Product Bulletin

AFE8406: Highly Integrated Wideband Receiver for Wireless Infrastructure

Highly Integrated Receiver

The AFE8406 wideband receiver from Texas Instruments (TI) provides two ADCs and up to 16 DDC channels for high density in a variety of wireless infrastructure equipments. Leveraging TI's advanced digital signal processing and mixed-signal technologies, this multi-channel communica-tions signal processor offers a high level of integration that leads to lower costs and faster development times for systems supporting a range of 3G standards. The integration of multiple ADCs and DDCs into a single AFE8406 can significantly reduce board space and lower system cost.

Wireless applications that can benefit from the integration, performance and flexibility of the AFE8406 include:
- Base station receivers
- Multi-carrier digital receivers
- UMTS (4 carriers/1 sector with diversity)
- CDMA-1X (8 carriers/1 sector with diversity)
- TD-SCDMA (16 carriers/ 1 sector without diversity or 8 carriers/1 sector with diversity)
- Wideband receivers
- Software radios
- Wireless local loop
- Intelligent antennas

The AFE8406 receiver delivers outstanding IF performance with extremely low noise characteristics, assuring the signal integrity that enables multi-carrier systems. The high SNR and SFDR performance provided by the integrated dual channels of the 14-bit 85 MSPS ADC enable the designation of up to eight carriers for each channel. The device provides a greater number of DDC channels than any previously available solution, enabling more carriers on each signal chain. The integrated DDC channels further support the channelization of each individual carrier in the receiver. The flexibility of the DDC also enables the support of narrowband or wideband carriers. This level of integration simplifies and reduces the amount of
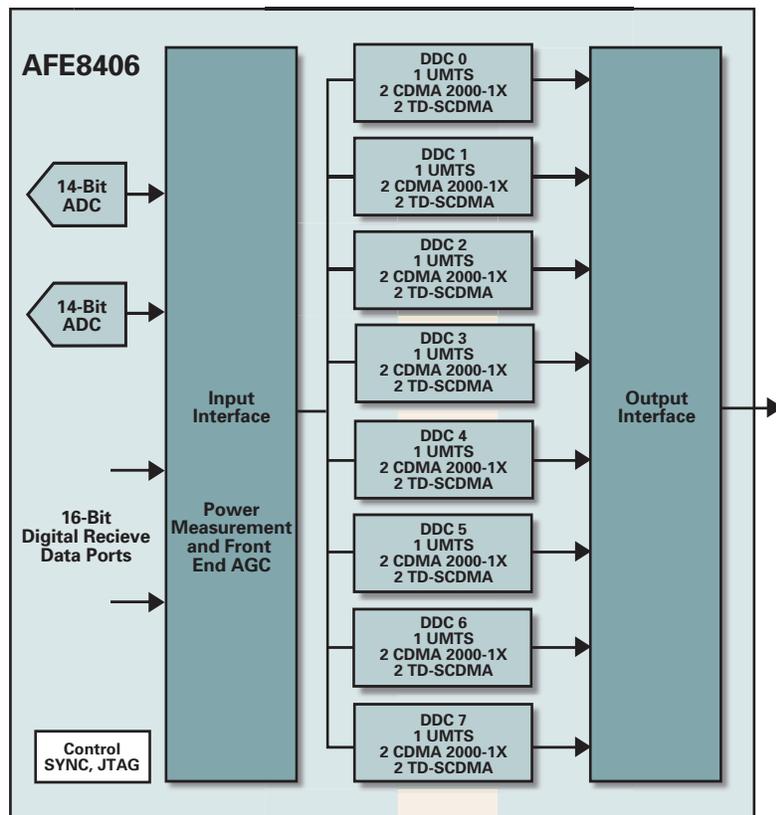
The AFE8406 wideband receiver combines two ADCs and up to 16 DDC channels to achieve higher density and lower costs in a variety of wireless infrastructure equipments.

interfaces required between multiple ADC and DDC channels, as well as reduces the number of devices necessary to achieve high-density applications on one chip. The result is a smaller and lower-cost board.

An additional AFE8406 feature that provides flexible implementation are two 16-bit digital inputs. Each DDC channel can be programmed to accept data from any of the four inputs, and each channel can operate with real or complex inputs. The ADC and DDC functions are clocked independently, with built-in FIFO support for each. The device provides received total wideband power (RTWP) measurement for the composite power across carriers, with a programmable time window for measurement. The AGC in this block detects signal power, generates 6-bits control word going outside to the digitally controlled variable gain amplifier (DVGA) connected before the ADCs, thereby creating a front end composite AGC loop that maximizes full use of the ADCs dynamic range achieving better sensitivity.

The AFE8406 wideband receiver is available in a small-footprint, 23 mm x 23 mm BGA package that keeps board requirements to a minimum.

Development Support
The AFE8406 is backed by TI's worldwide design support and manufacturing capacity. An evaluation module with the GC Studio software suite is available for analysis, providing a fast start in development. Application notes and reference designs are also available. TI's in-depth support and manufacturing strength help speed time to market and volume ramp up for wireless infrastructure products.

For More Information
To learn more about the AFE8406 wideband receiver please visit our Web site at **www.ti.com/afe8406**. For more information about any of TI's extensive line of wireless infrastructure products, call your TI sales office or visit our Web site at **www.ti.com/wi** to find out how TI can help you cost-efficiently enhance your next generation of wireless products.

TI Worldwide Technical Support

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