

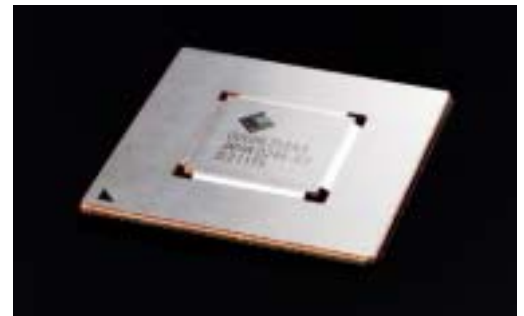
## EIZO ASIC Provides Industry's First Picture-in-Picture and Hardware Supported Portrait Mode Orientation

### Introduction

One of the key reasons EIZO is able to offer industry-leading screen quality and innovative features for its LCD monitors is because of an ASIC (Application Specific Integrated Circuit) developed in-house. This ASIC is a custom LSI (Large Scale Integration) component that serves as the core of the image control of EIZO monitors.

The latest ASIC is the 4<sup>th</sup> generation version (Development Code: G4 ASIC). With its ActiveRotation function for portrait display, and ActiveShot function with a picture-in-picture from two PC sources, this ASIC performs tasks that were previously done with software applications. These new functions are the first of their kind to be available in a color LCD monitor.<sup>1</sup>

<sup>1</sup>As of April 1, 2003 (according to EIZO's own research). ActiveShot offers the first picture-in-picture capability from two PC sources.



### History of the EIZO ASIC

EIZO has been developing an ASIC for its monitors for over 10 years. With the advent of LCD monitors in the late 1990's, EIZO began putting forth special efforts to develop an ASIC that could improve the image quality of this burgeoning technology. Its first ASIC, called the D<sup>3</sup> ASIC (D-Cubed), allowed EIZO LCD monitors to provide noticeably superior brightness, color reproduction levels and control over image position and size compared to other products on the market at the time. The D<sup>3</sup> ASIC was incorporated in EIZO's first generation of LCD products – the FlexScan L23, L34, L360, and L66.

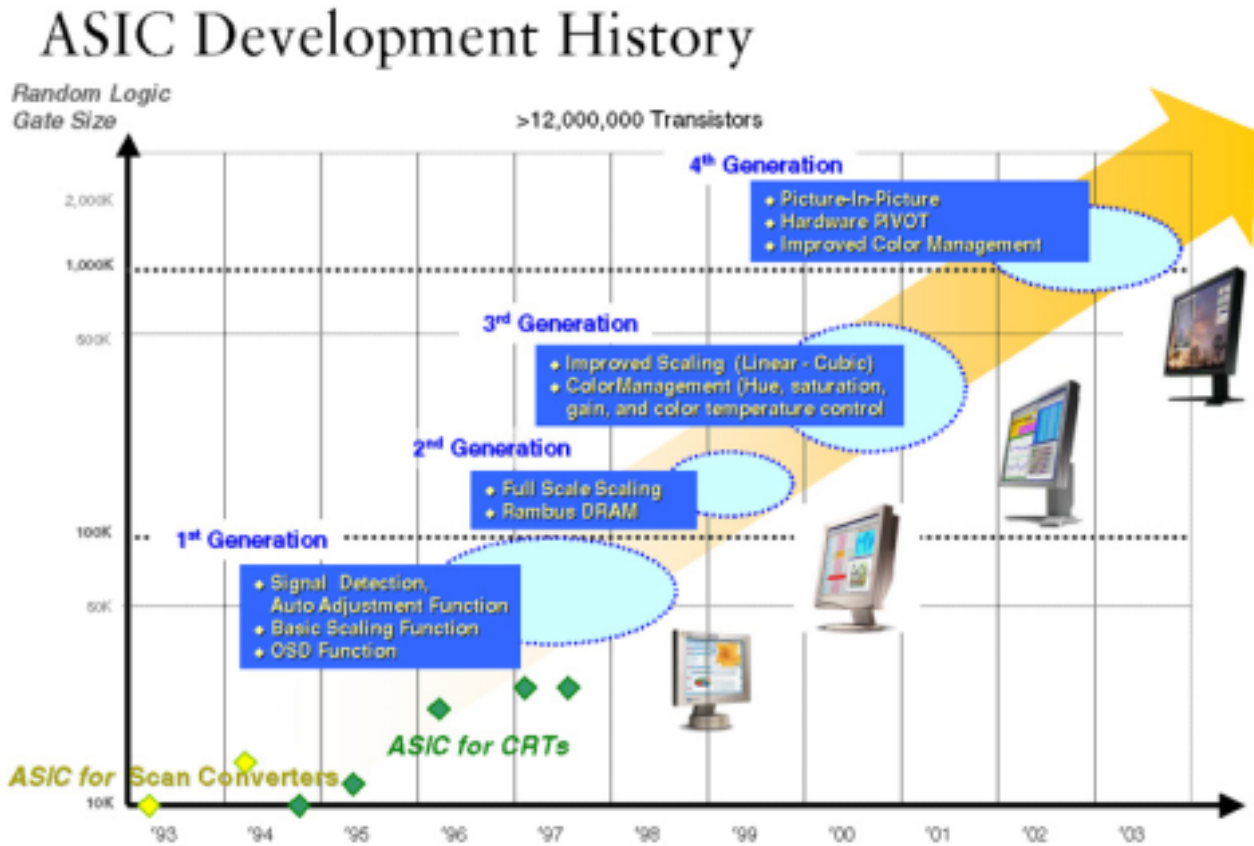
In February of 2001, EIZO developed its second generation ASIC with a liquid crystal controller that employed a Rambus DRAM and an upscaling engine (with a remarkably improved expanding interpolation function) that used an EIZO original linear algorithm. Models equipped with this ASIC contained a compact power supply unit that fit in the rear of the panel. These included the FlexScan L680, which expanded the use of LCD monitors to creative work with a new Super-IPS (In-Plane Switching) panel.

In April of 2002, EIZO developed its third generation ASIC with the goal of adding a color management function and improving image scaling. In upscaling processing, cubic convolution (bicubic processing used in image applications like Adobe® Photoshop® for changing resolutions.) was



3<sup>rd</sup> Generation ASIC

introduced to achieve more natural image quality through vertical direction processing. For color management processing, EIZO used a circuit for changing the color space, and implemented simple color temperature and hue adjustment functions. The FlexScan L675 and L685, products well-received in the financial market, were two of the monitors that used this ASIC. EIZO continued to improve this ASIC with two additional products, the L985EX and L685EX, by adding a 10-bit gamma look-up table and an independent 6-color (RGB, CMY) control circuit.



### About ASIC

In an ASIC, a switch circuit called a “gate” comprises the basic component of the function circuit, and “gate number” is used to express the circuit size. Just as the number of transistors in the Intel CPU has followed Moore’s Law and grown exponentially, the number of transistors in the EIZO ASIC is also growing exponentially with improvements in its performance. If we express the 4<sup>th</sup> generation ASIC used in the FlexScan L695 in transistors including logical circuits and memory, the number of transistors is approximately 9 million. This surpasses the 7.5 million figure for the number of transistors used in the Intel Pentium II processor. This exponential growth ties in with the continuous improvement in performance and screen quality of EIZO products.

### Innovative Features in the New 4<sup>th</sup> Generation ASIC

EIZO released the FlexScan L695, the first product carrying its fourth generation chip in April of 2003. This latest ASIC is a departure from software-based solutions with its two new features – ActiveRotation and ActiveShot. These features provide greater

#### Portrait Display with ActiveRotation

1. Landscape display
2. Vertical signal is outputted from the graphics board
3. ActiveRotation rotates the image 90°
4. Rotate panel 90° for portrait display.



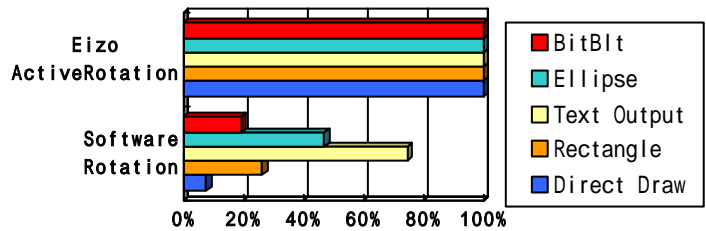
speed, efficiency, and reliability for the trading room floor and high-end corporate customers.

### ActiveRotation – Portrait Orientation

Previously, Portrait orientation had been achieved primarily through software control, but this has its drawbacks such as poor drawing performance, poor system stability, and incomplete support for Direct3D™ and OpenGL™, causing some applications to not run properly. ActiveRotation is not reliant upon the software, but achieves fast, stable portrait display through hardware control, producing a natural work environment similar to that of notebooks and documents.

#### ActiveRotation Performance (SXGA)

(Testing Environment: PC (Pentium 4 1.6 GHz))



### ActiveShot

ActiveShot is a “picture-in-picture” function similar to that included with many televisions. In the L695, this function is carried out with hardware processing in the ASIC so the output from two computers can be shown on screen at the same time. The screen is divided into a main window that covers the entire screen, and a sub-window that uses just a part of the screen. The sub-window size is a user selectable 1/4 or 1/16 size of the entire screen and its position can be moved as required. ActiveShot comes with Standard and Clip modes. Standard mode shows the entire screen from the second PC source in the sub-window. With Clip mode, the user can select just the desired area of the screen for display in the sub-window.

