

μPD61151, 61152

MPEG2 AUDIO VIDEO ENCODER LSI

μPD61151 is a LSI of MPEG audio and video encoding , decoding and transcoding . μPD61151 has MPEG2 video encoder , MPEG audio encoding DSP, 32-bit RISC CPU, video input/output unit which contains a processing filter and a time base collector, and MPEG system layer which contains the multiplexer and de-multiplexer. It combines with 64M or 128 M bit SDRAM and it uses. μPD61152 has a Dolby Digital consumer encoder (DDCE) in addition to μPD61151.

μPD61151/2 is the optimal for portable consumer digital video recording replay equipment to process a MPEG.

Features

- MPEG2 video MP@ML, SP@ML standard , MPEG1 standard Video encoding
Picture size: max size: 720 * 480 pixel (NTSC) , 720 * 576 pixel (PAL)
- Single Pass Variable bit rate(VBR), Constant bit rate(CBR) Encoding
- 350 mW's Low Power Operation
- Support PCI bus interface which complies with PCI Local Bus Specification Rev.2.1
- MPEG1 audio layer 2 standard based encoding / decoding
- Dolby Digital standard based encoding (Only μPD61152)
- Multiplex: MPEG2-PS, MPEG2-TS and DVD-VR
- Partial TS generation
- Transcoding: MPEG2 format conversion (MPEG2 TS ⇔ MPEG2-PS)
bit rate conversion, VBR⇔CBR
- Pre analysis: inverse cinema, scene changing, and motion estimation assist
- Time base collector, VBI data slicer

Application

Camcorder, Note PC

"Dolby" is a Trademark of Dolby Laboratories.
To use the "μPD61152", a license from Dolby Laboratories Licensing Corporation is necessary.

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

The diagram illustrates the internal architecture of the ADI-0100 SoC, centered around a system bus. Key components include:

- System Bus:** A central horizontal bus connecting the SDRAM Interface Unit, Video Output/Input Units, Motion Estimation Unit, Internal CPU, Stream Interface Unit, Audio DSP Engine, and System Control Unit.
- External Interfaces:**
 - Top:** AD31-0, C/B/E#3-0, PAR, FRAME, IRDY, TRDY, STOP, REQ, IDSEL, DEVEL, GNT, PERR, SERR, INT, PCICLK, V7-0, VHSYNC, VVSYNC, VFLD, VCLK, VOEN, VO7-0, VOHSYNC, VOVS, VOCLK.
 - Right:** HMODE2-0, SIREQ, SIRDY, /SIVLD, SISYNC, SIBST, /SICLK, SI7-0, SOREQ, SORDY, /SOVLD, SOSYNC, SOSTB, /SOCLK, SO7-0, SOEN_.
 - Bottom:** PWM, GPIO7-C, RESET_.
 - Left:** MCKE_, MCLK_, MCS_, MRAS_, MCAS_, MWE_, MA13-0, MD31-0, MDQM_, PSTOP, STCLK (27MHz).
- Internal Blocks:**
 - SDRAM Interface Unit:** Connected to the bus and external memory signals.
 - Video Output Unit & Video Input Unit:** Handle video data flow.
 - Motion Estimation Unit:** Part of the video processing pipeline.
 - Internal CPU:** The central processing unit.
 - Stream Interface Unit:** Manages data streaming to and from the device.
 - Audio DSP Engine:** Processes audio data, connected to various clock and data lines.
 - System Control Unit:** Manages system-level operations.
 - VLD Engine, MB process, VLC Engine:** Part of a video processing pipeline.
 - PLL:** Phase-Locked Loop for clock generation.

The diagram illustrates the internal architecture of the S3C2410 SoC, which is organized around a central system bus. Key components include:

- Host Bus (Parallel bus) Interface Unit:** Manages external memory and peripheral buses.
- Internal CPU:** The central processing unit.
- Motion Estimation Unit:** Used for video processing.
- Stream Interface Unit:** Manages data flow between the CPU and external devices.
- Audio DSP Engine:** Processes audio signals.
- PLL (Phase-Locked Loop):** Generates clock signals.
- System Control Unit:** Manages system-level control and interrupts.
- Video Output/Input Units:** Handle video data.
- SDRAM Interface Unit:** Manages SDRAM memory.
- VLD Engine, MB process, and VLC Engine:** Part of the video processing pipeline.

External Interfaces:

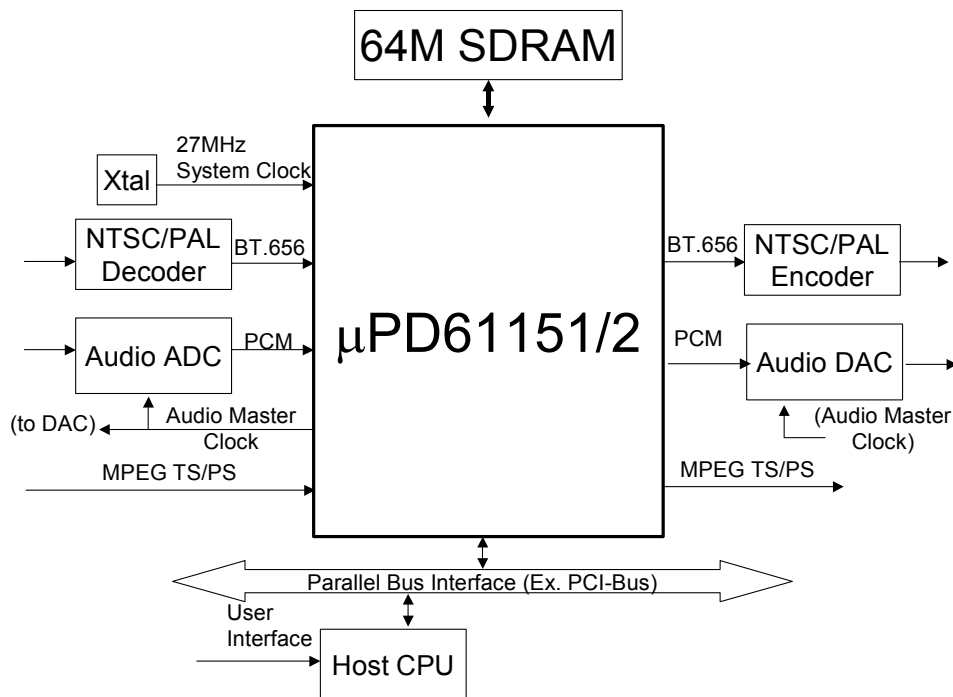
- Memory:** MCKE_, MCLK_, MCS_, MRAS_, MCAS_, MWE_, MA13-0, MD31-0, MDQM_.
- Video:** VO7-0, VOHSYNC, VOVS, VOCLK, VOEN_, VCLK, VHSYNC, VVS, VFLD.
- Host Bus:** CA15-0, CD15-0, CACK1_, CREQ1_, CREQ0_, CWAIT, CINT, CCS_, CRE_, CWE_.
- Stream Interface:** SIREQ, SIRDY, /SIVLD, SISYN, SIBT, /SICLK, SI7-0, SOREQ, SORDY, /SOVLD, SOSYN, SOSTB, /SOCLK, SO7-0, SOEN_.
- Audio:** AIBD, AIBCK, AILRCK, AIOB, AIOBCK, AIOCLK, AIOCLK, AIMCLK.
- Control:** PSTOP, STCLK (27MHz), RESET_, GPIO7-0, PWM.

PRELIMINARY PRODUCT INFORMATION

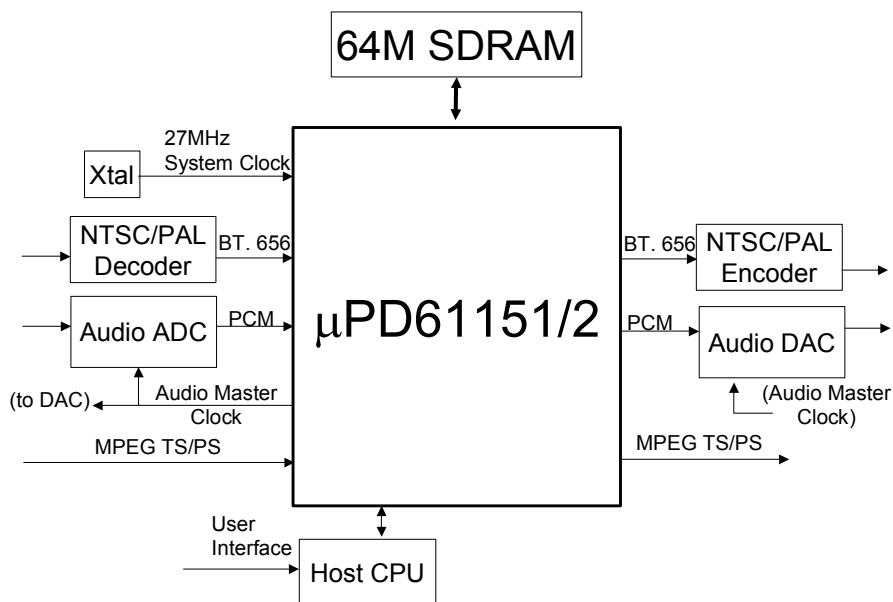
Connections

Host bus connections

Parallel bus interface



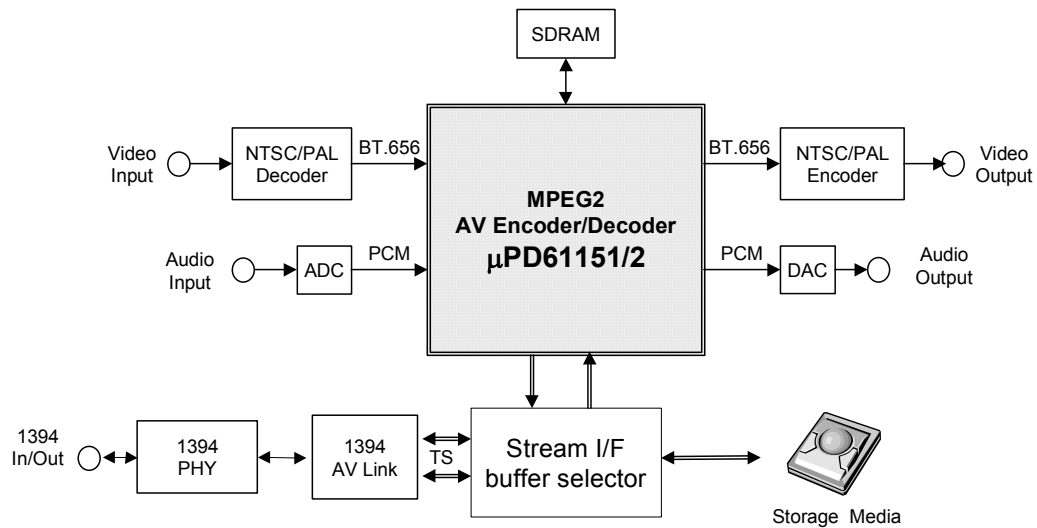
Serial bus interface



The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

PRELIMINARY PRODUCT INFORMATION

Example for making MPEG Codec system



The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

PRELIMINARY PRODUCT INFORMATION

Specification Overview

- Video encoding/decoding
 - Format: MPEG2 video MP@ML, SP@ML standard , MPEG1 standard
 - Single Pass Variable bit rate(VBR), Constant bit rate(CBR) Encoding
 - Picture size: horizontal: 720,704,640,544,480,352,320 dots/line
Vertical: 480,240,576,288 line/frame
 - Transcoding: bit rate conversion, VBR⇔CBR
 - Video input/output
 - Format: 8 bits Y/Cb/Cr 4:2:2(ITU-R BT.656)
8 bits Y/Cb/Cr 4:2:0
 - Pre analysis: inverse cinema, scene changing, and motion estimation assist
 - Time base collector, VBI data slicer
- Audio encoding / decoding
 - MPEG1 audio layer 2 standard based codec
 - Dolby Digital standard based codec (Only μ PD61152)
 - Elementary stream and PCM audio input/output
 - MP3, WMA, AAC(2ch) decode with the extension of the audio firmware
 - PCM input/output format
 - Bit length: 16 bits, 20 bits , 24 bits
 - Sampling rate: 32 kHz, 44.1 kHz, 48 kHz
- Connected Memory
 - 64/128Mb SDRAM (16bit bus) \times 2
 - 64/128Mb SDRAM (32bit bus) \times 1
 - 3.3/2.5V interface
- MPEG system processing
 - Multiplex: MPEG2-TS、MPEG2-PS 、DVD -VR
 - De-multiplex: MPEG2-TS、MPEG2-PS
 - Partial TS generation
 - Transcoding
 - MPEG2 format conversion (MPEG2 TS \Leftrightarrow MPEG2-PS)

Physical

- Power supply: 360 mW (TYP)
- Power supply voltage: 3.3 \pm 0.3 V, 1.5 \pm 0.15 V (internal circuit power)

Package

- 273 pin FPBGA (15mm \square , 0.65mm pitch)

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

PRELIMINARY PRODUCT INFORMATION

The export of this product from Japan is regulated by the Japanese government. To export this product may be prohibited without governmental license, the need for which must be judged by the customer. The export or re-export of this product from a country other than Japan may also be prohibited without a license from that country. Please call an NEC Electronics sales representative.

There is a case of preliminary version in a related data but in this data, it doesn't make the display of " preliminary " it. Understand beforehand.

- **The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Electronics Corporation, at its own discretion, may withdraw the device prior to its production.**
- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors which may appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software, and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software, and information in the design of the customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by the customer or third parties arising from the use of these circuits, software, and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special", and "Specific". The Specific quality grade applies only to NEC Electronics products developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.
 - Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots
 - Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
 - Specific: Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise specified in NEC Electronics Data Sheets or Data Books. If customers intend to use NEC Electronics products for applications other than those specified for Standard quality grade, they should contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

- (1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.
- (2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

PRELIMINARY PRODUCT INFORMATION

Regional Information

Some information contained in this document may vary from country to country. Before using any NEC Electronics product in your application, please contact the NEC Electronics office in your country to obtain a list of authorized representatives and distributors. They will verify:

- Device availability
- Ordering information
- Product release schedule
- Availability of related technical literature
- Development environment specifications (for example, specifications for third-party tools and components, host computers, power plugs, AC supply voltages, and so forth)
- Network requirements

In addition, trademarks, registered trademarks, export restrictions, and other legal issues may also vary from country to country.

[GLOBAL SUPPORT]

<http://www.necel.com/en/support/support.html>

NEC Electronics America, Inc. (U.S.)

Santa Clara, California
Tel: 408-588-6000
800-366-9782

NEC Electronics (Europe) GmbH

Duesseldorf, Germany
Tel: 0211-65 03 01

- **Sucursal en España**
Madrid, Spain
Tel: 091-504 27 87
- **Succursale Française**
Vélizy-Villacoublay, France
Tel: 01-30-67 58 00
- **Filiale Italiana**
Milano, Italy
Tel: 02-66 75 41
- **Branch The Netherlands**
Eindhoven, The Netherlands
Tel: 040-244 58 45
- **Tyskland Filial**
Taeby, Sweden
Tel: 08-63 80 820
- **United Kingdom Branch**
Milton Keynes, UK
Tel: 01908-691-133

NEC Electronics Hong Kong Ltd.

Hong Kong
Tel: 2886-9318

NEC Electronics Hong Kong Ltd.

Seoul Branch
Seoul, Korea
Tel: 02-558-3737

NEC Electronics Shanghai, Ltd.

Shanghai, P.R. China
Tel: 021-6841-1138

NEC Electronics Taiwan Ltd.

Taipei, Taiwan
Tel: 02-2719-2377

NEC Electronics Singapore Pte. Ltd.

Novena Square, Singapore
Tel: 6253-8311

J03.4

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

PRELIMINARY PRODUCT INFORMATION