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## Electromobility and EMC – An Often Underestimated Subject

Germany is planning to be climate-neutral by 2045. Road transportation is responsible for a large share of greenhouse emissions, not just in Germany, and innovation is needed that is often seen in electromobility. From the Federal Government's perspective, electromobility includes all vehicles that are powered by an electric motor and draw the majority of their energy needs from the electrical grid.

And yet despite all this innovation: modern electrified drivetrains create a new and exacerbated electromagnetic environment in vehicles. Operating voltages of several hundred Volts, currents of several hundred Amperes and electric motors with performance levels of 100 kW and more are leading us into completely new and unprecedented dimensions. And this in a sector that has until recently invested a lot of money and resources in the optimization and further development of combustion technologies and now has to build up comprehensive expertise in the electrification of drivetrains.

Particularly in electromobility, electromagnetic compatibility (EMC) plays an important role. EMC tests have been legal requirements for conventional electrical devices for many years and the prerequisite for the marketing of these products. The drivetrain components, namely the inverter and motor, play particularly prominent roles in electromagnetic compatibility of vehicle components. Their potentially high degree of interference can severely degrade the function of other elec-

tronic vehicle components. No one wants false measurements in the onboard electronics due to electromagnetic fields.

This is why electromagnetic compatibility must be included early enough in the development of vehicles and vehicle components. Retrofit solutions are often associated with a lot of effort and seldomly adapted to the actual problem. In addition, they are expensive as they are created under great time pressure. Time and again, one sees surprised faces when presenting the EMC components required to achieve the goals and fulfil constraints. Even the qualification of the components does not always correspond to the vehicle manufacturer's expectations. Although many components have been used in comparable applications for many years, comparable is not identical, and life in a switching cabinet is a little more relaxing. Luckily, the gap is not as great as it may seem at first glance. Many EMC components can be implemented without any problems. Very often, only small adaptations are required, or test cycles need to be simply extended to ensure the necessary safety for use in vehicles.

Ultimately, electromobility will also lead to more innovation in EMC components, in particular regarding the size and weight of the solutions. The automotive sector will have to develop an even greater understanding of EMC in these times of electromobility and become aware of its importance for the safety and reliability of electric vehicles.