Si2156

Worldwide High-Performance TV Tuner IC for Analog and Digital Standards

Description

The Si2156 integrates a complete hybrid TV tuner supporting all worldwide terrestrial and cable TV standards. Leveraging Silicon Labs' field proven digital low-IF architecture, the Si2156 maintains the unmatched performance and design simplicity of the Si2153 while further reducing footprint size and bill of materials cost. No external LNAs, tracking filters, wirewound inductors, or SAW filters are used.

Compared with competing silicon tuners and discrete MOPLL-based tuners, the Si2156 delivers superior picture quality and a higher number of received stations in crowded and near/far real-world reception conditions. The high linearity and low noise RF front-end delivers superior blocking performance and higher sensitivity in the presence of strong undesired channels and interference.

The Si2156 integrates the complete signal path from antenna input to IF outputs for both analog and digital transmission standards. Compared to traditional discrete MOPLL-based tuners, the Si2156 eliminates hundreds of external components including external LNAs, tracking filter varactors and inductors (unlike competing silicon tuners), and SAW filters, resulting in the simplest, lowest-cost BOM for a hybrid TV tuner.

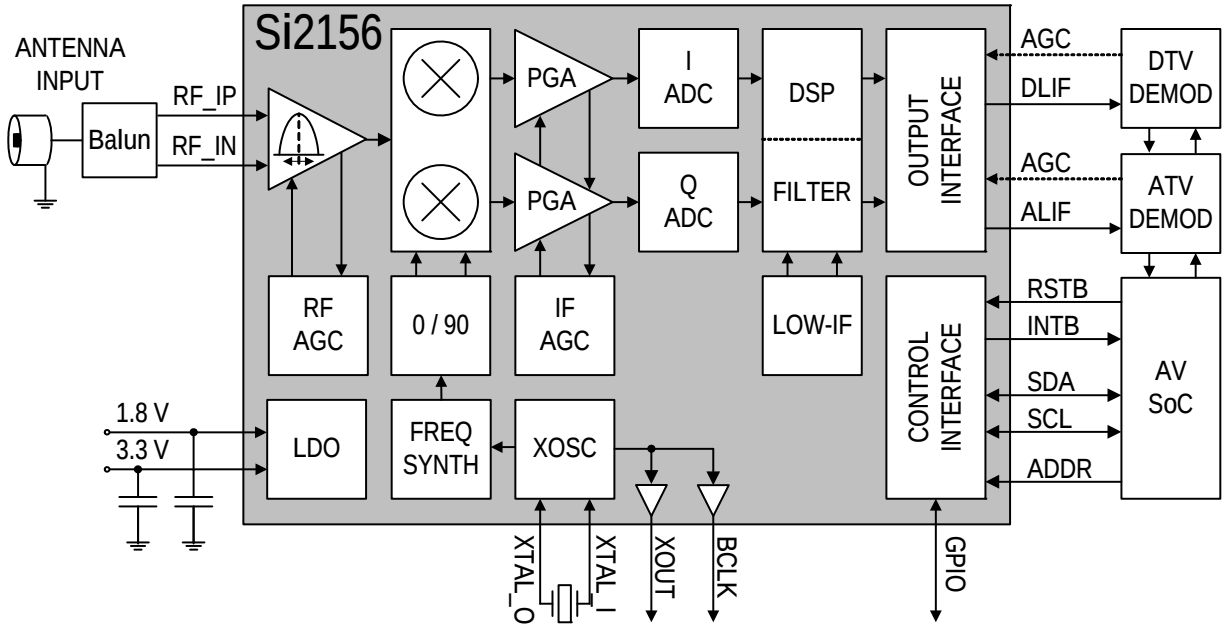
Interfacing the Si2156 seamlessly with the Si2165 DVB-T/C demodulator creates a complete terrestrial and cable DVB-T/C receiver plus PAL/SECAM tuner.

Features

- Worldwide hybrid TV tuner
  - Analog TV: NTSC, PAL/SECAM
  - Digital TV: ATSC/QAM, DVB-T/T2/C, ISDB-T/C, DTMB
  - 42-1002 MHz frequency range
- Compliance to A/74, NorDig, D-Book, C-Book, ARIB, EN55020, OpenCable™ specifications
- Best-in-class real-world reception
  - Exceeds discrete MOPLL-based tuners
- Highly integrated, lowest BOM
  - No SAW filters or wirewound inductors required
  - Integrated LNAs and complete tracking filters
- No alignment, tuning or calibration required
- Digital low-IF architecture
  - Integrated channel select filters
- Flexible output interface
  - ALIF to analog TV demodulator or SoC
  - DLIF to digital TV demodulator or SoC
- 3.3 and 1.8 V power supplies
- Standard CMOS process technology
- 5 x 5 mm, 32-pin QFN package
- RoHS compliant

Applications

- Hybrid ½-NIM
- iDTV (Integrated Digital TV)
- Digital terrestrial and cable STB
- Hybrid PVR and DVD recorder



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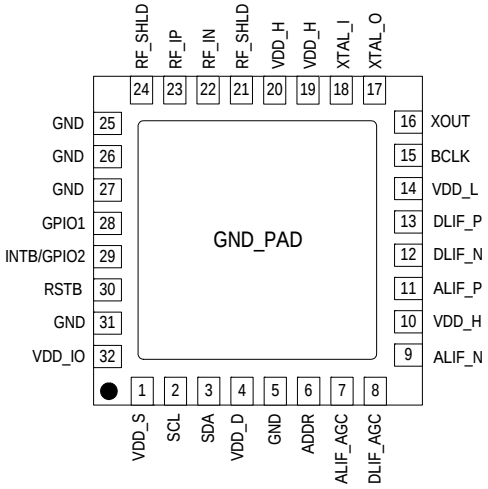
Selected Electrical Specifications

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

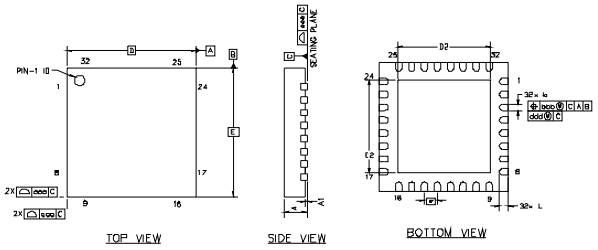
Parameter	Test Condition	Typ	Unit
Supply Voltage		1.8 and 3.3	V
Total Power Consumption	VHF bands | UHF bands	0.98 | 0.87	W
RF Input Frequency Range		42 to 1002	MHz
Noise Figure*	max gain	4.0	dB
Wideband IIP3*	N±18,±36; max RF gain	+18	dBm
Inband IIP3*	N±1,±2; max RF gain	–7	dBm
LO Phase Noise at 860 MHz	125 Hz | 250 Hz | 1 kHz | 10 kHz | 100 kHz	–83 | –91 | –96 | –95 | –104	dBc/Hz
LO Integrated Phase Noise at 860 MHz	DSB: 125 Hz to 4 MHz	0.4 (–43)	deg. rms (dBc)
Adjacent Channel Attenuation	N±1; RF input* to DLIF output	80	dB
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 Swing	programmable	0.5 to 2.0	V_{ppd}
ALIF Output Center Frequency	channel BW = 6 MHz | 7 MHz | 8 MHz	4 to 7 | 4.5 to 6.5 | 5 to 6	MHz
Analog IF Spurious Distortion	S = P – 6 dB	–78	dBc
ALIF Differential Output Voltage Swing	programmable	0.5 to 2.0	V_{ppd}

***Note:** Measured at the F-connector input of the Si2156 reference design and includes all connector, PCB, and front-end circuit losses.

Pin Assignments



5 x 5 mm QFN-32 Package



Symbol	Min	Nom	Max	Unit
A	0.80	0.85	0.90	mm
D, E		5.00 BSC		mm
e		0.50 BSC		mm

Selection Guide

Part #	Description
Si2156	Worldwide high performance TV tuner IC for analog and digital standards: NTSC, PAL/SECAM, ATSC/QAM, DVB-T/T2/C, ISDB-T/C, DTMB

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