



# Triple-Play Translation HD Interactive STB Solution

## Key Specifications

### CPU

- High-performance ARM Cortex A9 processor
- Dual-core service processing mechanism
- Built-in I-cache, D-cache, and L2 cache
- Hardware Java acceleration
- Floating-point coprocessor

### Memory Control Interfaces

- DDR3/DDR3L interface
  - Maximum 512 MB
  - 16-bit memory
- SPI flash interface
- NAND flash interface
- SPI NAND flash interface

### HiVXE Video Decoding Engine

- H.264 MP, HP@L4.1
- AVS baseline@L6.0
- AVS+
- MPEG1
- MPEG2 MP@HL
- MPEG4 SP@L0-3, ASP@L0-5
- VC-1 AP
- VP6 and VP8
- 1080p@30 fps real-time decoding
- Video post-processing such as denoising and deblocking

### Image Decoding

- JPEG decoding, maximum 64 megapixels
- PNG decoding, maximum 64 megapixels

### Audio Decoding

- MPEG L1/L2 decoding
- Dolby Digital and Dolby Digital Plus decoding, and Dolby Digital Plus transcoding
- Dolby Digital transparent transmission
- DTS core decoding
- DTS transparent transmission
- Downmixing
- Resampling
- 2-channel audio mixing
- Intelligent volume control

### TS Demultiplexing/PVR

- Two standard serial TS input and one DVB-C IF input; or four two-line serial inputs
- Maximum 96 hardware PID filters
- DVB-CSA2, AES, and DES descrambling algorithms
- Full-service PVR
- Recording of scrambled and non-scrambled streams

### Channel Decoding

- One embedded QAM, compliant with the ITU J83-A/B/C standards
- One QAM loopback output

### Security Processing

- Advanced security CA
- Downloadable CA
- OTP and chip ID
- AES, DES, and 3DES data encryption
- Content protection for USB devices
- Data protection for DDR SDRAMs

### Graphics Processing

- Enhanced full-hardware TDE
- Full-hardware anti-aliasing and anti-flicker

### Display Processing

- 3-layer OSDs
- 16-bit or 32-bit color depth
- Two video layers
- 1920-pixel width for each layer
- Image enhancement

### Audio/Video Interfaces

- PAL, NTSC, and SECAM standard output, and forcible standard conversion
- Aspect ratio of 4:3 or 16:9, forcible aspect ratio conversion, and free scaling
- 1080p50(60)/1080i/720p/576p/576i/480p/480i outputs
- SD and HD signal reception
- HD and SD outputs from the same source
- xvYCC (IEC 61966-2-4) standard for color gamut
- HDMI 1.4b with HDCP 1.2
- Analog video interfaces
  - One CVBS interface
  - One YPrPb interface
  - One S-Video interface
  - Four embedded VDACs
  - Configurable output interfaces
  - Rovi
  - VBI
- Audio interfaces
  - Audio-left and audio-right channels: RCA, low-impedance, and unbalanced output interfaces
  - S/PDIF interface
  - One embedded ADAC

### Peripheral Interfaces

- Two USB 2.0 host ports, integrated with the PHY
- Two 10/100 Mbit/s adaptive Ethernet ports and one embedded 100 Mbit/s PHY, supporting layer 2 and layer 3 switching
- One UART interface
- One smart card interface, supporting T0, T1, and T14 protocols
- One IR receiver with two input interfaces
- One LED and keypad control interface
- Two I2C interfaces
- Five groups of GPIO interfaces

### Low-power consumption

- passive standby, Less than 0.5 W standby power consumption of the STB
- Less than 5 W typical working power consumption of the STB

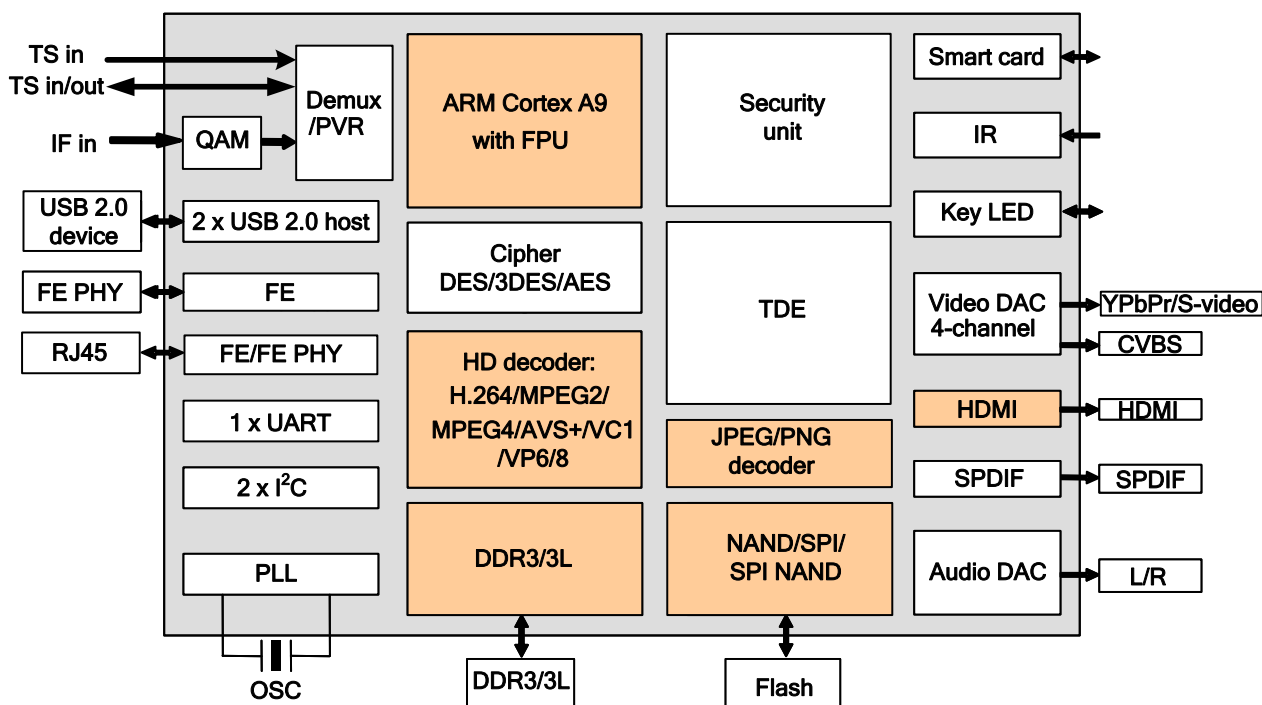
### Others

- Fast startup
- Boot program download and execution over a serial port
- QFP or PBGA package
- 2-layer PCB



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## Functional Block Diagram



### NOTE

- DTS, mentioned in this document, is a registered trademark of DTS Inc. and its subsidiaries. Any parties intending to use the trademark must obtain the permission from DTS Inc. or its subsidiaries.
- Dolby, mentioned in this document, is a registered trademark of Dolby Laboratories, Inc. Any parties intending to use the trademark must obtain the permission from Dolby Laboratories, Inc.
- In the four two-line serial input mode, the embedded QAM is not supported. The two-line refers to the clock and data lines, and the clock is the output after the clock signal is ANDed with the valid signal.

## Acronyms and Abbreviations

ADAC	audio digital-to-analog converter
AES	advanced encryption standard
AVS	audio video standard
BOM	bill of material
CA	conditional access
CVBS	composite video broadcast signal
DES	data encryption standard
DHCP	Dynamic Host Configuration Protocol
EPG	electronic program guide
GPIO	general-purpose input/output
GPU	graphics processing unit
HDMI	high-definition multimedia interface
I <sup>2</sup> C	inter-integrated circuit
IR	infrared
I <sup>2</sup> S	inter-IC sound
JPEG	Joint Photographic Experts Group
MJPEG	Motion Joint Photographic Experts Group
MPEG	Moving Picture Experts Group



## Triple-Play Translation HD Interactive STB Solution

NTSC	National Television System Committee
PBGA	plastic ball grid array
PCB	printed circuit board
PID	packet identifier
QFP	quad flat package
SCI	smart card interface
S/PDIF	Sony/Philips digital interface
SPI	serial peripheral interface
STB	set-top box
TDE	two-dimensional engine
UART	universal asynchronous receiver transmitter
VBI	vertical blanking interval
VDAC	video digital-to-analog converter