

Keywords: MAX3541, single-conversion, terrestrial tuner ic, tuner, DVB-T, PAL

REFERENCE DESIGN 4175 INCLUDES: ✓Tested Circuit ✓Board Available ✓Description ✓Test Data

## MAX3541 DVB-T/PAL Tuner

May 23, 2008

*Abstract: The **MAX3541** is an integrated, single-conversion terrestrial tuner IC for DVB-T and PAL. The device is designed to convert input signals in the VHF-Low, VHF-High, and UHF bands to an IF frequency of 36MHz. The MAX3541 is designed for television, analog/digital terrestrial receiver, and digital set-top box applications.*

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### Wireless Technology Overview

[Click here for an overview of the wireless components used in a typical radio transceiver.](#)

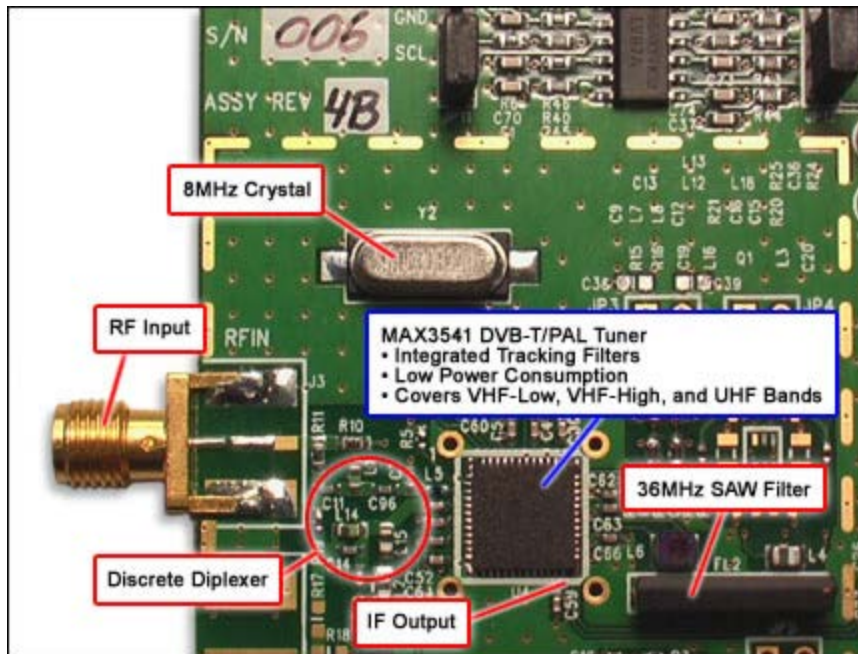


Figure 1. The MAX3541 DVB-T/PAL tuner.

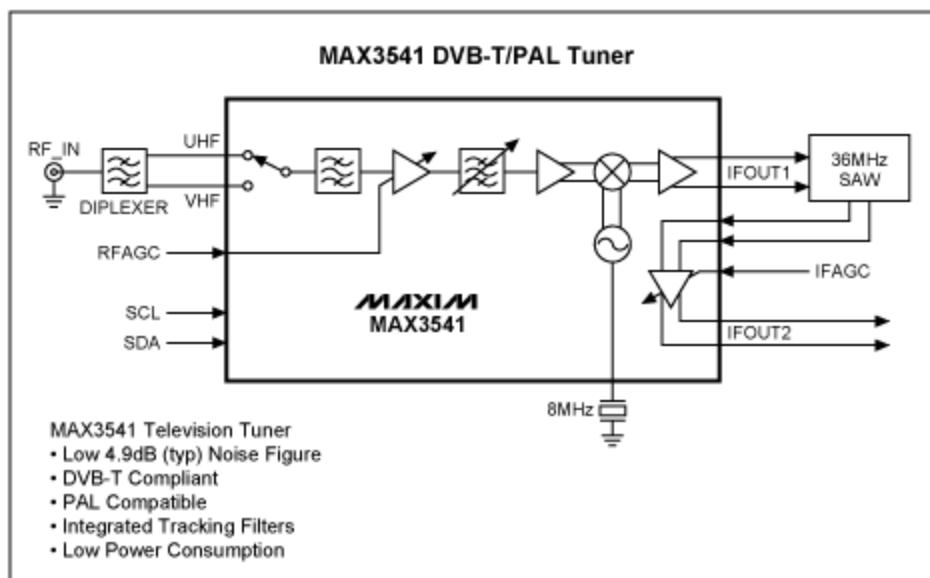


Figure 2. Tuner system block diagram.

## Lab Measurements

DVB-T system performance for the MAX3541 with a DVB-T demodulator complies with the NorDig 1.0.2 specification. Typical UHF sensitivity is -81dBm. **Figure 3** shows system immunity to digital interferers. These measurements are for DVB-T with 64QAM, 2/3 code rate, 8MHz bandwidth, 8k mode, and 1/4 guard interval.

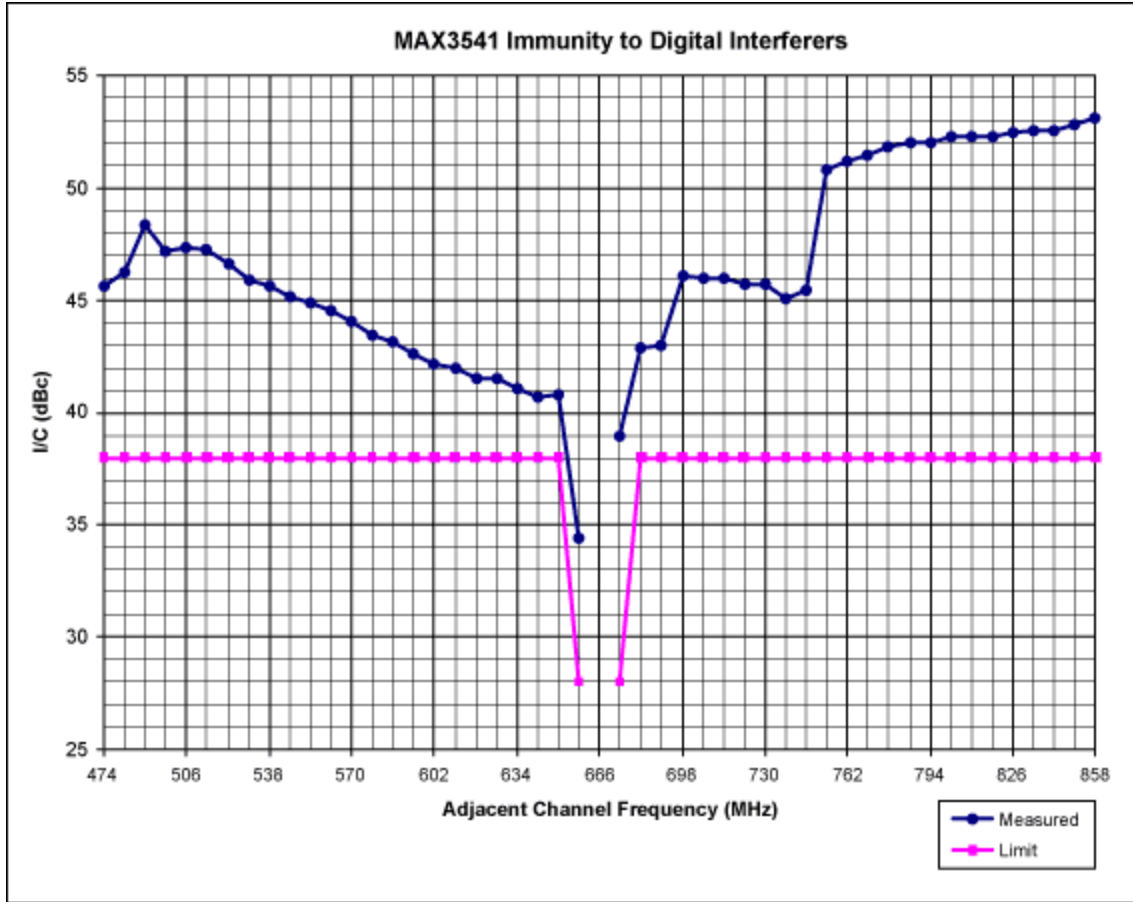


Figure 3. Data shows the immunity to digital interferers. This performance satisfies the NorDig 1.0.3 standard with 2.8dB margin.

### DVB-T/PAL Terrestrial Frequency Plan

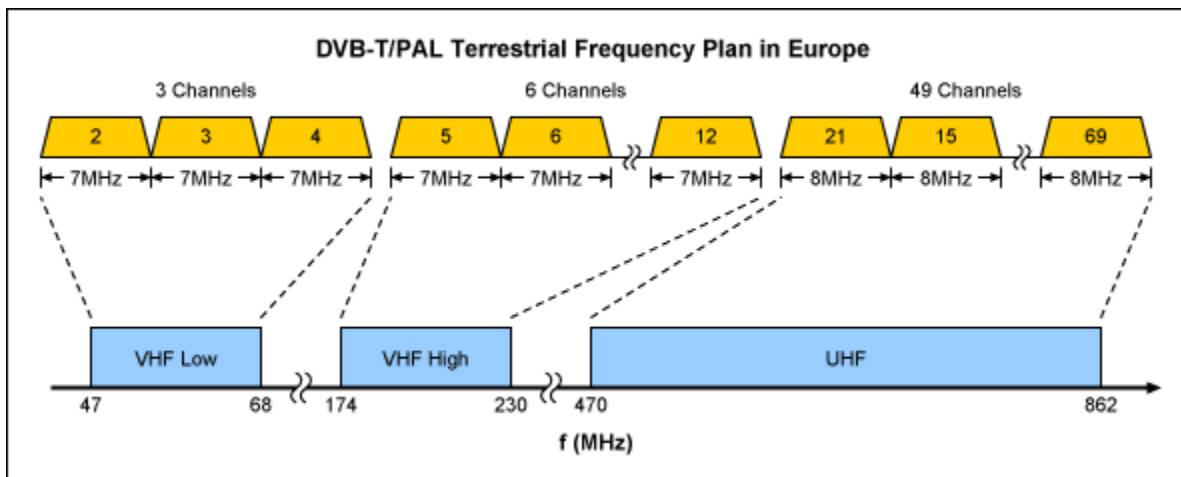


Figure 4. The DVB-T/PAL signal is broadcast in the VHF Low, VHF High, and UHF bands as shown above. Channel spacing is 7MHz in the VHF bands and 8MHz in the UHF band.

## Detailed Description

The MAX3541 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 MAX3541 is designed to convert PAL or DVB-T signals in the 47MHz to 68MHz, 174MHz to 230MHz, and 470MHz to 862MHz bands to an IF frequency of 36MHz.

The MAX3541 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 MAX3541 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 MAX3541 is specified for operation in the -40°C to +85°C temperature range and is available in a leadless 48-pin flip-chip (fcLGA) package.

## Related Parts

[MAX3541](#)

Complete Single-Conversion Television Tuner

## More Information

For Technical Support: <http://www.maximintegrated.com/support>

For Samples: <http://www.maximintegrated.com/samples>

Other Questions and Comments: <http://www.maximintegrated.com/contact>

Application Note 4175: <http://www.maximintegrated.com/an4175>

REFERENCE DESIGN 4175, AN4175, AN 4175, APP4175, Appnote4175, Appnote 4175

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