

APPLICATION NOTE 4176

## MAX3540 ATSC/NTSC Tuner

*Abstract: The [MAX3540](#) integrated, single-conversion terrestrial tuner IC for ATSC and NTSC is A/74 compliant. The MAX3540 converts a RF input signal in the 54MHz to 860MHz band to a 44MHz balanced-IF output.*

- ◆ More Information
- ◆ [Wireless Home](#)
- ◆ [Application Notes and Tutorials](#)
- ◆ [EV Kit Software](#)
- ◆ [Technical Support](#)

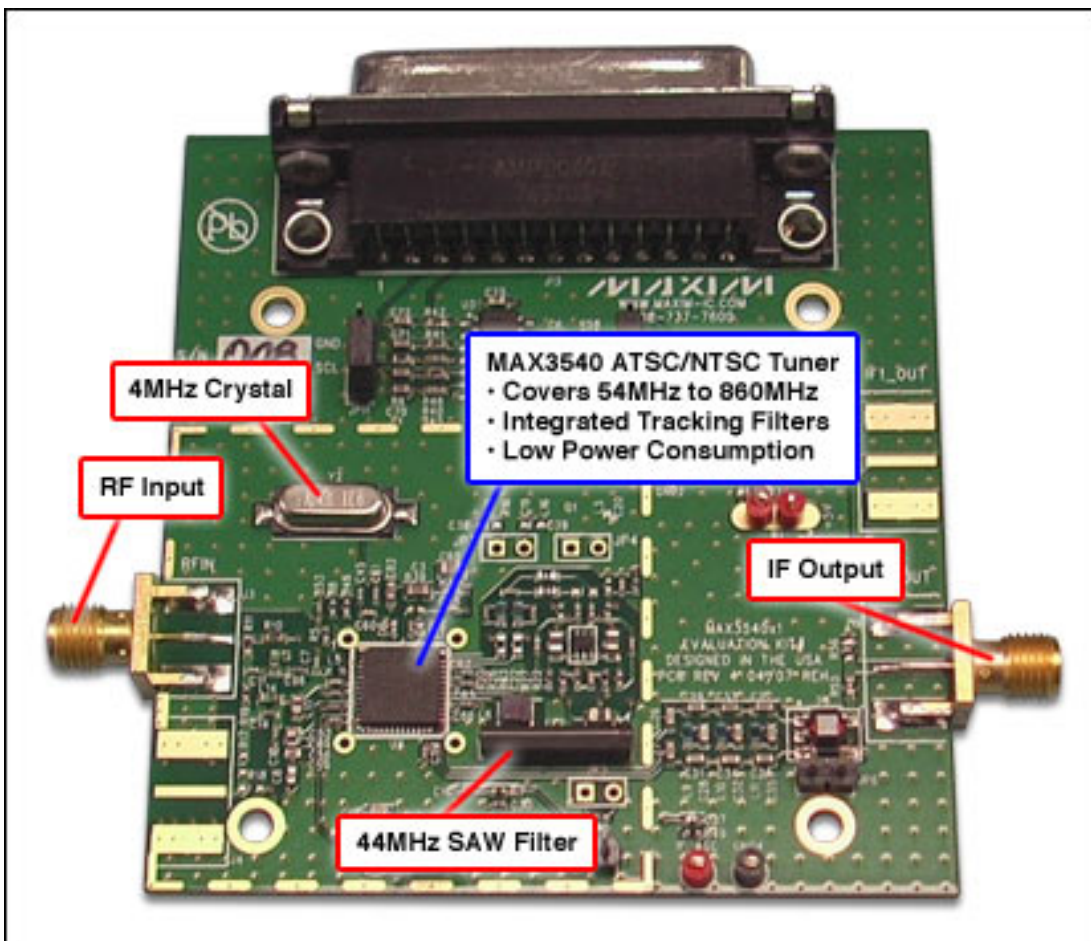


Figure 1. The evaluation board for the MAX3540 single-conversion terrestrial tuner for ATSC/NTSC.

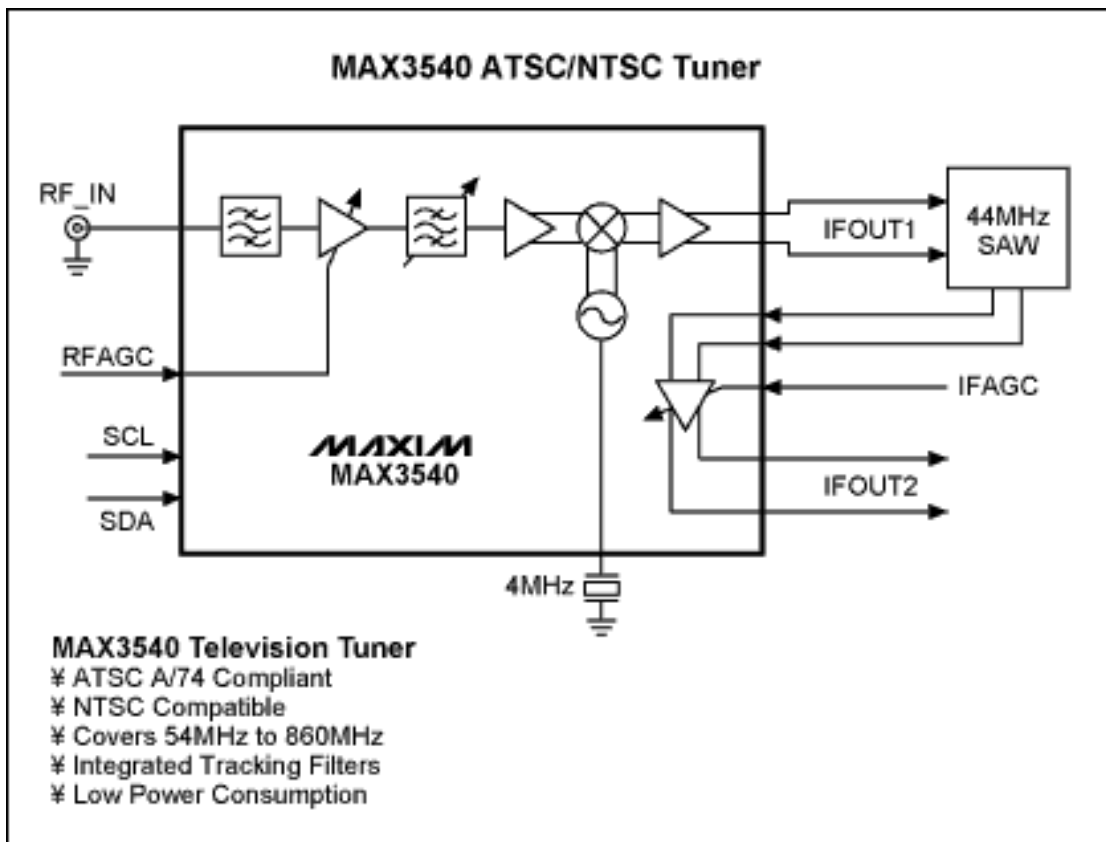


Figure 2. Tuner system block diagram.

The ATSC system performance of the MAX3540 with an ATSC demodulator is shown below.

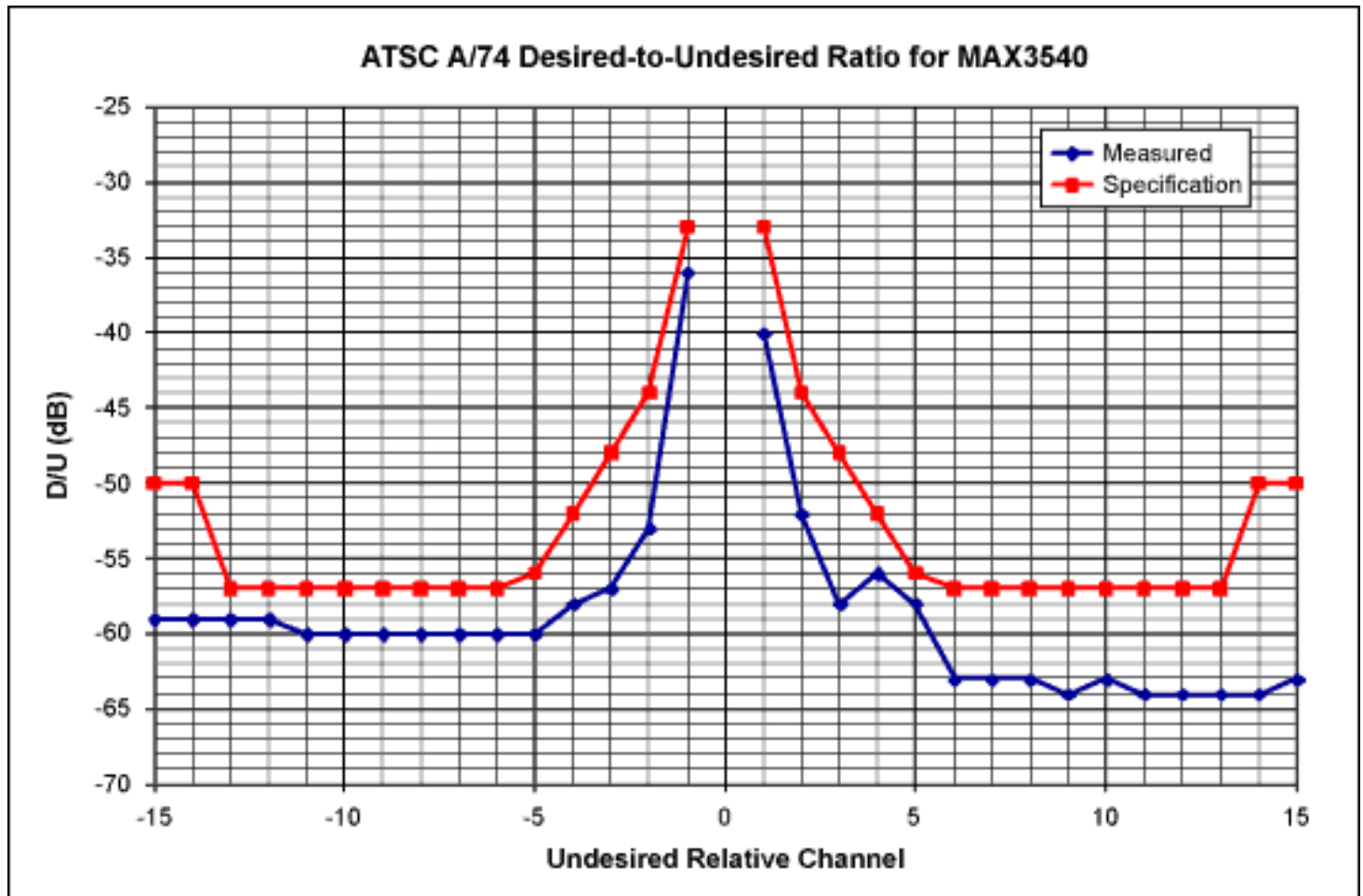


Figure 3. Desired-to-undesired ratio (D/U) measurements meet the A/74 specification with at least 2dB of margin. These measurements are for a weak desired signal at -68dBm with an ATSC undesired signal.

Parameter	Measured	A/74 Specification	Unit
Sensitivity	-85 typical	-83	dBm
Maximum Signal	-2 typical	-8	dBm

Table 1. The margin to A/74 is typically 2dB for sensitivity and 6dB for maximum signal.

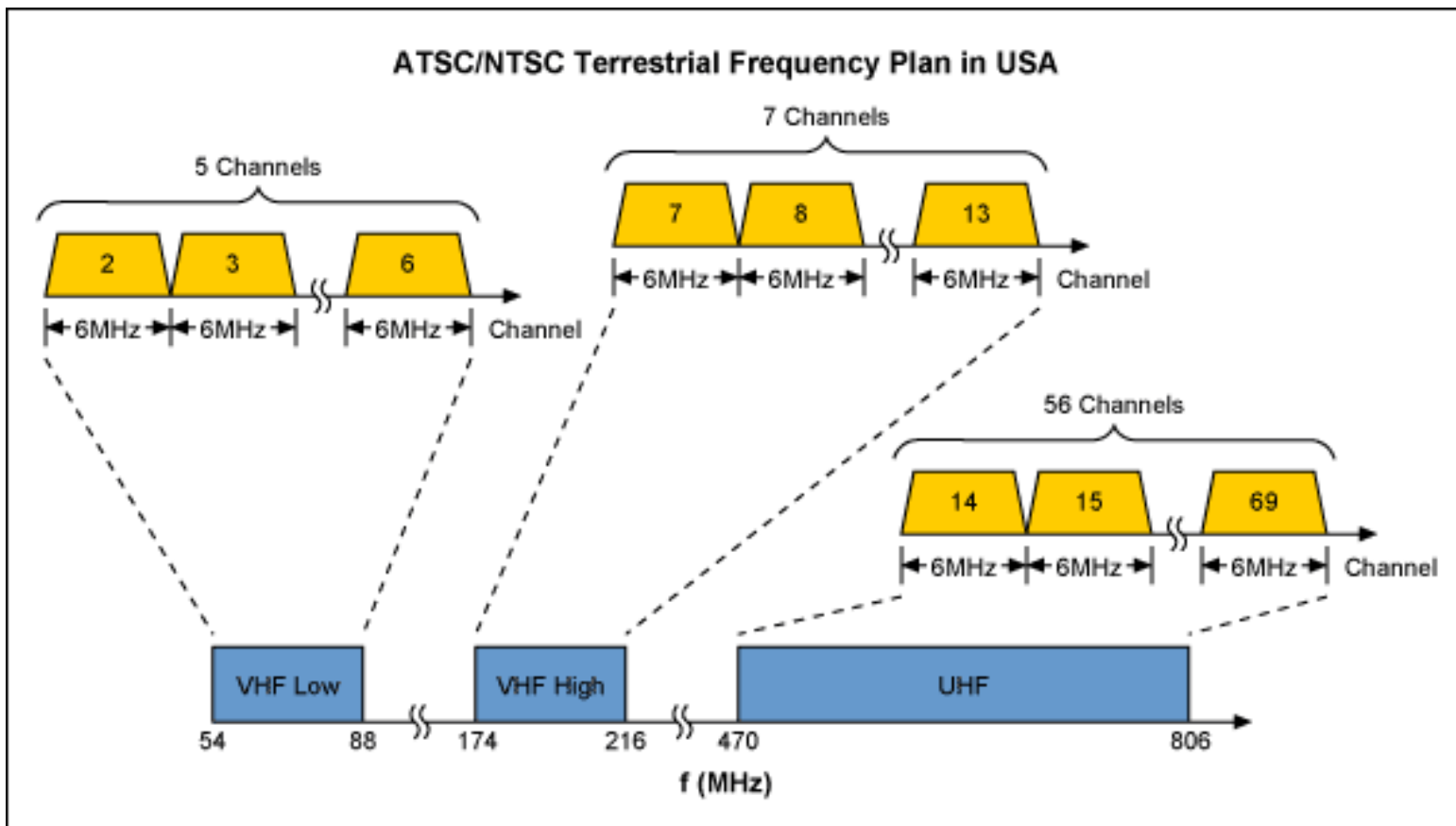


Figure 4. The ATSC/NTSC RF signal is broadcast in the VHF Low, VHF High, and UHF bands, as shown above. The channel spacing is 6MHz.

## Detailed Description

The MAX3540 is a complete single-conversion television tuner designed for use in analog/digital terrestrial applications and digital set-top boxes. This television tuner draws only 760mW of power from a +3.3V supply voltage.

The MAX3540 is designed to convert NTSC or ATSC signals in the 54MHz to 860MHz band to a 44MHz intermediate frequency (IF).

The MAX3540 includes a variable-gain low-noise amplifier, multiband tracking filters, a harmonic-rejection mixer, a low-noise IF amplifier, an IF power detector, and a variable-gain IF amplifier. The MAX3540 also includes fully-monolithic VCOs and tank circuits, as well as, a complete frequency synthesizer. This highly integrated design allows for low-power tuner-on-board applications without the cost and power-dissipation issues of dual-conversion tuner solutions. The MAX3540 is specified for operation in the 0°C to +85°C temperature range, and is available in a leadless 48-pin flip-chip (fcLGA) package.

Application Note 4176: [www.maxim-ic.com/an4176](http://www.maxim-ic.com/an4176)

## More Information

For technical support: [www.maxim-ic.com/support](http://www.maxim-ic.com/support)

For samples: [www.maxim-ic.com/samples](http://www.maxim-ic.com/samples)

Other questions and comments: [www.maxim-ic.com/contact](http://www.maxim-ic.com/contact)

## Automatic Updates

Would you like to be automatically notified when new application notes are published in your areas of interest?

[Sign up for EE-Mail™.](#)

---

### **Related Parts**

MAX3540: [QuickView](#) -- [Full \(PDF\) Data Sheet](#)

AN4176, AN 4176, APP4176, Appnote4176, Appnote 4176

Copyright © by Maxim Integrated Products

Additional legal notices: [www.maxim-ic.com/legal](http://www.maxim-ic.com/legal)