IEEE802.11a Baseband SOC



System-on-Chip Design, Guest lecture at University of Kragujevac, Technical Faculty Cacak, 01.10.-05.10.2012

Baseband Processor



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Baseband Components



Baseband Board



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Prototype Laptop



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Fault Tolerant SOC

• Single-event effects (SEU, SET and SEL)

A change of state caused by a charged particle strike to a sensitive volume in a microelectronic device

Alpha particles emitted by radioactive atoms found in packaging materials

Thermal neutrons in certain device materials that are heavily doped with ¹⁰B

High-energy terrestrial cosmic rays (play a major role)

• SEU tolerance by design (LEON3-FT)

Triple modular redundancy (TMR) on all flip-flops

Three copies of a flip-flop

Two of three voting on output

Register file error-correction (up to 4 errors per 32-bit word)

Cache RAM error-correction (up to 4 errors per tag or 32-bit word)

Autonomous and software transparent error handling

No timing impact due to error detection or correction

Fault-tolerant memory controller

Provides an Error Detection And Correction Unit (EDAC)

Corrects one and detects two errors