

RECENT PROGRESS IN THE DEVELOPMENT OF HIGH-EFFICIENCY THERMOELECTRICS

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ABSTRACT

This paper will discuss the recent developments of high-efficiency quantum well thermoelectrics at Hi-Z Technology, Inc. The performance of the latest P-type B_4C/B_9C – N-type Si/SiGe couple will be presented as well as data for the new N-type Si/SiC that will replace Si/SiGe and improve couple efficiency.

Preliminary calculations regarding the development of actual quantum well modules will be presented for both power prediction and cooling

applications. These modules can be used in future diesel exhaust energy conversion systems as well as air-conditioning system designs. The design of a family of small quantum well based generator wells being developed for wireless sensor systems will also be presented. These small generators use energy-harvesting techniques to produce power for the system.

Our current efforts to produce quantum well films more rapidly will be discussed.