

Description

The Si21602 integrates two separate high-performance DVB-C2, DVB-C, DVB-T, DVB-S, and DVB-S2 digital demodulators into a single compact package for terrestrial, cable, and satellite TV standards. Leveraging Silicon Labs' proven digital demodulation architecture, each embedded demodulator achieves excellent reception performance for each media while significantly minimizing front-end design complexity and cost. Connecting the Si21602 to both a dual terrestrial/cable TV tuner, and a dual satellite tuner, 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. The DVB-T and DVB-C demodulators are enhanced versions of proven and broadly used Si2167/68/69 Silicon Labs devices.

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 allows for a seamless connection to market proven satellite silicon tuners.

The Si21602 offers an on-chip blind scanning algorithm for DVB-S/S2 and DVB-C standards (as well as blind lock). It also integrates two DiSEqC™ 2.0 LNB interfaces for satellite dish control and, for each satellite demodulator, an equalizer to compensate for echoes in long cable feeds from the LNB to the satellite tuner RF input.

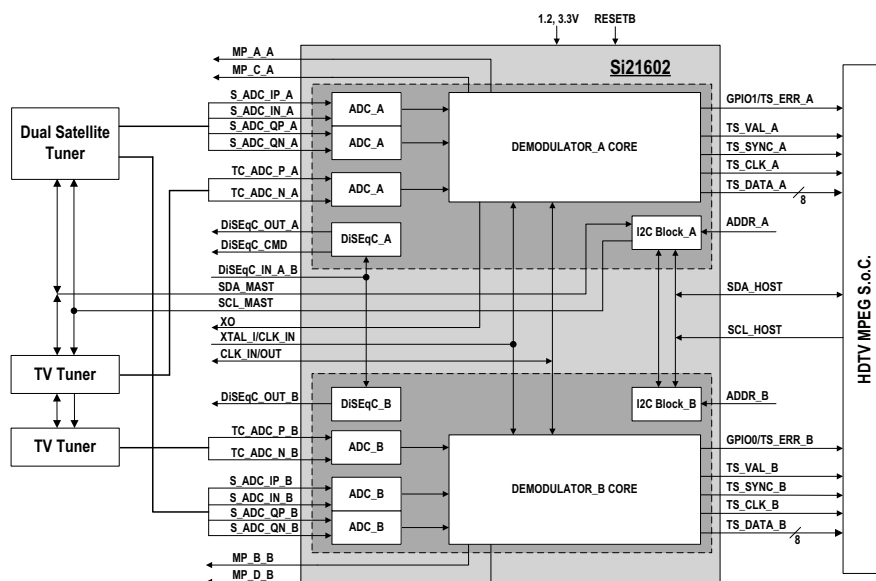
The Si21602 embeds two independent programmable transport stream interfaces which provide a flexible range of output modes and are fully compatible with all MPEG decoders or conditional access modules to support any customer application.

Features

- DVB-C2 (ETSI EN 302 769)
 - 16-QAM to 4096-QAM OFDM demodulation
 - 6 MHz and 8 MHz bandwidth, Notch management
- DVB-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-S2 (ETSI EN 302 307 and TR102-376)
 - 1 to 45 MSymbol/s
- DVB-S and DSS
 - QPSK demodulator and enhanced FEC decoder
 - 1 to 45 MSymbol/s
- LDPC and BCH decoding for C2 and S2 standards
- Dual DiSEqC™ 2.x interface, Unicable support
- Enhanced immunity to co-channel interferers
- I²C serial bus interfaces (master and host)
- Dual independent differential IF input for T/C tuners and differential ZIF I/Q inputs for satellite tuners
- GPIOs and multi-purpose ports (two per demodulator)
- Firmware control for upgradeability
- Separate flexible TS interfaces with serial or parallel outputs
- Fast lock times for all standards, including DVB-T2
- Only two power supplies: 1.2 and 3.3 V
- 8x8 mm, QFN-68 pin package, Pb-free/RoHS compliant
- Pin-to-pin and API compatible with all dual demodulator family: Si216x2

Applications

- Multi-receiver iDTV: on-board or in a NIM
- Advanced multimedia PVR STBs
- PC-TV accessories
- PVR, DVD, and Blu-Ray disc recorders

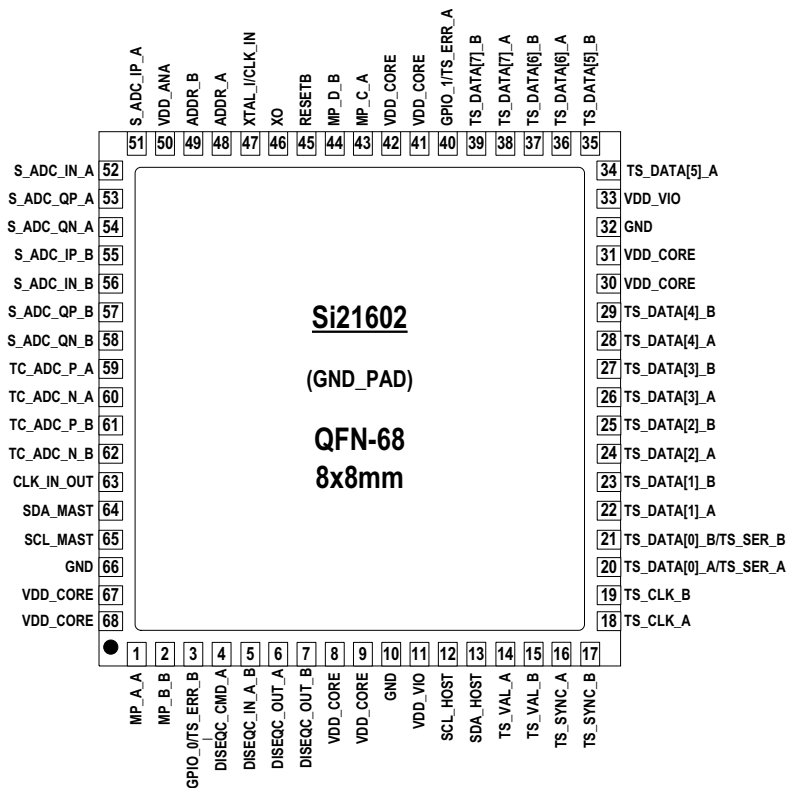


Selected Electrical Specifications

(T_A = -10 to 70 °C).

Parameter	Test Condition	Min	Typ	Max	Unit
General					
Input clock reference		4	—	30	MHz
Supported XTAL frequency		16	—	30	MHz
Total power consumption for each demodulator	DVB-C2 ¹	—	350	—	mW
	DVB-C ²	—	180	—	mW
	DVB-T ³	—	190	—	mW
	DVB-S2 ⁴		480		mW
	DVB-S ⁵		240		mW
Thermal resistance (θ _{JA})	4 layer PCB	—	42	—	°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: 4096-QAM, CR = 5/6, GI = 1/128, C/N = 34 dB (picture failure) 2. Test conditions: 6.9 MBaud, IF mode, 256-QAM, parallel TS 3. Test conditions: 8 MHz, IF mode, 8K FFT, 64-QAM, parallel TS output 4. Test conditions: 32 MBaud, CR = 3/5, 8PSK, pilots On, parallel TS, C/N at picture failure (PER = 10⁻⁴). 5. Test conditions: 30 MBaud, CR = 7/8, parallel TS, at QEF: BER = 2 x 10⁻⁴.					

Pin Assignments



Selection Guide

Part #	Description
Si21602-A40-GM/R	Dual Digital TV Demodulator for DVB-C2/C/T/S/S2, 8x8 mm QFN-68