



Feature Articles: Business and CSR — “Monolithic Ceramic Capacitors”

Monolithic ceramic capacitors: Contributing to the evolution of smaller and more efficient electronic devices

Creating new value that will promote the evolution of mobile phones and smartphones

At the time it first appeared, the mobile phone was carried on the shoulder like a shoulder bag. That look has now evolved into the size of one's palm and is thinner than a small notebook. In addition to phone calls and e-mail, everything that we used to put in our pockets, like commuter tickets, wallets, maps, and cameras... all of these functions are now contained in a single smartphone. However, since they incorporate so many functions, it is necessary to pack a large number of electronic circuits into a narrow space. For example, there are no less than 500 to 700 miniature monolithic ceramic capacitors in the latest smartphone. And those built-in electronic components need to continually be ever smaller and ever thinner. Presently, communication networks represented by mobile phones and smartphones have become a part of the social infrastructure that delivers safety, security, and affluence to our lives, just like electricity, gas, and water utilities. They are naturally used for regular communication, but they also demonstrate their enormous importance in times of disaster. Since our foundation, at Murata we have worked towards total integration from material development to the manufacturing process and all the way to the finished products, and we lead the drive for smaller, larger capacity monolithic ceramic capacitors.

We think that Murata has the responsibility to continue finding ways to offer even newer value in monolithic ceramic capacitors that will advance the evolution of those mobile phones and smartphones, which have become an indispensable part of the infrastructure. And we are determined to continue our vigorous efforts as an "Innovator in Electronics®" in the development of parts, service, and solutions that create new value.

Murata. Always challenging miniaturization and leading the industry towards the "world's smallest" products

This January, Murata's micro monolithic ceramic capacitors were given the Nikkei Awards for Excellence in the 2012 Nikkei Superior Products and Services Awards sponsored by the Nihon Keizai Shimbun newspaper. Presented for superior products and services, we were commended for our development of small products, like 0.4 x 0.2 mm for practical use (0402 size) and an even smaller 0.25 x 0.125 mm (0201 size). "Murata is always a leading vendor in the industry and delivers the electronic components that are indispensable in smartphones, the use of which is spreading quickly in today's market." The trend towards miniaturization and greater capacity in monolithic ceramic capacitors can be said to mirror the very history of Murata itself. And our development of 0201-size products now opens a new page in that history.



Feature Articles: Business and CSR — “MEMS Sensors”

Preventing loss of stability even in suddenly changing road surfaces and contributing to safety in an automotive society via “Active Safety”

A new ally joins the Murata Group: MEMS sensor technology from Finland

MEMS is an acronym for “Micro Electro Mechanical Systems” and it involves the micro fabrication of silicon wafers just like with semiconductor products such as memory and microcomputers. MEMS products are not merely circuits on a silicon substrate but possess a three-dimensional, mechanically movable configuration. This structure enables functions that employ sensors for converting such physical quantities such as pressure, temperature and acceleration into electrical signals and actuators that conversely receive the electrical signal and mechanically move the movable structure. When VTI Technologies Oy, a dedicated MEMS producer in Finland, was added to the Murata Group as Murata Electronics Oy in January 2012, it became possible for us to employ three-dimensional MEMS technology and offer the robust functions of accelerometers, gyro sensors, and inclination sensors. The main market for this new technology is the

automotive domain, especially for the ESC (Electronic Stability Control) system that is indispensable to safe driving. In response to the over- or under-steering that is generated when there is sudden change in road surface conditions, or from rapid steering actions, this mechanism instantly returns the vehicle to a state of stability through automatic and integrated control of the brake and engine output. Europe and North America have already made installation of an ESC system obligatory, and that same requirement was imposed even in Japan for new models and full model changeovers starting from October 2012. Conventionally, the mainstream of automotive safety was “ex post facto remedies” with the installation of air bags and other safety equipment, but ESC is based on the concept of “Active Safety”, i.e., preventative safety. And Murata technology contributes a great deal to the spread of systems like this.



Providing automotive safety through sensors that adopt MEMS technology

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