

Description

The Si2164 integrates digital demodulators for all of the first and second generation DVB video broadcasting standards (DVB-T2/C2/S2/T/C/S) in a single advanced CMOS die. Leveraging Silicon Labs' proven digital demodulation architecture, the Si2164 achieves excellent reception performance for each media while significantly minimizing front-end design complexity, cost, and power dissipation. Connecting the Si2164 to a terrestrial and cable hybrid TV tuner or digital only tuner, such as Silicon Labs' Si2178/58/48 devices, results in a high-performance and cost optimized TV 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/T2, DVB-S/S2 and DVB-C demodulators are enhanced versions of proven and broadly-used Silicon Labs Si2169/68/67/66 devices. DVB-T2-Lite (ETSI EN 302 755-V1.3.1) compatibility is also supported as an added feature to the DVB-T2 standard.

The satellite demodulation functionality allows demodulating widely deployed DVB-S, DIRECTV™ (DSS) legacy standards, and new generation DVB-S2 (AMC compliant) satellite broadcasts. A zero-IF interface (differential) allows for a seamless connection to market proven satellite silicon tuners. Si2164 embeds DiSeqC™ 2.0 LNB interface for satellite dish control and an equalizer to compensate for echoes in long cable feeds from antenna to the satellite tuner input.

The cable demodulation functionality allows demodulating widely deployed DVB-C legacy standard (ITU J.83 Annex A/C) and Americas' cable standard (ITU J.83 Annex B).

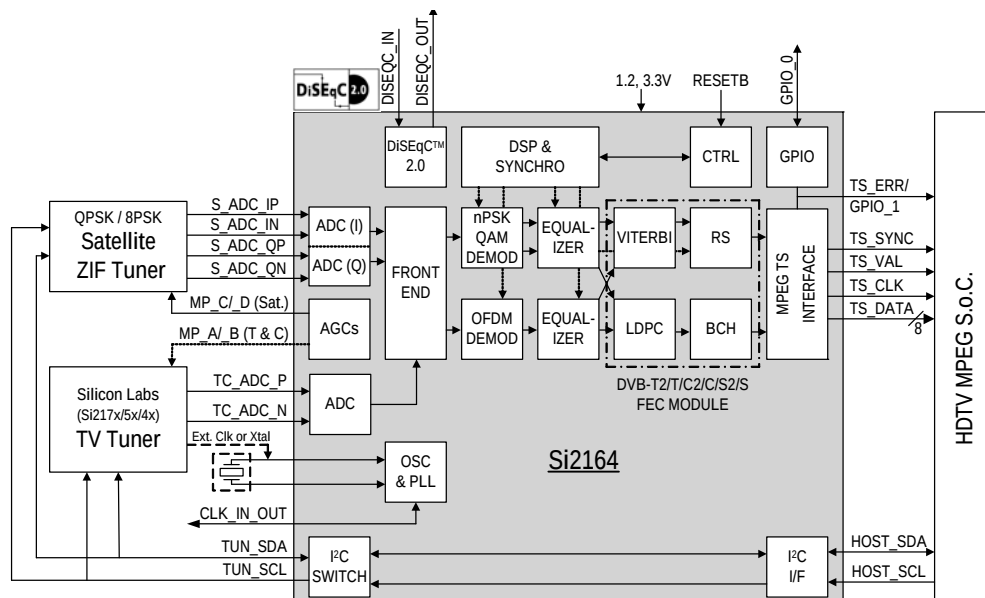
The Si2164 offers an on-chip blind scan algorithm for DVB-S/S2 and DVB-C/C2 standards, as well as a blind lock function. The Si2164 programmable transport stream output interface provides a flexible range of output modes and is fully compatible with all MPEG decoders or conditional access modules to support any customer application.

Features

- DVB-C2 (ETSI EN 302 769)
 - 16-QAM to 4096-QAM OFDM demodulation
 - 6 MHz and 8 MHz bandwidth
 - Notch management
- DVB-T2 (ETSI EN 302 755-V1.3.1) with T2-Lite (Annex I)
 - Bandwidth: 1.7, 5, 6, 7, or 8 MHz and extended BW
 - Supports up to 255 PLPs
 - FEF management
 - NorDig Unified 2.4 and D-Book 7 V2 compliant
- DVB-S2 (ETSI EN 302 307 and TR102-376)
 - QPSK/8PSK demodulator
 - 1 to 45 MSymbol/s
- DVB-C (ETSI EN 300 429) and ITU J.83 Annex A/B/C
 - QAM demodulator and FEC decoder
 - 1 to 7.2 MSymbol/s
- DVB-T (ETSI EN 300 744)
 - OFDM demodulator and enhanced FEC decoder
 - NorDig Unified 2.4 and D-Book 7 V2 compliant
- DVB-S and DSS
 - QPSK demodulator and enhanced FEC decoder
 - 1 to 45 MSymbol/s
- LDPC and BCH FEC decoding for C2/T2 and S2 standards
- I²C serial bus interfaces (master and host)
- Firmware control for upgradeability
- Flexible TS output interface (serial, parallel, and slave)
- DiSeqC™ 2.0 interface and Unicable support for satellite
- Fast lock times for all media including DVB-C2 and DVB-T2
- Low power consumption
- Two power supplies: 1.2 and 3.3 V
- 7x7 mm, QFN-48 pin package, Pb-free/RoHS compliant
- Pin-to-pin and API compliant with Si2166/67/68/69/60/62 Silicon Labs' devices

Applications

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

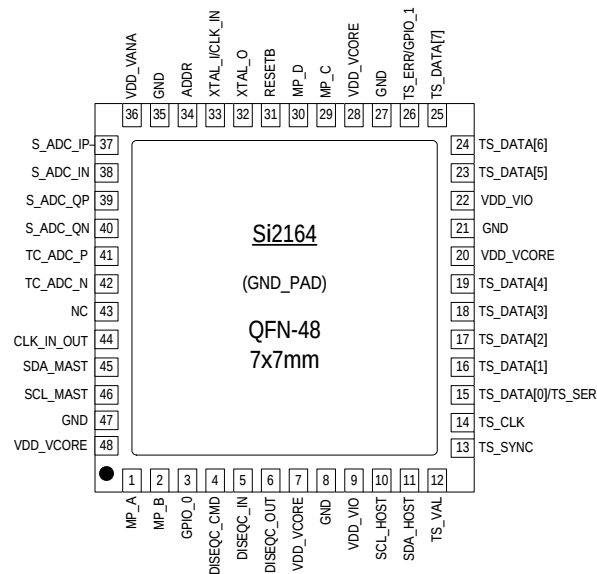


Selected Electrical Specifications

(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-T2 ¹	—	420	—	mW
	DVB-T ²	—	190	—	mW
	DVB-C2 ³	—	350	—	mW
	DVB-C ⁴	—	180	—	mW
	DVB-S2 ⁵	—	480	—	mW
	DVB-S ⁶	—	240	—	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, 256-QAM, 32K FFT, CR = 3/5, GI = 1/128, PP7, parallel TS, C/N at picture failure.					
2. Test conditions : 8 MHz, IF mode, 8K FFT, 64-QAM, parallel TS.					
3. Test conditions : 4096-QAM, CR = 5/6, GI = 1/128, C/N = 34 dB (at picture failure).					
4. Test conditions : 6.9 Mbaud, IF mode, 256-QAM, parallel TS.					
5. Test conditions : 32 Mbaud, CR = 3/5, 8PSK, pilots On, parallel TS, C/N at picture failure (PER = 10 ⁻⁴).					
6. Test conditions : 30 Mbaud, CR = 7/8, parallel TS, at QEF: BER = 2 x 10 ⁻⁴ .					

Pin Assignments



Selection Guide

Part Number	Description
Si2164-A40-GM	Universal DVB Demodulator for DVB-T2/C2/S2/T/C/S, 7x7 mm QFN-48