Electronic Component Field

As microprocessors are increasingly being used in almost every modern electronic equipment surrounding us, the application areas of their peripheral electronic components and circuit boards are rapidly expanding. Recently, the demands for mobile electronic equipment including cell phones, smart phones, tablets, and notebook PCs are growing explosively with the rapid development of a network called cloud, where the equipment is used as a terminal. Not only mobile equipment, but digital cameras, car navigation systems, and home electric appliances such as TV sets are now connected to cloud network. In keeping with this trend, new products are appearing one after another. Smaller, lighter, faster, denser electronic components are sought after than ever before to achieve more functionalities of the mobile equipment.

Fujikura offers two types of products towards the market for the components mentioned above.

One product category includes wiring components and their peripherals that we have developed on the basis of our careers as a wire and cable manufacturer. Flexible printed circuit (FPC) boards, electric wires, and connectors fall under the category. This paper describes the current state of our FPC fabrication technologies and the newest FPC products made by state-of-the-art technologies. One of the technologies is a subtractive patterning method, where a copper circuit is formed on a copper-clad laminate (CCL) by photolithography and etching. Another is a semiadditive method, where a copper circuit is grown by electroplating after patterned on a thin copper seed layer. The paper also describes an all-polyimide IVH co-laminated technology (APIC) that allows fabricating a high-reliability, high-density multilayered FPC in an efficient way and a component-embedded circuit board by using the APIC technology (WABE: Wafer And Board level Embedded technology). In the electronic wiring cable field, we introduce a micro-coaxial cable for intra-equipment wiring made of a very small, thin coaxial cable with a diameter less than 0.3 mm, high-speed interface cables for inter-equipment wiring such as a USB 3.0 cable and a thin-film planar antenna. We also present our state-of-the-art connector technology and products such as FPC connectors, micro-coaxial connectors, and high-performance connectors for mobile use, all of which are coming down in size, height, and pitch between pins.

The other product category includes functional components with a variety of features. Printed electronics products, discrete sensors, and thermal technology products fall under this category. Among the printed electronics products, we introduce membrane switches used in a PC keyboard, an occupant detection sensor in a seat-belt reminder system, and capacitance sensors used in a touchpad whose circuits are formed with a conductive silver paste on a thin plastic base film. Printed electronics is a promising technology making it possible to fabricate many kinds of planar sensors with a larger surface area and display at low fabrication costs. We have developed planar sensors with a variety of functions utilizing all of our accumulated technology for flexible planar wiring boards. We also describe discrete devices and a related technology such as an ultra-compact digital-output atmospheric-pressure sensor built by silicon MEMS processing technology, a magnetic sensor of thin-film fluxgate type, and a packaging technology to enable 3D wiring by applying the through-hole silicon via technology. In the thermal-technology-related fields, we present our cooling products for various electronic hardware ranging from note PCs to data center systems and the state-of-the-art technology for putting such products into practical use. The processing speed of CPUs gets faster and faster as large-capacity video transmission becomes common in recent years. That brings us a serious challenge of dissipating heat that increases with the increase in power consumption. That is the reason why the thermal technology products providing efficient cooling solution have come under the spotlight.