

**FOR IMMEDIATE RELEASE**

**Hitachi Automotive Systems has developed a high-output 48V lithium-ion battery pack for mild hybrid electric vehicles**

**Tokyo, Japan, April 20, 2016** --- Hitachi Automotive Systems, Ltd. today announced that it has developed a high-output 48-volt battery pack to improve the fuel efficiency of mild hybrid electric vehicles (“mild HEVs”) that use a battery and motor to provide power assistance when the vehicle is being driven by its internal combustion engine. This summer, Hitachi Automotive Systems will start shipping samples to customer car manufacturers and aims to commence mass-production in fiscal 2018.

A mild HEV is a technology for improving the fuel efficiency of passenger cars by using the power of a battery-driven motor to provide power assistance when the vehicle is being driven by gasoline power. In recent years, mild HEV systems, especially those using 48-volt lithium-ion batteries, have been attracting increasing attention in the vehicle markets of Europe and China. In Japan’s domestic car market, the mainstream has been strong HEVs, which use high-voltage batteries of 100 volts or more, with mild HEV systems being limited to light cars that are equipped with low-voltage 12-volt batteries and storage capacitors. In Europe and China, however, mild HEV systems that use 48-volt batteries are rapidly spreading as they are viewed as a relatively low-priced way of achieving improved fuel economy. With the expectation being for rapid future growth, Hitachi estimates that by 2023, HEV unit production will be over 2 million units in Europe and over 4 million units in China.

In view of these trends in the vehicle markets of Europe and China, Hitachi Automotive Systems concentrated on bringing together its accumulated strengths in the technology of manufacturing lithium-ion battery cells for hybrid vehicles and its battery management system (BMS) technology to develop a battery pack, and in this March completed the basic design of a lithium-ion battery pack for 48-volt HEV systems.

The newly developed 48-volt lithium-ion battery pack is a highly integrated package that in addition to the BMS board and battery cells, includes a relay and fuse. With excellent low-temperature characteristics and approximately 1.5 times the output density of Hitachi’s previous battery cells, it is a highly reliable battery pack that, with its high-output prismatic lithium-ion cells, when assisting the acceleration of a motor

using a 48-volt system, delivers a fully sufficient torque performance for a maximum output of 10 kW or more and maximum input of 13kW or more (for 10 seconds in each case). Moreover, the compact design of the battery pack helps to increase the degree of installation freedom in the passenger compartment.

Hitachi Automotive Systems is in charge of product development and sales, while the manufacturing will be done by Hitachi Vehicle Energy, Ltd., which is a manufacturer of automotive lithium-ion batteries.

The lithium-ion battery pack will be on display at the 14th Beijing International Automobile Exhibition (also referred to as the Beijing Motor Show 2016) from Wednesday April 27 to Wednesday May 4 in Beijing, China, and at the Automotive Engineering Exposition Yokohama 2016 held under the sponsorship of the Society of Automotive Engineers of Japan, Inc. to be held at Pacifico Yokohama from Wednesday, May 25 to Friday May 27.

Hitachi Automotive Systems will continue to contribute to the evolution of electric vehicles by strengthening lithium-ion batteries and electric powertrain components.



Newly developed lithium-ion battery pack for mild HEV systems

### Specifications of the new lithium-ion battery pack

Item	Specification
Dimensions (mm)	175x280x100
Number of cells	12
Weight (kg)	5.0
Voltage range (volts)	33-51
Capacity (Ah)	5.5
Maximum input (kW)	13
Maximum output (kW)	10

**About Hitachi Automotive Systems, Ltd.**

Hitachi Automotive Systems, Ltd. is a wholly owned subsidiary of Hitachi, Ltd., headquartered in Tokyo, Japan. The company is engaged in the development, manufacture, sales and services of automotive components, transportation related components, industrial machines and systems, and offers a wide range of automotive systems including engine management systems, electric power train systems, drive control systems and car information systems. For more information, please visit the company's website at <http://www.hitachi-automotive.co.jp/en/>.

**About Hitachi Vehicle Energy, Ltd**

Hitachi Vehicle Energy, Ltd. is a subsidiary of Hitachi, Ltd., headquartered in Ibaraki Prefecture, Japan. The company manufactures lithium-ion batteries and is expanding the scale of mass production. For more information, please visit the company's website at <http://www.hitachi-ve.co.jp/en/>.

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