CEA 3207A
ARM7-BASED CAR ENTERTAINMENT CONTROLLER

The CEA 3207A is the first device of Micronas' 32-bit Car Entertainment Controller family based on an ARM7TDMI CPU core.

Like the already available CDC 3207G, the CEA 3207A is part of the LEAP family concept (Low Emission Automotive Processor).

The microcontroller with its ARM7TDMI RISC CPU core allows two states of operation: ARM state with 32-bit instructions and THUMB state with 16-bit instructions.

It is suited for entertainment-related applications like car radio or navigation systems. The current version CEA 3207A offers 32 kBytes of SRAM, 512 kBytes of Flash, and 8 kBytes of boot ROM. Communication is possible via two FullCAN modules, two I^2C modules and two UART or SPI modules each. Due to its scalable architecture, further derivatives can be obtained within short lead time. An upgrade version with 1 MByte Flash and up to 64 kBytes RAM, as well as a downgrade version with 256 kBytes Flash and 16 kBytes RAM in the same package is planned. All devices have the patented built-in ERM (EMI Reduction Module) and are operated on a single 5-V power supply.

Features

- 512 kBytes Flash ROM
- 32 kBytes SRAM
- 8 kBytes boot ROM
- Four CPU operation modes (Deep Slow, Slow, Fast, PLL)
- PLL circuitry delivering up to 50 MHz
- 4- to 5-MHz oscillator
- EMI reduction module (ERM)
- Digital watchdog
- Central clock divider
- Interrupt controller with 40 inputs and 16 priority levels
- Six port interrupts
- Regulator input supervision for reset/ alarm
- Clock and supply supervision
- 16-channel 10-bit ADC
- Two comparators
- ADC reference (1 internal, 3 external)
- 48 × 4 LCD module (optional)
- Three DMA channels

- Two UARTs, two SPIs
- Two CAN modules with 512 Bytes each of object RAM according to Bosch specification V2.0B (32 message objects)
- DigitBus master module
- Two I^2C master modules
- Six PWM modules (configurable as 2 × 8 bit or 1 × 16 bit)
- Phase frequency modulator
- Sound generator with auto decay
- Two SW-selectable clock outputs
- 16-bit free-running counter with six capture/compare modules
- 1 × 16 bit timer and 4x8 bit timer
- JTAG interface
- -40 to +105 °C case temperature range
- Single 3.5 V to 5.5 V supply voltage (limited I/O performance below 4.5 V)
- Up to 100 GPIOs
- 128-pin PQFP package with 0.5 mm pin pitch

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Application

The CEA 3207A targets infotainment applications with a need for high performance. It serves as controller, as well as interface to signal processing units.

Due to its scalable architecture, the CEA 3207A can be upgraded with more memory, CAN controller, DSP, and graphical functions. The application can also be upgraded towards multistandard decoding capabilities (MP3, AAC, WMA) using Micronas' MAS 35xx family devices.
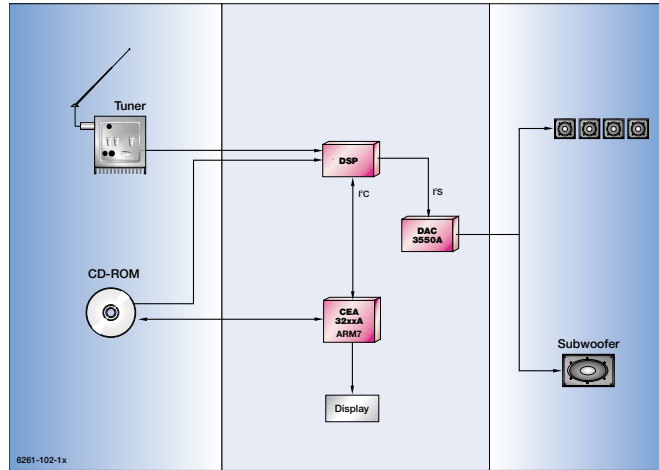

Fig. 1: Example application: CD-ROM-based car radio

System Architecture

The Car Entertainment Controller CEA 3207A contains an embedded ARM7-TDMI processor which operates at a maximum clock frequency of 50 MHz.

Internally, this device works with different supply voltages: 2.5 V for the core and 3.3 V for the Flash memory.

The system is scalable in terms of Flash memory, RAM, CAN, and the number of peripherals and can be expanded up to 1 MByte of Flash memory.

The built-in ERM delivers superb EMI results reducing the peak values by up to 10 dBµV.
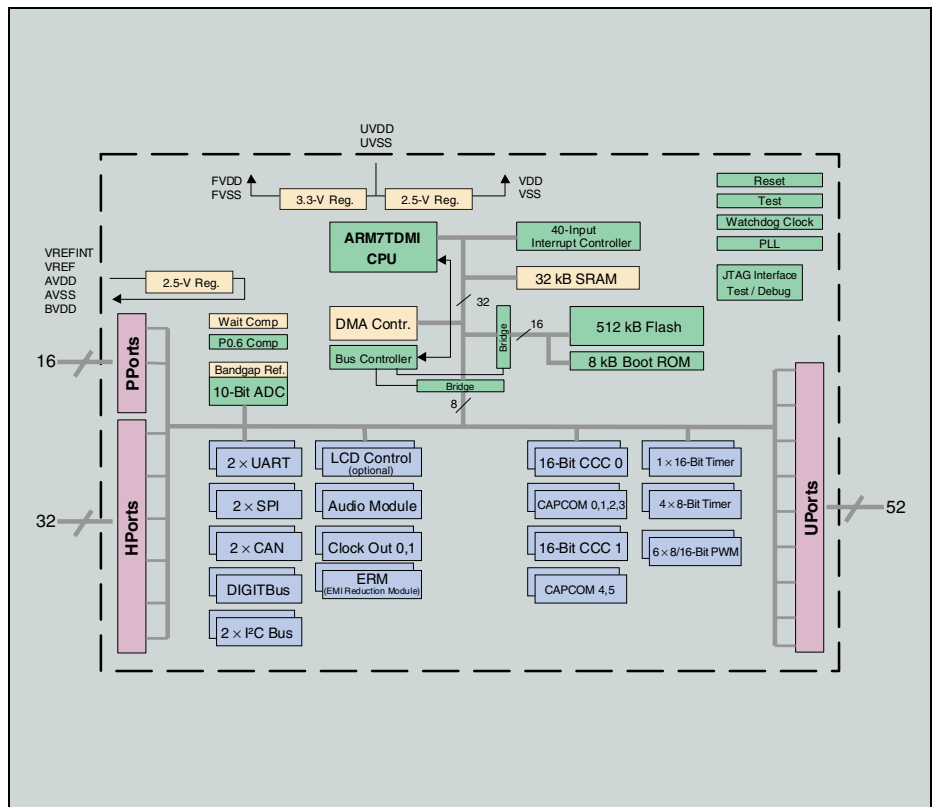

Fig. 2: Block diagram of the CEA 3207A