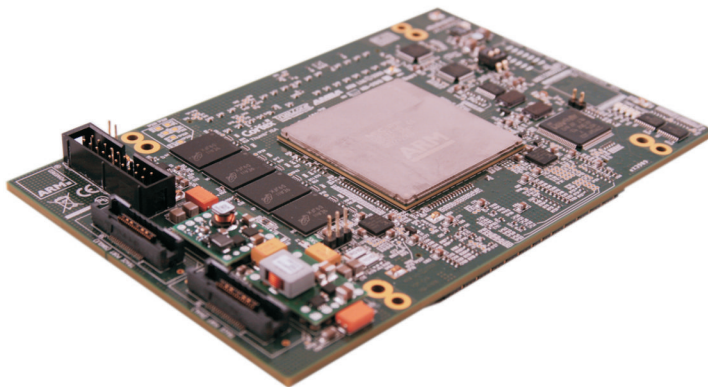# CoreTile *Express* **A9x4**
For the Versatile *Express* **Family**

ARM®

The Versatile™ *Express* family development platform provides an excellent environment for prototyping the next generation of system-on-chip designs. Through a range of plug-in daughterboards hardware and software applications can be developed and debugged.

The CoreTile *Express*™ A9x4 is a daughterboard for use on the Motherboard *Express* μATX for evaluation, and prototyping of the Cortex™-A9 processor. It enables:

- Evaluation of the new ARM Cortex-A9 quad core processor
- System benchmarking
- Operating system ports
- Customer peripheral driver development
- Early software development

CoreTile Express A9x4 for Cortex-A9

The daughterboard uses a TestChip containing a quad Cortex-A9 processor with NEON, and DDR2 memory controller. This provides a high performance sub-subsystem for software development and benchmarking.

The external AXI master and slave ports allow user prototyping in the LogicTile *Express* daughterboards. This is useful when proving peripheral hardware designs, and software/device driver development at near real-time with a real processor.
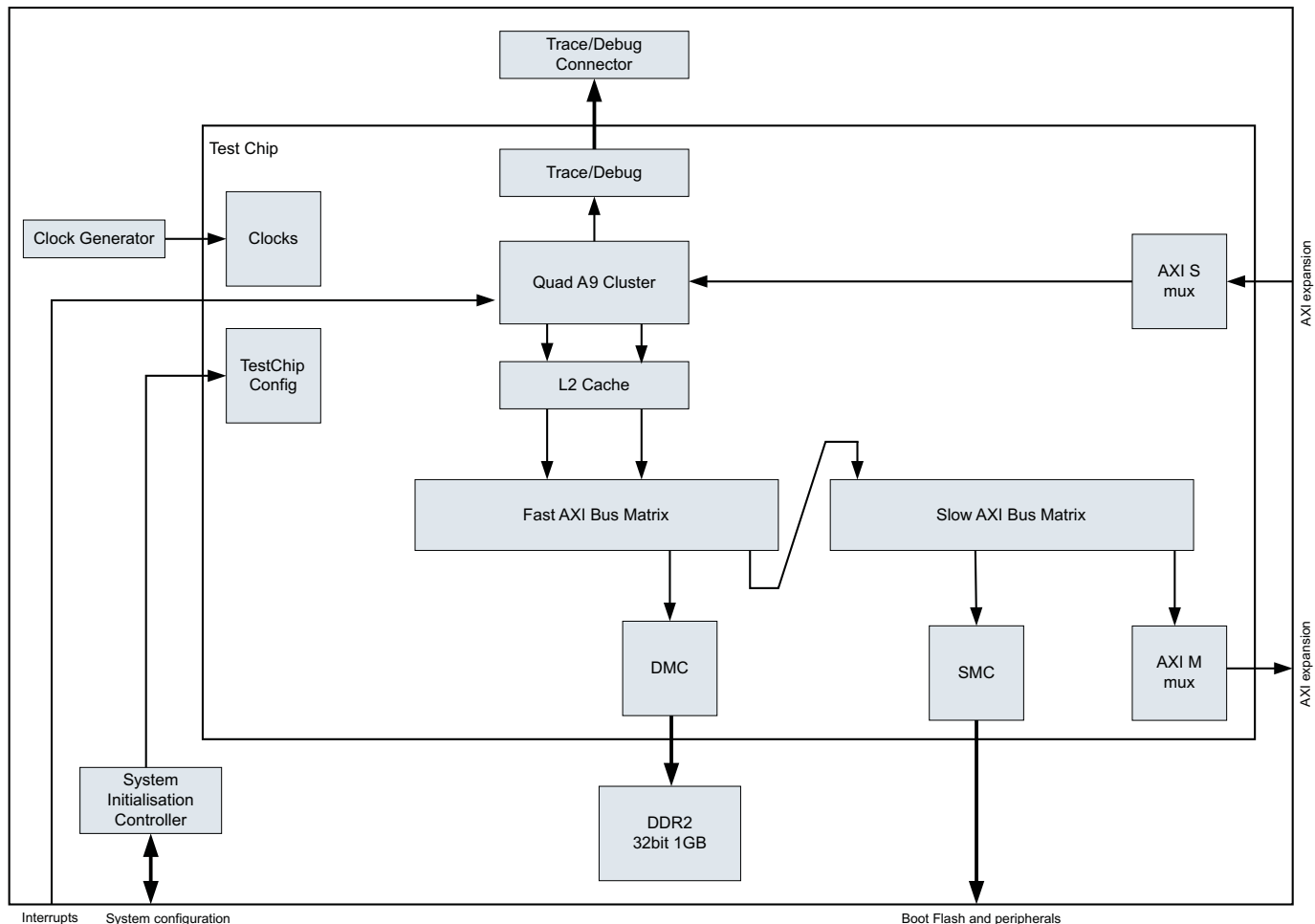
Features

- Processor Subsystem
    - Quad Cortex-A9 processor each with NEON (r0p1) at 400MHz
    - L1 Cache 32kInst and 32kData
    - L2 Cache 512K (L2C-310)
    - Debug via PTM and CoreSight
- AXI Subsystem
    - Internal AXI Fast at 200MHz Slow at 50MHz
    - External AXI Master 50MHz
    - External AXI Slave 30 MHz
    - DMC-341 DDR2 memory 1GB x 32 bit at 266MHz
    - SMC-354 Static Memory Bus Interface 32bit at 60MHz to motherboard
    - TrustZone support TZASC (PL280) and TZPC
    - Boot from NOR Flash or over external AXI
- Expansion support
    - AXI master and slave links to FPGA daughterboard
- Peripheral set and address space compatible with Versatile family
    - EB, PB-11MPCore, PB-A8 and PBX
- Simplified configuration of system
    - USB flash drive to PC
    - Remote power cycling
    - Fast programming and configuration
    - Configuration file for system settings
    - Support for automated/remote operation

Deliverables

- Daughterboard
- Versatile *Express* support DVD
- Boot monitor software
    - Retarget of C I/O libraries
- Self Test software
    - Peripheral driver example
- OS support
    - Linux Debian 2.6.28
    - Symbian to follow
    - WinCE to follow

CoreTile *Express* **A9x4 Architecture**

Trace/Debug Connector	
Test Chip	AXI expansion
Clock Generator → Clocks	AXI S mux
Trace/Debug	
Quad A9 Cluster	
TestChip Config	
L2 Cache	
Fast AXI Bus Matrix	Slow AXI Bus Matrix
DMC	SMC · AXI M mux
System Initialisation Controller	AXI expansion
DDR2 32bit 1GB	

Interrupts   System configuration

Boot Flash and peripherals

CoreTile Express A9x4 Architecture diagram

When connected to a Versatile *Express* motherboard the configuration system enables programming and updating of the CoreTile *Express* A9x4. Configuration and operation parameters of the daughterboard are defined in a configuration file stored on the motherboard.

The daughterboard communicates to the motherboard via a static memory interface for all peripheral and flash memory accesses.

The exported AXI interfaces have dedicated routing for an optimal prototyping solution.

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