

Title (en)  
QUANTUM WELL THERMOELECTRIC MATERIAL ON VERY THIN SUBSTRATE

Title (de)  
THERMOELEKTRISCHES QUANTENTOPF-MATERIAL AUF SEHR DÜNNEM SUBSTRAT

Title (fr)  
MATERIAU THERMOELECTRIQUE A PUITS QUANTIQUE APPLIQUE SUR UN SUBSTRAT TRES MINCE

Publication  
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Application  
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Abstract (en)  
[origin: WO0030185A1] Thermoelectric elements (62A, 64A, 66A, 62B, 64B, and 66B) for use in a thermoelectric device. The thermoelectric elements have a very large number of alternating layers of semiconductor material deposited on a very thin substrate. The layers of semiconductor material alternate between barrier semiconductor material and conducting semiconductor material creating quantum wells within the thin layers of conducting semiconductor material. The conducting semiconductor material is doped to create conducting properties. The substrate preferably should be very thin, a very good thermal and electrical insulator with good thermal stability and strong and flexible. In a preferred embodiment, the thin organic substrate is a thin polyimide film (specifically Kapton3) coated with an even thinner film of crystalline silicon. The substrate is about .3 mills (127 microns) thick. The crystalline silicon layer is about 0.1 micron thick. This embodiment includes on each side of the thin Kapton substrate about 3,000 alternating layers of silicon and silicon-germanium, each layer being about 100 ANGSTROM and the total thickness of the layers being about 30 microns.

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