AFE Combines Codec, Embedded Signal Processing and Auxiliary System Support

The CMX7861 'FirmCODEC' is a full featured analog front end for DSP/FPGA/Microcontroller based systems. The device is a combination of codec, embedded signal processing and auxiliary system support functions, allowing simple interfacing between analogue and digital systems that together improve overall system performance, reduce development time and overall system cost, according to the company. The device is intended for use in a number of applications including radio systems performing the main data conversion and auxiliary operations for monitoring and control, operating in channel bandwidths up to 50 kHz and interfacing RF devices to baseband DSP/FPGA/microcontroller. Single-ended and differential interface options are provided and I/Q-based operation is supported. Fully-programmable on-chip independent dual channel, digital channel filters can be used for signal conditioning purposes. An Intelligent four-channel SAR ADC, 4 independent DACs and GPIO sub-systems perform valuable functions and minimize host interaction and resources. Two synthesized system clock generators develop clock signals for off-chip use. The C-BUS/SPI master interface expands host C-BUS/SPI ports to control external devices. Two general modes of operation are supported: codec mode and modem mode.

Codec mode is intended for applications where a general purpose codec is required. When in codec mode, the CMX7861 will provide digital-to-analogue and analogue-to-digital conversion, and a front end intelligent codec for the DSP/FPGA/Microcontroller.

Modem mode is suited to applications where the CMX7861 is used to transmit and receive modulated data. Modem mode provides a transmit signal interpolator which

will aid in the modulation process by converting mapped symbols to a filtered, modulated output. Receive channel filters are also provided.

The CMX7861 uses CML's proprietary FirmASIC component technology that enables on-chip sub-systems to be configured by a Function Image data file, which is uploaded during device initialization and defines the device's function and feature set. The Function Image can be loaded automatically from a host microcontroller over the C-BUS serial interface or from an external memory device. The device's functions and features can be enhanced by subsequent Function Image releases, facilitating in-the-field upgrades.

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