

Description

The Si2183B integrates digital demodulators for the Japanese and South American terrestrial ISDB-T standard and for all first and second generation DVB standards (DVB-T/T2/C/C2/S/S2 and S2X) in a single advanced CMOS die. Leveraging Silicon Labs' proven digital demodulation architecture, the Si2183B achieves excellent reception performance for each media while significantly minimizing front-end design complexity, cost, and power dissipation. Connecting the Si2183B 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.

Leveraging significant field experience in DVB terrestrial demodulation (DVB-T2/T), Silicon Labs' internally-developed ISDB-T demodulator can accept standard or low-IF inputs (differential) and complies with the Brazilian SBTVD-T terrestrial specifications (ABNT NBR 16.601 and 15.604). Main features include fast channel scan, very short lock times, state of the art CCI performance, partial reception, and auxiliary channels decoding.

DVB-T2/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. DVB-T2-Lite (ETSI EN 302 755-V1.3.1) compatibility is also supported.

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. Si2183B 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).

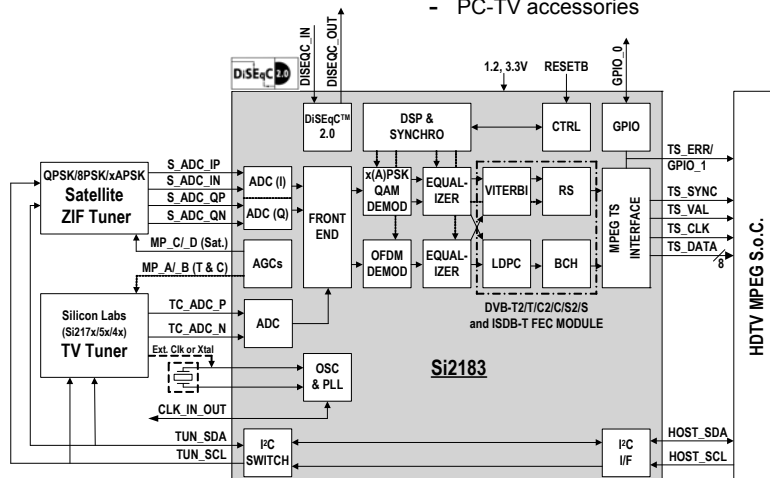
The Si2183B offers an on-chip blind scan algorithm for DVB-S/S2/S2X and DVB-C standards, as well as a blind lock function. The Si2183B programmable transport stream output interface provides a flexible range of output modes and is fully compatible with all MPEG decoders or conditional access modules 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
- ISDB-T (ABNT NBR 16.601 and 15.604)
 - 6, 7, and 8 MHz bandwidth
 - Partial reception supported
 - AC1 and AC2 decoding
- DVB-T2 (ETSI EN 302 755-V1.4.1) with T2-Lite (Annex I)
 - Bandwidth: 1.7, 5, 6, 7, and 8 MHz
 - NorDig Unified 2.5 and D-Book 8 compliant
- DVB-C2 (ETSI EN 302 769-V1.2.1)
 - 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, 8/16/32APSK demodulator
 - 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 (ETSI EN 300 421) 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/T2 and S2 standards
- I²C serial bus interfaces (master and host)
- Firmware control (embedded ROM/NVM)
- Upgradeable with patch download via fast SPI or I²C (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

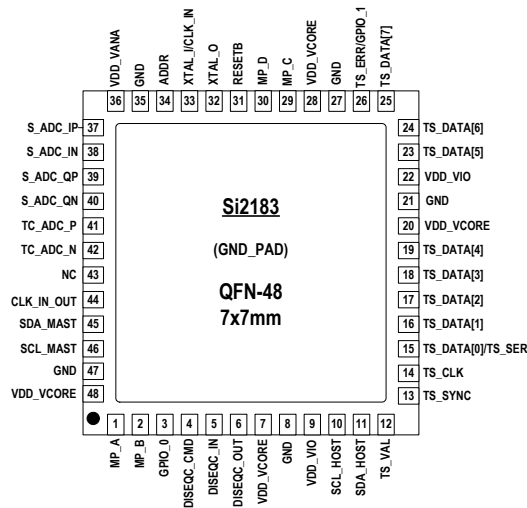


Selected Electrical Specifications

(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	ISDB-T ¹		168		mW
	DVB-T2 ²		356		mW
	DVB-T ³		182		mW
	DVB-C2 ⁴		327		mW
	DVB-C ⁵		142		mW
	DVB-S2 ⁶		421		mW
	DVB-S ⁷		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: 8K, 64-QAM, CR = 7/8, GI = 1/32, 13 segments, parallel TS.					
2. Test conditions: 8 MHz, 256-QAM, 32K FFT, CR = 3/5, GI = 1/128, PP7, C/N at picture failure, parallel TS.					
3. Test conditions: 8 MHz, 8K FFT, 64-QAM, parallel TS.					
4. Test conditions: 4096-QAM, CR = 5/6, GI = 1/128, C/N = 34 dB (at picture failure), parallel TS.					
5. Test conditions: 6.9 Mbaud, 256-QAM, parallel TS.					
6. Test conditions: 32 Mbaud, CR = 3/5, 8PSK, pilots On, C/N at picture failure, parallel TS.					
7. Test conditions: 30 Mbaud, CR = 7/8, at QEF: BER = 2 x 10 ⁻⁴ , parallel TS.					

Pin Assignments



Selection Guide

Part Number	Description
Si2183-B60-GM	ISDB-T and DVB-T2/C2/S2/S2X/T/C/S Demodulator, 7x7 mm QFN-48