STV6120

8PSK/QPSK low-power 3.3-V dual wide-band satellite tuner IC

Data brief

Features

- Four VLNA inputs
- On-chip 4:2 matrix
- Input frequency range 250 MHz to 2150 MHz
- Two independently programmable tuners
- RF to baseband direct conversion
- Single 3.3-V DC supply
- Fractional N synthesizers
- Extremely low phase noise, compliant with DVB-S2 requirements
- Flexible crystal frequency output to drive the demodulator IC
- Continuously variable gain: 0 to 65 dB
- Additional and programmable gain on baseband amplifier: 0 to 16 dB
- Programmable 5- to 36-MHz cut-off frequency (Butterworth 5th-order baseband filters)
- Low power consumption
- Compatible with 5- and 3.3-V I^2C bus

Applications

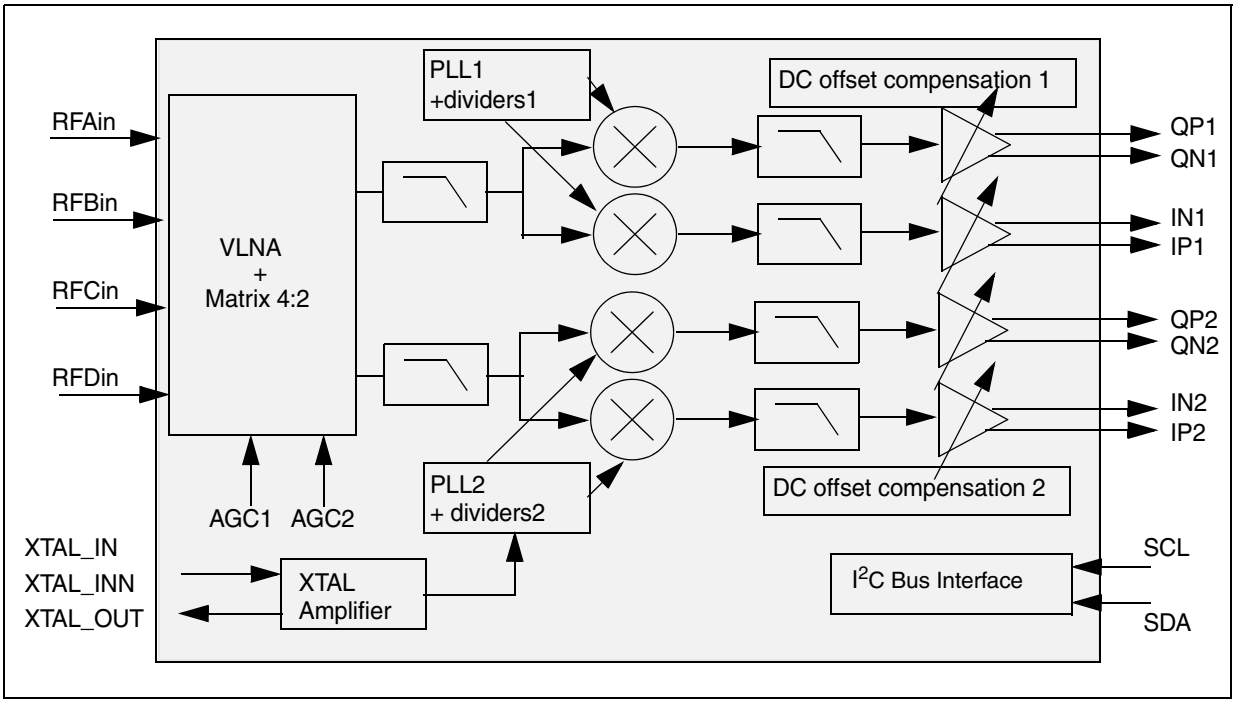
- Direct broadcasting satellite (DBS) QPSK/8PSK demodulation
- Set-top box

Package

- VFQFPN-56 8 x 8 x 1 mm^3 with exposed pad down (EPD) for heat dissipation
- ECOPACK®, environmentally friendly package

Description

The STV6120 satellite tuner is a quad-input dual direct-conversion (zero-IF) wideband satellite tuner intended for digital set-top boxes and similar applications.



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1 Introduction

The STV6120 dual tuner has four identical wideband RF inputs. The switch matrix 4:2 allows the selection of the appropriate RF input for each down-conversion path. After the matrix, there is a high-frequency low-pass filter followed by two down mixers. Each mixer, which down-converts the signal to baseband, is followed by a low-pass filter and amplifying stages. The baseband gain can be varied by programming a register through the I^2C bus.

The local oscillator signals are provided by two integrated fractional-N PLLs. Each PLL contains an on-chip voltage controlled oscillator, which meets stringent phase noise requirements. The PLL loop filters are partially integrated. The local oscillator frequencies are programmable between 250 and 2150 MHz.

The comparison frequency for the phase-frequency detector is generated by dividing the crystal oscillator reference frequency. The crystal frequency will be in the range 16 MHz to 30 MHz depending on the application.

The design of the STV6120 has been carefully implemented to avoid the problems associated with having two tuners integrated on a single chip.

Features	Benefits
Quad tuner inputs	Fits universal quad and Quattro LNB requirements or if fewer inputs are used, very high isolation
4:2 switch matrix	Low-cost, high-performance BoM integration allowing flexibility between legacy systems and SCR (unicable) systems
Single flexible Xtal	Wide choice of crystal frequencies with robust clock buffer to drive second tuners and demodulators allowing eBoM savings
Fine-grained power management	Allows power savings and settings optimized for actual use conditions
Wide input frequency range	Allows flexible and novel frequency planning and in some cases BoM cost optimization
Intrinsic performance	Excellent compromise between linearity and noise figure allowing the most difficult signals to be extracted in the most congested and noisy conditions
Fractional-N PLL	Low phase noise for low packet error rate under extreme conditions (e.g., low symbol rates), fast locking

2 Ordering information

Table 1. Device summary

Order code	Temperature range	Package	Packaging
STV6120B	-10 to 70 °C	VFQFPM-56 EPD	Tray
STV6120BT	-10 to 70 °C	VFQFPM-56 EPD	Tape and Reel

3 Revision history

Table 2. Document revision history

Date	Revision	Changes
29-Nov-2011	1	Initial release.

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