

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JEFFREY A. BABCOCK, ANGELO PINTO, GREGORY E. HOWARD,  
PHILIPP STEINMANN, and SCOTT BALSTER

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Appeal No. 2005-0188  
Application No. 09/949,541

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ON BRIEF

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Before HAIRSTON, BLANKENSHIP, and SAADAT, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1, 3, 4, 9, 11 and 12.

The disclosed invention relates to an integrated circuit trim resistor structure, and to heater structure located adjacent to the trim resistor structure on the integrated circuit chip.

Appeal No. 2005-0188  
Application No. 09/949,541

Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. An integrated circuit trim resistor structure with on-chip heaters, comprising:

providing a substrate with at least one isolation structure;

a doped polysilicon trim resistor structure on said isolation structure; and

at least one heating structure on said isolation structure adjacent to said trim resistor structure and separated from said trim resistor structure by a heat conducting electrical insulator.

The references relied on by the examiner are:

Spraggins et al. (Spraggins)	5,466,484	Nov. 14, 1995
Singh et al. (Singh)	US 2002/0008302 A1	Jan. 24, 2002
	(effective filing date Apr. 26, 2000)	

Claims 1, 3, 4, 9, 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spraggins in view of Singh.

Reference is made to the supplemental brief, the reply brief and the answer for the respective positions of the appellants and the examiner.

#### OPINION

We have carefully considered the entire record before us, and we will reverse the obviousness rejection of claims 1, 3, 4, 9, 11 and 12.

Appeal No. 2005-0188  
Application No. 09/949,541

We agree with the examiner's findings (answer, page 3) that Spraggins discloses a semiconductor device that comprises a substrate with at least one isolation structure, a trim resistor structure on the isolation structure and at least one heating structure on the isolation structure adjacent to the trim resistor structure and separated from the trim resistor structure by a heat conducting electrical conductor. Inasmuch as Spraggins uses an intrinsic polysilicon layer 22 and a tungsten silicide layer 23 as a trim resistor structure (Figure 1), we additionally agree with the examiner's finding (answer, page 3) that the trim resistor structure in Spraggins does not comprise a doped polysilicon resistor as required by the claims on appeal.

Turning to the teachings of Singh, we agree with the examiner's finding (answer, page 4) that "Singh discloses a trim resistor structure comprising a doped polysilicon resistor (pp. 2, section [0024])." Based upon the teachings of Singh, the examiner is of the opinion (answer, page 4) that "[i]t would have been obvious for one skilled in the art at the time of the invention to use a doped polysilicon resistor element as disclosed by Singh for the device of Spraggins for the purpose of

providing a structure with greater flexibility by varying the dopant concentration of the polysilicon layer (Singh; Summary of the Invention)."

As indicated supra, the trimming resistor in Spraggins is trimmed by a heating structure located adjacent to the trimming resistor structure. In Singh, the trimming resistor is trimmed by passing a heating current directly through the doped polysilicon resistor layer (section 0028). Singh does not provide a separate heating structure to aid in the trimming of the resistor.

Appellants argue (supplemental brief, pages 4 and 5) that Spraggins and Singh use completely different methods of resistor trimming (i.e., heating of a separate heating structure in Spraggins as opposed to a current that passes directly through the resistor structure in Singh), that the applied references neither teach nor would have suggested to one of ordinary skill in the art to interchangeably use the two different resistor trimming methods and that the examiner has not explained how and why the skilled artisan would have replaced the bi-layer resistor structure of an intrinsic polysilicon layer and a tungsten silicide layer in Spraggins with a doped polysilicon layer disclosed by Singh.

Appeal No. 2005-0188  
Application No. 09/949,541

We agree with the appellants' arguments. The examiner has not presented a plausible reason (answer, pages 4 and 5) for modifying the undoped polysilicon layer in Spraggins with the varied doping concentrations of the polysilicon layer as taught by Singh. Turning to the applied references for guidance, we find that neither reference teaches or would have suggested to the skilled artisan to change the undoped polysilicon layer in Spraggins to a doped polysilicon layer with varied dopant concentration as taught by Singh. The obviousness rejection of claims 1, 3, 4, 9, 11 and 12 is, therefore, reversed because the evidence of record does not support the examiner's contention that the skilled artisan would have looked to the teachings of Singh to make the proposed modification to the teachings of Spraggins.

Appeal No. 2005-0188  
Application No. 09/949,541

DECISION

The decision of the examiner rejecting claims 1, 3, 4, 9, 11 and 12 under 35 U.S.C. § 103(a) is reversed.

REVERSED

KENNETH W. HAIRSTON  
Administrative Patent Judge

HOWARD B. BLANKENSHIP  
Administrative Patent Judge

MAHSHID SAADAT  
Administrative Patent Judge

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Appeal No. 2005-0188  
Application No. 09/949,541

TEXAS INSTRUMENTS, INC.  
P.O. BOX 655474, M/S 3999  
DALLAS, TX 75265