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Abstract
In this thesis, striped Ni(500Å)/a-Si(1000Å)/glass structure was utilized for the investigation of the electrical field effect on the enhancement of the lateral crystallization of silicon. Ni is used as electrodes to provide the electrical field for the structure and the crystallization enhancement behavior is investigated.

Results show that the lateral growth rate of poly-Si is about 4μm/hr when the samples were annealed at 600℃ for 9hr with E = 0V/mm. The growth rate increases to about 5μm/hr when annealed at 600℃ for 1hr with E = 25、50、100、250 V/mm. For the samples annealed (600℃, 1hr) with E=500、1000 V/mm, the growth rate can be enhanced to 6 and 8 μm/hr, respectively. This observation implies that film stress may be the dominating factor and prohibit the crystallization when E < 250V/mm. Whereas for E > 250 V/mm, the electrical field appears to become effective and can speed up the growth rate of poly-Si.

This study indeed demonstrates that the existence of the electrical field can enhance the lateral crystallization in the Ni-induced silicon crystallization system.
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