



Freescale Simplifies Set-Top Box Designs with Low-Power CMOS Broadband Silicon Tuner; Power-efficient MC44S803 Single-Chip Tuner Helps Reduce System Cost and Design Complexity

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Freescale Semiconductor (NYSE:FSL)(NYSE:FSL.B) has introduced a 3.3V single-chip CMOS broadband silicon tuner designed to reduce power, cost and complexity for a wide range of home entertainment appliances. With power consumption as low as 700mW, the high-performance MC44S803 broadband tuner is one of the most power-efficient dual-conversion tuner solutions available today.

Addressing the rapidly growing set-top box (STB) and analog/digital TV tuner markets, the MC44S803 tuner is optimized for analog and digital cable STB, digital TV, cable modem and terrestrial STB applications. According to a recent report by Semico Research Corp., the digital STB market is forecast to grow at a compound annual growth rate (CAGR) of 16.2 percent between 2004 and 2009, with unit shipments roughly doubling from 46 million to 97.4 million during that period. Of units shipped in that time frame, cable STBs are expected to dominate the market.

"Freescale's heritage in the home entertainment industry dates to 1947, when Motorola launched its first TV-set product," said Ritu Favre, director of operations for Freescale's Application-Specific Products Operation. "We continue to serve the home entertainment market with innovative silicon solutions, such as our next-generation broadband tuner, the MC44S803, which delivers best-in-class performance and low-power operation."

The MC44S803 tuner supports flexible power-consumption modes, enabling power to be adjusted from less than 700mW to 900mW to meet various system performance requirements. The device dissipates 700mW (typical) in the low-power mode. For particular markets, the typical power is 800mW (digital cable), 850mW (analog cable), and 900mW (analog terrestrial). The MC44S803 also offers a programmable power-down mode with fast start-up, enabling further power savings.

Innovative double-conversion architecture

Freescale's MC44S803 broadband tuner is based on an innovative double-conversion architecture that simplifies STB and TV tuner designs and streamlines the manufacturing process. Single-conversion tuners require multiple tracking filters, which must be adjusted while being manufactured. Manual alignment of tracking filters is a labor-intensive process that adds significant time and cost to the manufacturing process. In addition, tracking filter components typically have poor temperature, age and stability. The MC44S803 device's double-conversion architecture eliminates the need for discrete tracking filters and manually aligned coils, thereby reducing system cost and complexity, while improving performance and reliability.

High-performance features

The MC44S803 device tunes 48 MHz to 861 MHz RF signals and converts them to an IF signal of 30 MHz to 50 MHz. An on-chip IF amplifier enhances the device's power efficiency, and two on-chip IF outputs support systems with multiple demodulators (digital demodulator and one analog TV demodulator).

The MC44S803's high-performance capabilities include a wide gain control range (greater than 80dB AGC range), a choice of analog or digital gain control and the ability to switch between two analog AGC controls for dual demodulator systems. The MC44S803 has an exceptional noise figure of 7.5dB, as well as outstanding phase noise and competitive distortion figures. The MC44S803 offers a choice of industry-standard I2C or SPI interfaces for easy programming and configuration control.

The MC44S803 tuner is designed to meet Data Over Cable Service Interface Specification (DOCSIS) requirements for 64- and 256-quadrature amplitude modulation (QAM). The tuner's low-power 800mW operation meets DOCSIS v2.0 requirements. The device is also designed to support the NorDig Unified 1.0.1 specifications for coded orthogonal frequency-division multiplexing (COFDM) for DVB-T.

The MC44S803 represents the third generation of Freescale's silicon broadband tuners. It is also the latest addition to Freescale's broad portfolio of silicon solutions for the home networking and home entertainment market. These Freescale solutions include RF modulators, stereo encoders, 8/16/32-bit microcontrollers, i.MX applications processors, ZigBee(TM)-compliant and Ultra-Wideband(UWB) wireless platforms, power management ICs, digital signal processors based on StarCore(R) technology, PowerQUICC(TM) communications processors based on PowerPC(R) cores, and high-performance PowerPC processors.

Availability and pricing

MC44S803 broadband silicon tuner samples and evaluation kits are available now, with volume production planned for Q1 2006. The device is offered in a Pb-free, 64-pin quad leadless package (QFN). The MC44S803 is available at a suggested retail price of less than \$5(USD) in 10K quantities.

About Freescale Semiconductor

Freescale Semiconductor, Inc. (NYSE:FSL)(NYSE:FSL.B) is a global leader in the design and manufacture of embedded semiconductors for the automotive, consumer, industrial, networking and wireless markets. Freescale became a publicly traded company in July 2004 after more than 50 years as part of Motorola, Inc. The company is based in Austin, Texas, and has design, research and development, manufacturing or sales operations in more than 30 countries. Freescale, a member of the S&P 500(R), is one of the world's largest semiconductor companies, with 2004 sales of \$5.7 billion (USD). www.freescale.com

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NOTE TO EDITORS: In the paragraph discussing the MC44S803's range, there is a "greater-than" symbol preceding the "80" in "80dB AGC range," and in the term "I²C" above, the "2" is superscript. Both were changed for transmission purposes only.