

## **Analog Devices Technology in Yamaha's Digital Home Theater Receivers**

*ADI's Blackfin digital signal processing innovations and Advantiv advanced TV solutions deliver high-end features in Yamaha's RX-V563, RX-V463 and DSP-AX463 receivers*

Bangalore, Karnataka, June 12, 2008 /[India PRwire](#)/ -- Analog Devices, Inc. (NYSE: ADI) today announced that Yamaha Corporation (TOKSE 7951) is using ADI's Blackfin® processor and three ICs from the Advantiv® advanced television solutions portfolio to drive high-end functionality, flexibility and intuitive operation in three audio video receivers (AVRs) from its 2008 line. In addition to providing and integrating Blackfin and Advantiv advanced television solutions components that enable true-to-life audio and video, ADI collaborated with Yamaha to engineer additional turnkey functions including HDMI® (High-Definition Multimedia Interface®) repeater capability and a Blackfin-controlled user interface.

"Our target for these home theater receivers was to further extend high-end capabilities into mainstream price points. Analog Devices' deep experience in high-performance video and audio applications helped us achieve this objective," said Sadayuki Narusawa, department manager, Product Development Department, AV Products Division of Yamaha. "We chose to work with ADI because they enabled vibrant audio processing, great video, flawless HDMI output, intuitive operation, and full integration of the software that brings all these capabilities together seamlessly."

The Yamaha RX-V563 and RX-V463, available in the United States, and the DSP-AX463, available in Japan only, boast rich capabilities that include 1080p-compatible HDMI switching, XM and SIRIUS Satellite Radio compatibility, four system-configuring SCENE modes, sound-optimizing Yamaha Parametric Room Acoustic Optimizer (YPAO) technology, and improved CINEMA DSP (digital signal processing) technology. With their optional accessories, both models feature wireless Bluetooth® audio playback and iPod® compatibility. Detailed specifications are available at [www.yamaha.com/hometheater](http://www.yamaha.com/hometheater).

"Audio and video receivers such as these digital home theater systems are among the most challenging of consumer electronics applications," said Jerry McGuire, vice president, General Purpose DSP Group, Analog Devices. "ADI's ability to take system-level responsibility for supplying and integrating high-performance hardware and software in these function-rich, moderately priced receivers has earned us a place as a key solutions provider to Yamaha, one of the world's most recognized consumer electronics brands."

### **Optimizing ADI's Blackfin and Advantiv Advanced TV Solutions in Yamaha's AVRs**

In these Yamaha digital home theater receivers, a single Blackfin processor and three advanced television ICs from the Advantiv advanced television solutions portfolio work in concert to enable features that until recently were found only in AVRs at high-end price points.

To enable shorter time to market and reduced overall system cost for Yamaha's application, ADI integrated software drivers for three Advantiv advanced television solutions ICs, the ADV7441A, AD9389B and ADV7172, into the Blackfin system software package. Optimized audio and video software modules supplied by ADI included Dolby® Digital (AC-3) decoder, DTS® decoding, and the standards-compliant HDMI repeater functionality with HDCP (high-bandwidth digital content protection).

More specifically, the receivers use Blackfin to perform digital signal processing, including multichannel audio decoding and post-processing. In addition, the Blackfin processor performs microcontroller functions that control the system and drive the user interface, putting users in convenient command of the entertainment experience through on-screen displays on connected TVs or monitors.

Three high-performance video and connectivity ICs from ADI's Advantiv advanced television solutions portfolio are used: the ADV7441A integrated video decoder and HDMI receiver, the AD9389B HDMI transmitter, and ADV7172 digital video encoder. The Yamaha home theater receivers depend on video and connectivity technologies of these Advantiv advanced television solutions and the Blackfin processor to provide connectivity between the AVRs and multiple audio and video components that use the HDMI standard; to accurately reproduce movies and music without annoying audio pops and clicks or video artifacts; and to enable high-end 1080p video performance – even

from traditional analog input sources such as VCRs and standard-definition DVD players.

A particularly challenging part of the design was the HDMI repeater capability, which includes HDCP. The HDMI repeater – which is enabled by the Blackfin processor, AD9389B HDMI transmitter, ADV7441A integrated video decoder and HDMI receiver, and ADI-provided software – checks that other audio and video components connected to the digital home theater receiver have standards-compliant media content protection in place to prevent unauthorized recording and that authentication takes place without delay.

## **Notes to Editor**

### **About Analog Devices**

Innovation, performance, and excellence are the cultural pillars on which Analog Devices has built one of the longest standing, highest growth companies within the technology sector. Acknowledged industry-wide as the world leader in data conversion and signal conditioning technology, Analog Devices serves over 60,000 customers, representing virtually all types of electronic equipment. Celebrating 40 years as a leading global manufacturer of high-performance integrated circuits used in analog and digital signal processing applications, Analog Devices is headquartered in Norwood, Massachusetts, with design and manufacturing facilities throughout the world. Analog Devices'

common stock is listed on the New York Stock Exchange under the ticker "ADI" and is included in the S&P 500 Index.

### **Analog Devices India**

India Product Development Center (IPDC)

The India Product Development Center (IPDC), Bangalore is involved in some of the most challenging technologies today, such as high-speed DSP IC design, Analog IC design, and Multi-media embedded software. Other groups include DSP Application Engineering and DSP Product and Test Engineering.

Three generations of industry leading DSP SHARC processors have been developed at IPDC .Engineers at IPDC are involved in all stages of product development from "Concept to Silicon to Production".

### **India Sales**

ADI India sales has well established sales and distribution network across India which serve and support major manufacturing and design services companies in the Telecom, Industrial, Defense and IT segments.

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