

## Advanced HD application processor with 3D graphics acceleration and ARM Cortex-A9 SMP CPU

Data brief

### Features

- ARM Cortex-A9, dual core CPU, SMP NEON SIMD engine yielding up to 6000 DMIPS
- ARM Mali-400 quad core GPU yielding up to 1600 Mpixels/s fill rate and supporting up to 1080p60 or 1080p30 stereoscopic 3D graphics
- Dual HD H.264/VC-1/AVS/MPEG2 video decoder or SVC video decode
- MVC video decode for 3DTV: supports up to 1080p60L/60R, 3D video formats
- Dual HD internet video decoding: real video 8/9/10, DivX, Xvid, MP4p2, Adobe® Flash videos
- Single HD internet video decoding: WebM/VP8
- H.264 video encoder up to 1080p60 HD resolution with video preprocessing; deinterlacing, HQ resizing and TNR
- High-quality of image with Faroudja video
- ST proprietary multi-compartmental security IP and DRM processor

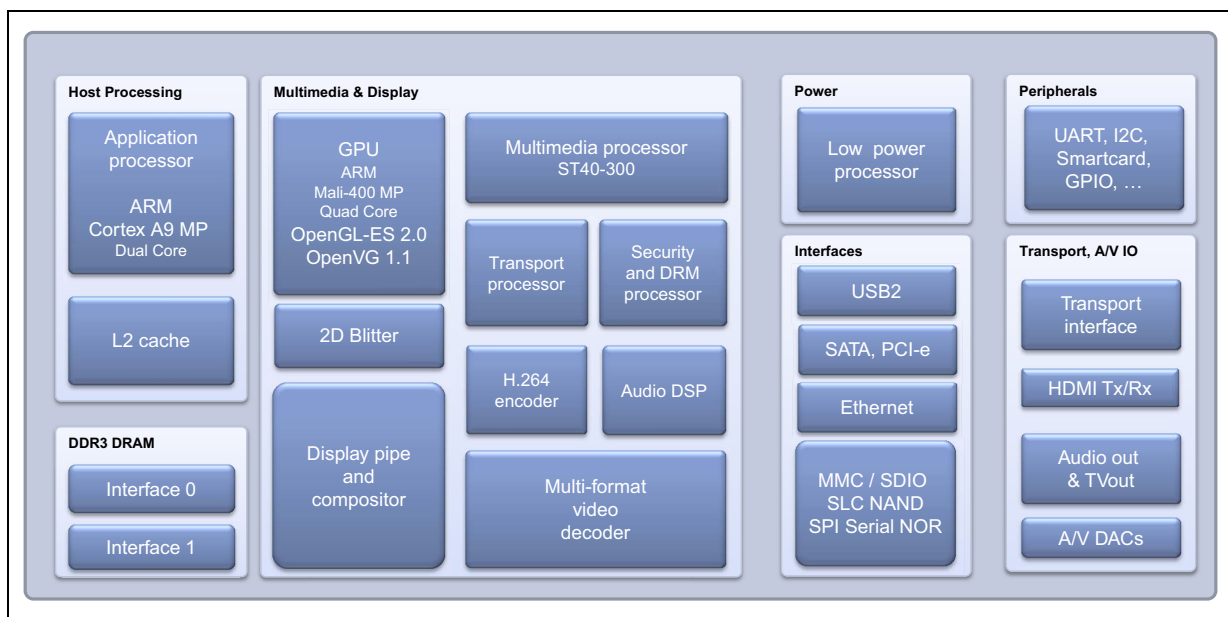
- Dual audio DSP: supports Dolby MS11
- Integrated low power processor: < 30 mW passive standby mode

### Description

The new STiH416 SoC combines the best of STMicroelectronics' leading set-top box system expertise and silicon process capability with ARM's exemplary core architecture.

The STiH416 SoC provides high security and system integration, functionalities tailored to both the broadcast and broadband ecosystems, accessibility for open platform software applications, eye-popping performance and unequalled power efficiency.

This combination of incredible performance, a future-proof architecture, and rich software ecosystems allow operators to offer a rich variety of innovative and value-added services to their subscribers.



# 1 Introduction

The STiH416 application processor integrates in a single IC, multi-stream transport demultiplexing, dual core SMP application CPUs, a real-time CPU, A/V decode, A/V encode/transcode, video processing, true 3D graphics and display, advanced security, peripherals, audio/video DACs, digital A/V outputs, HDMI output and input, dual eSATA2 ports, PCI-e, quadruple USB ports, dual Ethernet controllers (GbE capable), SLC NAND Flash controller and an SDIO/SD-MMC card controller.

Features	Benefits
Dual-core, ARM Cortex-A9 applications CPU, ST40 multimedia real-time processor, ST231 and DRM processor.	Brings full open Internet into the living room. Very high host processor performance, extensive connectivity, supports wide software ecosystem.
Integrated graphics processing unit (GPU); Programmable Vertex (geometry) processor, and quadruple fragment (pixel) processors, accelerated four times full scene anti-aliasing (4 × FSA).	High-performance 3D GPU supporting up to 1080p60 3D graphics or 1080p30L30R stereoscopic 3D graphics for blending with 3D stereoscopic video displays. Advanced 3D user interface. Drive 3D casual and semi core gaming.
Dual video decoder (latest generation) with an ST231-based multi-codec capable controller, coupled with a very high-quality video display pipeline and 1080p120 display compositor.	Further extends broadcast services to support internet video formats. Full HD Full Motion 1080p120 3DTV, MVC, SVC and so on.
H.264 video encoder capable of encoding up to HD resolutions of 1080p60 (or 2 x 720p60 or 4 x 720p30); includes preprocessor video pipeline that can resize, deinterlace and noise filter the video before encoding.	High-quality transcoded video, whatever the input source resolution / format and transcoded output resolution, up to HD. Adaptive streaming server in home network.
HDMI 1.4b receiver input.	Allows input of high-quality digital video from other sources to switch to the HDMI TV output or combine with application video / graphics to master final output.
Latest generation transport/security subsystem, with enhanced performance for DVR, client/server-based, home networks up to HD 1080p60 video encoding.	Distributes content securely around the home. Audio and video transcoding.
Dedicated security / DRM processor.	Independent security / DRM processor allows easy integration of firmware based DRM schemes.
Quadruple USB 2.0 hosts, dual e-SATA2, dual Gbit Ethernet MAC with MII/RMII/TMII/GMII/RGMII interfaces, PCI-e, SLC 1-bit and multi-bit ECC raw NAND Flash controller, SD-MMC/SDIO interface.	Extensive high-speed connectivity for the widest range of application peripherals, such as Flash drives, external HDDs, Gigabit Ethernet, home network controllers (such as MoCA®, Wi-Fi), DOCSIS® modem and memory cards.

## 2 Revision history

Table 1. Document revision history

Date	Revision	Changes
03-Jan-2012	1	Initial release.
25-Jul-2013	2	<ul style="list-style-type: none"><li>– Updated the Introduction (<a href="#">Chapter 1</a>).</li><li>– Updated the Features and Benefits table <a href="#">on page 2</a>.</li></ul>

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**ST PRODUCTS ARE NOT AUTHORIZED FOR USE IN WEAPONS. NOR ARE ST PRODUCTS DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

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

© 2013 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 - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)