

291. DESIGN AND ANALYSIS OF AN INTEGRATED MEMS HARVESTER SCAVENGING ENERGY FROM WASTE HEAT AND VIBRATIONS (DIMHSEWHV)

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This paper introduces a hybrid energy harvester generating electric power from both ambient heat and vibration. Harvesting energy from vibration was realized by piezoelectric effect phenomena in Lead ZirconateTitanate (PZT) crystals, whereas the energy generation from heat was supplied by making use of Seebeck effect of n-type and p-type Bi₂Te₃ thermocouples. The industrial software Comsol Multi physics is used for the simulation. A total voltage of 17.024V was generated from the thermoelectric part and .4 V from the piezoelectric part of the device. Total power produced from the chip is predicted to be 1.91nW.

Keywords: Energy harvesting, thermoelectric, piezoelectric, vibration,micro power generation.