Comparison of Characteristics of Rapid Thermal and Microwave Annealed Amorphous Silicon Thin Films Prepared by Electron Beam Evaporation and Low Pressure Chemical Vapor Deposition

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Abstract

In this study we use chemical and physical vapor depositions to fabricate amorphous
silicon (a-Si) films. We also use traditional rapid thermal annealing (RTA) and advanced microwave
annealing (MWA) to activate or crystallize a-Si films and then observe their sheet resistances and
crystallization. We discovered, although the cost of films fabricated by electron beam (e-beam)
evaporation is relatively lower than by chemical vapor deposition (CVD), the effects of the former
method are poorer whether in sheet resistance or film crystallization. In addition, only at the doping
layer prepared by CVD can film crystallization degree produced by MWA match RTA

Keyword：E-beam evaporation, low pressure chemical vapor deposition, amorphous silicon thin