

### Description

The Si2166D integrates digital demodulators for first and second generation satellite DVB standards (DVB-S/S2 and S2X) in a single advanced CMOS die. Leveraging Silicon Labs' proven digital demodulation architecture, the Si2166D achieves excellent satellite reception performance while significantly minimizing front-end design complexity, cost, and power dissipation. Connecting the Si2166D to a satellite silicon tuner results in a high-performance and cost optimized TV or STB front-end solution.

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. Si2166D 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.

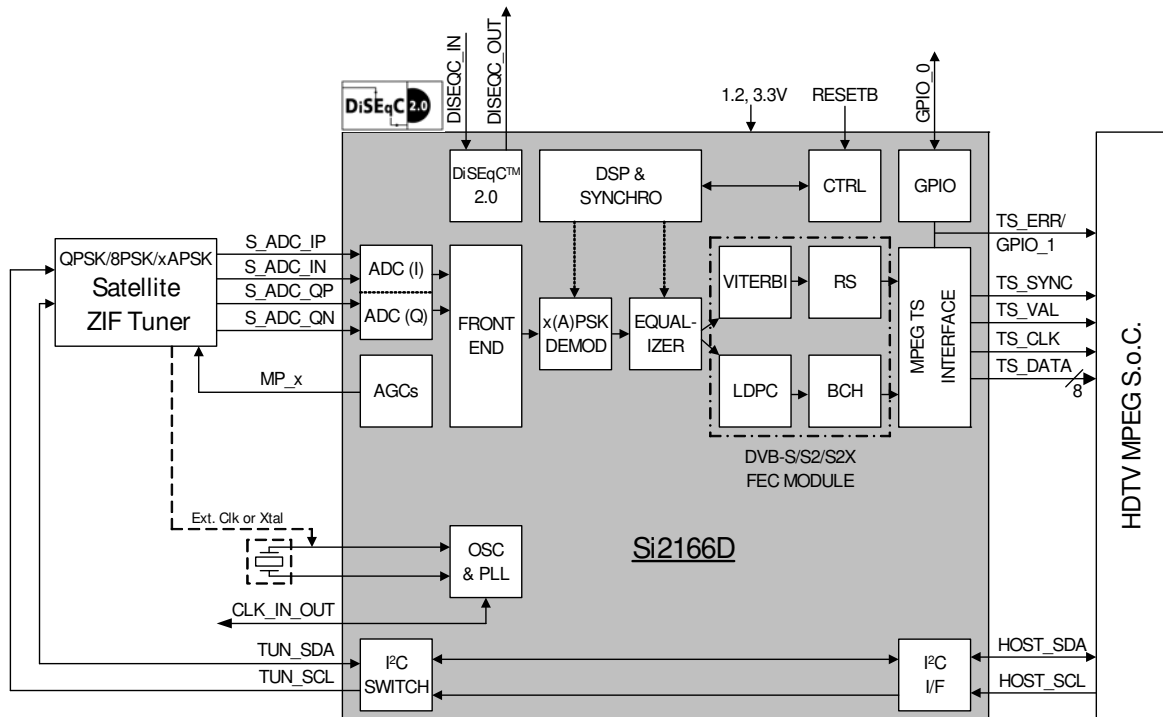
The Si2166D offers an on-chip blind scan algorithm for DVB-S/S2/S2X standards, as well as a blind lock function. The Si2166D programmable transport stream output interface provides a flexible range of output modes and is fully compatible with all MPEG decoders or conditional access modules to support 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-S2 (ETSI EN 302 307-1 V1.4.1)
  - QPSK/8PSK demodulator
- DVB-S2X (ETSI EN302 307-2 V1.1.1)
  - Support the normative broadcast services
  - QPSK/8PSK, 8/16/32APSK demodulator
  - Roll-off factors from 0.05 to 0.35
  - VCM supported
  - ISSY and NPD supported
  - MIS supported
  - Output modes: TS, GPCS, and GSE-HEM supported
- 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 DVB-S2/S2X standards
- I<sup>2</sup>C serial bus interfaces (master and host)
- Firmware control (embedded ROM/NVM)
- Upgradeable with patch download via I<sup>2</sup>C or fast SPI
- Flexible TS output interface (serial, parallel, and slave)
- DiSEqC™ 2.0 interface and Unicable™ support
- Fast lock times
- Low power consumption
- Two power supplies: 1.2 and 3.3 V
- 7x7 mm, QFN-48 pin package, Pb-free/RoHS compliant

### Applications

- Full-NIM
- iDTV (integrated Digital TV)
- Digital satellite STB
- PC-TV accessories
- PVR, DVD, and Blue Ray disc recorders



### Selected Electrical Specifications

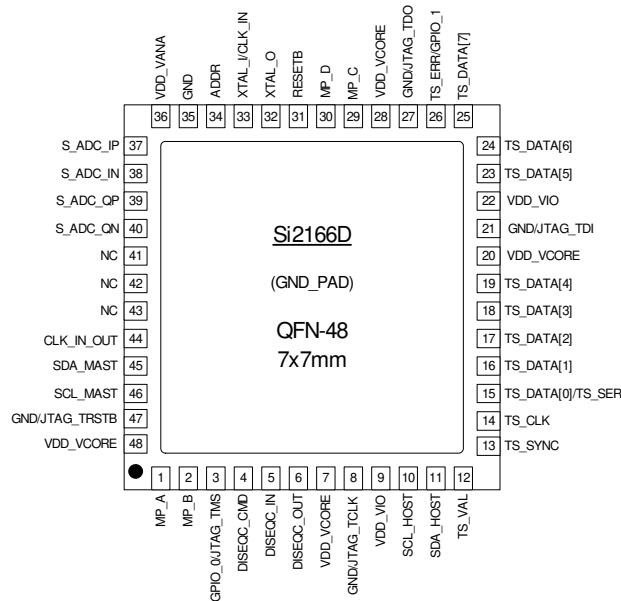
(T<sub>A</sub> = -10 to 75 °C)

| Parameter                | Test Condition                  | Min  | Typ  | Max  | Unit |
|--------------------------|---------------------------------|------|------|------|------|
| <b>General</b>           |                                 |      |      |      |      |
| Input clock reference    |                                 | 4    | —    | 30   | MHz  |
| Supported XTAL frequency |                                 | 16   | —    | 30   | MHz  |
| Total power consumption  | DVB-S <sup>2</sup> <sup>1</sup> | —    | 421  | —    | mW   |
|                          | DVB-S <sup>2</sup> <sup>2</sup> | —    | 230  | —    | mW   |
| Thermal resistance       | 2 layer PCB                     | —    | 35   | —    | °C/W |
|                          | 4 layer PCB                     | —    | 23   | —    | °C/W |
| <b>Power Supplies</b>    |                                 |      |      |      |      |
| V <sub>DD_VCORE</sub>    |                                 | 1.14 | 1.20 | 1.30 | V    |
| V <sub>DD_VANA</sub>     |                                 | 3.00 | 3.30 | 3.60 | V    |
| V <sub>DD_VIO</sub>      |                                 | 3.00 | 3.30 | 3.60 | V    |

**Notes:**

1. Test conditions: 32 Mbaud, CR = 3/5, 8PSK, pilots On, parallel TS, C/N at picture failure.
2. Test conditions: 30 Mbaud, CR = 7/8, parallel TS, at QEF: BER = 2 x 10<sup>-4</sup>.

### Pin Assignments



### Selection Guide

| Part Number   | Description  |
|---------------|--|
| Si2166-D60-GM | DVB-S/S2/S2X Digital TV Demodulator, 7x7 mm QFN-48 |