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Micro-Electrostatic Actuators enabling smartphone Cameras To Achieve Autofocus and Optical Image Stabilization

Dr.Ridha Ben-Mrad
President

Sheba Microsystems Inc.
www.shebamicrosystems.ca

Contact:
Ridha Ben-Mrad
416-270-0397
r.benmrad@shebamicrosystems.com

Interview conducted by:
Lynn Fosse, Senior Editor
CEOCFO Magazine

CEOCFO: ***Dr. Ben-Mrad, what is the idea behind Sheba Microsystems?***

Dr. Ben-Mrad: Sheba Microsystems is a manufacturer of MEMS chips that go into smartphone cameras to achieve autofocus and optical image stabilization. Our chips are micro-electrostatic that are fabricated on Silicon. They are very fast, accurate, reliable, very thin and require very little power. They offer large benefits in terms of performance that lead to one to two orders of magnitude improvement over the Voice Coil Motor technology that is dominant today. In addition, our chips can be very easily integrated with other technology and microelectronic devices.

CEOCFO: ***Are some of these capabilities unusual for chips?***

Dr. Ben-Mrad: For actuators yes, because these micro-electrostatic actuators have a thickness of about .5 to .6 millimeters. They are able to manipulate large masses of up to 100 milligrams, which is unusual for electrostatic technology, because typically such electrostatic technology has been limited to manipulating about 1 to 2 milligrams of mass. Therefore, we have at least one to two orders of magnitude increase, in terms of the size of the mass, that we can manipulate. We can move these masses up to 100 micrometers in stroke, which is needed to achieve autofocus. In addition, we have very high speed and high accuracy in the sense that we can move the objects with an accuracy of the order of plus/minus .5 micrometers, which is very high and enables the cameras to achieve much higher performance. The fact that this is an electrostatic driver implies that basically the power requirements for the actuators is 2 orders of magnitude smaller than the requirements of the voice coil motor technology that is dominant in the market today.

CEOCFO: ***How are you able to have something that is better and faster than your competitors?***

Dr. Ben-Mrad: It is all embedded in the design and how we were able to come up with a design for this electrostatic actuator platform that integrates a very large number of small surfaces that are used together to generate a large force which is acting directly on the load. We have spent quite a bit of time trying to master how to microfabricate these chips based on the design, but now we have simplified the fabrication process and design so that the technology is suitable for fabrication by standard fabrication processes.

CEOCFO: ***Where are you in the process? Are you still in development or are you chips on the market today?***

Dr. Ben-Mrad: We have developed a number of designs of our microchips, which we are making available to our customers. We develop so that they are suitable for specific application and for specific requirement for different customers. At the Mobile World Congress in Barcelona at the end of February, 2017, we launched our first two cameras. The first camera achieves autofocus by moving the lens barrel, using the micro-electrostatic actuator technology, and the second camera that we are launching is the first of its kind, where we are using the same actuator technology to move the image sensor to achieve autofocus. This has never been done before.