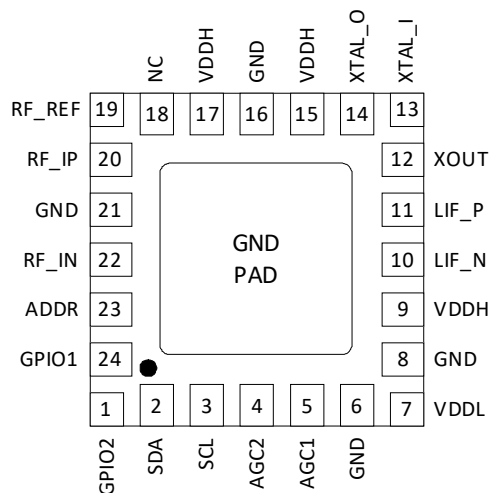


Table 1. Selected Electrical Specifications

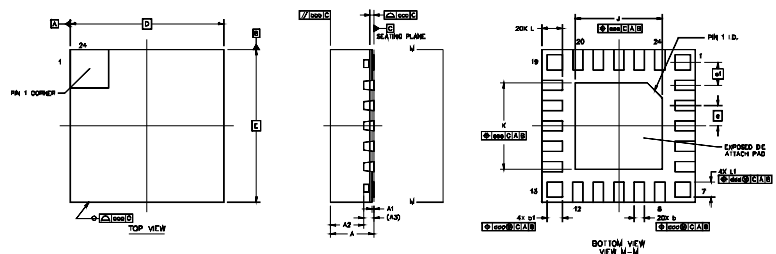
($V_{DDH} = 3.3\text{ V}$, $V_{DDL} = 1.8\text{ V}$, $T_A = 25\text{ }^{\circ}\text{C}$)

| Parameter | Test Condition | Typ | Unit |
|--------------------------------------|------------------------------------|------------------------------|-------------------------|
| Supply Voltage | | 1.8 and 3.3, or only 3.3 | V |
| Total Power Consumption | External 1.8 V supply | 494 | mW |
| RF Input Frequency Range | | 42 to 1002 | MHz |
| NF, terrestrial* | VHF-L1 (42–103 MHz) | 3.6 | dB |
| | VHF-L2 (104–198 MHz) | 2.3 | dB |
| | VHF-H (199–470 MHz) | 3.0 | dB |
| | UHF (471–870 MHz) | 3.2 | dB |
| Return Loss* | Terrestrial mode | 3 | dB |
| | Cable mode | 8 | dB |
| Out-of-band IIP3* | VHF-H, $N \pm 18$, ± 36 | +5 | dBm |
| In-Band 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 offset | 0.25 (–47) | $^{\circ}$ rms (dBc) |
| LIF Output Center Frequency | Channel BW = 6 MHz 7 MHz 8 MHz | 4 to 7 4.5 to 6.5 5 to 6 | MHz |

Pin Assignments



3x3 mm QFN-24 Package Information



| Dimension | Min | Nom | Max | Unit |
|-----------|----------|------|------|------|
| A | 0.80 | 0.85 | 0.90 | mm |
| D, E | 3.00 BSC | | | mm |
| e | 0.40 BSC | | | mm |
| e1 | 0.45 BSC | | | mm |
| J, K | 1.60 | 1.70 | 1.80 | mm |

Mouser Electronics

Authorized Distributor

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Skyworks:

[SI2141-A10-GM](#) [SI2141-A10-GMR](#) [SI2141-B10-GM](#) [SI2141-B10-GMR](#)