Press information

KYOCERA Develops Ultra-Thin, Lightweight 'Piezo Film Speaker' for TVs, PCs, Tablets & Co

"Smart Sonic Sound", utilized in flat-screen TV for first time by LG, delivers highest audio quality

KYOTO, August 29, 2013 — Kyocera Corporation (NYSE:KYO) (TOKYO:6971) today announced that it has developed an ultra-thin, lightweight (medium-size model thickness: 1mm; weight: 7g) audio device, called "Smart Sonic® Sound." The new product is based on the company's long history of pioneering fine ceramic technology and utilizes a piezoelectric actuator combined with a special film to create a piezo film speaker. Smart Sonic Sound will not only contribute to making digital devices even thinner — such as flat-screen TVs, PCs and tablets — but also enhances audio quality for a much more realistic audio experience. Its low directivity characteristics broaden the sound projection range, providing 180-degree sound quality and bringing delicate and minute sounds to life.

This innovative piezo actuator audio technology is being utilized in a flat-screen television for the first time[*1] by LG Electronics, Inc. in the company's new 55" curved-screen OLED TV, which will be presented at IFA 2013 in Berlin Smart Sonic Sound comes in three different sizes (large, medium and small), and Kyocera plans to expand its use in a broad range of applications including digital devices and automotive applications with strict weight requirements.

Development Background

Currently there is a growing demand for even further downsizing (thickness and weight) of flat-screen TVs, PCs and other digital devices. However, up until now there has been a limit to the achievable thinness of such devices due to the size of conventionally-used cone-shaped electromagnetic

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speakers, which has confined design and engineering layouts. Furthermore, as organic light-emitting displays (OLED) and 4K high-definition screens create a superior visual experience, it has become necessary for audio technology to rise to new heights as well.

Main Characteristics

1. Ultra-thin, lightweight size allows flexibility in end-product design

The piezo actuator used in the new product was born from Kyocera's proprietary fine ceramic material technology and lamination technology, combined with a special film. Smart Sonic Sound can create the same audio volume as conventional electromagnetic speakers in just a fraction of the width and weight. This allows for the speaker device to be built onto the front face of an end-product with ease — contributing to flexibility and enhancements in end-product designs.

2. Low directivity, and high responsivity create a high-quality audio experience

As the new product's piezo actuator and film create sound through vibrations, the directivity (directional projection of sound waves) is more balanced than a conventional speaker, meaning that sound quality and volume are delivered almost completely equally within a 180 degree range. Moreover, the high speed of responsivity in the Smart Sonic Sound is able to reproduce delicate and minute sounds such as raindrops and background effects with greater clarity, thus providing an even more realistic audio experience.

Other products using Kyocera piezo actuators

Kyocera has developed a range of piezo actuator products using the company's proprietary technology. Among the wide range of applications, some notable examples include: actuators[*2] for diesel-engine vehicles requiring high reliability; actuators[*3] in the world's fastest inkjet printhead[*4] used for on-demand printing applications; as well as Kyocera's Smart Sonic Receiver.

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Model	Large	Medium	Small
Size (mm)	70×110×1.5	35×65×1.0	19.6×27.5×0.7
Weight (g)	23g	7g	1g
Frequency range	200Hz - 20kHz	500Hz - 20kHz	800Hz - 20kHz

*1 The world's first use of a ceramic piezoelectric actuator as the sound device for a flat-screen television. As of July 31, 2013; based on research by Kyocera.

*2 These actuators control fuel injection, thus enhancing fuel efficiency and reducing emissions.

*3 These actuators are used to control the ejection of ink drops in inkjet printheads.

*4 As of July 31, 2013; based on research by Kyocera.

For more information about Kyocera: www.kyocera.eu

About Kyocera

Headquartered in Kyoto, Japan, Kyocera Corporation is one of the world's leading manufacturers of fine ceramic components for the technology industry. The strategically important divisions in the Kyocera Group, which is comprised of 228 subsidiaries (as of April 1, 2013), are information and communications technologies, products which increase quality of life, and environmentally friendly products. The technology group is also one of the largest producers of solar energy systems worldwide, with more than 3,0 gigawatts of solar power having been installed around the world to date.

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The company is ranked #492 on *Forbes* magazine's 2013 "Global 2000" listing of the world's largest publicly traded companies.

With a global workforce of about 71,000 employees, Kyocera posted net sales of approximately €10.58 billion in fiscal year 2012/2013. The products marketed by the company in Europe include laser printers, digital copying systems, microelectronic components, fineceramic products and complete solar power systems. The Kyocera Group has two independent companies in the Federal Republic of Germany: Kyocera Fineceramics GmbH in Neuss and Esslingen and Kyocera Document Solutions in Meerbusch.

The company also takes an active interest in cultural affairs. The Kyoto Prize, a prominent international award, is presented each year by the Inamori Foundation — established by Kyocera founder Dr. Kazuo Inamori — to individuals and groups worldwide who have contributed significantly to the scientific, cultural, and spiritual betterment of humankind (converted at present €400,000 per prize category).

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