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Efficiency, Power and Period of a model quantum heat engine working in a finite time[1] MULUGETA BEKELE, Associate Professor of Physics, AAU, TOLASA A DIMA, Graduate student, MEKUANNENT ALEMYE, Lecturer: Debre Tabor University, WARGA CHEGENO, Lecturer: Wolkite University — We take a spin-half quantum particle undergoing Carnot type cyclic process in a finite time assisted by two heat reservoirs and an external magnetic field. We find that the power of the heat engine is maximum at a particular period of the cyclic process and efficiency at the maximum power is at least half of the Carnot efficiency. We further apply the Omega-criterion for a figure of merit representing a compromise between useful power and lost power determining the corresponding efficiency for the optimization criterion to be at least three fourth of the Carnot efficiency.

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