

ABSTRACT

A method to form a combined enclosure and heat sink structure for a semiconductor device is achieved. A first feedstock comprising a first mixture of powdered metal materials, lubricants, and binders is prepared. A second feedstock comprising a second mixture of powdered metal materials, lubricants, and binders is prepared such that the difference between the sintering shrinkage of each of the first and second feedstocks is less than 1%. The first and second feedstocks are pressed to form a first green part having an enclosure shape and a second green part having a heat sink shape. The lubricants and the binders from said first and second green parts are removed to form a first powdered skeleton and a second powdered skeleton. The first and second powdered skeletons are sintered to complete the combined enclosure and heat sink structure. The first and second powdered skeletons are in intimate contact during the sintering. Optionally, at least one hollow cooling channel is formed in the combine structure by burning away a fugitive plastic structure during the sintering process.



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