ABSTRACT

Method for recovering bare semiconductor chips from plastic packaged modules

Plastic package decapsulation is absolutely necessary in the electronic industry, in particular for construction and failure analysis of semiconductor chips molded in plastic packaged modules. The aim of opening methods is to recover the bare semiconductor chips undamaged. The problem is very acute when etch resistant plastic encapsulating resins are used as the molding material. The method of the present invention is more particularly directed to plastic packaged module (10) of the type wherein the contact zones of the chip (11) are connected by wire-bonding to lead conductors (12) and wherein the chip is molded in such etch resistant resins. The novel opening method includes the steps of: a) polishing the module (10) upside to eliminate the top part of the plastic encapsulating resin (13) until the conductors (12) of the lead frame are exposed; b) removing the lead frame; c) roughly polishing the module backside to eliminate the bottom part of the plastic encapsulating resin (13) until the passive face of the silicon chip (11) is exposed; d) immersing the resulting module in a hot fuming nitric acid bath raised to a temperature of about 120°C and for a time of about 8 mn; and, e) immediately cooling the said resulting module by blowing compressed air at the ambient temperature thereon to create a thermal shock whereby all the remaining parts of the plastic encapsulating resin (13) are eliminated, leaving the desired bare silicon chip without any damage.

Fig. 4

This Sheet Has Been Replaced

