PRODUCTION OF ELECTRICAL ENERGY FROM ELECTRONIC DEVICES BY USING GRAPHENE

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Abstract:- In this automotive world the things are changing rapidly day by day and there is an evolution of new technology as the time in progress .As there is increase in technology the computing devices also increases and the speeding time increases. As the electrons flow through the electronic devices there is dissipation of heat. For every 10(degrees Celsius) raise in temparature the performance of the electronic devices is decreased by 20%.This makes the usage of graphene thin films. Here the heat from the electronic devices (example: Microprocessors and Microcontrollers) is absorbed by using graphene oxide which is layered on a silicon wafer like Silicon On Insulator film(SOI) and the absorbed heat is converted into electrical energy by using pyroelectric energy conversion from low grade thermal sources that exploits strong field –and temparature –induced polarization susceptibilities in the relaxor ferroelectrics 0.68pb(Mg1/3Nb2/3)o3-0.32pbTio3 and the resulting energy is stored at certain parts of the computer and can be accessible through programming .The emitted heat from the electronic devices is not only costly for the business but environment too. The electronic devices which are in electronic servers in data centres results in global warming. So this research may be helpful for increasing the lifespan of electronic devices, decrease in the power consumption of the electronic devices and to reduce the cost of the business. Finally to protect the environment too.

Keywords:-relaxor, pyroelectric energy, polarization

INTRODUCTION:-

In this brief enclosure of discussion on global warming and the utilisation of waste heat that is dissipated from the electronic devices .In this automotive world the technology, people and emission of pollutants increases as the whole world focuses on decrease in consumption of power and related researches .In the modern days for the production of power we are making huge destruction and the effect caused by it causes global warming .Nearly 65% of the energy produced in the USA(United States of America) is wasted as heat. If we consider in data centres there will be large number of electronic servers in which there will be huge amount of generation of waste heat. According to a study of research says that for every raise in (10 degree Celsius) of heat in the electronic devices the working efficiency of the device is going to be decreased by 20% .By decrease in the working performance of the electronic device there will be change in the working time of the device which in turn causes huge damage to the device this damage is not only costly for business but the environment too in a way that in the process of cooling of electronic devices causes global warming this in turn effects environment in a huge way. The main reason for global warming is the waste heat that is produced by the electronic devices (here mainly electronic servers in data centres and some of the other electronic devices) so the main problem is that the heat is dissipated outside to the environment through the heat sinkers followed by a fan to take away the heat from the Central Processing Unit, Microprocessors, Microcontrollers. So cooling of electronic devices can cause global warming. In the future we are going to have Quantum Computers in which there will be possibility of generation of huge amount of waste heat which may cause adverse effect to the environment. From the recent survey in the ordinary circumstances a data centre releases 2000 tons of greenhouse gases and also the Tech industry produces 1/50th of all carbon emissions

and that is likely to grow up to 5times in the next 7 years. According to a survey of ICT (Information and Communication Technology) the electronic devices alone causes 2%of global warming. So, our research drives in such a way that it utilises the waste heat and converts it into another form of energy by using thin films of graphene. The conversion of energy can be done by pyroelectric energy conversion which is mostly suitable for low-grade thermal energy conversion. Here for the extraction of the heat we are going to use thin films of graphene because of its thermal, electrical, mechanical properties of the graphene and it is thermal conductive and it can resist to higher temparature and it can transfer heat without loss of heat to longer distances and all is mechanical properties. The generated electrical energy from the transducer can be stored at certain parts of the devices. This helps in increasing the performance of the electronic devices, reduces the power consumption in turn reduces the cost of the business. Finally reduces the global warming.

RESEARCH METHODOLOGY OR PROCESS:-

Here we will discuss about the extraction of heat from the electronic devices and the conversion of the extracted heat into electrical energy with the help of pyroelectric energy conversion by using thin films of graphene. Let us discuss about all the above one by one. First we will discuss about the extraction of the heat from the electronic devices. The major parts of the electronic devices that produces huge quantity of heat are Microprocessors, Microcontrollers, Central Processing Units. In general all these Microcontrollers, Microprocessor, Central Processing Units are mounted on the PCB's (Polychlorinated Bi-phenyl).The proper functioning of the devices can only be made when we take away the accumulated heat from those parts. In this process we need to use graphene. The heat carrying of graphene can usually make it look like a device. Here we need to take a Silicon Wafer or Silicon On Insulator (SOI) or Indium Tin Oxide (IOT) film where we need buried oxide layer of thickness=500 (Armstrong)-6(micro meters) ,tolerance = +/-5%.

So we are going to deposit graphene oxide layer in place of buried oxide layer. So the film which is coated with the graphene oxide layer actually looks like a device which is placed upon top of the Microcontrollers, Microprocessors when the device is switched on both the Microcontrollers, Microprocessors starts its functioning during its functioning as the electrons flows through them there is heat dissipation from the Microprocessor, Microcontroller. The emitted heat is called ambiquios heat or waste heat. This heat can increase the ambient temparature or surrounding temparature which in turn effect the other components and also affect their proper functioning. So the SOI film which contains graphene oxide which is placed upon the Microcontroller, Microprocessor will absorb the heat from them continuously because heat flows from hot body to the cold body .Now we had absorbed the heat from the device by using the graphene oxide layer so the next thing is to convert the absorbed heat into electrical energy by using pyroelectric energy conversion which converts low grade thermal sources that exploits strong field –and temparature –induced polarization susceptibilities in the relaxor ferroelectrics 0.68pb(Mg1/3Nb2/3)o3-0.32pbTio3.Field and temparature –dependent pyroelectric measurements highlight the role of polarization rotation and field-induced polarization in mediating these effects. Solid state thin film devices that convert low grade heat into electrical energy are demonstrated by using pyroelectric Ericson cycles, and optimised to yield maximum energy density, power density abd efficient of 1.06Jcm^-3,526cm^-3 and 19% of Carnot , respectively ; the highest values reported the date and equivalent to the performance of a thermoelectric with an effective ZT=1.16(approximately) for a temparature change of 10K. So the converted electrical energy can be stored at certain parts of the electronic devices and can be utilised for various purposes. So by making the usage of graphene we can make a device that efficiently absorbs the dissipated heat and efficiently converts into electrical energy. So by this process we can increase the

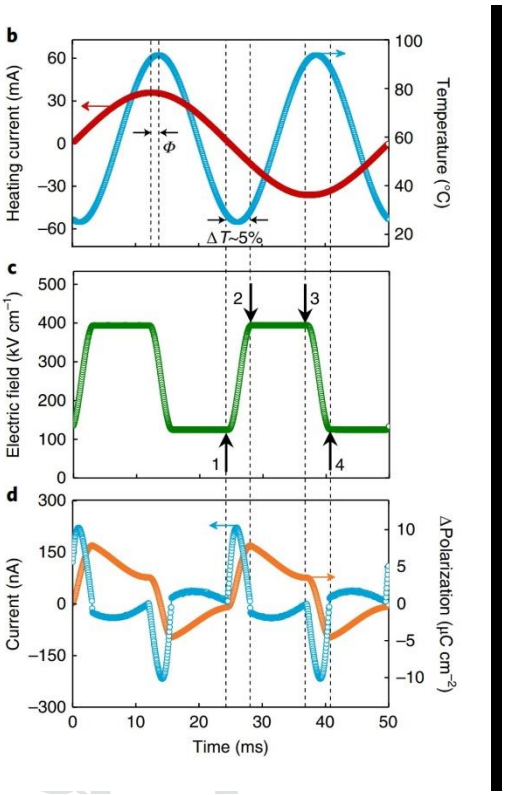
performance of the electronic devices and also the future of quantum computing can be greatly experienced. Thus we can increase the life span of the devices and also reduce the effect of global warming which helps the mankind in the future and also we can reduce the cost of the business in maintaining the electronic devices in electronic servers that are present in the data centres. So this research will be a pathway of using graphene in making devices of graphene and the usage of pyroelectric energy conversions for low grade thermal energy.

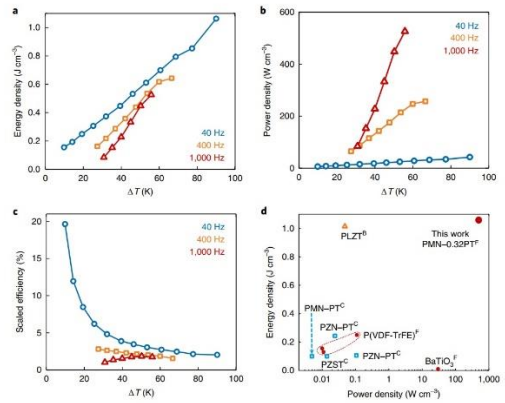
III.UNITS

Armstrong, kelvin(SI) , micrometre (SI)

IV.HELPFUL UNITS

A.FIGURES





B.ABBREVATIONS AND ACRONYMS:

Ambiquios stands for waste heat, pyroelectric devices stand for devices which converts heat into electricity, realxor ferroelectric stands for ferroelectric materials that exhibit high electrostriction.

V.SOME COMMON MISTAKES

Use the word “micrometre” instead of “micron”. A graph within a graph is an “inset” not an “insert”. Do not use the word “essentially” to mean “approximately” or “effectively”. 0.68pb(Mg1/3Nb2/3)o3-0.32pbTio3 is a not a ferroelectric its usually relaxor ferroelectric.

VI.CONCLUSION

Our findings suggest that we can make graphene devices and pyroelectric devices that will be used for low grade thermal energy conversion.

VII.REFERENCES

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