Future developments of power electronics devices and its applications

Engineering

Power Electronic Devices Power Electronics Devices Power electronics involves the use of solid electronics to control and convert electric power, and most industries around the globe are adopting to these new technologies. They play a critical role in transforming the electric grid into the next generation grid, the best thing to happen in the world of electronics. Devices that are available dictate power electronics, and their usage for different purposes in the economy play a role in determining the availability (Moorthi, 2005). Formerly, the mercury arc valve, thermionic rectifiers and other triggered devices such as ignitron were used but have been replaced by solid state devices such as diode and the silicon controlled rectifier.

The devices maybe used as switches or amplifiers as they have the ability to withstand applied voltage without passing current. They can also pass any amount of current without a drop in voltage. Only little power is therefore wasted, compared to other previous electronic devices as argued by Moorthi, (2005). The existing silicon based electronics are used because they enable conversion of direct current to alternating current as well as the movement of electricity from a higher voltage transmission to a lower distribution even though the technology cannot handle power levels that are anticipated with the next generation utility grid and applications.

Based on wide band gap (WBG) semiconductor materials such as Silicon Carbide and Diamond, power electronics could up the efficiency and reliability of the next generation electric grid, as they are able to route power more quickly and handle high voltages (Perret, 2009). They can operate at higher temperatures and have relatively low thermal resistance thereby allowing for better cooling. This kind of strength gives them an edge over

other electronic devices made for the same function. However, they face a challenge in the design of new device types to best exploit them, meaning innovators need to do more work to ensure that the designs meet the current trends in the world.

If successful, the semi-conductor technology will improve performance of power electronic applications such as electric vehicles and motor drives and also lower their costs. They will facilitate greater adoption of the vehicles and as a result reduce U. S oil imports, and this gesture would result to a stable economy in the country (Sira and Silva-Ortigoza, 2006). More efficient power electronic systems could lead to lower electricity consumption reducing harmful related emissions as well as less energy use saving many families and business owners a lot of money spend on power bills.

In conclusion, power electronics semi-conductor devices are the next big breakthrough in power electronics and upon their successfully being inculcated in the electric grid, they will result in energy saving as well as environmental conservation through reduction of energy related emissions that are harmful (Rashid, 2011). Power electronics play a significant role in economy and the best technologies which advance best performance must be practiced. They however face the challenge when it comes to designing new device types to exploit these devices. A lot of research needs to be done on it to ensure success.

References

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