Preface

Through Innovation in Energy and Environment Technology, We Contribute to the Creation of Sustainable Societies.

Since its inception in 1923, Fuji Electric has been making contributions to society in the fields of industrial and social infrastructure.

As a result of unprecedented rapid increases in population growth and industrialization, the earth is now faced with energy and environmental problems. With its brand statement of "Innovating Energy Technology," Fuji Electric is determined to contribute to the creation of a responsible and sustainable society through our pursuit of innovation in energy and environment technology. Going forward, Fuji Electric will continue to improve its energy and environment technology and manufacturing capabilities in order to supply environmentally friendly products that provide high added-value and that are able to use energy as efficiently as possible.

With our core technologies of power semiconductors and power electronics, and also including instrumentation and thermal technology, Fuji Electric's research and development initiatives are resulting in the development of thoroughly distinctive components. Moreover, by establishing and packaging a platform for control technology that is centered on these distinctive components, Fuji Electric is also focused on the development of products that will provide various solutions to our customers. For the Internet of Things (IoT), which is currently attracting much attention, Fuji Electric is leveraging its expertise in sensing and other technologies to focus on the development of distinctive devices and platforms. To accelerate these developments and strengthen the development structure, in FY2015, Fuji Electric completed construction of the Development Center at its Matsumoto Factory, which is our central base for power semiconductors, and also completed construction of the Core R&D Center that will be used as a company-wide technical development base at its Tokyo Factory, and in addition, Fuji Electric is currently constructing the Power Electronics Technical Center at its Suzuka Factory to be used as a central base for power electronics.

Fuji Electric has been pursuing synergy with power semiconductor technology and power electronics technology, and is focusing on the development of power devices based on silicon carbide (SiC), which is expected to revolutionize power devices, and on the development of power electronics products that incorporate these devices. At the Matsumoto Factory, which is our production base for power semiconductors, the industry's first 6-inch wafer process line is running as a production facility for SiC devices, and Fuji Electric is mass-producing 600- to 1,700-V Schottky barrier diodes (SBDs) and 1,200-V metal-oxide-semiconductor field-effect transistors (MOSFETs). At the same time, Fuji Electric is also developing various ultra-small and high-reliability modules capable of extracting the maximum performance from SiC devices. In addition, we have developed a 3,300-V hybrid module using a SiC-SBD that was developed in collaboration with the Tsukuba Power-Electronics Constellations (TPEC), a joint research consortium. Employing this module, we have developed a traction converter for Central Japan Railway Company. High-speed railway testing of systems that use SiC modules are being conducted for the first time in the world with Series N700 Shinkansen trains. For inverter applications, we have developed high reliability SiC-MOSFETs, and All-SiC

modules that incorporate SiC-SBDs. Leveraging the low-loss performance of these modules, we have developed a dustproof and waterproof inverter in a fully-enclosed self-cooling structure suitable for installation in adverse environments, where installation had been difficult previously. Going forward, Fuji Electric will continue to leverage the advantages of SiC devices to develop products that provide new value. Moreover, while maintaining synchronicity with the development process for power semiconductors, we also intend to develop a power electronics platform so that products can be developed efficiently within a short period of time.

As solutions to create customer value, we have combined our distinctive sensing technology with our vast experience in control technology and our strength in power electronics to develop a boiler combustion solution package that helps to reduce the cost of boiler fuel and a harbor crane solution control package that realizes the industry's highest level of steadying accuracy and energy savings. Furthermore, we have developed a supply and demand management system that supports the liberalization of the electricity retail market which has been underway since April 2016, and in collaboration with NTT Data Corporation and Kyowa Exeo Corporation, have begun selling this as a cloud service for power producers and suppliers.

Fuji Electric has a comprehensive line-up of products and technologies, ranging from onsite data sensing to gateway and network technology, and data analysis technology, and is preparing a variety solutions that will put the IoT to practical use.

As one example, we have developed a cloud-based comprehensive facilities management system, and have begun offering this service. This service allows customer equipment to be managed throughout its lifecycle, from installation of the equipment to its operation and replacing, thereby maximizing the management efficiency for customer equipment and minimizing energy cost. Fuji Electric will continue to develop distinctive devices and technology platforms to realize solutions that create customer value through the practical use of the IoT.

Fuji Electric will continue to create electromagnetic noise simulation technology, to develop resins for devices that operate at high temperatures, to develop bonding technology for dissimilar metals, to investigate the physical properties of magnetic materials, to create technology for analyzing resin and metal adhesion, and so on, as fundamental technologies and leading-edge research and development with an eye to the future.

Fuji Electric has adopted the slogan of "To be enthusiastic, ambitious and sensitive" to express its corporate philosophy. "Enthusiastic" means our creative passion and motivation, "ambitious" means our aim for advancing our high goals, and "sensitive" means the richness of the human spirit. With these concepts in mind, Fuji Electric intends to continue to accurately assess the needs of society and to realize innovations in energy and environment technology so as to contribute to the creation of a responsible and sustainable society. We are truly grateful for the guidance and encouragement received from everyone.

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Fuji Electric

Innovating Energy Technology

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