MPEG-4 SD, DVR-Ready, Hybrid STB Solution

Based on EMMA3SL/LP

Renesas Electronics' STB reference solution is a complete hardware and software platform based on Renesas' latest chipset for FTA and pay-TV STB applications from simple low cost DVB-T or DVB-S2 zapper to mid range cost with optional features such as CI+, embedded conditional access, simple PVR, Ethernet and USB.

The solution's primary purpose is to give flexibility to balance time to market, R&D and product function cost according to the manufacturers priorities. This is achieved by making available different combinations of hardware and software packages.

The design is based on Renesas' 3rd generation MPEG-4 decoder IC, EMMA3SL/LP (µPD6131x). It also utilises Renesas' second generation DVB-T channel decoder (µPD61541) and ultra-low power stand-by microcontroller (78K0 series). It benefits from Renesas' EMMA3SL/LP IC's advanced security features defined to meet the most stringent security demands of conditional access companies. Therefore the combination offers outstanding performance, low power consumption as well as low cost for both FTA or pay-TV.

Key Benefits

Flexibility to balance time to market, R&D cost and software royalties:

- Options to reduce time to market and R&D expense:
  - » Complete hardware kit, from schematics and material list up to PCB layout available from Renesas
  - » Full turnkey software including Conditional Access or turnkey hardware + software available from Renesas experienced design partners
- Options to reduce solution cost:
  - » Free RTOS and low level software packages available from Renesas

Block Diagram

MPEG-4 SD, DVR-Ready, Hybrid STB Solution
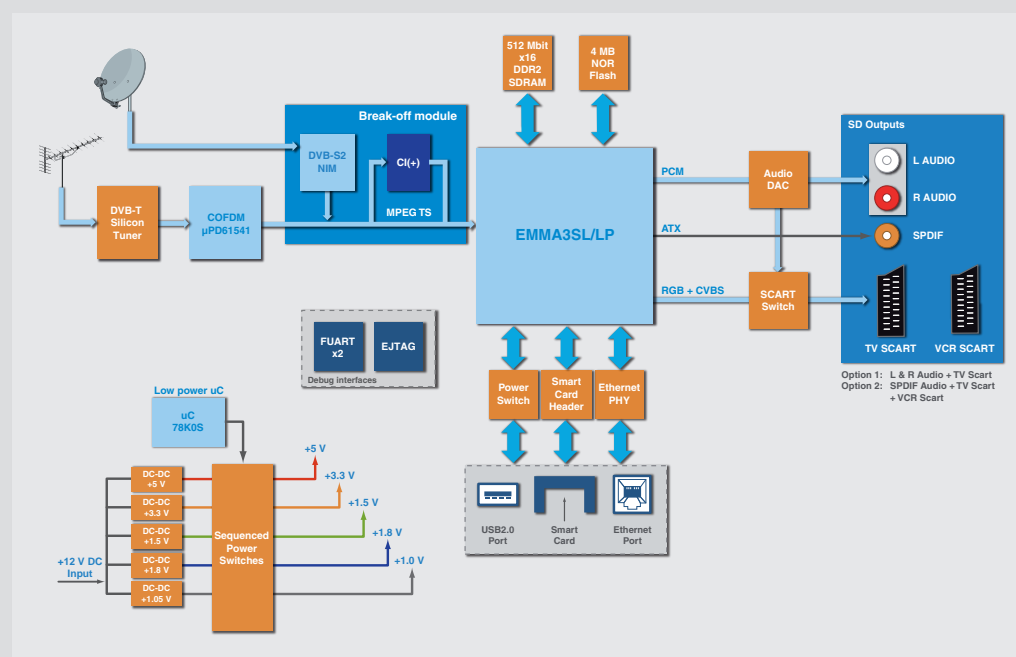
Key Features:

- DVB-T or DVB-S2 broadcast reception
- Standard Definition MPEG-4 decoding including H.264, VC-1 and DivX (option) formats
- MPEG-1, 2, 4 audio formats including MPEG-4 AAC, HE-AAC, AC3 (option), EAC3 (option) and WMA
- Audio description and EAC3 to AC3 transcode
- Advanced Security features for Pay TV secured STB application
- NTSC, PAL and SECAM video standards including PAL-M, PAL-N and PAL-Nc
- USB2.0 host interface
- Ethernet interface
- DVB-CI+
- Option for single or dual SCART
- Low power standby mode using Renesas' ultra low cost microcontroller

Reference Design Description

- System Specification from Renesas:
  - » MPEG processor: EMMA3SL/LP µPD6131x, MIPS32®4KEc®, 440 MIPS@288 MHz
  - » COFDM channel decoder: µPD61541
  - » Microcontroller µPD78F050x
  - » Low Power DVB-T Silicon Tuner
  - » DVB-S2 full NIM (break-off module)
  - » 4 Mbytes Flash
  - » 512 Mbit x 16b DDR2
- Connections
  - » 12 V DC power supply in for external power supply
  - » RF in, RF out
  - » L + R analogue audio output phonos
  - » Coaxial SPDIF digital audio output
  - » TV and VCR SCART: RGB, CVBS and Audio
  - » 1 USB2.0 Port
  - » 1 10/100 Base-T Ethernet
  - » 1 smart card interface
  - » DVB-CI+ module (break-off module)
- Optimized hardware design
  - » 4 layers PCB
  - » Debug: EJTAG or JTAG
  - » FUART
- Software
  - » Free RTOS and low level drivers from Renesas
  - » Free 78K Microcontroller software example for low power mode from Renesas
  - » Option:
    - complete and validated DVB-T application software
    - customizable user interface
    - 7 days EPG
    - MHEG 1.0.6

Deliverables

The kit can be supplied as	Reference hardware (guide for in-house design): hardware database, driver software from Renesas
	Reference solution: Hardware database for customization and customizable software UI
	Turnkey solution: Ready to manufacture hardware and software
Hardware	Main PCB Schematics Layout and Gerbers
Software	Renesas low level driver code (under license)

Documentation	EMMA3SL/L(P) µPD6131x	S19590EE
	COFDM uPD61541	S18959EE
	Microcontroller µPD78F050x	U17425EE

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