

# Si2211/12 Satellite Radio Tuners

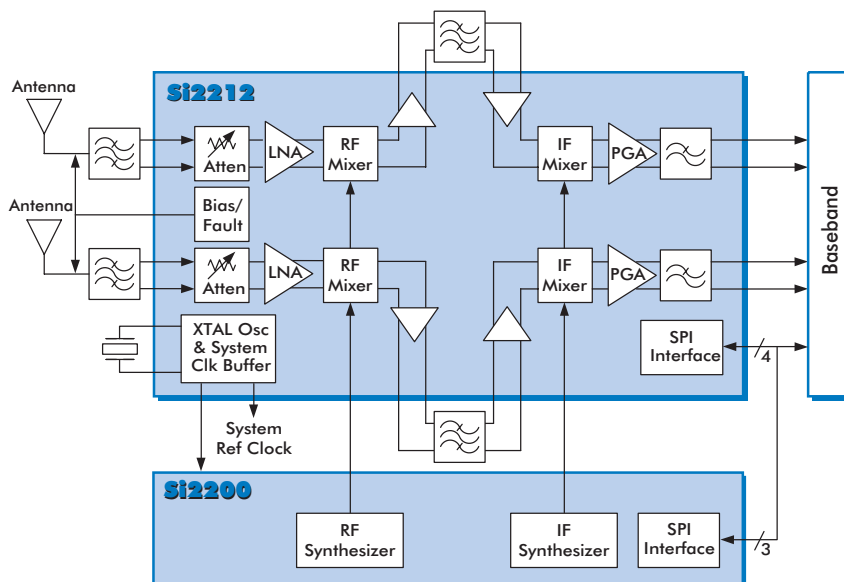
## PROGRAMMABLE CMOS SATELLITE RADIO TUNER SOLUTIONS



### DESCRIPTION

Leveraging Silicon Laboratories' RF CMOS expertise, the Si2211 and Si2212 significantly lower solution costs for XM radio receivers by drastically reducing the board space and component count required by competing solutions. The Si2211 supports the next generation single-path architectures, with only a single SAW filter in the entire design. The Si2212 offers a straightforward enhancement from Si2211-based designs, providing a simple approach for dual-branch systems. By integrating the functionality of two Si2211 tuners, the Si2212 is the only single-chip, dual-branch solution for enhanced satellite radio service for next generation radios. Each product is offered as a solution with the Si2200 RF synthesizer. Derived from Silicon Laboratories' industry leading Si4136XM RF synthesizer, the Si2200 eliminates the need for external voltage-controlled oscillators (VCOs), varactor diodes and loop filters, while eliminating RF interference issues and phase noise that are common in other designs. Both the Si2211 and the Si2212 integrate a serial-peripheral interface (SPI) allowing complete configuration and control with performance and fault monitoring through software.

### SDARS Dual-Branch Tuner Solution Block Diagram



### FEATURES

- Unmatched performance
- Highly integrated:
  - 75% fewer components
  - 60% PCB area reduction
- Single antenna, single SAW (Si2211)
- Single chip, dual-branch antenna support (Si2212)
- Industry-proven superheterodyne architecture
- 100% CMOS implementation
- Integrated antenna regulator and fault diagnostics
- Integrated system reference oscillator allows use of low-cost crystal
- Low phase noise LO frequency synthesis using integrated RF and IF VCO
- SPI bus allows full software control and monitoring
- Low profile packages:
  - Si2211: 7 x 7 mm TQFP-48
  - Si2212: 10 x 10 mm TQFP-64
  - Si2200: 5 x 5 mm QFN-28

### APPLICATION

- XM satellite radio receivers

## PRODUCT BRIEF

THE INDUSTRY'S MOST  
INTEGRATED SATELLITE  
RADIO TUNER SOLUTIONS



# Si2211/12 Satellite Radio Tuner Solutions

**INTEGRATED. FLEXIBLE.  
HIGH PERFORMANCE. CMOS.**

## Unparalleled Performance

The Si2211/12's RF front-end architecture provides a unique combination of low noise, high gain, and low distortion to provide industry-leading performance in demanding satellite radio applications. In addition, the Si2200's proven frequency synthesizer technology provides unmatched phase noise and spurious noise levels using integrated VCOs.

## Dramatic PCB Reduction

The small footprint requires up to 60% less board area and 75% fewer discrete components than existing SDARS tuner solutions.

## Fully Software Programmable

Both the Si2211/12 and the Si2200 use a standard SPI digital control interface to program the solution for a variety of satellite radio configurations in software. This interface also allows continuous monitoring of vital RF functions and antenna fault conditions.

## 100% CMOS Technology

While conventional solutions use BiCMOS or boutique semiconductor processes, the Si2211/12 solution is implemented in 100% digital CMOS. This enables high levels of integration and offers manufacturing capacity to easily support high-volume consumer applications.

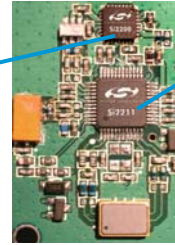
## 60% Area Reduction and 75% Fewer Components

### Si2211 SDARS Tuner Solution

As few as 45 external components required

#### Si2200 RF/IF Synthesizer

- Ultra-low phase noise
- Industry's fastest settling time
- 28-pin QFN package

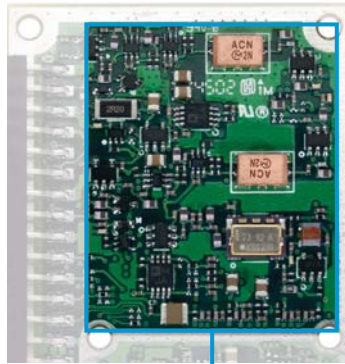


#### Si2211 Tuner

- 6.25 MHz bandwidth superheterodyne tuner
- Fully software configurable
- Antenna fault diagnostics
- 48-pin TQFP

### Competing SDARS Tuner

More than 223 external components required

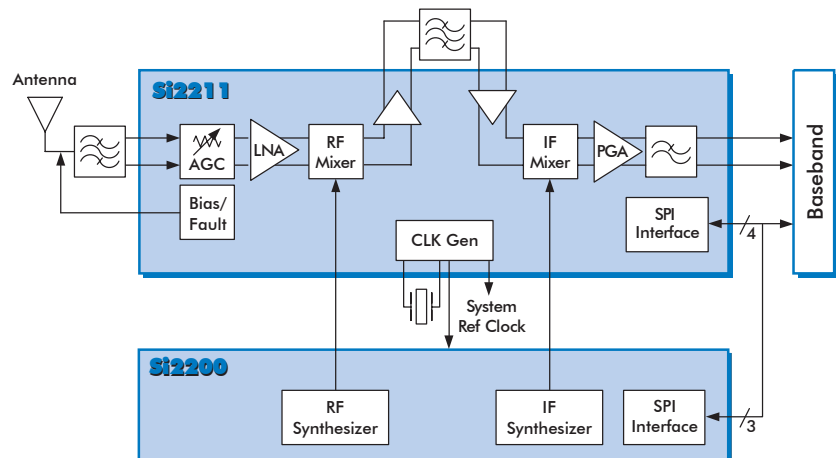


RF Subsection



IF Subsection

## SDARS Single-Branch Tuner Solution Block Diagram



## CONTACT INFORMATION



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## ORDERING INFORMATION

### Part Number

Si2211-GQ

Si2212-GQ

Si2200-GM

### Evaluation Boards

Si2211REF-EVB

Si2212REF-EVB

### Description

Single-path SDARS tuner, -40 to 85 °C

Dual-branch SDARS tuner, -40 to 85 °C

RF/IF frequency synthesizer for satellite radio, -40 to 85 °C

Single-path radio evaluation board for Si2211 + Si2200

Dual-branch radio evaluation board for Si2212 + Si2200