

Petitioner Bluehouse Global Ltd.

Ex. 1005



US 20070072439A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0072439 A1**
Akimoto et al. (43) **Pub. Date: Mar. 29, 2007**

(54) **SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF**

(30) **Foreign Application Priority Data**

Sep. 29, 2005 (JP) 2005-283782

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Publication Classification

(51) **Int. Cl.**
H01L 21/00 (2006.01)
(52) **U.S. Cl.** **438/795**

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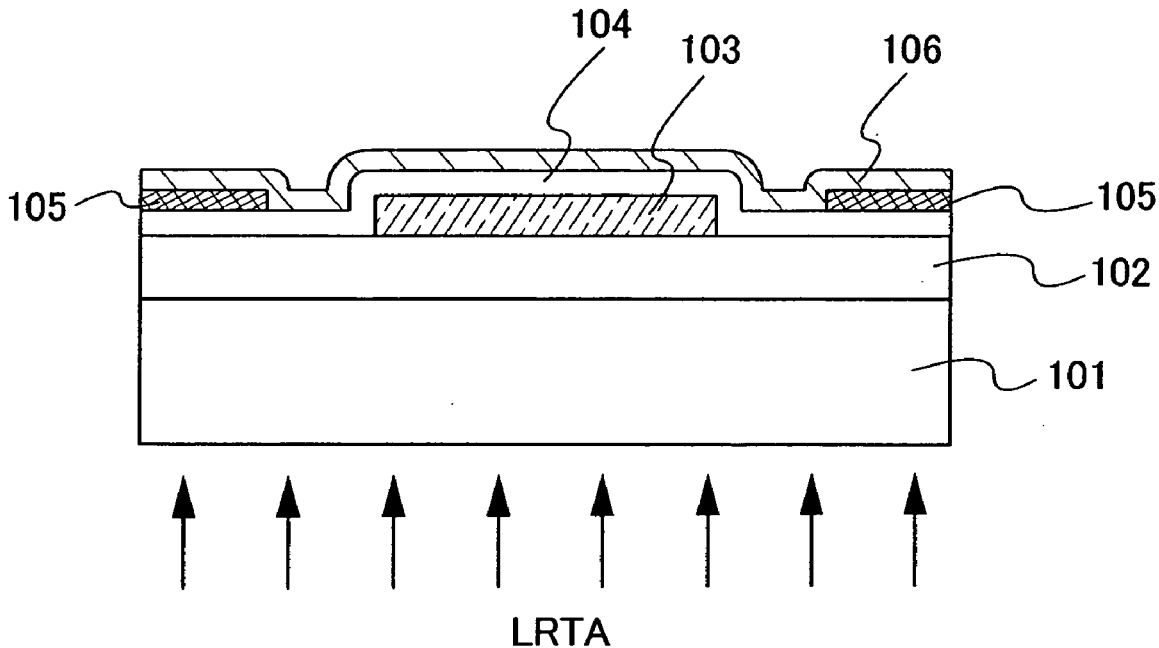
(57) **ABSTRACT**

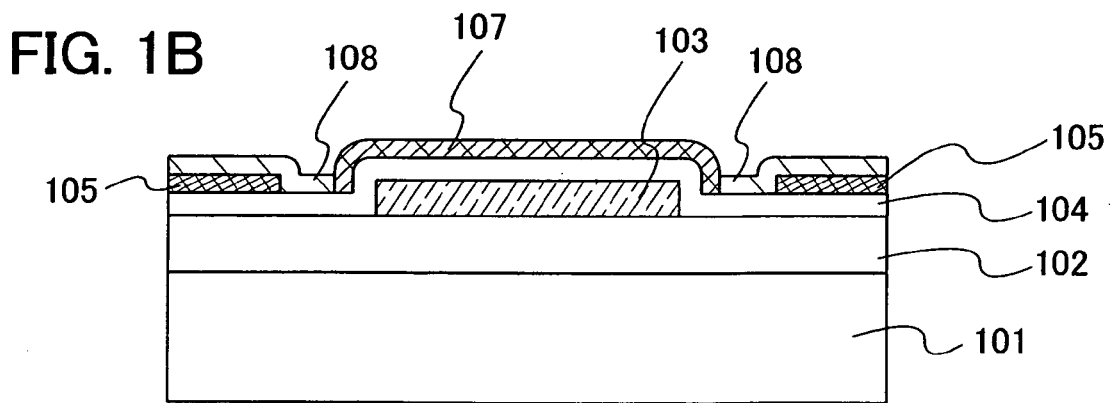
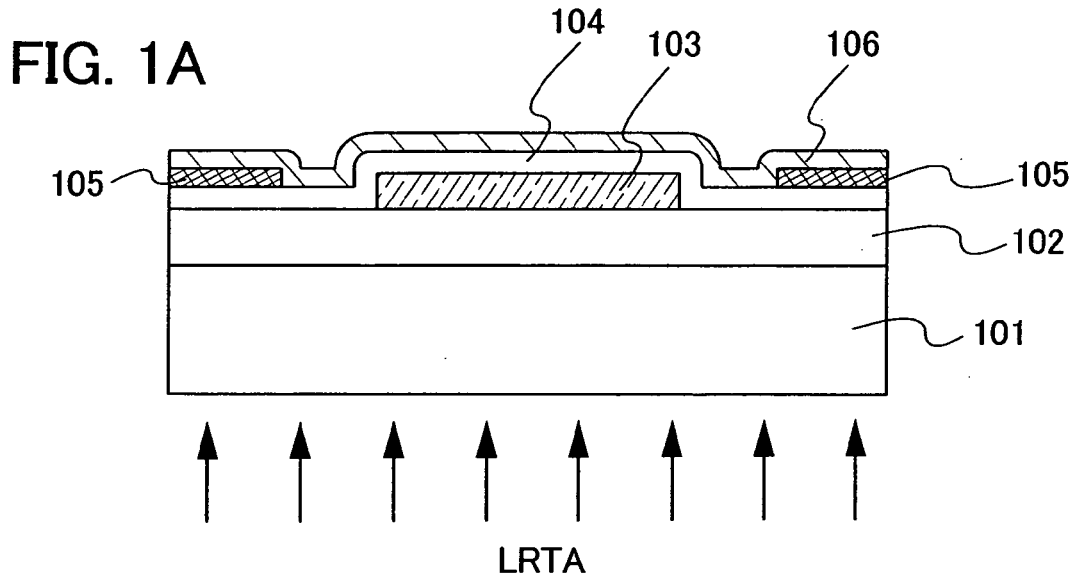
An object is to provide a semiconductor device of which a manufacturing process is not complicated and by which cost can be suppressed, by forming a thin film transistor using an oxide semiconductor film typified by zinc oxide, and a manufacturing method thereof. For the semiconductor device, a gate electrode is formed over a substrate; a gate insulating film is formed covering the gate electrode; an oxide semiconductor film is formed over the gate insulating film; and a first conductive film and a second conductive film are formed over the oxide semiconductor film. The oxide semiconductor film has at least a crystallized region in a channel region.

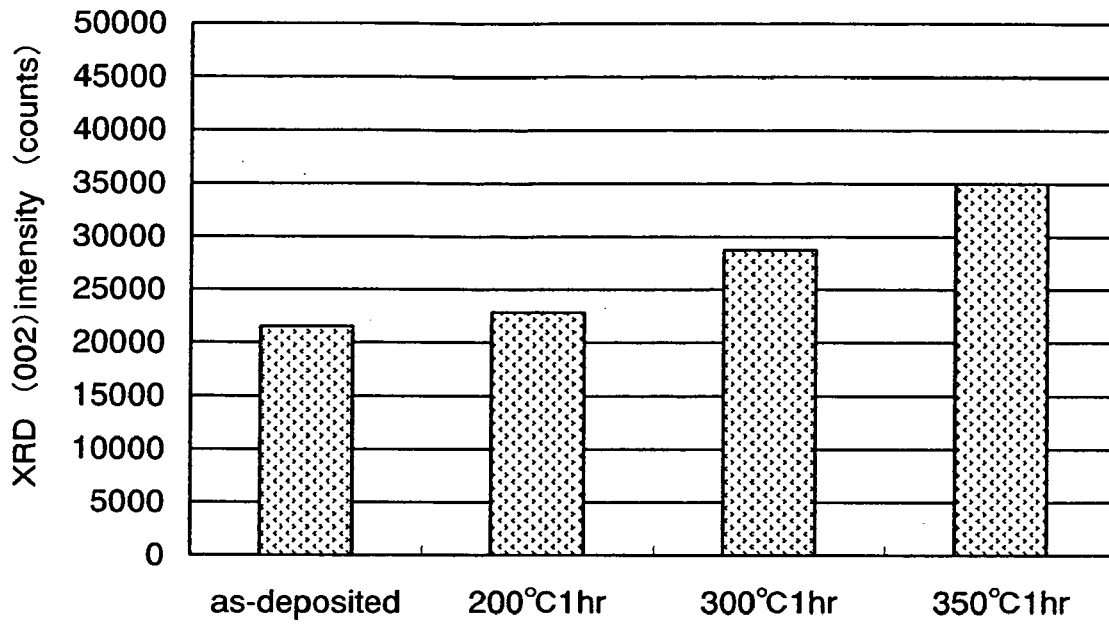
(73) Assignee: **Semiconductor Energy Laboratory Co., Ltd.**

(21) Appl. No.: **11/524,549**

(22) Filed: **Sep. 21, 2006**







a heat treatment temperature dependency of a crystallinity of ZnO (XRD (002) intensity gas using for forming ZnO: Ar/O₂=50/5sccm)

FIG. 2

FIG. 3A

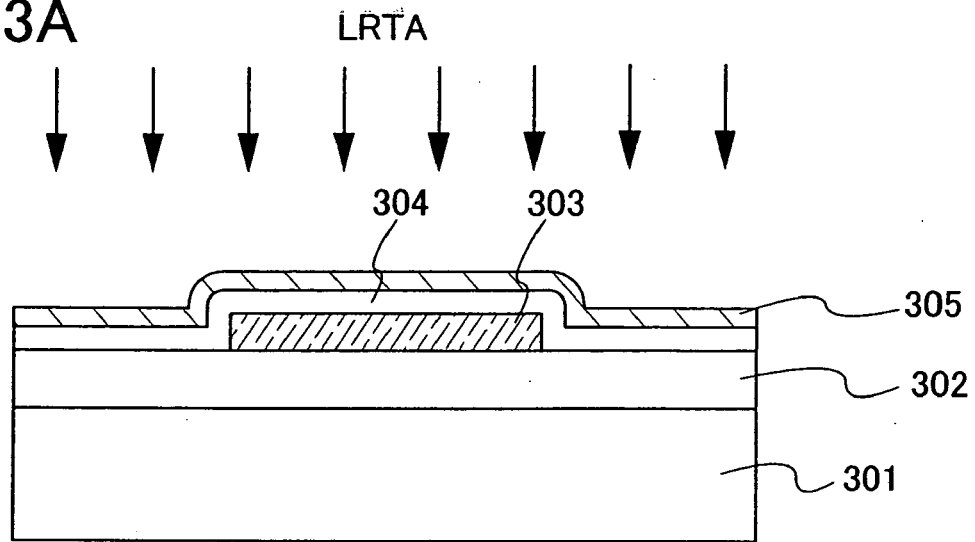


FIG. 3B

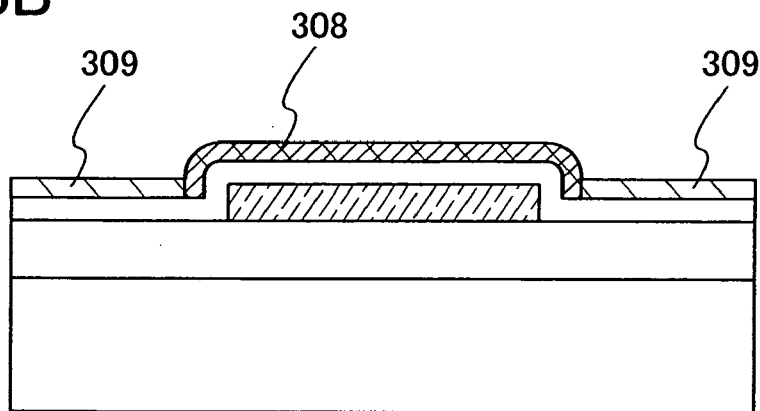
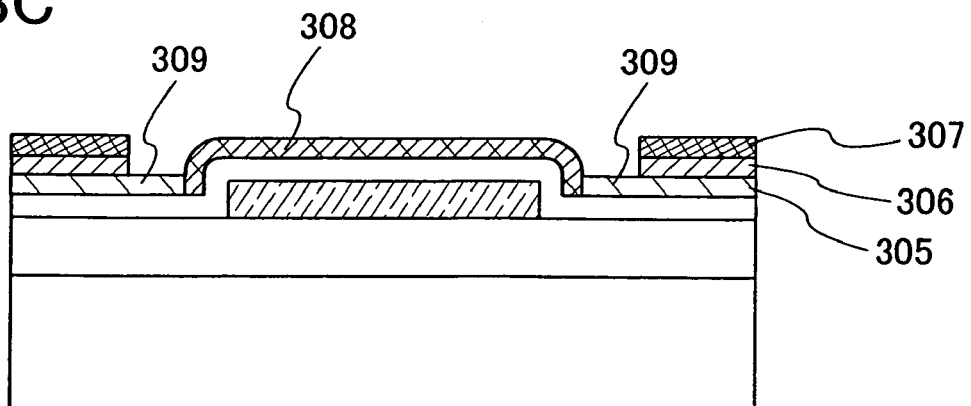


FIG. 3C



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