Si21672-D60

Dual DVB-S2/S2X/T/C/S Digital TV Demodulator

Description

The Si21672D integrates two separate high-performance digital demodulators for the DVB-T/C, DVB-S2/S and DVB-S2X standards into a single compact package. Leveraging Skyworks' proven digital demodulation architecture, the Si21672D achieves excellent reception performance for each media while significantly minimizing front-end design complexity, cost, and power dissipation. Connecting the Si21672D 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.

The DVB-T and DVB-C, including ITU-T J.83 annex B, demodulators are enhanced versions of proven and broadly used Si2164/67/68/69 Skyworks 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. 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 Si21672D offers an on-chip blind scanning algorithm for DVB-S/S2/S2X and DVB-C standards, as well as blind lock function.

The Si21672D embeds two independent programmable transport stream interfaces which provide a flexible range of output modes, including a cross-bar functionality, and are fully compatible with all MPEG decoders or conditional access modules to support any customer application.

Features

- Pin-to-pin compatible with all dual demodulator family: Si216x2 and Si218x2
- API compatible with all single and all dual demodulators
- DVB-T (ETSI EN 300 744)
  - NorDig Unified 2.5, D-Book 8 compliant
- DVB-C (ETSI EN 300 429) / ITU-T J.83 Annex A/B/C
  - 1 to 7.2 MSymbol/s, C-Book compliant
- 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
  - Channel bonding for TS transmission supported
- DVB-S (ETSI EN 300 421) and DSS supported
- Dual DiSEqC™ 2.x interface, Unicable support
- 1 to 45 MSps for all satellite standards (<40 MSps in 32APSK)
- I^2C serial bus interfaces (master and host)
- Upgradeable with firmware patch download via fast SPI or I^2C (broadcast mode supported)
- 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)
- Separate flexible TS interfaces with serial or parallel outputs and cross-bar feature
- Fast lock times for all standards
- Only two power supplies: 1.2 and 3.3 V
- 8x8 mm, QFN-68 pin package, Pb-free/RoHS compliant

Applications

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

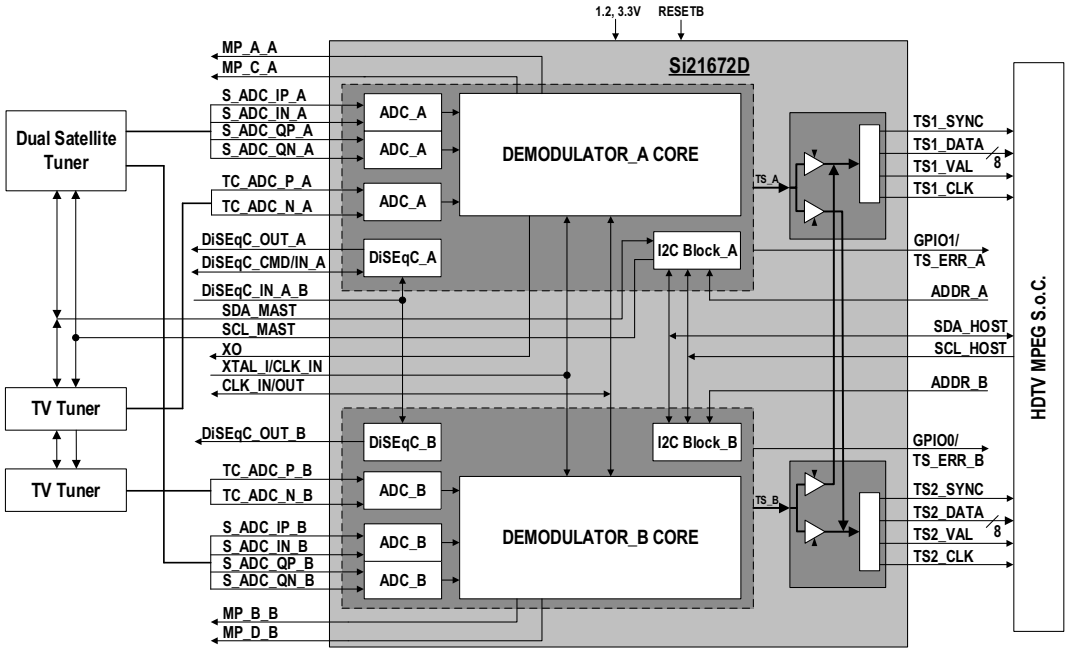

Table 1. Selected Electrical Specifications

(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-T[1]	—	182	—	mW
	DVB-C[2]	—	142	—	mW
	DVB-S2[3]	—	421	—	mW
	DVB-S[4]	—	230	—	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: 8 MHz, 8K FFT, 64-QAM, parallel TS.
2. Test conditions: 6.9 Mbaud, 256-QAM, parallel TS.
3. Test conditions: 32 Mbaud, CR = 3/5, 8PSK, pilots On, parallel TS, C/N at picture failure.
4. Test conditions: 30 Mbaud, CR = 7/8, parallel TS, at QEF: BER = 2 x 10^{-4}.

Pin Assignments

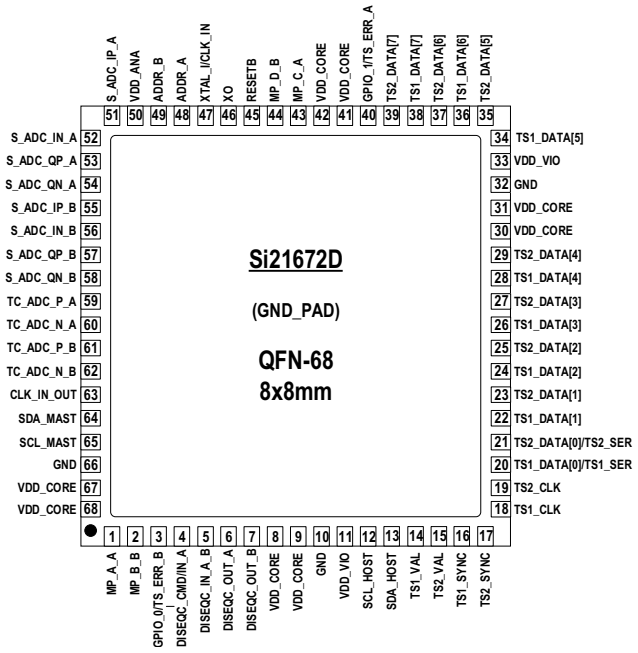

Table 1. Selection Guide

Part #	Description
Si21672-D60-GM/R	Dual Digital TV Demodulator for DVB-S2/S2X/T/C/S, 8x8 mm QFN-68