

For Immediate Release:

October 1, 2007

JVC's own image processing system with leading-edge digital high-definition image technology
JVC Develops "Next-Generation High-Definition Engine" for Large-screen Displays
Creates accurate, vivid colors and superb images worthy of today's large screen high-definition televisions

Victor Company of Japan, Ltd. (JVC) has developed a new Next-Generation High-Definition Engine for use in large-screen displays. The new engine achieves both "accurate, vivid color expression" and "eye-friendly images" regardless of the image content or display device, suitable for this era in which high-definition large-screen technology use is rapidly expanding.

This new JVC image processing system reproduces high-grade images suitable for large-screen, high-definition televisions, images that not only include high-definition commercial content, but also user-created content such as high-definition video from consumer camcorders.

Next-Generation High-Definition Engine for large-screen displays

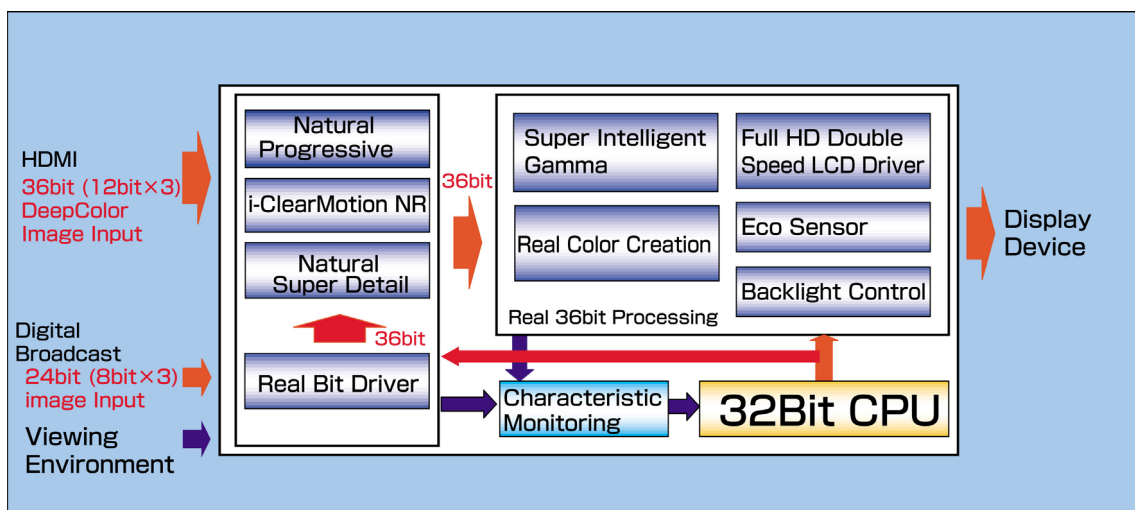
The newly developed Next-Generation High-Definition Engine drastically raises the signal processing capacity of the GENESSA series image processing LSIs, which were already highly rated for their high-definition capabilities. This gives the new engine the power both to reproduce accurate, vividly colored, high grade images necessary for our "big-screen age" and create an eye-friendly television that minimizes glare and flicker.

JVC's original high-definition image technology developed over many years under the JVC principle of "pursuit of primary colors." In April 2004, JVC developed and announced its GENESSA "image intelligence" technology as the world's first*¹ CPU-installed dedicated image processing LSI, integrated on a single system LSI.

Since then, JVC continued to evolve GENESSA in order to "realistically reproduce images the human eye finds most beautiful." Products incorporating GENESSA-series technology such as the EXE series of LCD TVs have received high praise for "rich color and image expressiveness" that draws out the intrinsic information embodied in the image content.

*1: Announced April 20, 2004 (JVC Internal survey)

< System diagram of the Next-Generation High-Definition Engine for large-screen displays >



Key characteristics of the Next-Generation High-Definition Engine for large-screen displays

By developing a sophisticated new image processing algorithm and greatly increasing the bit accuracy of the image processing engine, JVC achieved superb motion image quality that meets the needs created by new-format high-quality image signals, display panel evolution beyond 10 bits, and the accelerating trend towards larger and larger screens.

The engine's key characteristics are described in more detail below.

1. High-accuracy signal processing quality using Real 36-bit (12bit x3) Image Processing

The engine's digital image processing computing accuracy has greatly increased. It handles "36-bit Deep Color" input at 12bit x3 for R, G and B. By using corresponding 12bit x3 "36-bit RGB processing" to maintain extremely high-accuracy signal processing quality, this engine achieves a "68-billion color expression capability" and "high-grade image reproduction without perceptible image deterioration from digitization."

2. Innovative "Real Bit Driver" bit extension technology for high-quality content reproduction

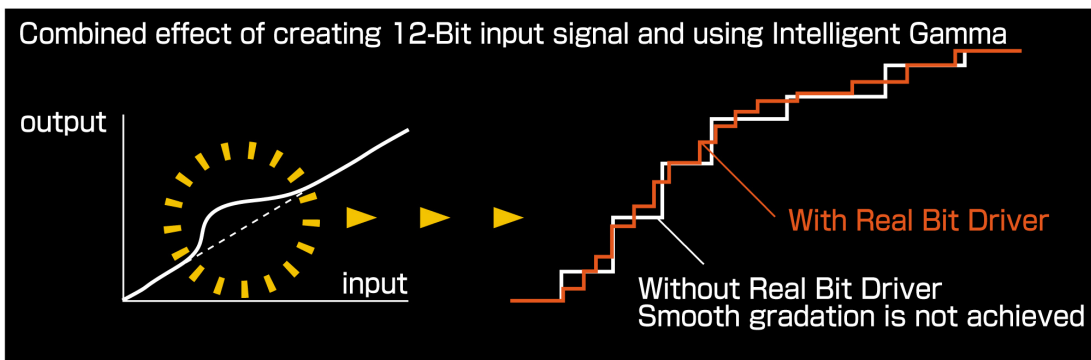
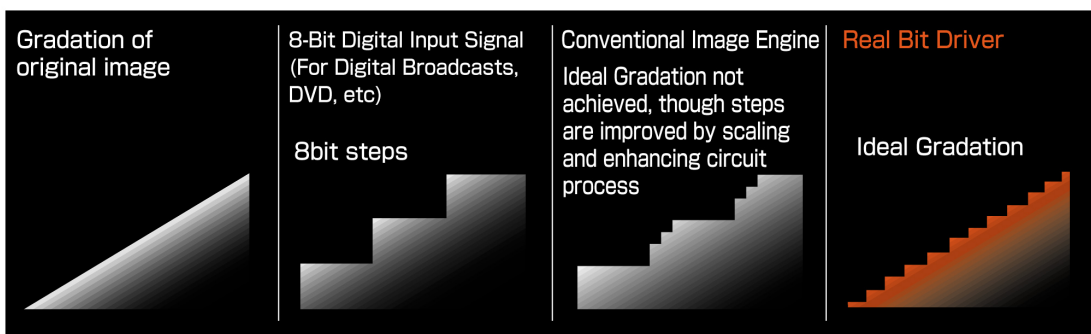
- Generating 12-Bit image Precision from 8-bit images -

Based on the new concept of "creating enriched content transcending the limitations of the image source," JVC succeeded in developing the totally new bit extension technology called Real Bit Driver, which takes 8-bit images and turns them into images with 12-bit precision.

While LCD panels are evolving to RGB 10-bit display, for today's digital image content such as digital broadcasts, DVDs and so forth 8-bit RGB / Y,Cb,Cr(Y,Pb,Pr) is becoming mainstream. When 8-bit images are input, the conventional image processing circuit bit extension technique for preventing deterioration of content bit precision is inadequate for improving display image quality.

Utilizing JVC's original Real Bit Driver technique for converting the TV input signal to 12 bits and then doing high-definition processing, we are able to reproduce smooth, natural gradations without losing the perceived resolution of the image source and without false contours in gradation caused by an inadequate number of bits.

Effect of Real Bit Driver



3. i-ClearMotion NR noise reduction technology born by applying “120-frame Clear Motion Drive Technology” - Strong noise-suppression of blurring in moving scenes as well as stationary -

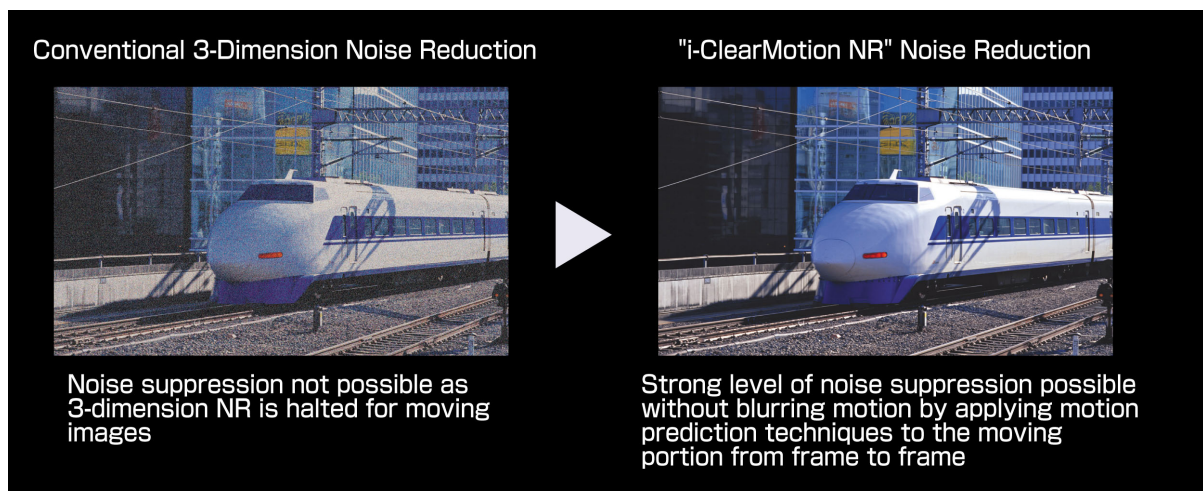
It is possible to achieve strong noise suppression for stationary scenes with conventional 3-dimension noise reduction, but for moving images the mainstream practice has been to halt 3-dimension processing in order to reduce the unwanted blurring effects that it causes.

With its new Next-Generation High-Definition Engine, JVC achieved a high level of noise suppression without blurring motion by using 3-dimension noise reduction processing for moving images in a way not possible in the past. Such noise reduction is now made possible by applying the high-precision motion prediction techniques of the double-speed 120Hz Clear Motion Drive Technology first developed by JVC.

In addition, JVC simultaneously developed technology for accurate detection in each frequency band of the noise volume contained in image content. Beautiful, low-noise images can now be continuously reproduced using an automatic setting for the optimum amount of noise removal for a given television broadcast channel and content quality.

■ **i-ClearMotion NR benefits**

	i-ClearMotion NR	Conventional JVC 3-dimension NR	Standard 3-dimension NR
Motion processing	3-dimension NR processing <i>even during motion</i>	2-dimension NR processing during motion	NR off during motion
Noise detection and reduction processing methods	Detection of image noise volume in each frequency band; detailed, automatic definition of optimum noise removal amount by band	Detection of image noise volume; automatic adjustment of optimum noise removal amount	Fixed noise removal that does not depend on noise volume



Conventional 3-Dimension Noise Reduction

"i-ClearMotion NR" Noise Reduction



Noise suppression not possible as 3-dimension NR is halted for moving images

Strong level of noise suppression possible without blurring motion by applying motion prediction techniques to the moving portion from frame to frame

Simulated Images

4. Further evolution of “intelligent high-definition processing technology” cultivated in developing JVC’s own GENESSA high-definition technology

JVC has now developed and introduced “Real Color Creation” for greater reality in color reproduction in addition to “Intelligent Gamma γ ”, which fine-tunes contrast in content light and dark areas to produce images with depth, and “Intelligent Clear”, which makes possible crisp low-noise images.

Utilizing the human characteristic that visual perception of color intensifies for objects on which a person’s vision is focused; Real Color Creation makes it possible to reproduce the images people focus on with more intensely real colors and textures. It does this by analyzing the color distribution of each separate image in real time.

5. “x.v.Color” enabled signal processing technology gives even more realistic color expression, even creating perception of depth of field and texture

JVC developed and installed its own original x.v.Color^{*2} enabled signal processing circuit to support the xvYCC



international color space standard. The xvYCC extended color space standard reproduces with greater realism natural-world colors that were not handled well by conventional televisions.

As the range of display color reproduction expanded, JVC made it possible to create realistic representations and color expression that makes full use of the display capabilities, even to the extent of producing perceptions of depth of field and texture.

^{*2}: “x.v.Color” and  x.v.Color are registered trademarks.

Development background

Flat panel screen technology has evolved rapidly in recent years as televisions continue to develop even greater realism in image reproduction. One example of this is “clear motion drive” technology developed first by JVC and introduced to the market in October 2005 with the LT-37LC70 LCD television. This technology represented a drastic step up in LCD TV motion display capabilities.

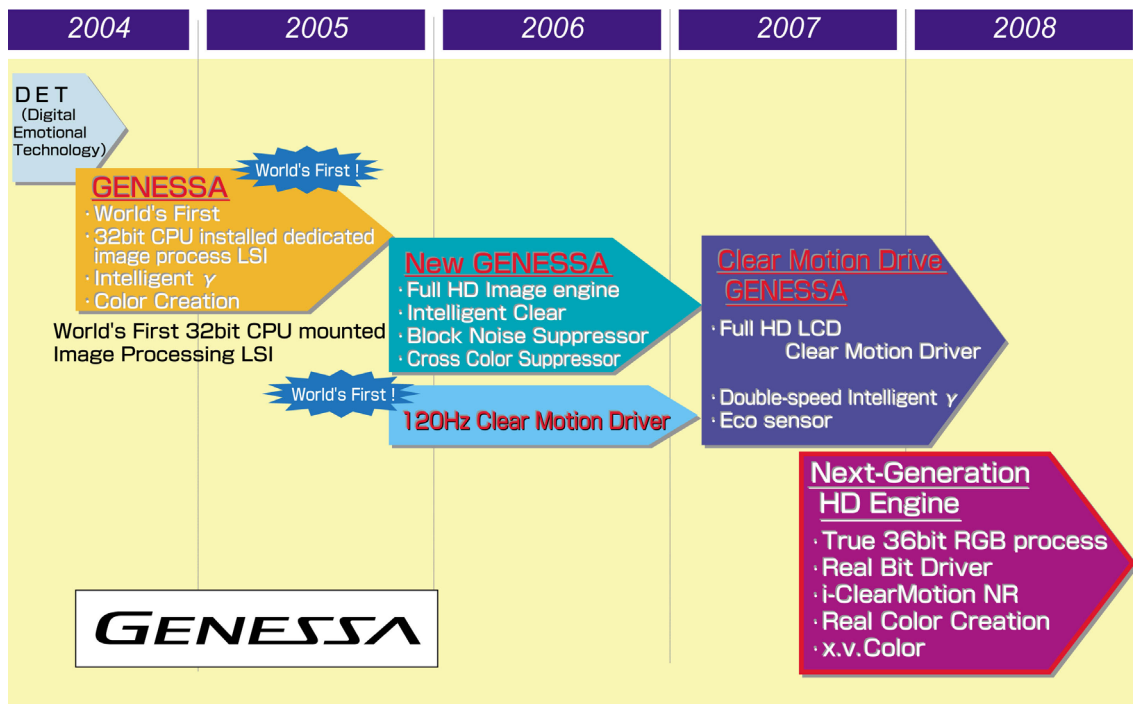
At the same time, with the growth in popularity of high-definition content such as personal high-definition video shot with video cameras like JVC’s GR-HD7 hard disk drive camcorder, the expansion in size of LCD panels and other flat panel screens has accelerated, pushed by market demand for ever bigger screens. With this market in mind, JVC moved forward with research and development on new image processing technology to satisfy demand for higher-definition, larger-screen images, while also producing both “accurate, vivid color expression” and “eye-friendly images.”

The newly developed Next-Generation High-Definition Engine concentrates these various new image processing technologies on a single system LSI. JVC plans to widely utilize this engine as a core technology for LCD panels and other large-screen displays.



GENESSA “image intelligence” technology CPU-installed dedicated image processing LSI, integrated on a single system LSI.(sample)

<JVC Image Processing LSI Evolution>



**"Genessa" is the name for JVC's high-definition display technology in the Japan domestic market.

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