



## DESCRIPTION

The ES6698 Vibratto™II processor is a highly integrated single-chip DVD solution that integrates read channel, ECC, Servo DSP, MCU, and MPEG-2/MPEG-4/DivX decoder that has a state-of-the-art 480p/576p progressive-scan video feature to provide brilliant and sharp, flicker-free video output, and S/PDIF input and output support. The ES6698 performs audio/video stream data processing, TV encoding, Macrovision™ copy protection, DVD system navigation, system control, and housekeeping functions.

The Vibratto-II DVD processor is built on the ESS proprietary dual CPU Programmable Multimedia Processor (PMP) core consisting of 32-bit RISC and 64-bit DSP processors and offers the best DVD feature set. The processing units enable simultaneous parallel execution of system commands and data processing to perform specialized encoding and decoding tasks.

The RISC processor performs bit stream parsing, control audio data output, transfer video and audio data to the vector engine and service system control and housekeeping functions. The vector engine performs audio and video micro-code processing required by A/V standards, such as Dolby® Digital, MPEG and JPEG imaging. These processing tasks include video motion compensation and estimation, loop filtering, Discrete Cosine Transforms (DCT), inverse DCT, quantization, and inverse quantization.

The Vibratto-II DVD processor supports all popular pick-up units, industry standard I<sup>2</sup>S audio data input and output, EPROM and DRAM access. It also supports both letterbox and pan-and-scan displays, sub-picture overlay, and On-Screen Display (OSD).

The Vibratto-II's Unified Memory Architecture enables the lowest possible system memory cost by consolidating multiple memory subsystems into a single unit.

In addition, the Vibratto-II DVD solution offers support for Karaoke CD+G, DVD-Audio, HDCD, CD-DA, MP3, and WMA.

The ES6698 Vibratto-II DVD processor with DTS support is offered with the ES6698D, which has the same pinout as the standard ES6698. The ES6698 and ES6698D DVD processors are available in a 208-pin Plastic Quad Flat Pack (PQFP) device package.

## FEATURES

- Single-chip DVD processor incorporating all front-end and back-end functions.
- Unified memory architecture.
- Proven focusing, sledding, tracking, and CLV/CAV spindle servo control.
- Proven ECC, EFM/EFM+ demodulation, and EDC circuit.
- Built-in ADCs and DACs for servo control signals.
- Direct interface to the ES6603 servo AFE chip.
- Integrated NTSC/PAL encoder with pixel-adaptive de-interlacer and five 10-bit 54 MHz video DACs.
- DVD-Video, DVD-VR, VCD 1.1 and 2.0, and SVCD.
- DivX and MPEG-4 Advanced Simple Profile\* at full screen (D1).
- Full DVD-Audio support including MLP and LPCM decode, CPPM decryption, and watermark detection.
- Media playback with CD-ROM, CD-R/RW, DVD-R/RW, and DVD+R/RW.
- Up to 7.1 channel audio outputs.
- Direct interface of 16-bit DRAM up to 128-Mb capacity.
- Direct interface for up to 4 banks of 8-bit EPROM or Flash EPROM for up to 4 MB per bank.
- Macrovision 7.1 for NTSC/PAL interlaced video.
- Macrovision NTSC/PAL (480p/576p) progressive scan video.
- Simultaneous composite, S-video and YUV outputs.
- CCIR656/601 YUV 4:2:2 output.
- OSD controller supports 256 colors in 8 degrees of transparency.
- Subpicture Unit (SPU) decoder supports karaoke lyric, subtitles, and EIA-608 compliant Line 21 Captioning.
- SmartLogo™ for custom JPEG wallpaper.
- JPEG digital photo support (Kodak Picture CD™ and Fujifilm FujiColor CD™).
- ESS Music Slideshow™.
- Windows™ Media Audio (WMA).
- Bass management.
- Dolby Digital (AC-3), Dolby Pro Logic™, and Pro Logic II.
- DTS™ surround (ES6698D only).
- S/PDIF digital audio input and output.
- MPEG AAC and Multichannel.
- SRS TruSurround®.
- Professional karaoke with full scoring scheme.



# ES6698 PINOUT DIAGRAM

The device pinout for the ES6698 is shown in Figure 1.

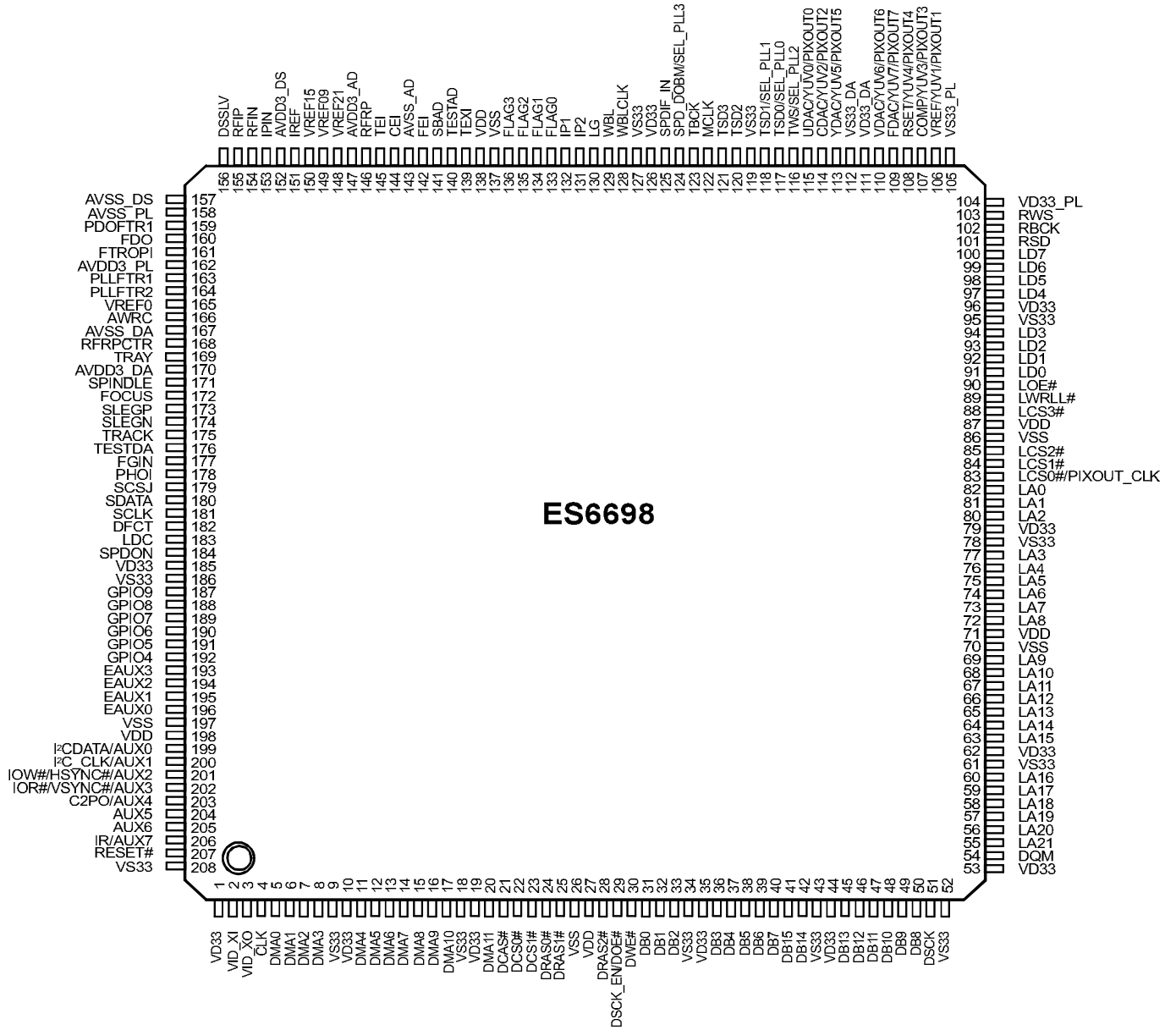


Figure 1 ES6698 Device Pinout

## SYSTEM BLOCK DIAGRAM

A sample system block diagram for the ES6698 Vibratto-II DVD player board design is shown in Figure 2.

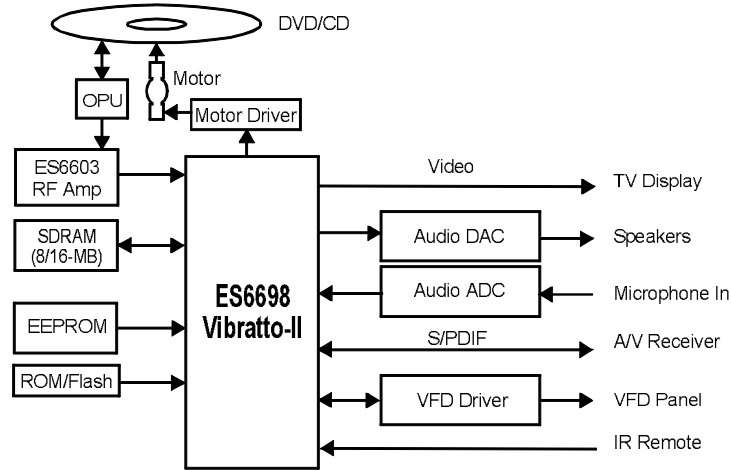


Figure 2 ES6698 Vibratto-II System Block Diagram

## FUNCTIONAL DESCRIPTION

Figure 3 shows the internal block diagram for the ES6688A Vibratto-II DVD processor.

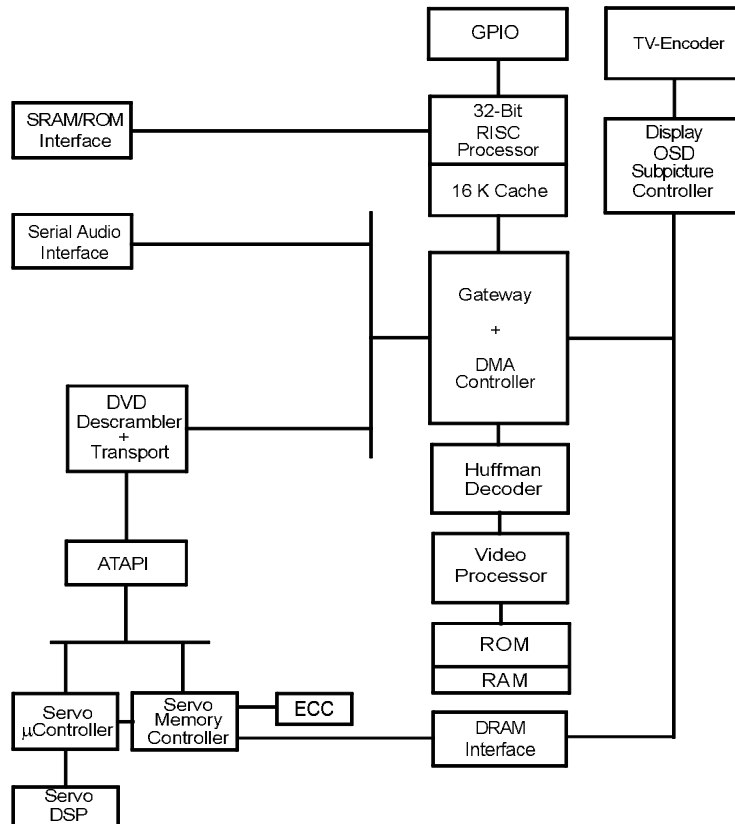


Figure 3 ES6688A Vibratto-II Block Diagram

## ORDERING INFORMATION

Part Number	Description	Package
ES6698F	Vibratto-II DVD, Servo Control, Progressive scan, DivX (certified), DVD-Audio, and TV encoder	208-pin PQFP
ES6698FD	Vibratto-II DVD, Servo Control, Progressive scan, DivX (certified), DVD-Audio, DTS surround, and TV encoder	208-pin PQFP

The letter F at the end of the part number identifies the package type PQFP.

ES6603SF	DVD Servo AFE for Vibratto-II	64-pin LQFP
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The letter SF at the end of the part number identifies the package type LQFP with lead-free leads. This device is also for non lead-free designs and has the same soldering requirement as the Vibratto-II devices.

## Other Vibratto-II DVD Processors

Part Number	Description	Package
ES6629F	Vibratto-II DVD, Servo Control, Progressive scan, and TV encoder	208-pin PQFP
ES6629FD	Vibratto-II DVD, Servo Control, Progressive scan, DTS surround, and TV encoder	208-pin PQFP
ES6688FA	Vibratto-II DVD, Servo Control, Progressive scan, MPEG-4, DVD-Audio, and TV encoder	208-pin PQFP
ES6688FAD	Vibratto-II DVD, Servo Control, Progressive scan, MPEG-4, DVD-Audio, DTS surround, and TV encoder	208-pin PQFP

The letter F at the end of the part number identifies the package type PQFP.

Note: (\*) DivX and MPEG-4 Advanced Simple Profile without hardware Q-PEL and Global Motion Compensation (GMC).



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U.S. patents pending.

MPEG is the Moving Picture Experts Group of the ISO/IEC. References to MPEG in this document refer to the ISO/IEC JTC1 SC29 committee draft ISO 11172 dated January 9, 1992.

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