Atmel FPGA's
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All the space you need

ASTRIUM
CRISA
AN EADS COMPANY

ATMEL FPGAs

- Devices: ATF280 and AT40KEL040
- Application: PCU for Export.
  - No export regulation constraint is mandatory.
- Two implementations:
  - BSM module: Battery balancing function.
    - Based on CQFP160 AT40KEL040 devices operating in triplication.
    - New design with low risk
  - OBDH module: P/F interface functions & internal unit control.
    - Baseline is the use of CQFP256 ATF280 device. 1 per module
    - Migration from existing design based on RTSX72.
  - Programming PROM: AT17LV017 1Mb (for AT40KEL040)
    AT69170E 4Mb (for ATF280)

ATMEL FPGAs

- BSM application No problems due to the high margin in terms of frequency and resources needed.
- OBDH application
  - > ATF280 device.
    - 4Mb memories **not qualified**
    - Alternative: 4 x 1 Mb memories. Approach **unfeasible** due to the available surface and qualification risks.
    - Back-up solution based on the AT40K.
  - > AT40K device.
    - **Synthesis** issues: The original design fitted in a RTSX72 with an occupation of 50%, but when trying to synthesize in the AT40K, the **design didn't fit**.
    - Serious **limitations** found in **frequency**: 10MHz in the AT40K vs 20MHz in the RTSX72.
    - **Major** HW **changes** induced to secure the design
    - Final result: AT40K with major HW changes, occupancy of almost 100% of the device resources and frequency just in the limit for the application (10MHz)

Development SW

- Atmel development tool: Integrated Development System (IDS)
  - > Tool's Documentation is short.
  - > IDS is not efficient.
    - Device resources
    - Operating frequency
  - > Unfriendly menus
  - > STA tool difficult to use.
  - > Some troubles found during tool set-up (OS constraints: Win XP)
  - > Bitstream downloading from IDS doesn't work. A different tool (called CPS) is needed.
  - > Technical support slow and scarce

Development kit

- Development kit available:
  - Atmel AT40K Rad-Hard FPGA
  - power supply circuit
  - configuration circuit.
- Issues found with the development related to the use of IDS/CPS tool
- Development kit considered too basic:
  - lack of any other type function/interfaces.
  - lack of status leds or selection switches.
  - A little bit poor if compared to other commercial development kits.
- Bugs found in the HW

HW Test

- First steps of testing on HW, but….
  - Available documentation scarce and scattered in unconnected AppNotes.
  - Extra power consumption during power-up.
  - I/O status during power-up. Behaviour not explained
  - ……

Needs/wishes

- Qualification of 4Mb EEPROM
- To improve place and route process
  - IDS tool?
  - Device's HW ?
- Make the IDS a more friendly tool
  - Menus improvement
  - Bitstream downloading
  - STA tool
- Improvement of the documentation and development kit is welcome