Aria
Freescale MPC512x
CPU module

DAVe
Simply Embedded
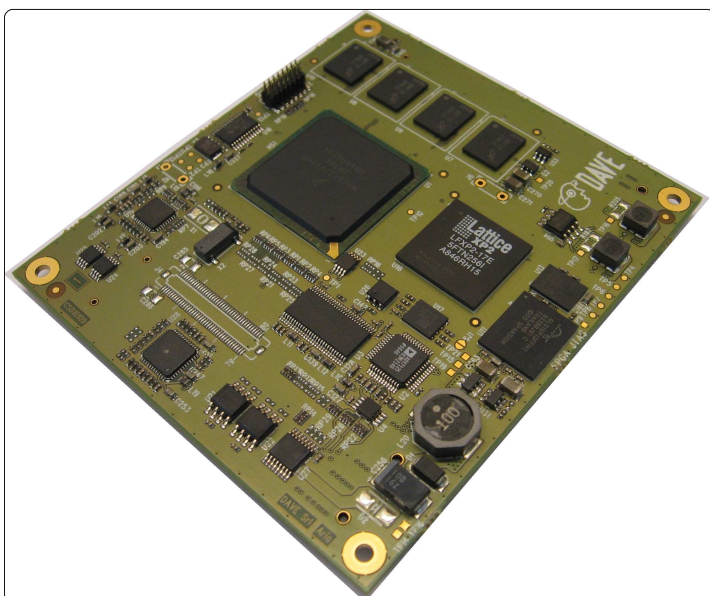
- CPU module based on Freescale MPC512x Power Architecture CPU
- e300 core built on Power Architecture technology
- Up to 400 MHz performance and 760 MIPS
- 32-bit RISC audio accelerator engine (AXE)
- PowerVR® MBX Lite 2D/3D Graphics Engine
- Evaluation Board available with exhaustive Development Kit
- FPGA on board for high flexibility
- Ready for Linux 2.6 + native component driver

ARIA is a high-level PowerPC CPU module based on Freescale MPC512x Power Architecture microprocessor.

ARIA is suitable for single board computing for industrial, automotive and consumer applications, including embedded solutions requiring network connectivity, sophisticated displays, rich user-interfaces (telematics, rear-seat entertainment systems, vehicle connectivity, infotainment, surveillance and security systems).

ARIA allows quick deployment of solutions due to the COM Express compliance and provides high flexibility thanks to the powerful FPGA on board.

Main Features

- Up to 1 GB DDR2 SDRAM
- Flash NOR (up to 128 MB) and Flash NAND (up to 1 GB) on board
- 4 x USB, 2 x UART, 2 x CAN
- SRAM with battery backup
- 1 x Serial ATA, 1 x Parallel ATA, 1 x SD/MMC
- Fast Ethernet LAN
- DIU Integrated Display Controller supports up to XGA resolution
- 1 x LVDS, 1 x VGA
- PCI, LPC and I2C buses
- Touch Screen controller
- Small form factor: 95mm x 84mm
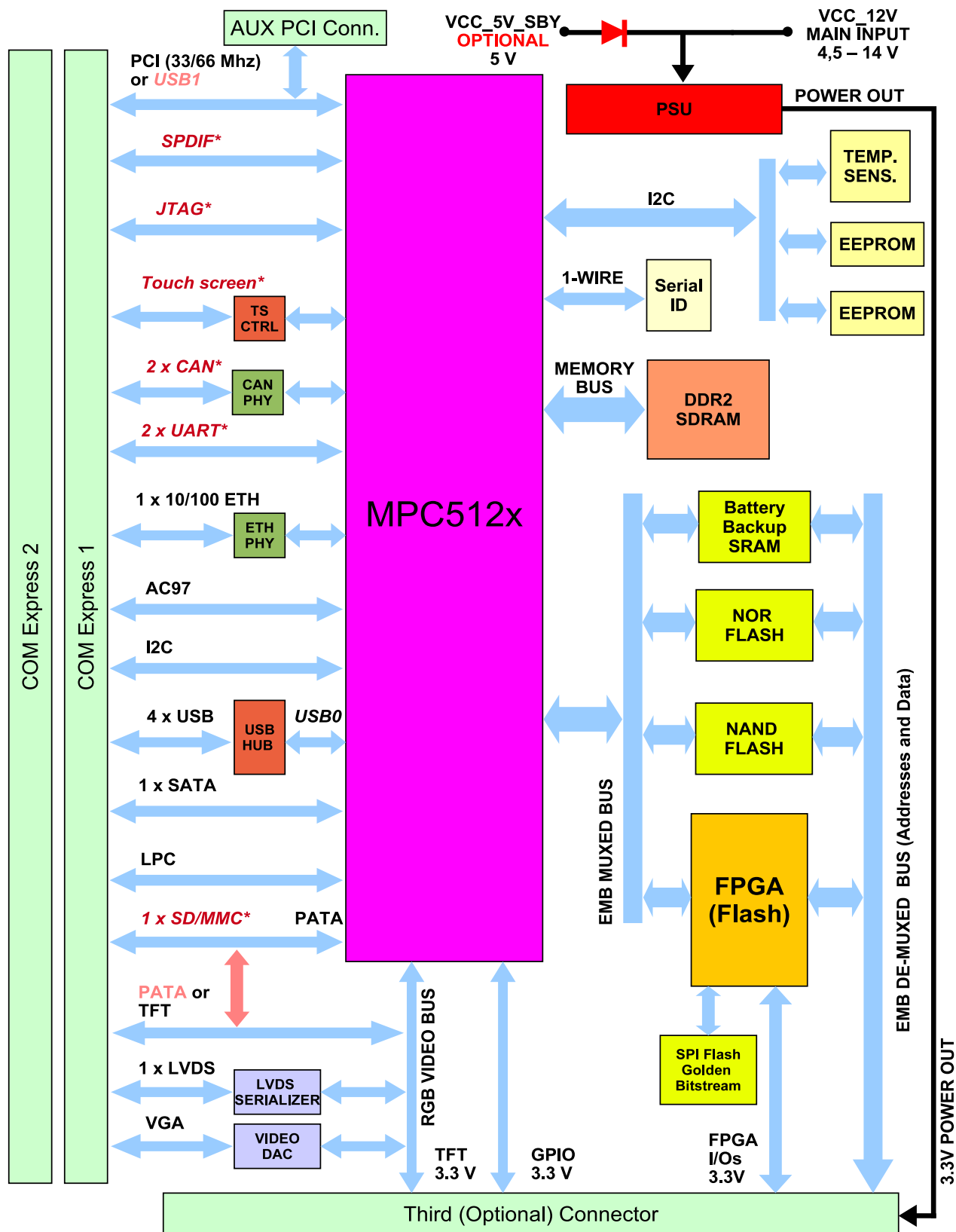- Available as COM Express Pluggable, Plus and Enhanced profiles

Block Diagram

* : Interface available only on COM Express Plus and COM Express Enhanced profiles

AUX PCI Conn.

VCC_5V_SBY **OPTIONAL** 5 V

VCC_12V **MAIN INPUT** 4,5 – 14 V

PCI (33/66 Mhz) or *USB1*

SPDIF*

JTAG*

Touch screen*

TS CTRL

2 x CAN*

CAN PHY

2 x UART*

1 x 10/100 ETH

ETH PHY

AC97

I2C

4 x USB

USB HUB

USB0

1 x SATA

LPC

1 x SD/MMC*   PATA

PATA or TFT

1 x LVDS

LVDS SERIALIZER

VGA

VIDEO DAC

COM Express 2

COM Express 1

MPC512x

RGB VIDEO BUS

PSU

POWER OUT

I2C

TEMP. SENS.

EEPROM

EEPROM

1-WIRE

Serial ID

MEMORY BUS

DDR2 SDRAM

Battery Backup SRAM

NOR FLASH

NAND FLASH

FPGA (Flash)

SPI Flash Golden Bitstream

EMB MUXED BUS

EMB DE-MUXED BUS (Addresses and Data)

3.3V POWER OUT

TFT 3.3 V

GPIO 3.3 V

FPGA I/Os 3.3 V

Third (Optional) Connector

Technical Specification

CPU Freescale MPC5121e and MPC5123
e300 Power Architecture core, 90 nm process
760 MIPS @ 400 MHz

Multimedia PowerVR MBX Lite 2D/3D Graphic Accelerator
32 bit AXE RISC Audio Accelerator

Supervisor On board power supply supervision and power sequencer
Watchdog

Memory
Cache 32 Kbyte instruction, 32 Kbyte data
SDRAM 64, 128, 256, 512 or 1024 MB DDR2
NOR 8, 16, 32, 128 MB
NAND All sizes, on request
SRAM Up to 512 Kbyte, battery backup
EEPROM 2x 32 Kbyte (1 COM Express standard EEPROM, 1 user EEPROM)

Interfaces
LAN Fast Ethernet 10/100 Mbps
UART 2x UART ports (1x full, 2x four-wires)
USB 4x 2.0 Host ports
CAN 2x ports (2.0A/B protocol)
External Bus PCI specification v2.3 compliant, 32 bit, 33/66 MHz
LPC bus
Debug JTAG IEEE 1149.1 Test Access Port (for CPU and FPGA)
PC Card SD/MMC card host controller
Audio S/PDIF serial audio interface
AC97 controller
Hard Disk Support 100 MB/s Parallel ATA IDE controller
150 MB/s Serial ATA controller
Other On-board Flash FPGA
Temperature sensor
1-wire Silicon Serial Number
GPIOs available
Configuration pins available

Video
Resolution Display Interface Unit supports up to 1280x720
Type TFT
LVDS Yes
VGA Yes
Touch Screen Yes

Mechanical
Connectors 2x COM Express type 2
1x optional connector (for COM Express enhanced versions)
Physical 95 mm x 87 mm
Temperature Commercial (0°C / +70°C) Temperature Range
Industrial (-40°C / +85°C) Temperature Range

PSU
Input 4.5V - 14V. Full regulation on board
Consumption TBD

Software
Bootloader U-Boot
Multitasking OS Linux 2.6.xx

Agency approvals
Pre-compliance TBD

Key Factors

- **Power Supply**
  - Extended input voltage range: [+4.5 , +14V]
  - Fully powerable with a +5V signal as an alternative for the COM Express standard (+12V)

- **Available as:**
  - COM Express type 2 Pluggable profile (2 connectors, COM Express compliant. Can be plugged on standard COM Express carrier boards to use the standard interfaces)
  - COM Express type 2 Plus profile (2 connectors, provides more interfaces than the Pluggable version).
  - COM Express type 2 Enhanced profile (as Plus, but with the third connector used for more specific signal routing)
  - COM Express type 2 SuperEnhanced profile (as Enhanced, but with a more powerful FPGA)
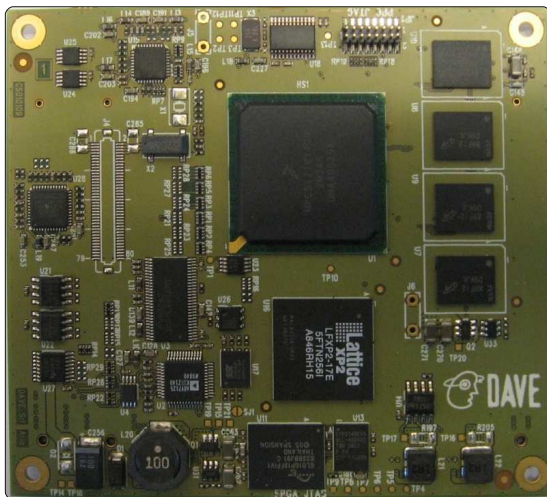
- **Static RAM**
  - Supervisor with automatic battery switchover to allow reliable battery backup

- **EEPROM**
  - Programmable I2C address

- **SD/MMC**
  - Fully compatible with the 3.2 with MMC system specification version and supports up to version 4.0
  - Compatible with high speed MMC card using 1-bit or 4-bit serial interface
  - Compatible with the SDIO standard and SD Physical layer specification with 1 or 4 channels

- **CAN**
  - Implementation of the CAN protocol version 2.0A/B

Aria Order Codes

Please contact our Sales Department (sales@dave.eu) for available models and prices.