# Digital Audio

Overview

Over the past decade, digital signal processing (DSP) technology has developed at an unheard-of rate. Freescale Semiconductor's DSP technology has set the defacto standard for professional audio systems since the first 24-bit DSP was introduced in 1987. Freescale Semiconductor's DSP architecture continues to set performance records of 150 MIPS and beyond, roughly double the performance of most other audio-processing engines. Combining this architecture with peripherals, software, and development tools has enabled Freescale Semiconductor to offer the Symphony® DSP Audio Family.

Key Benefits

> Provides low cost, high-performance processing 24-bit DSP optimal for audio processing

> Offers extensive software library allowing a flexible, customized solution for most audio applications

> Includes Dolby Digital^{TM}, DTS-ES, DTS neo6, DTS 96/24, AAC 5.1, and Prologic II decoding with auto detection and auto switching on chip

> Offers general purpose version available for nonaudio customers, or customers supplying their own proprietary audio software

AUDIO SOFTWARE ARCHITECTURE BLOCK DIAGRAM
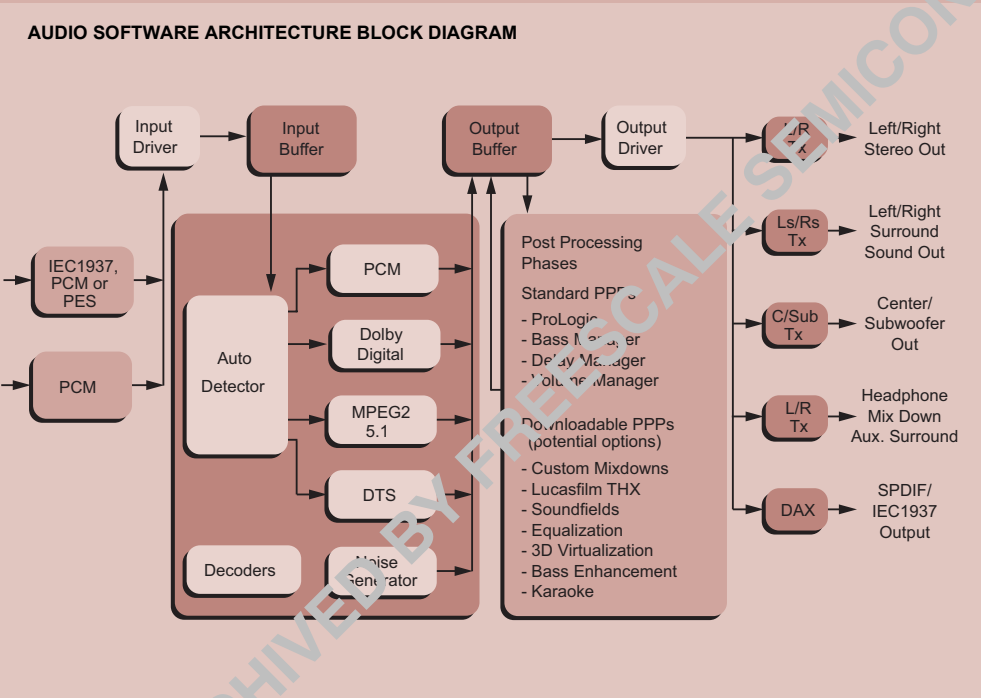
Freescale Ordering Information

Part Number	Product Highlights	Additional Information
DSP56362	Dolby Digital, DTS, and MPEG (DSPF56362PV120 [Note 1]) decoding; general purpose version available with nothing in ROM (DSPB56362PV120)	www.freescale.com[Note 2, Note 3]
DSP56364	Cost-effective DSP with 100 MIPS and nothing in ROM (DSPB56364FU100)	www.freescale.com[Note 2]
DSP56366	Extension of 56362 with additional on-board memory and second enhanced audio-serial interface; Dolby Digital, DTS, and MPEG decoding (DSPD56366PV120) [Note 1]; general purpose version available with nothing in ROM (DSPB56366PV120)	www.freescale.com[Note 4]
DSP56367	Same peripherals and memory as 56366 but also provides 150 MIPS vs. 120 MIPS; various Dolby, DTS, and MPEG decoding (DSP[A,C,D,]56367PV150) [Note 1]; general purpose version available with nothing in ROM (DSPB56367PV150)	www.freescale.com[Note 5]

Notes:
1. Requires Dolby and DTS licensing.
2. Search on the listed part number.
3. Lead-free version DSPB56362AG120 is also available for general purpose version.
4. Lead-free version DSPB56366AG120 is also available for general purpose version.
5. Lead-free version DSPB56367AG150 is also available for general purpose version.

Design Challenges

Popularity of home theaters is driving audio systems toward increasing complexity. Consumers expect the same experience in the home they experience in movie theaters. Likewise, the consumer expects a similar exceptional audio experience in the car. With the increasing popularity of the automotive back-seat electronic entertainment, home theater applications are appearing in expanding numbers within automotive electronics.

Consumer expectations have caused proliferation of new audio algorithms, resulting in an astounding product growth rate. Their collective expectations make it increasingly difficult to bring standard designed products to market quickly. Consequently, programmable architectures have a distinct advantage At the same time, it is imperative to have cost-effective solutions to reach the mainstream consumer.

Freescale Semiconductor Solution

Freescale Semiconductor combines the right balance of performance and low cost by using the audio industry standard Onyx 24-bit DSP, optimal for consumer and professional audio applications. The DSPs also utilize masked ROM where possible, ensuring cost effectiveness. Masked ROMs are further optimized by the addition of peripherals designed to be ideal for audio applications. This provides Freescale Semiconductor customers with the ability to use the most advanced audio technology, taking their products into cost-sensitive mainstream markets.

Freescale Semiconductor provides the standard audio decoders, thereby reducing its customers' software effort. Our customers can easily integrate differentiating audio IP from 3rd parties, Freescale Semiconductor, or develop their own IP. This all works in a "plug and play" fashion, providing the maximum flexibility and increased system performance.

Development Tools

Tool Type	Product Name	Vendor	Description
Hardware	DSPAUDIO5xMB1	Freescale Semiconductor	Motherboard Supporting 56362/4/6/7 (Requires Appropriate Daughter Card for Each Part and ROM Version)
Hardware	DSPB362DB1	Freescale Semiconductor	Daughter Card Supports DSPB56362PV120
Hardware	DSPF362DB1	Freescale Semiconductor	Daughter Card Supports DSPF56363PV120
Hardware	DSPB364DB1	Freescale Semiconductor	Daughter Card Supports DSPB56364FU100
Hardware	DSPB366DB1	Freescale Semiconductor	Daughter Card Supports DSPB56366PV120
Hardware	DSPD366DB1	Freescale Semiconductor	Daughter Card Supports DSPD56366PV120
Hardware	DSPB367DB1	Freescale Semiconductor	Daughter Card Supports DSPB56367PV150
Hardware	DSPA367DB1	Freescale Semiconductor	Daughter Card Supports DSPA56367PV150
Hardware	DSPC367DB1	Freescale Semiconductor	Daughter Card Supports DSPC56367PV150
Hardware	DSPD367DB1	Freescale Semiconductor	Daughter Card Supports DSPD56367PV150

Learn More: Contact the Technical Information Center at +1-800-521-6247 or +1-480-768-2130.

For more information about Freescale products, please visit **www.freescale.com**.

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