# Electric Car Development to Bring IGBT Revenue Past US$5.2 Billion in 2021, Says TrendForce

**2019-06-12** Chris Hsu

According to TrendForce, electric cars have already become the main motivator for growth of the future car industry, and are expected to exceed 8 million units in 2021, twice the amount of shipments for 2018. Apart from batteries and engines, IGBT power components are ranked as the most important among key electric car components, being used in numbers 5 to 10 times that of traditional internal combustion engines. These modules may therefore bring about continual growth of total IGBT market revenue, which is projected to go beyond the US$5.2 billion mark.

TrendForce Analyst Chris Hsu explains that electric cars mainly use five types of IGBT devices: inverters, DC/AC converters, on-board chargers, energy monitoring systems and other auxiliary systems. Among these, inverters, DC/AC converters and on-board chargers are the most critical to electric car performance, as IGBT components or IGBT modules are often switched in for power components in order to satisfy high voltage, high power working conditions. This shows that their need for IGBT modules is the greatest. On the other hand, although energy monitoring systems and other auxiliary systems such as water pumps and AC compressors do not differ that much compared to previous designs,switching to high voltage car batteries for energy input necessitates a concomitant switch in load-bearing power components to IGBT power components with higher voltage working ranges. This will contribute to IGBT market demand.

Looking at supply chains, we see that the main IDMs for electric car IGBT components are Infineon, ON semiconductor, Fuji Electronics, STMicroelectronics, DENSO, BYD etc. Infineon takes the top position in the overall IGBT market with a market share of 30%, and provides both IGBT components and IGBT modules. And although DENSO and BYD are car manufacturers, they also possess the ability to design and manufacture their own IGBT components for electric cars, and rank among the few car manufacturers to extend to the semiconductor sector.

Moreover, the companies to whom IDMs offshore IGBT components along the supply chain include Taiwanese foundries such as VIS and Mosel Vitelic. China, on the other hand, has companies such as SMIC and Hua Hong to meet domestic demands. For electric car IGBT modules, customers may seek providers such as Mistubishi, SEMIKRON, Danfoss, CRRC and other suppliers who specialize in making these modules.

According to TrendForce's statistics, the number of electric cars has grown in 2016-2018, registering in sequence 28%, 29% and 27% YoY growths compared to the mere single-digit growths up until 2015, and brought IGBT revenue up by leaps and bounds. Total revenue for the global IGBT market 2018 lies at around US$4.7 billion, a 16% growth YoY.

Yet with the currently-stalled US-China trade talks; the erection of a tax-wall at US-Mexico borders due to illegal immigrants; Brexit; the instability brewing in the Middle East and other factors, the risk for global economic downturn is mounting and causing persistently sluggish car sales worldwide. Adding the less-than-expected sales performance seen in China, the world's largest single market for electric cars, car sales in 2H19 may become affected, and total IGBT revenue in turn as well. Total IGBT revenue is forecast to reach US$4.84 billion in 2019, a mere 3% growth over 2018.

For more information on the global car market and its development, please refer to TrendForce's newest Global Automotive Market Decode Report:

https://www.trendforce.com/Global-Automotive-Market-Decode

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