



# MC44S803

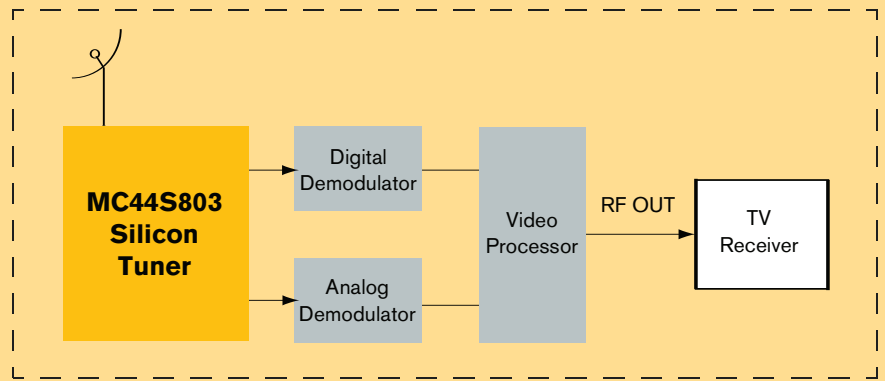
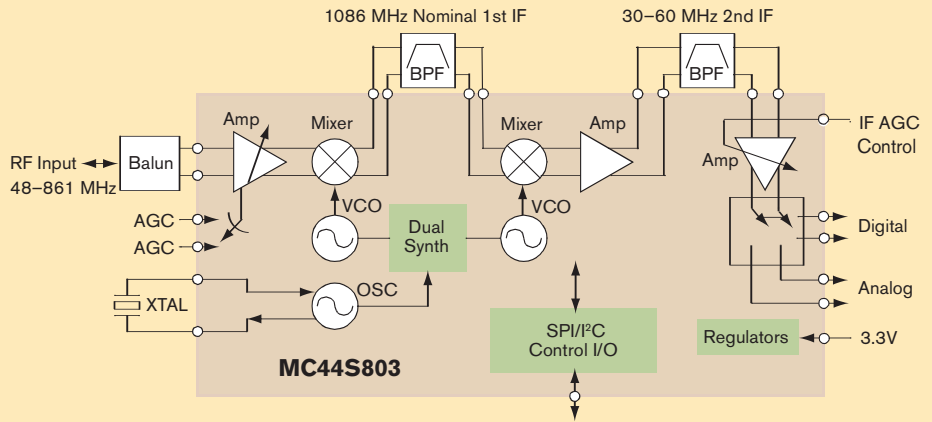
Freescale Semiconductor's MC44S803 is a 3.3V, low-power, high-performance, single-chip CMOS broadband tuner. This chip offers a cost-effective, low-power solution for the high-performance analog and digital TV market. The highly integrated third generation silicon tuner receives 48 MHz to 861 MHz radio frequency (RF) signals and converts them to a second intermediate frequency (IF) of 30 MHz to 50 MHz.

The single-chip broadband tuner uses double-conversion architecture, which eliminates tracking filters and their manually aligned coils. Two IF outputs are provided to support systems with multiple demodulators (e.g. one digital demodulator and one analog TV demodulator).

The MC44S803 is designed to meet all Data Over Cable Service Interface Specifications (DOCSISs) for 64- and 256-quadrature amplitude modulation (QAM) as well as the NorDig Unified 1.0.1 specifications for coded orthogonal frequency-division multiplexing (COFDM) for DVB-T.

The device is available in a Pb-free 64-pin quad leadless package (QFN). The chip is carefully designed for flexible power consumption and dissipates as low as 700 mW typical.

MC44S803 BLOCK DIAGRAM



Set Top Box



Parameter	Min	Typ.	Max	Units
Supply Current—High-power mode @ 3.3V		302		mA
Supply Current—Nominal-power mode @ 3.3V		247		mA
Supply Current—Low-power mode @ 3.3V		211		mA
Supply Current—All blocks shutdown		12	14	mA
Noise Figure		7.0	8.5	dB
Conversion Gain—All max settings		88		dB
Conversion Gain—All min. settings		65		dB
IF Gain Flatness—Within any channel		±0.5		dB
RF AGC Range, Normal mode range		47		dB
IF AGC Range, 0.5V to 3.3V		36		dB
Input Return Loss	6			dB
Spurious at Input Terminal: – 5 to 42 MHz – 54 to 861 MHz			-36 -50	dBc dBc
Second IF Image Rejection		66		dB
Distortions with 0 dBmV AGC Attack Point – Cross-Modulation Ratio – Composite Second Order (CSO) – Composite Triple Beat (CTB)		-55 -63 -63		dBc dBc dBc
Phase Noise @ 1 kHz		-96		dBc/Hz
Phase Noise @ 10 kHz		-93		dBc/Hz
Phase Noise @ 100 kHz		-102		dBc/Hz
Phase Noise @ 1 MHz		-128		dBc/Hz
Control interface clock frequency— <sup>1</sup> 2C			800	KHz
Control interface clock frequency—SPI			2.0	MHz

### Typical Applications

Typical applications include cable data modems, cable TV (CATV) set-top boxes (analog and digital), computer TV tuner cards (analog and digital), analog TV sets, digital terrestrial TV sets, digital terrestrial adapters, home DVD-R and DVR/PVR.

### Package

The MC44S803 is offered in a thermally enhanced quad flat pack no lead (QFPN) package. It has 9 x 9 x 1 mm body size and is RoHS compliant.

### Ordering Information

Device: MC44S803EP  
Temp. Range: 0° to 70°C  
Package: 64QFN  
RoHS: Yes

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REV 2

### Features

- > Flexible power consumption modes:
  - Low-power 700 mW typ.
  - Nominal-power 815 mW typ.
  - High-power 997 mW typ.
- > Single 3.3V supply operation
- > Programmable power-down mode with fast start-up
- > Variable-gain low-noise amplifier (LNA) with 47 dB gain control range
- > Ability to switch between two external analog control voltages for LNA
- > Fully integrated frequency synthesizers
- > Fully integrated tuned circuit voltage control oscillators (VCOs)
- > Fully integrated VCO inductors and varactors
- > Second IF variable gain amplifier
- > Flexible reference oscillator circuit (4 MHz to 28 MHz crystal)
- > Reference oscillator buffer to drive additional tuners or demodulators
- > Choice of I<sup>2</sup>C or SPI interface control buses
- > Internal self-diagnostic circuits
- > Temperature range: ambient 0° to 70°C