



US 20240213359A1

(19) **United States**

(12) **Patent Application Publication**
BARRAUD et al.

(10) **Pub. No.: US 2024/0213359 A1**

(43) **Pub. Date: Jun. 27, 2024**

(54) **MICROELECTRONIC DEVICE
COMPRISING LARGE CONTACT SURFACES
BETWEEN THE CONDUCTION CHANNEL
AND THE SOURCE AND DRAIN REGIONS**

H01L 29/417 (2006.01)

H01L 29/423 (2006.01)

H01L 29/51 (2006.01)

H01L 29/66 (2006.01)

H01L 29/786 (2006.01)

(71) Applicant: **COMMISSARIAT A L'ENERGIE
ATOMIQUE ET AUX ENERGIES
ALTERNATIVES**, Paris (FR)

(52) **U.S. Cl.**

CPC *H01L 29/775* (2013.01); *H01L 29/0673*

(2013.01); *H01L 29/41775* (2013.01); *H01L*

29/42392 (2013.01); *H01L 29/516* (2013.01);

H01L 29/66545 (2013.01); *H01L 29/66553*

(2013.01); *H01L 29/78696* (2013.01)

(72) Inventors: **Sylvain BARRAUD**, Grenoble Cedex
09 (FR); **Rémi COQUAND**, Grenoble
Cedex 09 (FR); **Shay REBOH**,
Grenoble Cedex 09 (FR)

(73) Assignee: **COMMISSARIAT A L'ENERGIE
ATOMIQUE ET AUX ENERGIES
ALTERNATIVES**, Paris (FR)

(21) Appl. No.: **18/393,149**

(22) Filed: **Dec. 21, 2023**

(30) **Foreign Application Priority Data**

Dec. 22, 2022 (FR) 22 14254

Dec. 22, 2022 (FR) 22 14255

Publication Classification

(51) **Int. Cl.**

H01L 29/775 (2006.01)

H01L 29/06 (2006.01)

(57) **ABSTRACT**

A microelectronic device comprising:

a semiconductor layer (120) several first areas (122) of
which are superposed and form a channel;

an electrostatic control gate (110) and a gate dielectric
layer (112) or a ferroelectric memory layer (112) parts
of which are each arranged between a part (106, 108)
of the gate and one amongst the first areas;

dielectric spacers (114) arranged against sidewalls of the
gate;

source (116)/drain (118) regions electrically coupled to
the first areas by second areas (124) of the semicon-
ductor layer extending between the source/drain
regions and the spacers, and/or between a substrate
(102) and each of the source/drain regions; and wherein
the second areas are not arranged directly against the
layer and form a continuous layer with the first areas.

