CML Microcircuits
COMMUNICATION SEMICONDUCTORS

Product Preview

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DE9944

SDR Demonstrator

Software Defined Radio Demonstrator for FDMA Digital/Analogue PMR

Introduction

FDMA (6.25 kHz) digital PMR is an enabler to achieve highly functional solutions by using low cost and low complexity technology.

There are a number of FDMA digital PMR technologies available including: dPMR, NXDN, ARIB STD-T98, ARIB STD T-102, all providing the best possible channel efficiency.

dPMR is an ETSI standard that offers voice and/or data for peer -to-peer through to complex trunking applications. The dPMR ETSI standards TS 102 490 and TS 102 658 comply with the Harmonised EN 301 166-2 Standard.

The DE9944 FDMA digital radio SDR demonstrator provides the fastest route from evaluation through to production of a small, highly integrated FDMA digital PMR Radio.

Design Support

Available via the CML website:

- DE9944 SDR Demonstrator
  - User manual
  - Board schematics
  - Board Gerber files
  - BOM list
  - Scripts
  - Host 'C' code
- Individual Product Data
  - CMX7141 Analogue/ digital PMR Processor
  - CMX994 Direct Conversion Receiver
  - CMX7262 Professional Radio Vocoder
  - CMX618 RALCWI Vocoder

DE9944 Brief Description

The DE9944 is a compact demonstration platform for Narrowband FDMA Digital/Analogue PMR Radio, providing a complete RF to baseband solution.

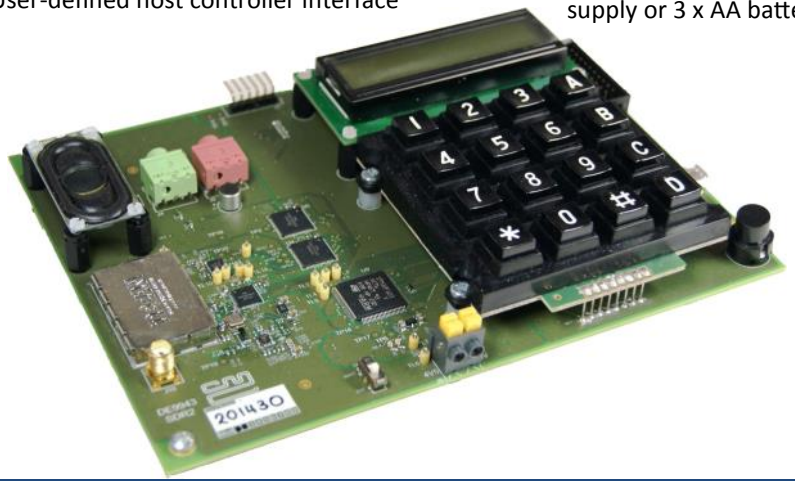
The board is based on the CMX7141 FDMA PMR Processor and incorporates the CMX618 RALCWI Vocoder, the CMX7262 TWELP Professional Radio Vocoder, and the CMX994 Direct Conversion Receiver. The board can be used to demonstrate a complete RF transceiver and baseband function supporting a direct conversion receiver and VCO 2-point modulation transmitter.

The DE9944 features a built in keyboard, display, microphone and speaker and so can be used to demonstrate peer-to-peer operation in a stand-alone configuration. The board has an ARM processor which handles initial board power up and loading of the Function Images for the CMX7141 and CMX7262. Once the system is powered up, the processor implements basic radio functionality (channel selection etc) and baseband control, allowing demonstration of a simple voice call and data transfer.

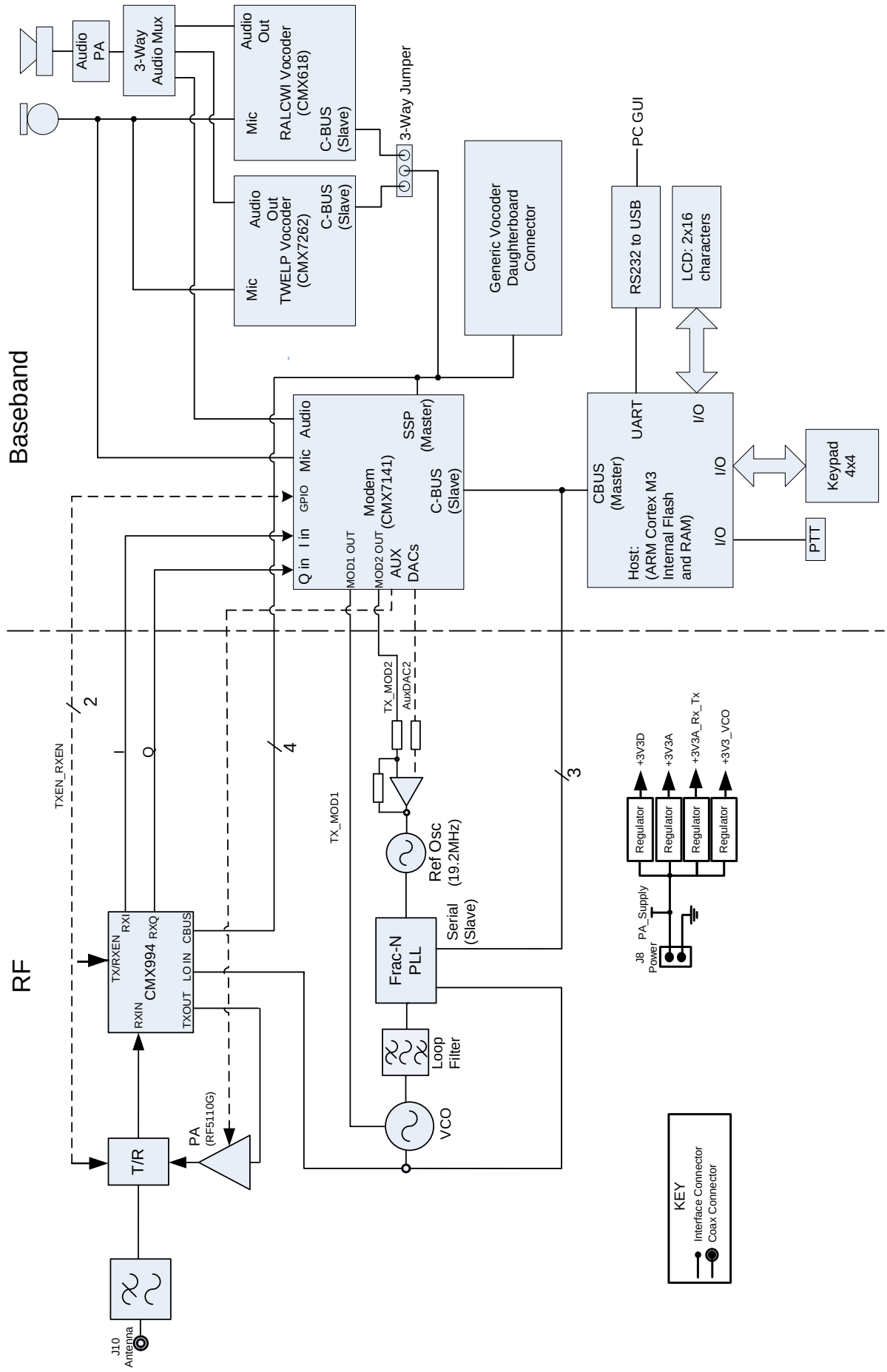
The DE9944 provides a Fractional-N PLL and VCO plus associated circuits to provide local oscillator signals for the CMX994. The design also includes a 1W power amplifier, harmonic filter and Tx/Rx switch. The RF performance is designed to be compliant with EN 301 166 for dPMR applications and TIA-603-D / EN 300 086 for analogue applications. All the circuits are provided with power-down capability to allow powersave / standby operation.

Feature Summary

- Direct Conversion Digital Radio Demonstrator
- Digital PMR (e.g. dPMR) and Analogue FM
- Provides demonstration platform for:
  - Direct Conversion Receiver CMX994
  - FDMA Radio Processor CMX7141
  - TWELP Professional Radio Vocoder CMX7262
  - RALCWI Vocoder with Integrated Voice Codec CMX618
- Can function in the following modes
  - Completely stand-alone
  - Controlled by scripts running via PC
  - User-defined host controller interface
- On-board
  - ARM Host Processor (Cortex M3)
  - Frac-N PLL and VCO for 444 MHz to 450 MHz Operation
  - 1W Power Amplifier
  - Microphone
  - Loudspeaker
  - Jack sockets for audio in/out
  - 16-button (4 x 4) Keypad
  - 2 x 16-character LCD Display
  - Powered by external 4.5V power supply or 3 x AA batteries



Board Block Diagram



For further details of the DE9944 SDR Demonstrator for FDMA Digital/Analogue PMR, please visit CML's website www.cmlmicro.com or just search for DE9944

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