Description

The Si2160C integrates digital demodulators for all first and second generation DVB standards (DVB-T/C/C2/S/S2 and S2X) in a single advanced CMOS die. Leveraging Silicon Labs' proven digital demodulation architecture, the Si2160C achieves excellent reception performance for each media while significantly minimizing front-end design complexity, cost, and power dissipation. Connecting the Si2160C to a hybrid TV tuner or digital only tuner, such as Silicon Labs' Si217x/5x/4x devices, results in a high-performance and cost optimized TV or STB front-end solution.

Silicon Labs' internally developed DVB-C2 demodulator can accept a standard IF (36 MHz) or low-IF input (differential) and support all modes specified by the DVB-C2 standard. The main features of the DVB-C2 mode are 4096-QAM, 6 or 8 MHz bandwidth, management of notch insertion (broadband and narrowband), and support of multiple data slices and PLPs.

DVB-T, DVB-C2/C and DVB-S2/S demodulators are next-generation enhanced versions of proven and broadly-used Silicon Labs' Si2169/68/67/66/64/62/60 devices.

The satellite reception allows demodulating widespread DVB-S, DIRECTV™ (DSS), DVB-S2, DIRECTV™ (AMC) legacy standards, and new Part II of DVB-S2 (S2X) satellite broadcast standard. A zero-IF interface (differential) allows for a seamless connection to market proven satellite silicon tuners. Si2160C embeds DiSEqC™ 2.0 LNB interface for satellite dish control and an equalizer to compensate for echoes in long cable feeds from the antenna to the satellite tuner input.

The cable reception allows demodulating widely deployed DVB-C legacy standard (ITU-T J.83 Annex A/C) and the Americas' cable standard (ITU-T J.83 Annex B).
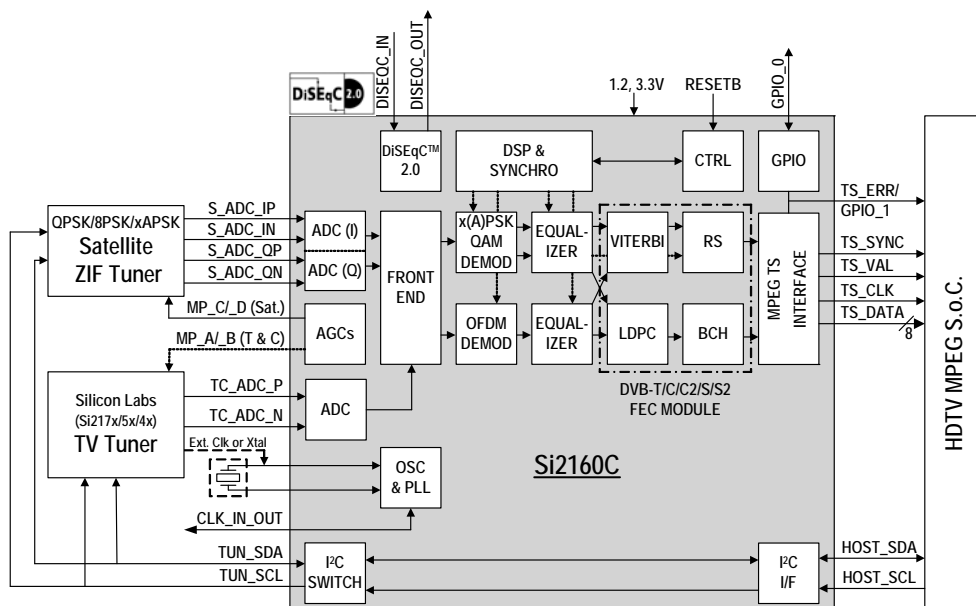
The Si2160C offers an on-chip blind scan algorithm for DVB-S/S2/S2X and DVB-C/C2 standards, as well as a blind lock function. The Si2160C programmable transport stream output interface provides a flexible range of output modes and is fully compatible with all MPEG decoders or conditional access modules to support any customer application.

Features

- Pin-to-pin compatible with all Si216x/8x single demods family
- API compatible with all single and dual demods families
- DVB-C2 (ETSI EN 302 769)
  - 16-QAM to 4096-QAM OFDM demodulation
- DVB-S2 (ETSI EN 302 307-1 V1.4.1)
  - QPSK/8PSK demodulator
- DVB-S2X (ETSI EN302 307-2 V1.1.1)
  - QPSK/8PSK, 8/16/32APSKdemodulator
  - Roll-off factors from 0.05 to 0.35
- DVB-T (ETSI EN 300 744)
  - OFDM demodulator and enhanced FEC decoder
  - NorDig Unified 2.5 and D-Book 8 compliant
- DVB-C (ETSI EN 300 429) and ITU-T J.83 Annex A/B/C
  - QAM demodulator and FEC decoder
  - 1 to 7.2 MSymbol/s
- DVB-S and DSS supported
  - QPSK demodulator and enhanced FEC decoder
- 1 to 45 MSymbol/s for all satellite standards (<40 MSps in 32APSK)
- LDPC and BCH FEC decoding for C2 and S2 standards
- I^2C serial bus interfaces (master and host)
- Firmware control (embedded ROM/NVM)
- Upgradeable with patch download via fast SPI or I^2C (broadcast mode supported)
- Flexible TS output interface (serial, parallel, and slave)
- DiSEqC™ 2.0 interface and Unicable™ support for satellite
- Fast lock times for all media
- Low power consumption
- Two power supplies: 1.2 and 3.3 V
- 7x7 mm, QFN-48 pin package, Pb-free/RoHS compliant

Applications

- iDTV: on-board design or in a NIM
- Advanced multimedia STB, PVR, and Blu-ray recorders
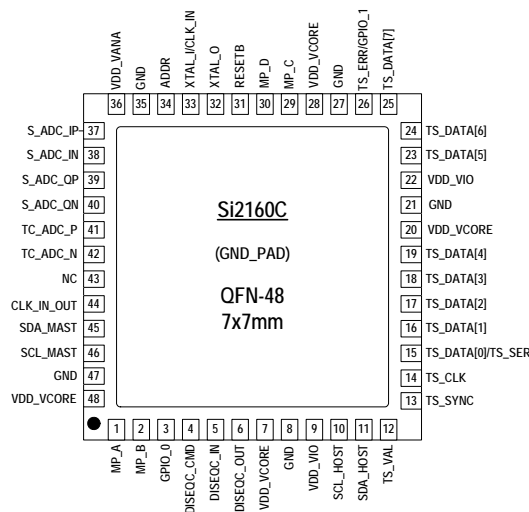- PC-TV accessories

Selected Electrical Specifications

(T_A = –10 to 75 °C)

Parameter	Test Condition	Min	Typ	Max	Unit
General					
Input clock reference		4	—	30	MHz
Supported XTAL frequency		16	—	30	MHz
Total power consumption	DVB-T[1]	—	182	—	mW
	DVB-C2[2]	—	327	—	mW
	DVB-C[3]	—	142	—	mW
	DVB-S2[4]	—	421	—	mW
	DVB-S[5]	—	230	—	mW
Thermal resistance	2 layer PCB	—	35	—	°C/W
	4 layer PCB	—	23	—	°C/W
Power Supplies					
V_{DD_VCORE}		1.14	1.20	1.30	V
V_{DD_VANA}		3.00	3.30	3.60	V
V_{DD_VIO}		3.00	3.30	3.60	V

Notes:
1. Test conditions: 8 MHz, 8K FFT, 64-QAM, parallel TS.
2. Test conditions: 4096-QAM, CR = 5/6, GI = 1/128, C/N = 34 dB (at picture failure).
3. Test conditions: 6.9 Mbaud, 256-QAM, parallel TS.
4. Test conditions: 32 Mbaud, CR = 3/5, 8PSK, pilots On, parallel TS, C/N at picture failure.
5. Test conditions: 30 Mbaud, CR = 7/8, parallel TS, at QEF: BER = 2 x 10^{-4}.

Pin Assignments

Selection Guide

Part Number	Description
Si2160-C60-GM	DVB-C2/S2/S2X/T/C/S Digital TV demodulator, 7x7 mm QFN-48