

# Increasing Product Values

We are aiming to increase the value of our products by increasing environmental performance through the elimination of hazardous chemical substances, increased energy saving and the extension of product service life, and development and provision of eco-conscious products.

## Providing Super-Green Products and Factor 2 Achievement

During the Fourth Environmental Action Plan phase, we continue to aim at the development and provision of super-green products with top-level environmental characteristics. Furthermore, we will aim at achieving Factor 2.

### Aim of the Fourth Environmental Action Plan

Increase the ratio of super-green products with top-level environmental characteristics among newly developed products to over 20% by the end of FY2009.

Achieve Environmental Efficiency Factor 2, compared against FY2005 products, among newly developed products by the end of FY2009.

### Development of Eco-Friendly Products

At the FDK Group, we review the design of new products at the development phase for product environmental assessment to build eco-friendliness in our products. By assessing and considering non-hazardous materials, energy saving, longer product life, and the recycling of materials and packaging as they pertain to related laws and regulations such as the RoHS Directive, we strive to develop and provide eco-friendly products.

### Providing Super-Green Products

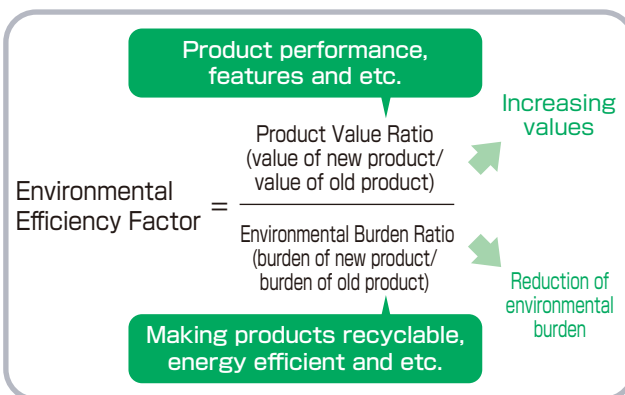
Super-green products are green products (products enhanced through environmental consideration) that are judged top-level characteristics by product environmental assessment such as "the world's first," "the world's smallest," "Japan's first," "the industry's first," "Japan's smallest," and "the industry's smallest." The FDK Group has positioned the development of super-green products as our mission since 2004.

So far, we have developed and made available two super-green products, the MIPF2520 series multilayer power inductor, "the world's smallest", and the AML0603E series RF multilayer chip inductor with "the top-level energy savings in the world." We are continuing to pursue the development of new super-green products throughout FY2007.

### Our Efforts for the Achievement of Factor 2

Factor 2 aims at more than doubling product value over product environmental burdens. By FY2009, we plan to make the value (features and performance) of our newly developed products equivalent to FY2005 products while reducing their environmental burdens to less than half. If a product has an environmental burden equivalent to its FY2005 counterpart, its product value must be at least twice the value of its FY2005 counterpart. This is the Factor 2 achievement plan drafted in FY2007, and we have commenced our product development programs accordingly.

### What Is an Environmental Efficiency Factor?



### Positioning of Super-Green Products



### Assessment Criteria for Eco-Friendly Products Major Categories

- Products**
  - Harmfulness (containing hazardous chemicals)
  - Resource saving and recyclable design
  - Recyclability
  - Decomposition
  - Energy saving
  - Ease of decomposition processing
- Packaging Materials**
  - Resource saving and recyclable design
  - Reusability
  - Materials used
- Overall**
  - Information disclosure
  - Environmental considerations

### Our Super-Green Products to Date

FY2005	FY2006
<b>World's smallest</b> The MIPF2520 series multilayer power inductor	<b>The top-level energy saving performance in the world</b> The AML0603E series RF multilayer chip inductor
*We determine top-level environmental characteristics (world's smallest, world's first, etc.) at the point we publicly announce product development.	

## Major Eco-Friendly Products Developed during FY2007

### Non-Isolated DC-DC Converter DK Series



#### Product Applications

This series is used to supply power to electronic equipment and components including servers, routers, multi-function printers, and amusement equipment.

#### Product Features

The DK series offers a comprehensive lineup of non-isolated regulated type\* compact DC-DC converters with specifications ranging between 3.3V to 12V for input and 1.0V to 6.0V for output. The series yields up to of 93.5% efficiency at 3A output, and provides high reliability by suppressing temperature increase of mounted components. Its attached metal cap improves heat discharge and noise reduction.

\*Regulated type

Method of stably supplying a specific voltage in spite of fluctuating output current.

#### Focus of Environmental Consideration

Power supply efficiency can be improved by approximately 12% by replacing the power supply made with the discrete design\* by this product. It also contributes to resource saving due to its small size by eliminating the need for a radiator, in addition to energy saving due to its high efficiency. Its substrate is halogen-free.

\*Discrete design

Method of designing using discrete components (individual components mounted on a circuit board)

#### Comment from the Development Engineer

This is a new series of DC-DC converters succeeding the Sensei and Senpai series. It is characterized by a new concept aiming to replace discrete design. Our major challenge was coming up with innovations for energy saving, downsizing and resource saving. We will continue to develop eco-friendly products in response to customer needs.

**Yurika Nakajima**

Fire Project

Power Devices Division  
Electronic Devices Group

### Stepper Motor SSMH6-20 Series



#### Product Applications

This series is used for autofocus and image stabilization in digital cameras and aberration correction in Blu-ray equipment.

#### Product Features

By combining FDK's own magnetic circuit and coil design technology, as well as high performance magnets manufactured by a Group company, we have realized a high output model while maintaining the size of the previous model. This series enables smaller, lighter and more energy-efficient motorized equipment.

#### Focus on Environmental Consideration

The SSMH6-20 series realized approximately 30% energy saving under FDK test conditions (voltage between terminals: 3.0V, two-phase excitation, 1000pps, and 20Ω) compared with the previous model. The presoldered area of the coil terminal is lead-free.

#### Comment from the Development Engineer

Although the external dimensions of this product are the same as the previous model, we have realized higher output and energy efficiency by aggregating the design and production technologies that we have nurtured through manufacturing. Its energy saving feature contributes to the prevention of global warming by reducing CO<sub>2</sub> emissions. We will continue to develop eco-friendly and high performance compact motors.

**Small Size Motor Team**

SM Engineer Group

FDK MECHATRONICS CO., LTD.

### Alkaline Battery G-PLUS



#### Product Applications

The G-PLUS series thoroughly pursues wide-range performance. Its main applications include equipment needing large current such as digital cameras, as well as remote control units and clocks.

#### Product Features

Four new technologies were introduced in the development of this product, namely ① thin film separator, ② internal short-circuit prevention technology [patent pending], ③ increased negative electrode material, and ④ optimized electrolyte composition, thus improving its wide-range\* and discharge performance. This series offers the leading edge performance worldwide in the areas requiring large discharge capacity such as digital cameras.

\*Wide-range performance

Offering appropriate performance in a wide range of applications from small to large current load

#### Focus on Environmental Consideration

Incorporation of new technologies improved discharge performance by approximately 20% in discharge tests equivalent to digital cameras\*. This also prolonged battery life by approximately 20%, contributing to the effective use of resources.

\* (1,500 mW 2 seconds / 650 mW 28 seconds) x 10 times / 1 hr, end point voltage 1.05 V

#### Comment from the Development Engineer

Recently, alkaline batteries are seeing application in wider varieties of equipment, due to more complex features in digital cameras, the popularization of TV game consoles with remote controls, and the permeation of simple cellular phone rechargers. Developing alkaline batteries that accommodate a wide range of usage conditions such as current load, temperature, humidity, vibration, environmental consideration and safety was no easy feat, but we are enjoying the challenge.

**Takeo Nogami**

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