

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RAVISHANKAR SANDARESAN

Appeal No. 1997-0515
Application 08/350,504¹

ON BRIEF

Before JERRY SMITH, BARRETT and FLEMING, **Administrative Patent Judges**.

FLEMING, **Administrative Patent Judge**.

DECISION ON APPEAL

¹ Application for patent filed December 6, 1994. According to appellant, the application is a continuation of Application 08/254,286, filed June 6, 1994, abandoned; which is a continuation of Application 07/752,863, filed August 30, 1991, abandoned.

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This is a decision on appeal from the final rejection of claims 10 and 14 through 16, all the claims pending in the present application. Claims 1 through 9 were withdrawn as directed to a non-elected invention. Claims 11 through 13 have been cancelled.

The invention relates to a transistor suitable for use in integrated circuits having small feature sizes. In particular, Appellant discloses on page 8 of the specification that figure 4 shows the invention. Figure 4 shows a structure having a moderately doped region 14 and an epitaxial layer 16 used to form a self-aligned, lightly doped drain (LDD) structure. Sidewall oxide regions 26 are then formed alongside the gate electrode 20 followed by implant of the heavily doped source/drain regions 28.

Independent claim 10 is reproduced as follows:

10. An integrated circuit device, comprising:

a substrate having a doped region therein, said doped region having a first doping level;

an epitaxial silicon region overlying the doped substrate region, said epitaxial silicon region having a second doping level that is less than said first doping level;

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a gate insulating layer and gate electrode overlying the epitaxial silicon region, wherein a channel region is formed under the gate electrode in said epitaxial silicon region;

sidewall insulating regions disposed alongside said gate electrode;

lightly doped source/drain regions in said epitaxial silicon region and said substrate underneath said sidewall insulating regions and adjacent the channel region;

highly doped source/drain regions in said doped substrate region and said epitaxial silicon region adjacent the lightly doped source/drain regions, each of said highly doped source/drain regions extending from an upper surface of said epitaxial silicon region into said doped substrate region; and

a threshold adjust impurity region within the channel region.

The Examiner relies on the following references:

Kotani et al. (Kotani)	4,242,691	Dec. 30, 1980
Shibata et al. (Shibata)	4,939,386	July 3, 1990
Nakada et al. (Nakada) (Japanese Kokai)	60-235471	Nov. 22, 1985

Claims 10 and 14 through 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Kotani in view of Nakada and Shibata.

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Rather than reiterate the arguments of Appellant and the Examiner, reference is made to the briefs² and answer for the respective details thereof.

OPINION

We will not sustain the rejection of claims 10 and 14 through 16 under 35 U.S.C. § 103.

The Examiner has failed to set forth a ***prima facie*** case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the express teachings or suggestions found in the prior art, or by implications contained in such teachings or suggestions. ***In re Sernaker***, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." ***Para-Ordnance Mfg. v. SGS Importers Int'l, Inc.***,

² Appellant filed an appeal brief on June 3, 1996. Appellant filed a reply brief on October 29, 1996. The Examiner mailed a communication on August 12, 1998 stating that the reply brief has been entered and considered.

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73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995),
cert. denied, 519 U.S. 822 (1996) **citing W. L. Gore & Assoc.,
Inc. v. Garlock, Inc.**, 721 F.2d 1540, 1548, 220 USPQ 303, 309
(Fed. Cir. 1983), **cert. denied**, 469 U.S. 851 (1984).

On pages 4 and 5 of the brief, Appellant argues that the three references cited against claim 10 teach alternative approaches to minimizing the short channel effect. These alternative approaches are taught as alternatives and cannot be combined to result in the claim structure. Appellant argues that the Examiner has selected various features of these references out of context to find the claim structure through hindsight

reconstruction. Appellant argues that there would have been no incentive to combine the references to produce the claim structure.

The Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the

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prior art suggested the desirability of the modification." **In re Fritch**, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), **citing In re Gordon**, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." **Para-Ordnance Mfg.**, 73 F.3d at 1087, 37 USPQ2d at 1239, **citing W. L. Gore**, 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-313.

Upon our review of the references relied upon by the Examiner, we fail to find any suggestion or reason to form the Nakada lightly doped epitaxial layer 3 and the Shibata sidewalls 13 in the Kotani structure. We note that Kotani actually teaches a distinct substrate 10 which has a doping level lower than the epitaxial layer 20. Furthermore, we note that Appellant claims a substrate having a first doping level in an

epitaxial silicon region overlying the doped substrate region having a second doping level that is less than the first doping level. We fail to find that Nakada or Shibata would

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suggest to those skilled in the art to modify Kotani's substrate 10 doping level and the epitaxial layer 20's doping level. Furthermore, we fail to find that there is any suggestion or teaching to modify Kotani to provide additional epitaxial layers as suggested by the Examiner. Finally, we fail to find that there is any suggestion in Shibata to use the silicon oxide film for sidewalls in Kotani's structure.

We have not sustained the rejection of claims 10 and 14 through 16 under 35 U.S.C. § 103. Accordingly, the Examiner's decision is reversed.

REVERSED

	JERRY SMITH)	
	Administrative Patent Judge)	
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)	
)	BOARD OF
PATENT)	
	LEE E. BARRETT)	APPEALS AND
	Administrative Patent Judge)	
INTERFERENCES)	
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)	
	MICHAEL R. FLEMING)	
	Administrative Patent Judge)	

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MRF:psb

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