

(54) Title of the invention : DESIGN AND IMPLEMENTATION OF THERMO ELECTRIC GENERATOR FOR PACEMAKERS

(51) International classification	:A61N0001378000, H01L0035000000, H03K0003030000, H03K0007080000, G21H0001100000	(71)Name of Applicant : 1)M.SUMATHI Address of Applicant :SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY, JEPPIAAR NAGAR, RAJIV GANDHI ROAD, CHENNAI - 600 119. Tamil Nadu India 2)S.LAKSHMI 3)M.R.EBENEZAR JEBARANI 4)P.KAVIPRIYA 5)P.CHITRA 6)K.SRILATHA
(31) Priority Document No	:NA	(72)Name of Inventor : 1)M.SUMATHI 2)S.LAKSHMI 3)M.R.EBENEZAR JEBARANI 4)P.KAVIPRIYA 5)P.CHITRA 6)K.SRILATHA
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:NA	
Filing Date	:NA	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

A Pacemaker is a tiny device which is placed in the chest or abdomen used to monitor and control the abnormal heart rhythms'. It uses electrical pulses to prompt the heart to beat at a normal rate. It consists of a battery, a computerized generator and wires with sensors at their tips. The battery powers the generators and both are surrounded by a thin metal box. The wires connect the generator to the heart. It helps monitor and control heartbeat. The electrodes detect your heart's electrical activity and send data through the wires to the computer in the generator. Batteries are one of the main problems in pacemakers as the capacity of the battery is limited, they limit the lifetime of pacemakers. After a period of five years, a surgical procedure should be done to replace the battery of the pacemaker. 60% of the volume of the pacemaker is taken up by its batteries. Eliminating this battery effectively reduce the dimensions of the pacemaker. Harvesting thermal energy is one of the alternative procedures to power up an implantable pacemaker. Thermal energy harvesting technique could eventually replace battery in any electronic device. Harvesting ambient thermal energy using thermoelectric generators (TEG) is a convenient means of supplying power to implantable sensors, especially pacemakers. Micro-TEG is scalable and reliable and doesn't require any moving parts like vibration energy transducers. Thus, it is very suitable in micro scale energy harvesting systems, such as human body-powered biomedical devices. Recently, on-chip TE modules have been used to harvest electrical energy from waste heat. A total warm vitality reaping thermo electric generator design for an implantable pacemaker is proposed that incorporates an inside start up. The startup circuit incorporates a prestart up charge pump (CP) and a startup support converter. The prestart up CP comprises of an ultra low-voltage oscillator. The framework design of the proposed help converter is designed and a comparator is utilized to contrast the yield voltage and the coveted yield esteem. A PMOS transistor with its door and source terminals associated with each other is utilized. This transistor works in the sub edge area and has a consistent current. This consistent current moves through a resistor and fabricates a reference voltage. A high-to-low level converter is utilized to change over the yield voltage of the comparator into a lower voltage. The proposed system consists of digital controlled oscillators, a synchronous counter, a combinational reset and combinational comparison logic. DCO tunable strength is high comparing VCO. It stored the input word. Digital to analog converter is designed by the digital pulse width modulator and low pass filter. The proposed boost converter uses Peltier effect to convert body temperature into electrical signal. A digitally controlled pulse width modulator (PWM) comprised of a header circuit, ring oscillator and a duty cycle to voltage convertor. A voltage multiplier circuit with an internal startup is introduced that converts a minimum of 40-mV input voltage provided from a TEG into a 2.5V output voltage needed for a pacemaker to operate normally. The voltage multiplier circuit is a boost convertor based on a constant charge time structure (CCT).

No. of Pages : 6 No. of Claims : 5