

ST100 DSP CORES**DATA BRIEF****1 FEATURES**

- State-of-the-art DSP core architecture
 - Complete & optimized memory systems
 - Multicore solutions
 - Standard or specific tightly coupled peripherals libraries
- Advanced Load/store Architecture
 - Regular and efficient.
 - Optimized for programming in 'C/C++/EC++' languages.
- Two Instruction Sets
 - GP16, a 16-bit instruction set.
 - GP32, a 32-bit instruction set.
- Three Instruction Modes
 - GP16: 2-way superscalar, for compact microcontroller codes.
 - GP32: 2-way superscalar, for high performance microcontroller codes.
 - SLIW: one SLIW per cycle, where a SLIW (Scoreboarded Long Instruction Word), is a bundle of four GP32 instruction words. This mode is for high performance vector codes (DSP loops).
- Predicated Execution For Most Instructions
 - Removes needs of conditional branches.
 - Compact coding and increased instruction level parallelism.
- Flexible Data Format
 - The ST100 supports the following data types:
 - 16-bit, 32-bit and 40-bit unsigned/signed integer.
 - 16-bit, 32-bit, and 40-bit signed fractional.
 - Signed and unsigned byte and Bit.
 - Supports little Endian for data and program.
- Circular And Bit-reversed DSP Addressing Modes
 - Facilitates the implementation of the DSP algorithms like the FIR filters and the FFT.
- Arithmetic Capability
 - 40-bit and 32-bit arithmetic.
 - Packed Arithmetic 2 x 16-bit (SIMD).
 - Saturating (Clamping) and/or Rounding options
- Application Oriented Instructions

- Useful instructions for ETSI (European Telecommunications Standards Institute) primitives in GP32 and GP16:
 - VITERBI...
- General usage instructions:
- Hardware Loop Controllers
 - Zero cycles overhead for continuous data processing.
 - Three nestable loops.
- Memory Space
 - 32-bit addressing range, 4 Gbytes of memory space.
- Interrupt, Trap And Context Switching
 - Fast response to external events or system errors.
- Protection System
 - User mode and Supervisor mode.
- Power Saving
 - Four "IDLE" modes performing power saving operations.

2 DESCRIPTION

STMicroelectronics' innovative ST100® DSP processor core architecture has been conceived specifically for embedded applications in custom system-on-chip products for demanding markets like cellular phones, hard disk drives, engine management units, telecommunication systems and advanced multimedia products. A completely new design, the ST100® architecture combines in a single core the advantages of a 16-bit instruction word for code compactness, a 32-bit instruction word for MCU performance and a 128-bit SLIW instruction word for high DSP performance. The ST100® core is also scaleable, so it can be implemented in many ways, ranging from low power devices for portable products to very high performance devices with a maximum of parallelism. Building on ST's experience in embedded cores, the ST100® architecture is based on an analysis of the real needs of system designers and software engineers in some of the fastest-moving segments of the industry, where high performance, low power consumption and fast time to market are all essential.

Table 1. Revision History

| Date | Revision | Description of Changes |
|----------------|-----------------|-------------------------------|
| September 2004 | 1 | First Issue |

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
ST100, STCC are trademarks of STMicroelectronics
All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com