

# **Importance of High Power/ High Frequency Compound Semiconductor devices for Wireless Power Transfer using Direct-Current-Resonance System**

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Wireless power transfer systems are now known as a revolutionary new technology. Their application is widely spread, from the power station level to home and personal appliances. Such systems are beginning to change our life style. The underlying technology is a combination of power electronics, high frequency power device technology, and high frequency electronics; so to say, it is a new fusion science field.

In this presentation, the Direct-Current-Resonance system is introduced as one of the major wireless power transfer systems. This system utilizes quite a new technical idea, in which one drives a resonance with a DC power source and transfers the energy through space. The energy exchange from electricity to electromagnetic field has been done using an electromagnetic phenomenon called a Resonance Field. How this system works will be shown using real demo system during the presentation. (please note that this is science, and not a magic show!)

The performance and efficiency of this system is strongly dependent on the characteristics of the power devices. Compound semiconductor power devices are expected to play an important role in these systems, because of their exceptional performance potential. In fact, a very high performance of 89.5% power efficiency (from DC power source to load) and 22.4W peak output power at 6.78MHz have been achieved in such a system using GaN-FETs.