
Calculation of the thin-film thermoelectric module manufactured by pulsed laser deposition

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The article presents calculation method of a thin-film thermoelectric module to be manufactured by pulsed laser deposition. The module is a polyimide substrate (54×20×0,1 mm), on which thermoelectric Bi₂Te₃-based material is deposited. By the results of calculation we determined the required number of thermocouples for the module to generate a voltage of 3.6 V at a temperature difference of 16 K.

Keywords: *thermoelectric module, thin-film thermoelements, pulsed laser deposition.*

REFERENCES

- [1] Goltsman B.M., Dashevsky Z.M., Kaidanov V.I., Kolomoets N.V. *Plenochnyye termoelementy: fizika i primeneniye* [Film thermoelements: Physics and Applications]. Moscow, Nauka Publ., 1985, 233 p.
- [2] *Ustroystvo termoelektricheskogo modulya (Element Peltier)* [Thermoelectric cooler (TEC) construction (Peltier cooler)]. Available at: <http://kryothermtec.com/ru/technology> (accessed 30 August 2015).
- [3] Rettig F., Moos R. Direct thermoelectric gas sensors: Design aspects and first gas sensors. *Sensors and Actuators B*. 2007, vol. 143, no. 1, pp. 413–419.
- [4] Marchenko O.V. *Metody rascheta termoelektricheskikh generatorov* [Methods for calculating the thermoelectric generators]. Novosibirsk, Nauka Publ., 1995, 199 p.

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