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(54) Title: THIN FILM TRANSISTORS USING MULTIPLE ACTIVE CHANNEL LAYERS

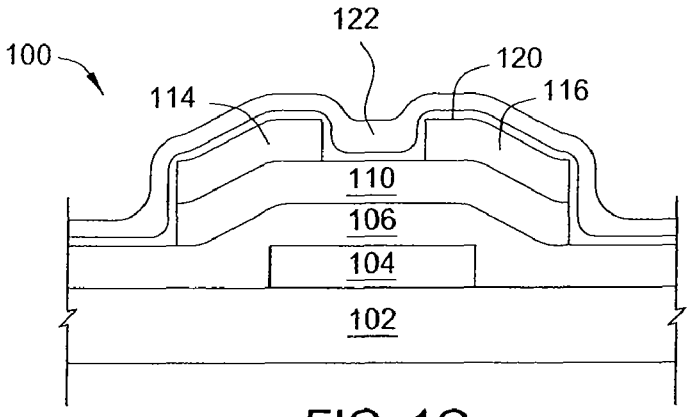

FIG. 1G

(57) Abstract: Embodiments disclosed herein generally relate to TFTs and methods of fabricating the TFTs. In TFTs, the active channel carries the current between the source and drain electrodes. By tailoring the composition of the active channel, the current can be controlled. The active channel may be divided into three layers, a gate control layer, a bulk layer, and an interface control layer. The separate layers may have different compositions. Each of the gate control, bulk and interface control layers may additionally comprise multiple layers that may have different compositions. The composition of the various layers of the active channel comprise oxygen, nitrogen, and one or more elements selected from the group consisting of zinc, indium, cadmium, tin, gallium and combinations thereof. By varying the composition among the layers, the mobility, carrier concentration and conductivity of the various layers may be controlled to produce a TFT having desired properties.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

H01L 29/786(2006.01)i, G02F 1/136(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01L 29/786; H01L 29/784; H01L 21/84; G02F 1/136; H01L 21/336

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: "multiple" and "active" and "channel"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2001-0011855 A (HYNIX SEMICONDUCTOR INC.) 15 February 2001 See the abstract; figs. 1-2; claims 1-3.	1-15
A	JP 06-045354 A (SEMICONDUCTOR ENERGY LAB CO LTD) 18 February 1994 See the abstract; figs. 1-5; paragraphs [0008]-[0072].	1-15
A	US 2006-0286725 A1 (HUA-CHI CHENG et al.) 21 December 2006 See the abstract; figs. 1-6; paragraphs [0026]-[0036].	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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