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DC-DC Buck Boost Converter For Renewable and Biomedical Application based Real-Time IoT

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Abstract*: *DC-DC buck boost converter is a conversion circuit using induced frequency inductors, switching.DC-DC converters dynamics was improved by using self calibrated preemptive current control. As, a result Preemptive concurrent control reduces capacitor size by 10x.DC DC buck converter with pulse width modulation.DC-DC buck converter with two step pulse width modulation was utilized for low power application by using delay, control line. Main motive of DC-DC buck converter with pulse width modulations obtains high linearity, high granularity. Conversion efficiency for Light load current was increased in buck converter by clocked hysteresis scheme. Power supplied to comparator was scaled to load easily. Conventional buck converter was integrated with LED to expand smart bulb. Main power from supply was decoupled by Non linear ramp control scheme preventing LED output flickering. Control scheme effectiveness was improved by small signal model. Three major characteristics of Light emitting diodes are improved lifetime, high efficiency, increased reliability, controllability. High brightness LED by multicell three phases was used for its lower cost. Heart beat was identified by using raspberry pi, system on chip with three stages in it namely Heart beat determination, Impedence, cardiography parameters. Accidents was restricted by this method.Overspeeding vehicles was identified was main goal of using complex proportional assessment method. Converting Rice husk into bio fuels was performed by thermo chemical processes. Rice hulk silica was utilized for fluorescent silica particles synthesis.

Keywords: DC-DC Buck Boost Converters-LED Drivers, IoT, Biomedical application streams, Mobile SoC, Automobile Applications.

I. INTRODUCTION

Advanced gadgets like smart homes, iPads, laptops and Personal Computers have become almost ubiquitous these days. In turn, these devices are equipped with many multimedia functions. It is necessary to incorporate PMIC which can be expanded as power Management Integrated Circuits to produce supply voltages. From a unified battery the blocks of diverse multimedia requires supply voltage since they generally operate on a reduced capacity. A high power switching DC-DC buck boost converter with CMOS effectiveness incorporated for increasing time taken for running in mobile devices.

The power converters of PMIC were optimized into linear regulator and an exchanging DC-DC buck boost converter based on requirement to produce output voltages.DC-DC buck boost converter was executed in individual block depending upon supply voltage characteristics. Feedback loops retains fixed voltage output in case of varying input voltages and output currents. The circuit performance will allow the entire incorporation of passive and active devices of switching DC-DC buck boost converter which has an increased voltage conversion ratio in a typical low voltage CMOS technology. The output voltage is generated via switching operation by a low-pass filter that comprises of both the capacitor as well as inductor. The power conversion method enables competently to utilize the restricted battery power. Due to aforementioned reasons, DC-DC buck boost converter is extensively utilized in mobile systems. Noise swapping was decreased because of performance affects since analogue function blocks are sensitive in nature. Also, switching noise proportionately rises along with increase in the load current, power stage and switching frequencies.

The increase in density of chip and reduction in the size of chip and complication intensifies problems to detect an increased performance low power consumption scheme on a chip. The most crucial design parameter in VLSI circuits is the power dissipation since it plays significant part measuring performance of devices which are battery activated that are utilized to a large extent for applications of the mobile. The design hierarchy of VLSI circuit involves dividing the circuit design into small tasks until it reaches simple levels. This process is most suitable for mobile applications as the design gets simpler, manufacturing such circuits on a large scale becomes much easier and cost effective.

The key technology for power ICs is the Bipolar CMOS. The BC technology is the combination of Bipolar and CMOS technologies. Therefore, it enables designing low-voltage devices (CMOS) and high-voltage ones (Bipolar and CMOS) on same wafer. A DC-DC buck boosts converter method Output voltage with greater input voltage. Continuous input current was not obtained in DC-DC buck boost converters .Input current with high voltage, less current than solar input panel was provided in boost converter.

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This is difference between DC-DC buck boost converters, boost converter. Full power voltage source regulation was the benefit. Discontinuous capacitor output due to larger filter size was the limitations.

An LED driver is an electrical device giving static quantity of power. Permitting constant electricity flow was benefit of LED. The limitation of LED is it costs high. Overheating of LED driver package causes failure. In Comparison to 3G services, the 4G services gives good data transmission rate. Speed intensive user application are connected by single carrier was obtained.

II. RELATED WORK

In this scrutiny of DC-DC buck boost converter based real-time applications research work contains DC-DC buck boost converter, LED drivers, Mobile System-On-A-Chip applications, Automobile applications and Bio-medical applications. Proposed system with benefits, limitation for DC-DC buck boost converter, LED drivers, Mobile System-On-A-Chip applications, Automobile applications and Bio-medical applications was explained briefly below.

III. DC-DC BUCK CONVERTER

[1] presented a dynamic response inductive dc-dc buck converters to improve repetitive load profiles (a). This periodic nature for load current profile has been predicted by power management circuits. A preemptive concurrent controller (PCC) was proposed to achieve dynamic response compared to time-optimal. [1] presented a dynamic response inductive dc-dc buck converters to improve repetitive load profiles (a). This periodic nature for load current profile has been predicted by power management circuits. A preemptive concurrent controller (PCC) was proposed to achieve dynamic response compared to time-optimal. It upgrades inductor current preceding load step occurrence and reduces required output capacitance. During preemptive inductor current, an inverting DC-DC buck-boost converter was utilized to avoid output voltage overshoot. A freewheeling interval for two hysteric control loops had operated simultaneously. To optimize timing for next cycle in preemptive current reference, a simple digital calibration method was utilized. System efficiency gets minimized. The experimental result for input voltage is 4.5v and output voltage is 3.3v.Both PCC and load profile learning algorithm verified 10× less capacitance was compared with existing method. A typical IOT device represented figure 1. Both energy harvester and upstream converter are responsible for charging energy storage, It includes battery source to supply loads through dc-dc converters. Periodic nature of load current was exploited by preemptive control current. Due to autonomous deployment, an IOT device was operated in periodic and predictable manner.

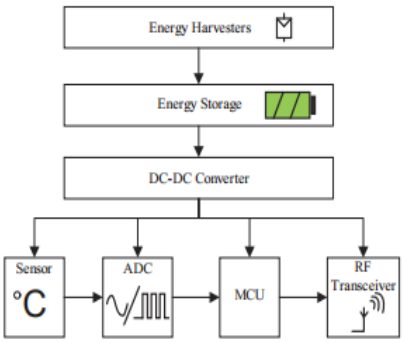

Figure 1: Basic hardware architecture for IoT-WSN[1]

$$t_{res} = \frac{\Delta I_{out} L}{V_{in} - V_{out}} \left(1 + \sqrt{1 + \frac{V_{in} - V_{out}}{V_{out}}}\right.$$

[2] proposed efficient switched-capacitor dc-dc buck converter in self- powered wearable electronics to generate multiple regulated output voltage like based on two reconfigurable bits present in entire load current.(a) In CMOS technology, a switched-capacitor converter was designed about 65 nanometer. Circuit areas for MIM, MOS stack capacitance was reduced by dc-dc buck converter.

The performance of proposed system achieves peak efficiency with eighty percent more than the previous regulated load voltage system. The experimental result of proposed enhance 80 percent voltage current efficiency about 800 micro ammeter.

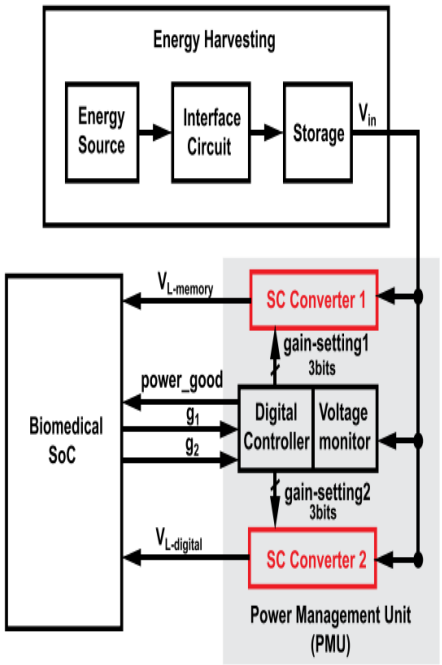

Figure 2: Block diagram for proposed self-powered biomedical system[2]

Conduction losses was combined with drain source resistance Rds transistor and whereas Ids is drain-source current than other parasitic resistance.

At high load current, conduction losses are dominant as proportional to quadratic current value. Pc_{fly} Inversely proportional f_{sw} quadratic. Pc_{fly} has load current dependent loss. Input voltage, Load voltage specifications for biomedical soc system level requirements was listed in table 2.1.

$$P_{cond} = I_{ds}^2 R_{ds}$$

$$P_{cfly} = \frac{I_L^2}{C_{fly} f_{sw}}$$

Table 2.1 Load voltage specifications for biomedical soc system level requirement[2]

V_{in}	V_L=1V(H)	V_L=0.8V(M)	V_L=0.6V(L)
1.2V-1V(H)	Yes	Yes	Yes
0.99-0.8V(M)	No	Yes	Yes
0.79-0.6V(L)	No	No	Yes

[3]presented high efficiency dc-dc buck converter with two-step digital pulse width modulation and low power self-tracking zero current detector for IoT to develop high efficiency dc-dc converter in theexisting method. (a)It consists ofcounter and delay line. The proposed system was adaptive window which converts analog to digital in order to reduce output voltage ripple. It was developed to minimize reverse current. It is two step delay control by counter, delay line. It improves efficiency by reducing control loss for large proportion dc-dc converter. CMOS process manufactures chip process by standard supply output voltage was 1.5-3 v.The advantage of proposed work is that it improves efficiency. Major limitation of the work was time consumption for deriving current was more. The experimental result of measured DPWM provides more efficiency than existing DPWM methods.The experimental result of proposed system consumed current about 91.5 percent.

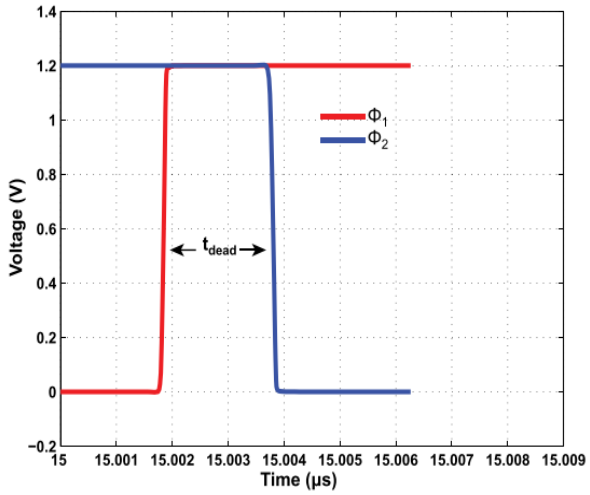

Figure 3 Non-overlapping two phase clock signals

The graph 1 represents non-overlapping two phase clock signals. It denotes that output waveform for dead-time circuit with dead-time about 1.90 nanoseconds. The x-axis represents time and y-axis represents voltage. A variation between time and voltage of two phase clock of an dead circuit was given above. It forms time between ϕ_1 and ϕ_2 for an very limited amount of time. During switching process, it is very essential to detect and avoid any short-circuit current from voltage to ground.

[4]proposed an open Zmeter (o Zm) as advanced low-cost open-source hardware device with high-precision energy and power quality systems(a). An analog front end stage was designed with acquisition, conditioning, and processing power signals. It is available on quad core. Theproposed hardware was responsible for adapting voltage signals and currents using different probes. It was described as fully autonomous system for computation and visualization with hardware. It has ability to send data from central cloud management systems. Bulk as well as sub metering appliances was uses for openzmeter. A transformation of traditional decentralized power model was utilized based on renewable energy sources. The disadvantage is that advanced devices need real-time monitoring, energy flow and power quality (PQ) was estimated.Result of proposed open system results provide more energy than other existing methods.Openzmeter hardware diagram was shown in Figure 3.The experimental result of proposed system adapts voltage signal till 800 v than existing system.

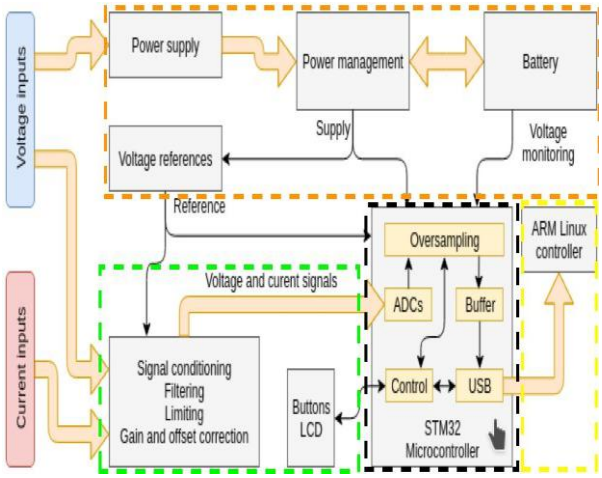

Figure 4openzmeter hardware diagram [4]

[5] proposed clocked hysteresis control method for power frequency to improve efficient conversion of buck converter for light IoT load current. An existing hysteresis control was utilized as comparator power frequencyIoT. The disadvantage of proposed work is that buck boost converter consumes no direct current comparators. Quick wakeup controls the inherent hysteresis was the main benefit of this work. The performance of proposed power law frequency scaling method achieves higher efficiency over 87 per cent than existing system ranged from 550 to 20 micro ammeters. When clock frequency is halfed, Consuming power was reduced. Graphical representation for power law frequency scaling scheme for half clock frequency was shown in figure 4.The experimental result of proposed system provides 87 percent efficiency load current from 500 to 20 micro ammeter.

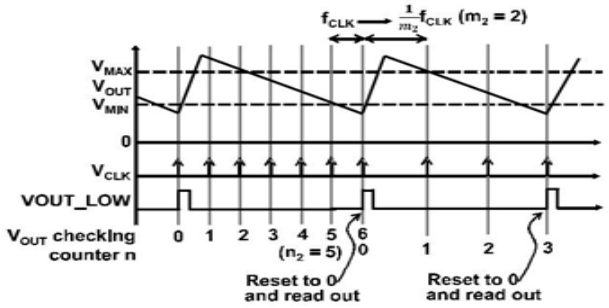

Figure 5 graph for power law frequency with half cock frequency[5]

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IV. DC-DC BOOST CONVERTER

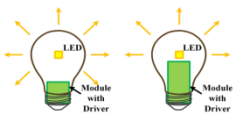
[6] proposed step-up DC-DC boost converter for voltage to convert and store low level to high level energy. In order to overcome existing, a new voltage boosting converter was used. It contains switched capacitor, voltage multiplier, inductor voltage lift, magnetic coupling and multistage. The advantage of proposed work is that boost converter provides efficiency and reliability. The disadvantage of proposed system is that it is converter became complex and inefficient. The performance of proposed dc-dc boost converter achieves high voltage power than existing system.The experimental result of proposed system provides higher frequency about 90 percent than existing system.

[7] proposed a topological review of DC-DC boost converter to compute maximum value of converter efficiency. A photovoltaic is based on renewable power generation system. To overcome existing system, new boost converter had been developed to improve capability conversion. The advantage of proposed system is that it enhances high power density and superior thermal performance. The disadvantage of proposed system is that due to block diode existence, power requires to transfer energy source faster from one place into another. The performance of proposed achieves better efficiency than existing system.The experimental results of proposed system produce high voltage about 90 percent than existing system.

[8] proposed sliding mode controller for dc-dc bidirectional boost converter to prove stability of closed loop system. To overcome existing system, a dynamic control strategy was utilized to enhance better output voltage. The advantage of proposed system is that voltage achieves better feasibility. The disadvantage of proposed system is that rate of fossil fuel gets increased. The performance of proposed system provides better edge control method than existing system. The result of proposed system shows 20 percent voltage stability than existing system.

A. Led Drivers

A light emitting diodes (LED) drivers is a method through which allows compact module to provide necessary requirement mainly Omni directional indoor LED bulbs.[9] presented flicker-free multi-channel light-emitting diode driver to provide power factor method. The proposed system separates transmission path from existing system based on instant input voltage that makes users improve and provide better PF relative value than existing system in which fixed LED method which contains only one electrolytic capacitor. A proposed LED driver with existing buck LED converter was integrated to supply peripherals. The performance for proposed LED driver IC was implemented with ultra-high voltage process about 2.9 × 2.0 mm. This proposed system factor provides high power conversion efficiency supply than the existing LED drivers. The results of proposed system provide 77.5 percent power efficiency than existing system.



(a) (b)

Figure 6 (a) compact LED driver with omni directional light , (b) bulky LED driver with directional [9]

[10] presented a cost effective method based on Fly back topology for constant current and voltage to provide auxiliary supply for LED drivers. The main disadvantage of existing fly back method is that it is not suitable under constant input voltage level for auxiliary supply. To overcome challenges in fly back method, a novel non-linear ramp based control method to decouple constant current power train from auxiliary supply from constant voltage and also to prevent LED output is developed. The advantage of proposed method is that small signal modeling includes higher efficiency than existing peak current mode control method. The experimental results of proposed dimmable LED driver were executed and determined successfully than existing fly back system.The result of proposed system consumes 40 watt power supply than existing system.

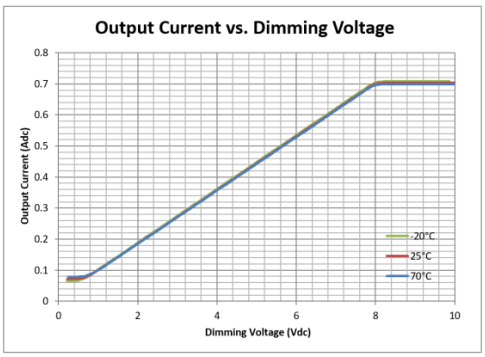


Figure 7 Dimming performances with auxiliary loading at different operating temperatures

[11] Illuminated a high brightness light emitting diodes to become omnipresent with various features like products, like efficiency, reliability, long lifetime controllability. It was utilized to drive medium high power HBLEDs with three phase power. It achieves high power factor, low total harmonic distortion capability contains flicker free behavior with galvanic isolation. Based on modular way, several cells for three-phase network and outputs were worked together and connected. A loss free resistor had been operated. To validate this concept, a prototype had been built by fly back converters operated Discontinuous Conduction Mode (DCM). The performance for High bright Light emitting diodes operates full range three-phase voltage differs from 380 to 420v, produces output voltage 48v maximum power 90 w than existing fly back methods.

The result of proposed system achieves maximum power about 90 watt than existing system.

[12] proposed a modular three-phase ac-dc LED driver for high power luminaires.It needs to achieve power factor correction complied with restrictive IEC 61000-3-2. A unity power factor and low total harmonic distortion had been achieved. The advantage of proposed system is that output of LED driver is equal to sum of lights. It was carried out to observe feasibility electrolytic capacitor that was guaranteed, even if each string pulsated as Twice the frequency. The performance high output current and voltage had revaluated limits between conduction modes. It leads to modularity which can easily drive high power luminaries.

In order to validate, three PFC boost converters has been built with electrolytic capacitors.
The disadvantage of proposed three phase ac-dc conversion is that it is necessary to provide higher efficiency LED drivers. The performance for proposed system achieves maximum power efficiency than the existing single phase LED drivers. The result of proposed system achieves 97.5 percent electrical efficiency than existing system.
[13] proposed an ambient intelligence in real time IoT which was multifaceted to achieve mental wellbeing. Ambient intelligence plays important role supporting emotional wellbeing and reducing discomfort and it is the existing method.
The disadvantage of proposed system is that if absence concern about wellbeing commercial vehicle drivers occurs, then it leads to accidents and poor lifestyle. To support drivers, a proposed method was required. The advantage of proposed system is that wellbeing vehicle drivers achieve low-income A possible solution for wellbeing discomfort was addressed. A long-term analytic support was proposed to improve wellbeing ambient intelligence. The performance for proposed system receives less discomfort community support than the existing systems. The result of proposed system enhances 43 percent more than existing system.

B. Mobile SoC Applications

[14] proposed low power mobile system with chip for calculating specific low power efficient nano clusters which is used for map, execute kernels. After that, a biomedical application was utilized to monitor inpatient, outpatient and e-patient care for both biomedical as well as physiological constantly. The advantage of proposed system is that it used to extract, combine and classify biomedical data efficiently. The disadvantage of proposed biomedical application is that it requires strict power sampling and processing multiple streams physiological signals. The performance of proposed power efficient nano clusters provides less energy consumption than the existing systems such as commercial off-the-shelf processing platforms. The result of proposed system achieves 80 percent energy consumption than existing system.
[15] proposed a near-field wireless power communication for biomedical to develop interest for certain implantable biomedical devices for different general free-space system. The advantage of proposed near-field magnetic chip is that it produces high-efficiency power transfer and data communication. The disadvantage of this proposed system is that simultaneous wireless power transfer information is required to be specified and implanted by biomedical device at a certain period of time. The performance for the proposed system provides higher efficient power and security than existing wireless power transform (WPT).The result of proposed system achieves 90 percent security than existing system.

[16]proposed a full impedance cardiograph measurement device of system on chip biomedical instrumentation using Raspberry PI3 to compute full 3-lead ECG recorder for educational research development. It is a platform for supporting various educational applications. It is part of Bio signal PI hardware platform with quick prototyping. It is used to sense cardiac bio potential. The advantage of proposed system is that recordings were transmitted through Bluetooth to PC, where waveforms and hemodynamic parameters displayed as heart rate, stroke volume, ejection time and cardiac output. The disadvantage of proposed system is that it is necessary to update details at right time. The performance of proposed Raspberry IP3 provides better quick prototyping method to support developers and users than existing full impedance System on Chip method. The result of proposed system achieves 75 percent power capacity than existing system.

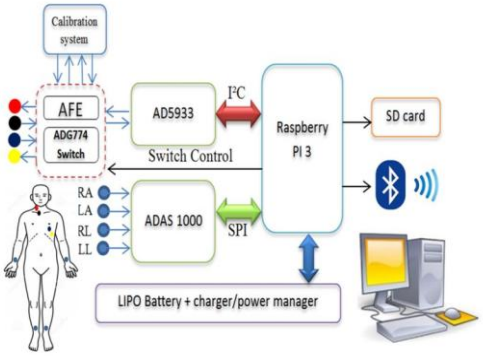


Figure 8 Basic architecture of Biomedical Application[16]

[17]proposed a Model Predictive Control (MPC) method to develop and execute with fast dynamics. MPC was introduced frequently to compute high computational loads, but the disadvantage is that it is difficult to assure real-time properties of dynamic system. It exploits system behavior properties benefits of real-time implementation which was imperative. It allows flexibility to control and change process, because of increased complexity and computational loads. To overcome existing MPC method, a new distributed control hierarchy was utilized to feed low control device. It is utilized to generate control active power filter. In general, new system architecture incorporates higher-level control also handles distribution controllers which were also obtained to obtain and control flexibility. A distributed control node was mixed with another controller if the objective or dynamic system changes. Based on distributed control, a standard optimization and software-hardware method was utilized. A hardware-in-loop simulator test was evaluated as application real-time and resource usage. The performance for proposed system achieves better resource usage than existing systems. The result of proposed system produces 50 percent high frequency than existing system. [18] proposed a shape modifying polymers by class smart stimuli-responsive.
It was utilized by polymer actuation light and it provides several features such as precise, spatial-temporal remote pausing and resuming control. The advantage of proposed polymers in biomedical application is that light-responsive polymer offers potential solutions which were desired. The disadvantage of proposed system is that these polymers required to be classified based on underlying light-driven actuation and shape-change method. The performance of proposed system provides efficient area and position than existing changing polymers. The result of proposed system achieves 60 percent efficiency than existing system.

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C. Automobile Applications

[19]proposed an emergence of hybrid energy storage systems in renewable energy and automobile application system in biomedical application to compute density of both power and energy. The advantage of proposed system is that two different existing energy storage systems in biomedical application provide better characteristics and features other methods. The disadvantage of this proposed system is that single energy storage unit was not available to provide good hybridization features of renewable energy of biomedical applications. The performance of proposed system shows high energy storage and response rate than the existing energy storage system. The result of proposed system achieves 99 percent energy than existing system.

[20] proposed a development auxiliary automobile air conditioning system using solar energy. It is primary passenger car are utilized to maintain humidity of vehicle cabin temperature at comfortable levels. Due to less negative power in automobile system, fuel efficiency was affected. A renewable resource increases reducing natural oil resources, increasing oil prices and environment pollution. Both electric and hybrid cars had limited applications.

The advantage of proposed system is that fuel efficiency and tail-pipe emission had been increased and reduced. In addition to this, a dispatching compressor engine through solar energy and also load engine gets decreases. The disadvantage of proposed system is that it produces less amount of power. The result of proposed system achieves 738 watt power than existing system.

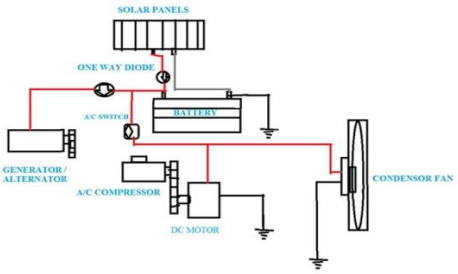

Figure 9 Basic circuit for solar operated automobile AC system[20]

[21]proposed a strain induced graphite PDMS sensors to fabricate and implement new graphite PDMS sensors. It involves new 3D printed molds that are developed by acrylonitrile thermoplastic polymer filament. It was utilized to develop electrodes and sensor patches. It was arranged in inter-digitized manner. It was designated with COMSOL simulation leads to electric field density distribution between two opposite polarity groups electrode under applied stress was represented. At different conditions, complexity changes in sensor patches were analyzed. The advantage of proposed system is that bending radius curvature was performed highly by developed sensor patches.

It was engaged by strain sensing purposes from different parts of body such as finger, elbow, neck and knee. The disadvantage of proposed system is that for processing sensor patches are needed. The performance for proposed strain sensing system was estimated for bending various patch sensors. The result of proposed system increases 50 percent frequency than existing system.

[22]proposed an automobile speed-breaker system method for complex proportional assessment in biomedical application to control and protect accidents caused by over-speeding. In existing system, a renewable system was developed from speed-breaker system. This system converts kinetic energy for moving vehicle into electricity such as street light, road signs and traffic lights. In order to effectively determine power generation, a speed breaker system of renewable energy in biomedical application was proposed. The proposed technique in biomedical application of renewable energy was Complex Proportional Assessment (COPRAS) and Standard Deviation (SDV) methods. The advantage of proposed system is that is easy to implement proposed system than the existing system. The disadvantage of proposed system is that it requires more amount of time to produce more amount of renewable energy in biomedical applications field. The result of proposed system produces 25 percent additive productivity than existing system.

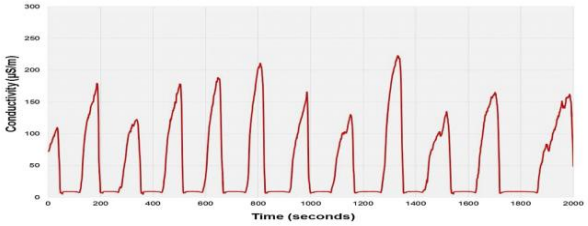

Figure 10 Response for bending sensor patch in cyclic order[21]

The figure 10 represents response for bending sensor patch in cyclic manner. The x-axis denotes time ranges from 0 to 2000 and y-axis denotes conductivity ranges from 0 to 300.

[23]proposed a polymers additive manufacturing of 4D printing with automobile application for biomedical applications. Additive manufacturing (AM) of automobile industry called additive manufacturing. The advantage of proposed system is that it permits full customized fabrication with reduced time and cost. In addition to, polymers became researched class materials.

A polymer material employed material was achieved for synthetic versatility and adaptability. It permits fabrication products for geometrical complex structure in an economic manner.

The disadvantage of proposed system is fundamental printing operation for allocated polymers in automobile biomedical application causes low precision level that are unable to sharp external corners at right time. The performance for proposed system achieves high precision level than the existing system. The result of proposed system achieves 70 percent optimal solution than existing system.

D. Bio-Medical Applications

A biomedical for IoT is defined as biomedical system that comprises of health, prevention and treatment. The advantage of biomedical system is that communication of IoT device provides high quality and efficiency. The disadvantage of biomedical application is that data that are collected requires some methods to rectify biomedical application.

[24]proposed a Fe_3O_4 composite particles of carbon for both capacitive and magnetic super capacitor renewable energy with 10mm diameters to develop and implement relatively low-cost biocompatible chemical co-precipitation method.

The advantage of proposed system is that the magnetic measurement for Fe3O4 nano particles contains both bi-functional super paramagnetic and ferromagnetic character with saturation magnetization. A pseudo capacitive Fe3O4 nanoparticle was combined into hazelnut shells by using energy efficient hydrothermal carbonization method. A simultaneous composite structure for magnesium oxide (MgO) ceramic template was presented. A micro-mesoporous possesses high specific surface area. It was presented by cyclic voltammetry and galvanostatic charge-discharge measurements cell. It was utilized to operate with large negative potential window. The disadvantage of proposed system is nano composite specific capacitance cannot be done without effect of effect of Fe_3O_4 carbon. The performance for proposed ferrous oxide provides higher power and energy than existing system. The result of proposed system achieves high specific surface area 344 $m^2 g^{-1}$ than existing system.

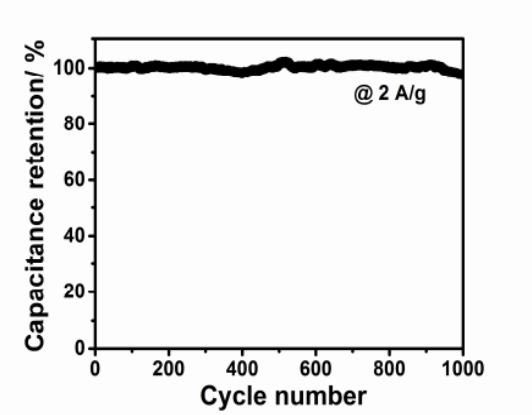

Figure 11 Stability of Fe_3O_4 nano composite

The figure 11 represents stability of Fe3O4 nano composite particles. A cyclic stability performance for Fe_3O_4 provides continuous charge-discharge between 1.2 and 0 volt about 1000 cycles. The x-axis denotes cycle number ranges from 0 to 1000 and y-axis denotes capacitance retention ranges from 0 to 100.

[25]presented rice husk silica derived nano materials for sustainable biomedical application for renewable energy that converts large amount of sustainable water biomass and bio chip into bio fuel simultaneously that gets utilized by thermo chemical parameters such as pyrolysis and gasification. A bio-oil for renewable fuels had been upgraded. The purpose of rice husk was to convert organic matters decomposition into value-added energy or chemical synthesis using rice husk silica material of renewable energy. Applications for rice husk are soil remediation, pollutants removal and silicon battery materials. The advantage of the proposed system is that rice husk material removes heavy organic metals contaminants such as soil amendment, wastewater treatment, and gas purification causes adsorption, catalysis and integrated processes. The disadvantage of proposed system is that it requires huge amount of energy to provide a new rice husk method. The performance of proposed system provides high content of silica with low cost renewable energy than existing rice husk method. The result of proposed system achieves 8.7 percent high silica content than existing system.

[26]proposed method evaluated energy harvesting systems for human implantable sensor was performed by polymeric based

composite materials includes large quantity of renewable energy. Energy harvesting systems was strengthened by photovoltaic, piezoelectric and thermoelectric methods. The advantage of proposed system is that lifetime of energy harvesting method in renewable energy gets increased. The disadvantage of proposed system is that maximum value of sustained energy should provide low-cost. The performance of proposed sustainable energy harvesting provides high sensitivity results than existing systems. The result of proposed system achieves 32.7 percent fabrication cost than existing system.

[27] proposed a self-powered energy harvesting internet of things (IoT) in biomedical application to deploy and access contribution of biomedical applications towards customers.

The advantage of proposed system is that solution for prolonged battery life had been harvested from huge amount of interconnected energy network source devices from other biomedical applications. The disadvantage of proposed system is that the life span of rechargeable batteries in IoT devices for inadequate battery power had been limited. The performance of proposed IoT devices provides high power efficiency than existing energy harvested system in biomedical applications. The result of proposed system produces 40 mw than existing system.

[28]proposed a context-aware energy optimization for perpetual IoT-based safe communities (SAFER) in biomedical application to detect critical events that triggers immediate action response in existing system. To overcome existing system, a new energy-aware perpetual home system was proposed to ensure safety of users. The advantage of proposed system is that activity daily living data device has been utilized to optimize activation of sensor. The disadvantage of proposed system it requires large energy consumption to combined with perpetual operations.

The performance of proposed context-aware energy harvesting system achieves greater energy dissipation than existing energy aware perpetual home IoT system in biomedical applications. The result of proposed system contains 95 percent battery powered device than existing system.

Table 2.2 Advantages, Disadvantages for LED, mobile SoC, automobile, biomedical applications in the papers.

Sl.No	TITILE	OUTCOMES OF PROPOSED METHODOLOGY	METHODS USED	RESULTS	ADVANTAGE AND DISADVANTAGE
1	A dynamic response inductive dc-dc converters	To improve load profiles and also to predict load current for periodic	Preemptive concurrent controller, simple digital	Experimental result is for Vin= 4.5V,	Adv:Increase system efficiency

		value	calibration	Vout=3.3V.	Dis: Need to operate battery in predictable manner.
2	Performance of DC-DC boost bidirectional converter with sliding mode and pi controller	To prove stability of closed loop system. Dynamic control strategy was utilized to enhance output voltage.	Sliding mode controller, dynamic control strategy, non-isolated dc-dc boost converter	The result of proposed system shows 20 % voltage stability than existing system.	Adv:Voltage achieves better feasibility Dis: Rate of fossil fuel gets increased rapidly.
3	A high efficiency dc-dc buck converter with two-step digital PWM and low power self-tracking zero current detector for IoT	To develop high efficiency DPWM is the existing method. It contains counter and delay line. A proposed system was adaptive window analog to digital reduces Vout ripple	Digital pulse width modulation, self-tracking zero current detector, adaptive window	Experimental result of proposed system consumed current about 91.5 percent	Adv:Improves efficiency of dc-dc converter Dis: It requires more time to consume current only 130 micro ammeters
4	A cost effective method based on Fly back topology	To provide auxiliary supply for LED drivers	Dimmable LED driver, nonlinear ramp control, fly back converter	The result of proposed system consumes 40 watt power supply than existing system.	Advantage Higher efficiency Disadvantage Input voltage level for auxiliary supply is not suitable.
5	A high brightness light emitting diodes	To have flicker free behaviour to dispose bulk capacitor and galvanic isolation	High power brightness light emitting diodes, three phase power grids, Loss free resistor, power factor correction	The result of proposed system achieves maximum power about 90 watt than existing system.	Advantage High power efficiency Disadvantage Requires additional dc-dc converter.
6	A modular three-phase ac-dc LED driver for high power luminaires	To control independent load removing for both electrolytic capacitor and increases efficiency.	Power factor correction, high brightness light emitting diodes	The result of proposed system achieves 97.5 percent electrical efficiency than existing system.	Adv: Low power harmonic distortion. Dis: Requires better electrical electricity
7	An ambient intelligence in the real time IoT	Supporting physical to mental wellbeing	Wearable low-cost IoT, wellbeing , resource constraint deployment	The result of proposed system enhances 43 % more than existing system.	Adv:Energy efficiency Dis:Absence of concern about wellbeing leads to accidents
8	A polymers additive manufacturing with automobile application for biomedical applications	To permit fabrication full customized with reduced fabrication time and cost	Polymer additive manufacturing, thermoplastics, fused deposition modelling	The result of proposed system achieves 70 percent optimal solution than existing system.	Adv:High polymer material is achieved. Dis: Low precision level and unable to sharp external corners at right time.
9	A strain induced graphite PDMS biomedical sensors	To design, graphite and PDMS sensors for biomedical	Graphite, PDMS, COMSOL, 3-d printed molds	The result of proposed system increases 50 percent frequency than existing system.	Adv:Highest radius curvature was achieved. DisTo increase chances of utilizing biomedical in future

V. CONCLUSION

The demand for design of

low power devices is in demand due to the growth in power consumption. DC-DC buck boost converters are high-frequency power change circuits that employ high-frequency swapping and inductors. Also, transformers and capacitors are consumed for smoothening of switching noise to render it appropriate for regulated DC voltages. In this inspection, the existing, proposed system, advantage and disadvantage for DC-DC buck boost converter, LED drivers, Mobile system on a chip, automobile application, and biomedical application had been described. This existing and proposed method for DC-DC buck boost converter, LED drivers, Mobile system on a chip, automobile application, and biomedical application can be rectified in future.

REFERENCES

1. D. Li, Z. Gong, M. Rose, H. Bergveld, and O. Trescases, "Improved dynamics in DC-DC converters for IoT applications with repetitive load profiles using self-calibrated preemptive current control," in 2017 IEEE Applied Power Electronics Conference and Exposition (APEC), 2017, pp. 3352-3356
2. D. Kilani, M. Alhawari, B. Mohammad, H. Saleh, and M. Ismail, "An efficient switched-capacitor DC-DC buck converter for self-powered wearable electronics," IEEE Transactions on Circuits and Systems I: Regular Papers, vol. 63, pp. 1557-1566, 2016.
3. S.-Y. Kim, Y.-J. Park, I. Ali, T. T. K. Nga, H.-C. Ryu, Z. H. N. Khan, et al., "Design of a high efficiency dc–dc buck converter with two-step digital pwm and low power self-tracking zero current detector for iot applications," IEEE Transactions on Power Electronics, vol. 33, pp. 1428-1439, 2018.
4. E. Viciana, A. Alcayde, F. G. Montoya, R. Baños, F. M. Arrabal-Campos, and F. Manzano-Agugliaro, "An Open Hardware Design for Internet of Things Power Quality and Energy Saving Solutions," Sensors, vol. 19, p. 627, 2019
5. C.-S. Wu, M. Takamiya, and T. Sakurai, "Clocked Hysteresis Control Scheme With Power-Law Frequency Scaling in Buck Converter to Improve Light-Load Efficiency for IoT Sensor Nodes," IEEE Transactions on Very Large Scale Integration (VLSI) Systems, vol. 26, pp. 1139-1150, 2018.
6. M. Forouzesh, Y. P. Siwakoti, S. A. Gorji, F. Blaabjerg, and B. Lehman, "Step-up DC–DC converters: a comprehensive review of voltage-boosting techniques, topologies, and applications," IEEE Transactions on Power Electronics, vol. 32, pp. 9143-9178, 2017.
7. V. I. Gandhi, V. Subramaniyaswamy, and R. Logesh, "Topological review and analysis of DC-DC boost converters," Journal of Engineering Science and Technology, vol. 12, pp. 1541-1567, 2017.
8. C. S. Purohit, M. Geetha, P. Sanjeevikumar, P. K. Maroti, S. Swami, and V. K. Ramachandaramurthy, "Performance analysis of DC/DC bidirectional converter with sliding mode and pi controller," International Journal of Power Electronics and Drive Systems, vol. 10, pp. 357-365, 2019.
9. Y. Ko, H.-S. Cho, S.-S. Lee, S.-B. Shin, Y. Song, and S.-G. Lee, "A compact flicker-free transformer-less LED driver with an enhanced power factor for omnidirectional multichannel smart bulb applications," IEEE Transactions on Power Electronics, vol. 31, pp. 5851-5862, 2016
10. L. Jia and Y.-F. Liu, "Topology and Control Innovation for Auxiliary Power Supply in Dimmable LED Drivers," IEEE Transactions on Power Electronics, vol. 32, pp. 8728-8742, 20
11. I. Castro, D. G. Lamar, M. Arias, M. M. Hernando, and J. Sebastian, "Multicell Three-Phase AC–DC Driver for HB-LED Lighting Applications," IEEE Transactions on Industry Applications, vol. 53, pp. 3803-3813, 2017.
12. I. Castro, A. Vazquez, D. G. Lamar, M. Arias, M. M. Hernando, and J. Sebastian, "An electrolytic capacitorless modular three-phase ac-dc LED driver based on summing the light output of each phase," IEEE Journal of Emerging and Selected Topics in Power Electronics, 2018.
13. N. Ahmed, R. J. Rony, M. T. Mushfique, M. M. Rahman, N. E. S. Tahsin, S. Azad, et al., "Ambient Intelligence in Systems to Support Wellbeing of Drivers," in Guide to Ambient Intelligence in the IoT Environment, ed: Springer, 2019, pp. 217-247.
14. A. Page, N. Attaran, C. Shea, H. Homayoun, and T. Mohsenin, "Low-power manycore accelerator for personalized biomedical applications," in 2016 International Great Lakes Symposium on VLSI (GLSVLSI), 2016, pp. 63-68.
15. H.-J. Kim, H. Hirayama, S. Kim, K. J. Han, R. Zhang, and J.-W. Choi, "Review of near-field wireless power and communication for biomedical applications," IEEE Access, vol. 5, pp. 21264-21285, 2017.
16. A. Hafid, S. Benouar, M. Kedir-Talha, F. Abtahi, M. Attari, and F. Seoane, "Full impedance cardiography measurement device using raspberry pi3 and system-on-chip biomedical instrumentation solutions," IEEE journal of biomedical and health informatics, vol. 22, pp. 1883-1894, 2018
17. E. Skjong, T. A. Johansen, and M. Molinas, "Distributed control architecture for real-time model predictive control for system-level harmonic mitigation in power systems," ISA transactions, 2019.
18. G. Stoychev, A. Kirillova, and L. Ionov, "Light-Responsive Shape-Changing Polymers," Advanced Optical Materials, p. 1900067, 2019.
19. R. Hemmati and H. Saboori, "Emergence of hybrid energy storage systems in renewable energy and transport applications–A review," Renewable and Sustainable Energy Reviews, vol. 65, pp. 11-23, 2016.
20. Y. Lethwala and P. Garg, "Development of auxiliary automobile air conditioning system by solar energy," International Research Journal of Engineering and Technology (IRJET), vol. 4, 2017.
21. A. Nag, N. Afasrimanesh, S. Feng, and S. C. Mukhopadhyay, "Strain induced graphite/PDMS sensors for biomedical applications," Sensors and Actuators A: Physical, vol. 271, pp. 257-269, 2018.
22. I. Emovon and I. Okaro, "Automobile Speed Breaker System Mechanisms Analysis: Complex Proportional Assessment Approach," Indian Journal of Engineering, vol. 15, pp. 1-8, 2018.
23. C. M. González-Henríquez, M. A. Sarabia-Vallejos, and J. Rodriguez-Hernandez, "Polymers for additive manufacturing and 4D-printing: materials, methodologies, and biomedical applications," Progress in Polymer Science, 2019.
24. N. Sinan and E. Unur, "Fe3O4/carbon nanocomposite: Investigation of capacitive & magnetic properties for supercapacitor applications," Materials Chemistry and Physics, vol. 183, pp. 571-579, 2016.
25. Y. Shen, "Rice husk silica derived nanomaterials for sustainable applications," Renewable and Sustainable Energy Reviews, vol. 80, pp. 453-466, 2017.
26. F. M. AL-Oqla, A. A. Omar, and O. Fares, "Evaluating sustainable energy harvesting systems for human implantable sensors," International Journal of Electronics, vol. 105, pp. 504-517, 2018.
27. A. S. Adila, A. Husam, and G. Husi, "Towards the self-powered Internet of Things (IoT) by energy harvesting: Trends and technologies for green IoT," in 2018 2nd International Symposium on Small-scale Intelligent Manufacturing Systems (SIMS), 2018, pp. 1-5.
28. N. S. Alhassoun, M. Y. S. Uddin, and N. Venkatasubramanian, "Context-Aware Energy Optimization for Perpetual IoT-Based Safe Communities," Sustainable Computing: Informatics and Systems, 201

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