Product Bulletin

TMS320DRI250 Digital Baseband

Key Benefits

- **Achieve lower system cost** – Integrates AM/FM and HD Radio™ receiver in one simple solution, along with WMA and MP3 CD support
- **Minimize risk while adding value** – Software radio concept allows for future features even after development begins
- **Power of performance** – Provides quality AM/FM performance along with HD Radio technology

Providing customers with the most complete digital radio solution on the market, Texas Instruments (TI) and iBiquity Digital Corporation, the sole developer and licenser of HD Radio™ technology, introduce the industry's first single-chip baseband to integrate all of the digital functions required to build a combined AM/FM and HD Radio receiver. For use in automotive applications, TI's second-generation HD Radio digital baseband and a new, complementary intermediate frequency (IF) analog front end (AFE) provide unmatched performance and integration, including audio processing, MP3 and Windows Media Audio (WMA) CD support on the DSP-based baseband for the first time. Available in 4Q03, the HD Radio solution includes:

- TI TMS320DRI250 software radio baseband
- TI AFEDRI8201 companion analog front end

AM/FM and HD Radio Receiver System

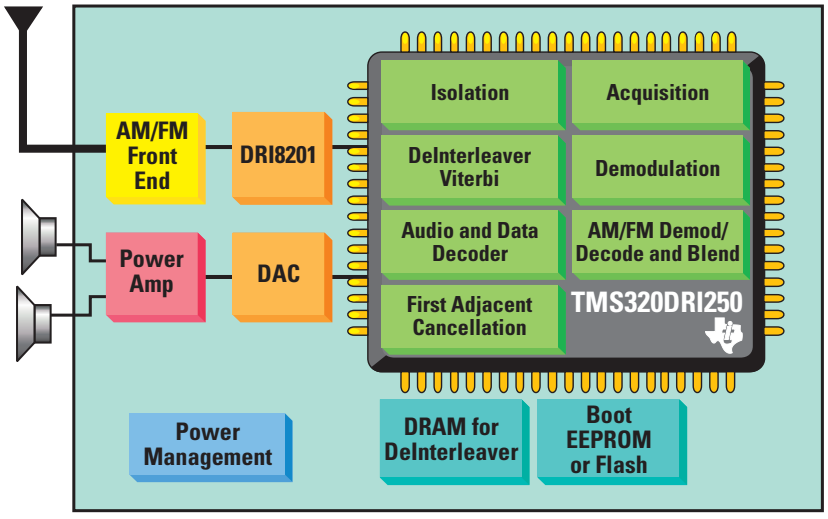
The TMS320DRI250 enables manufacturers to design and deliver HD Radio receivers in 2004 with a path to future developments from TI. The DRI250 chip incorporates digital channel source, data decoding and demodulation functions, along with AM/FM demodulation and decoding and HD Radio/AM/FM blend (see Figure 1). Features also include:

- Compatible with iBiquity's IBOC digital AM/FM system
- On-chip data decoding
- Compatible with standard audio DAC interface
- Can interface to external microcontroller, DRAM and SRAM
- JTAG emulation

Most Integrated Baseband

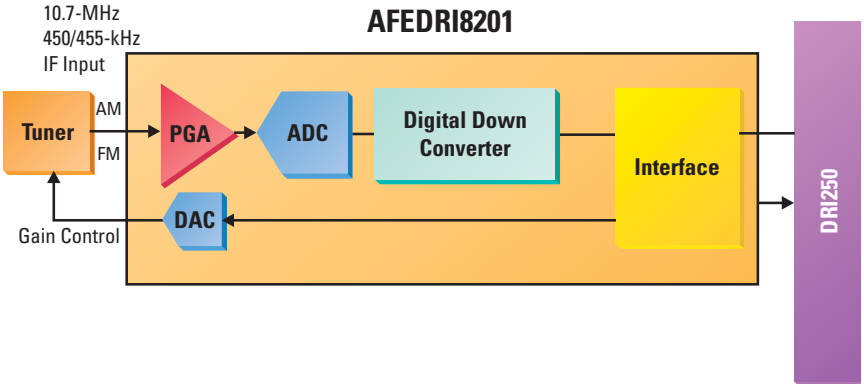
Beyond the integration of HD Radio technology and IF sampled AM/FM, the DRI250 baseband includes audio processing for sound, WMA and MP3 decoders for automotive CD radio. Such integration of digital processing features in a single chip coupled with the analog front end DRI8201 chip results in a lower cost of implementation of HD Radio. As a software radio baseband, the DRI250 baseband, in the future, allows for several new differentiated features such as surround sound FM for an enhanced listening experience and time buffering to rewind live radio. TI's programmable solution also allows for the possibility of

Figure 1. Digital Baseband System



The TMS320DRI250 implements the baseband processing for both HD Radio and AM/FM on a single device. The DRI8201 samples and downconverts the intermediate frequency (IF) from the AM/FM front end.

Figure 2. Companion Analog Front End



ADC and DDC integrated to provide precision AM/FM and HD Radio digitization.

the Tomorrow Radio Project, a proposal that would allow a second audio stream to be broadcast on each radio station, ultimately giving the listener access to more content on the air. As a software radio, the DRI250 provides manufacturers the flexibility and processing headroom to add support for new standards, features or modifications, as experienced recently with iBiquity's conversion to their proprietary HDC codec. Designers, searching for ways to make their HD Radio™ receivers a more compelling product beyond existing AM/FM, will find that the flexibility and processing headroom of the software radio baseband has the critical advantage of providing new features unavailable before.

Integrated AFE for Data Conversion

The DRI250 baseband is complemented by TI's new mixed-signal TMS320DRI8201 chip (see Figure 2), which provides the precision IF analog-to-digital converter (ADC), digital down converter (DDC) and control digital-to-analog converter (DAC) needed in a complete digital radio design. The DRI8201 uses an 80-megahertz (MHz), 12-bit ADC to digitize the AM/FM IF signal from the radio tuner with the high precision needed for optimum AM/FM and HD Radio performance.

Power of Performance

While offering the same HD Radio technology benefits as before, the DRI250 also provides exceptional AM/FM radio performance for automotive receivers. Part of this performance improvement comes through the oversampling done by the 12-bit ADC on the DRI8201. In addition, through software radio algorithms such as adaptive stereo separation and adaptive audio bandwidth control, the DRI250 addresses, among other things, the critical specifications of audio signal-to-noise ratio (SNR), total harmonic distortion + noise, stereo separation and sensitivity, all of which are critical in delivering quality audio sound to the listener.

Availability and Pricing

Samples of the new DRI250 baseband and DRI8201 are available in the fourth quarter of this year, with volume production expected to be available in early 2004. Sample pricing for DRI250 is U.S. $30 each and U.S. $8 each for the DRI8201.

For more information, please contact the nearest TI sales office or visit our website at:
www.ti.com/dri250b