磷化銦後段晶圓製程之孔洞蝕刻製程研究

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摘要

本論文的研究實驗目的是在研究出適當的4吋磷化銦晶圓後段製程以及研究磷化銦材料的乾式蝕刻機制。從結果發現使用次氯化硼 (BCl_3)與氯氣(Cl_2)為主要的蝕刻氣體可得到每分鐘1.2微米的高蝕刻率在高寬深比是2:1的100微米厚的晶圓，而且所使用的非光阻光罩材料對磷化銦的蝕刻選擇比超過200比1。所蝕刻出來的孔洞用高頻微波分析儀量測特定的監控元件可得到46pH。

A Study of Dry Etching process for InP backside vias

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Abstract

The purpose of my studies is to investigate a proper backside process for 4 inches InP wafers and to do research of the dry etching mechanism of InP material. The result represents that there is 1.2 μm/min high etching rate at the aspect ratio 2, for 50 μm diameter via in 100 μm thick wafer thickness. The selectivity of hard mask to InP is over 200:1 by using much more safe etching process with BCl_3/Cl_2 gases composition. The backside via inductance is 46 pH which was measured by an S parameter measurement tool at the particular PCM structures.

致謝

首先我要感謝我的父親 中村先生、母親 潘 尾春女士、妹妹 素琴和弟弟 昌惠，雖然父親大人在我中學畢業的暑假辭世，但是他對我做人處事上影響很深，母親更甚，辛苦教導我們栽培我們長大成人。而妹妹和弟弟是我的精神依靠，從小共患難。在這三年多的求學過程中，可以讓我全力專注於學業，進而完成學業，幕後最大的推手，莫過於總是躲在角落默默支持我的『牽手』 劉 惠玫女士，因為她的體貼，她的鼓勵，讓我完全沒有後顧之憂，並在這期間全心全意照顧我的一雙兒女(女: 羽柔 13 歲，子:浩群 2 歲)感謝他所為我做的一切。

特別感謝漢威光電 沈義德 博士，個人在任職漢威光電時，給我的提攜與關懷，之後在全球聯合半導體開始進行本論文之實驗開發，在產品的開發與論文的撰寫過程當中，更要感謝 侯立平 博士、王興國 博士及 楊悅非 博士，給我許多經驗的教導，並感謝我的同事們給予實驗上的協助，在團隊合作下，一起解決許多工程上的問題，才有可能共同完成本次的產品開發。

再以感恩的心謝謝以上諸位，及其他幫助過我的所有人，皆能以喜悅及幸福的心境，完成自己想做的事。

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