

ITRI to demonstrate multiple power modules by jointly developing with the enterprises

The alert of global warming has caught the universal attention to power saving and energy recycling, and the ideology has penetrated into multiple application dimensions, from livelihood, transportation to industrial manufacturing. Power modules may improve the switch efficiency, enabling the transmission of the electricity, and furthermore, the modulation of the power electronic component can obviously save the size and weight while enhancing the power density, and therefore, the demand of power module keep increasing. Yole Development indicated that the power module market will hit US\$ 5 billion by 2022.

Supported by the Ministry of Economic Affairs, R.O.C., Industrial Technology Research Institute (ITRI) has successfully developed various kinds of power module, ranging from Si MOSFET, IGBT, Gallium Nitride, to Silicon Carbide. In the meantime, through the collaboration with Taiwan's domestic enterprises, the developed power modules were further applied for the frequency conversion home appliances, industrial motors, motor drives for electrical automotive and scooters, and many more. The quality and performance of the power modules made by ITRI are not only competitive with the ones made by the suppliers who are dominating the global market, the automotive-oriented power module is also well recognized by Japan's Tier 1 supply chain maker.

Currently the offer price of the power modules remaining high that has been a burden for the system integration vendors. General Director of Electronic and Optoelectronic System Research Laboratories (EOSL) of ITRI, Dr. Chih-I Wu, addressed that the good semiconductor foundation offers Taiwan an advantageous standing point in the development of power semiconductor technology. Furthermore, the enterprise may access the power module trial production and test platforms established by ITRI, so that the time-to-market schedule may be further shortened.

In the meantime, in the operation of the industry alliance, Power Electronic System Consortium (PESC), ITRI formed the special interest groups with the involvement of the industrial partner. Research topics are categorized by subsystem of e-scooter, industrial servo motor, and wide-band gap device and system, and reliability testing. The participant members of the latter one will jointly establish the testing procedure and principle, especially in terms of the automotive application.

ITRI's power module trial production factory has been established in July of 2019, providing the services from design, simulation, fast prototyping, small volume

production, and reliability tests. So far, ITRI has helped several international companies to develop a variety of cost-effective products.

In Automotive World 2020, ITRI further leverages Unimicron Technology Corporation, Lite-On Semiconductor Corporation, Shihlin Electric and Engineering Corporation, and Mitsui Mining & Smelting Co., Ltd (MITSUI KINZOKU) to demonstrate the joint research results.