

New Scale demonstrates tiny SQUIGGLE optical zoom module for phone cameras at Photonics West

Greater than 4 mm range and 10 micrometer repeatability are achieved to validate this unique and scalable motion technology for both optical zoom and auto focus

San Jose, CA – January 24, 2006 – New Scale Technologies, Inc. demonstrated a new optical zoom module for mobile phone cameras today at the Photonics West conference in San Jose, CA. Using the patented SQUIGGLE motor, this miniature module achieves lens travel greater than 4 mm with better than 10 micrometer closed-loop repeatability. It validates the piezoelectric motor technology's ability to deliver both optical zoom and auto focus movement in a tiny package for next-generation handsets.

Using the newest and smallest SQUIGGLE motor (a 2.4 mm x 2.4 mm x 6.5 mm linear motor), this reference design is an integrated motion subsystem incorporating the piezoelectric motor, a smooth linear guide, preload springs, limit stops, and a position sensor. Computer control is demonstrated using an OEM motor controller that is smaller than a credit card. Single-chip controllers are under development by leading ASIC manufacturers and will be available by the second quarter of 2006.

The demonstration module's cross section of 10 mm x 12 mm is only slightly larger than the 8 mm diameter lens. The module's 18 mm length reflects the typical optical and physical properties of the lens elements and image sensor. The final dimensions of a customer's module will be determined by the customer's choice of optics and image sensor. SQUIGGLE ultrasonic motor technology can scale to any camera design.

"As phone cameras designers move to 3MP (mega pixel) and 5MP CMOS image sensors, both auto focus and optical zoom will be required to deliver the image quality they want from those sensors," said David Henderson, president of New Scale. "Our tiny SQUIGGLE motor is uniquely suited to provide both the range and repeatability required for this, in a tiny package."

Phone cameras with greater than 2 MP CMOS image sensors are currently in production, using auto focus mechanisms driven by short-stroke (less than 0.5 mm) piezoelectric actuators, voice coils or stepper motors. With higher resolution sensors, both auto focus and optical zoom are highly desirable but difficult to achieve without significantly increasing the phone size. A combined auto focus/optical zoom module requires at least two sets of moving optics with greater than 4 mm of stroke (zoom) and coordinated movement with better than 10 micrometer repeatability.

Compared to stepper motors and voice coils, SQUIGGLE motor-based modules scale to the smallest possible size, independent of the optics and image sensor. The simple and low-cost design eliminates gears, cams and barrels, and provides better robustness to mechanical shock and temperature extremes. SQUIGGLE motors have higher efficiency and longer battery life, holding the lens in position with zero power and high rigidity.

"The market pull for SQUIGGLE focus and zoom modules is huge," Henderson said. "Industry forecasts show that by 2009 the world market for mobile phones will be one billion per year and that up to 90 percent of those phones will incorporate cameras. Those cameras need image quality that rivals stand-alone digital cameras, as wireless service providers are eager to maximize revenue for photo transmission, sharing and printing."

About the SQUIGGLE motor

The patented SQUIGGLE motor uses a threaded nut and screw to create precise linear movement in a very small space. Piezoelectric ceramics create ultrasonic vibrations in the nut, causing the screw to rotate and translate with high precision. SQUIGGLE motors are smaller,

more precise, less expensive and more efficient than conventional electromagnetic motors. In addition, they use 90 percent fewer parts and require no gear reduction, which eliminates many failure modes. This ceramic motor is fundamentally compatible with high magnetic fields including MRI chambers. SQUIGGLE motors are used in nanotechnology research, microelectronics, optics, lasers, biotechnology, medical devices, aerospace and defense, fluid control, and office/consumer products including mobile phone cameras.

About New Scale Technologies

New Scale Technologies, Inc. (www.newscaletech.com) makes miniature ceramic motors that enable our customers to create smaller products and research tools. Our piezoelectric SQUIGGLE motors are smaller, more efficient and more precise than conventional motors. With only seven parts and no gears, this patented piezoelectric motor design uses ultrasonic vibrations to create precise linear motion. New Scale's miniature motors are compatible with extreme environments including vacuum, very low (sub-Kelvin) temperatures, and high magnetic fields.

SQUIGGLE is a registered trademark of New Scale Technologies, Inc.

Photo caption:

New optical zoom module is only a few mm larger than the lens. This reference design validates SQUIGGLE motor technology for phone camera auto focus and optical zoom.

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