



US005976939A

United States Patent [19]

[11] **Patent Number:** **5,976,939**

Thompson et al.

[45] **Date of Patent:** **Nov. 2, 1999**

[54] **LOW DAMAGE DOPING TECHNIQUE FOR SELF-ALIGNED SOURCE AND DRAIN REGIONS**

| | | | |
|-----------|---------|-------------------|-----------|
| 5,173,440 | 12/1992 | Tsunashima et al. | 437/164 |
| 5,234,850 | 8/1993 | Liao | 437/415 W |
| 5,518,945 | 5/1996 | Bracchitta et al. | 437/164 |

[75] Inventors: **Scott Thompson**, Portland; **Mark T. Bohr**, Aloha; **Paul A. Packan**, Beaverton, all of Oreg.

FOREIGN PATENT DOCUMENTS

| | | | |
|-----------|---------|-------|---------|
| 61-279129 | 12/1986 | Japan | 437/164 |
| 63-169047 | 7/1988 | Japan | 437/978 |
| 1-207932 | 8/1989 | Japan | 437/978 |

[73] Assignee: **Intel Corporation**, Santa Clara, Calif.

Primary Examiner—Michael Trinh
Attorney, Agent, or Firm—Blakely, Sokoloff, Taylor & Zafman

[21] Appl. No.: **08/498,028**

[22] Filed: **Jul. 3, 1995**

[57] ABSTRACT

[51] **Int. Cl.**⁶ **H01L 21/336**

[52] **U.S. Cl.** **438/305; 438/559; 438/563; 438/231**

[58] **Field of Search** 437/44, 405 W, 437/415 W, 164, 160, 161, 978; 148/DIG. 43; 438/305, 306, 307, 299, 301, 559, 563, 558, 562, 231, 230

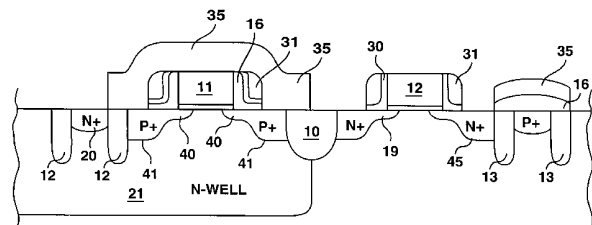
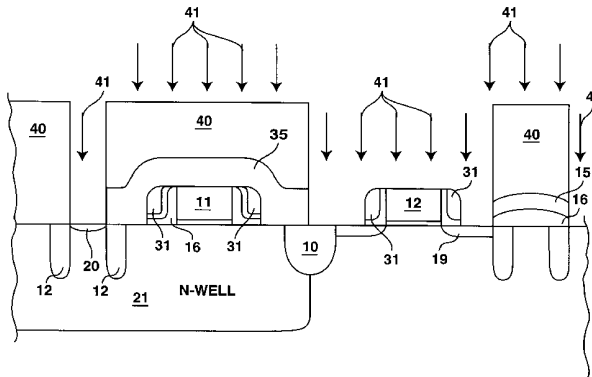
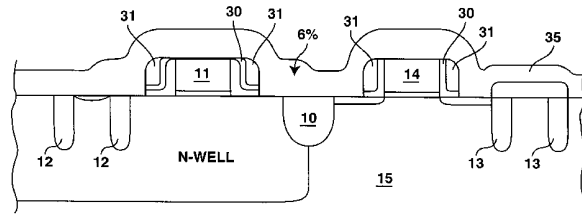
A process for fabricating a source and drain region which includes a more lightly doped source and drain tip region immediately adjacent to the gate and a more heavily doped main portion of the source and drain region spaced apart from the gate. A first layer of glass (2% BSG) is used to provide the source of doping for the tip region and a second layer of glass (6% BSG) is used to provide the dopant for the more heavily doped major portion of source and drain regions. Spacers are formed between the glass layers to define the tip region from the main portion of the source and drain regions.

[56] References Cited

U.S. PATENT DOCUMENTS

| | | | |
|-----------|--------|---------------|---------|
| 4,079,504 | 3/1978 | Kosa | 437/978 |
| 4,204,894 | 5/1980 | Komeda et al. | 437/164 |

4 Claims, 4 Drawing Sheets



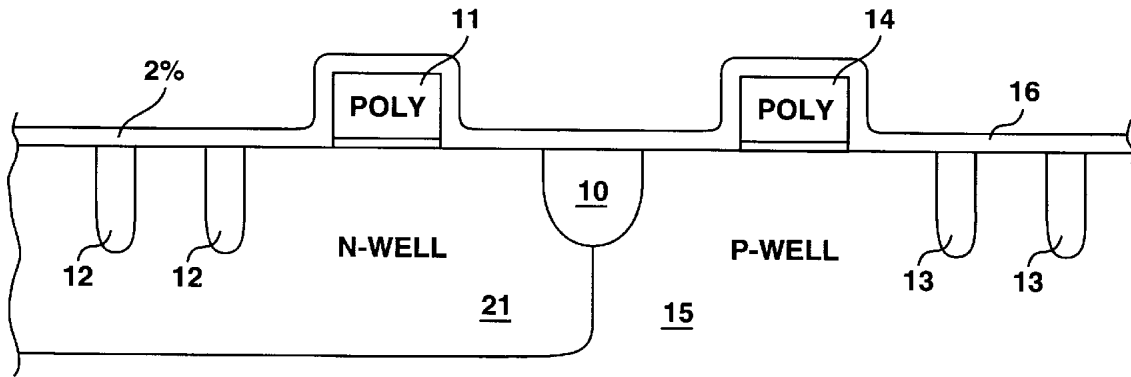


FIG. 1

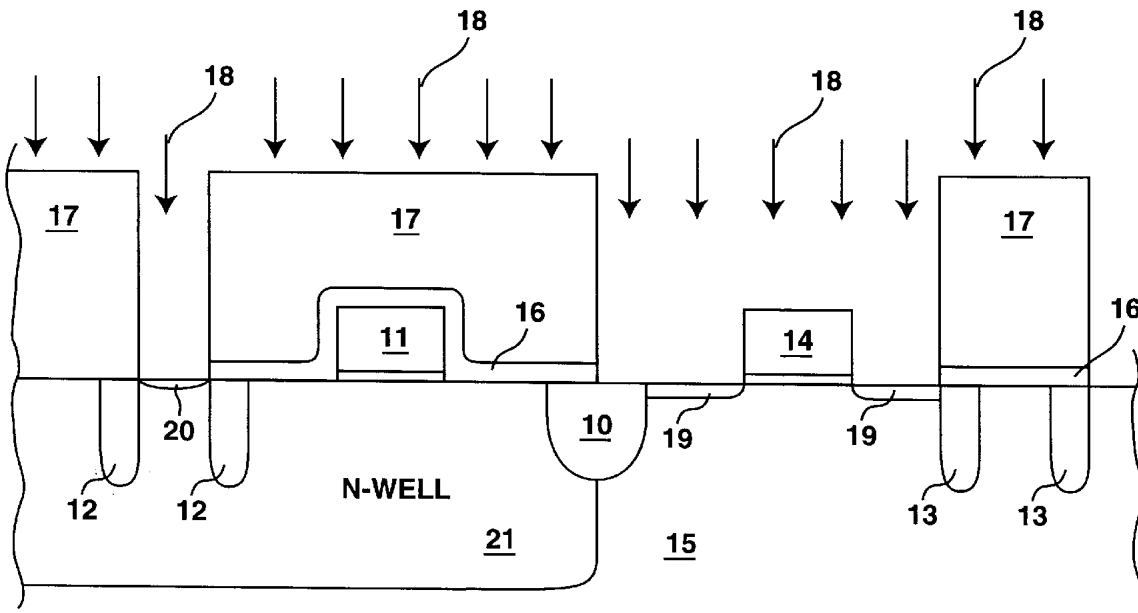


FIG. 2

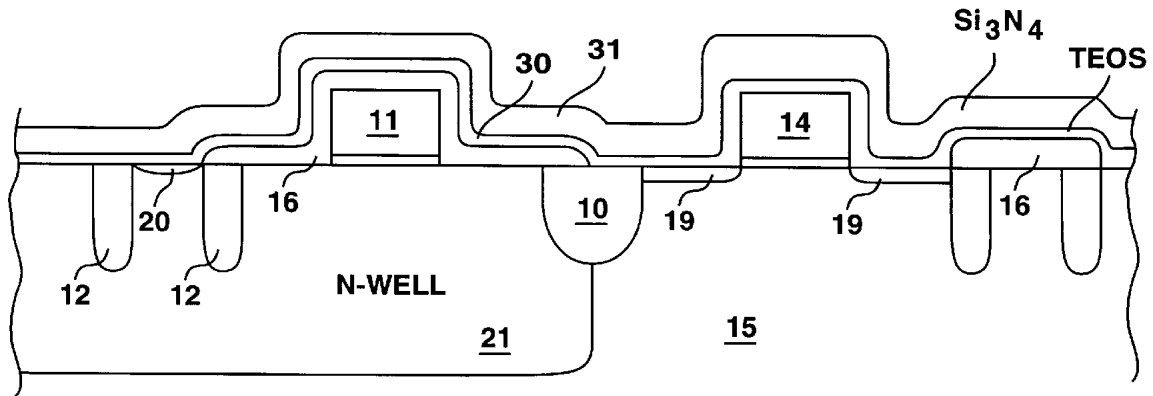


FIG. 3

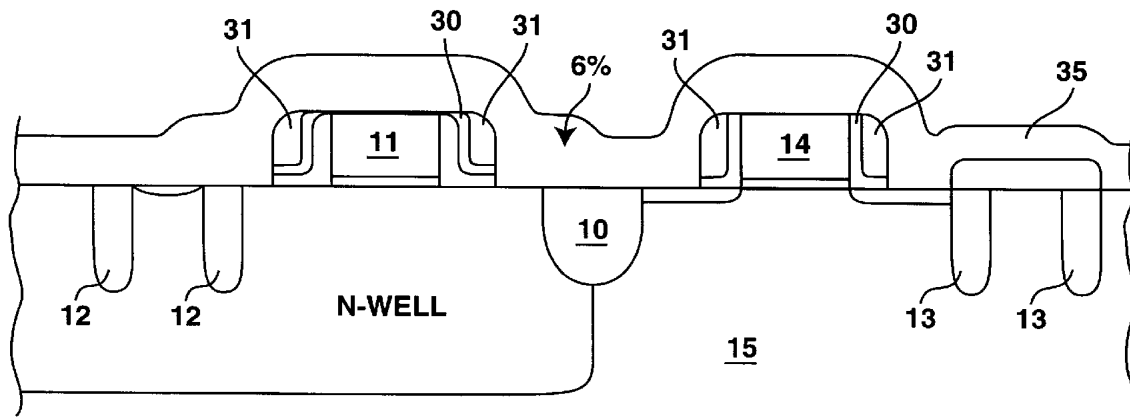


FIG. 4

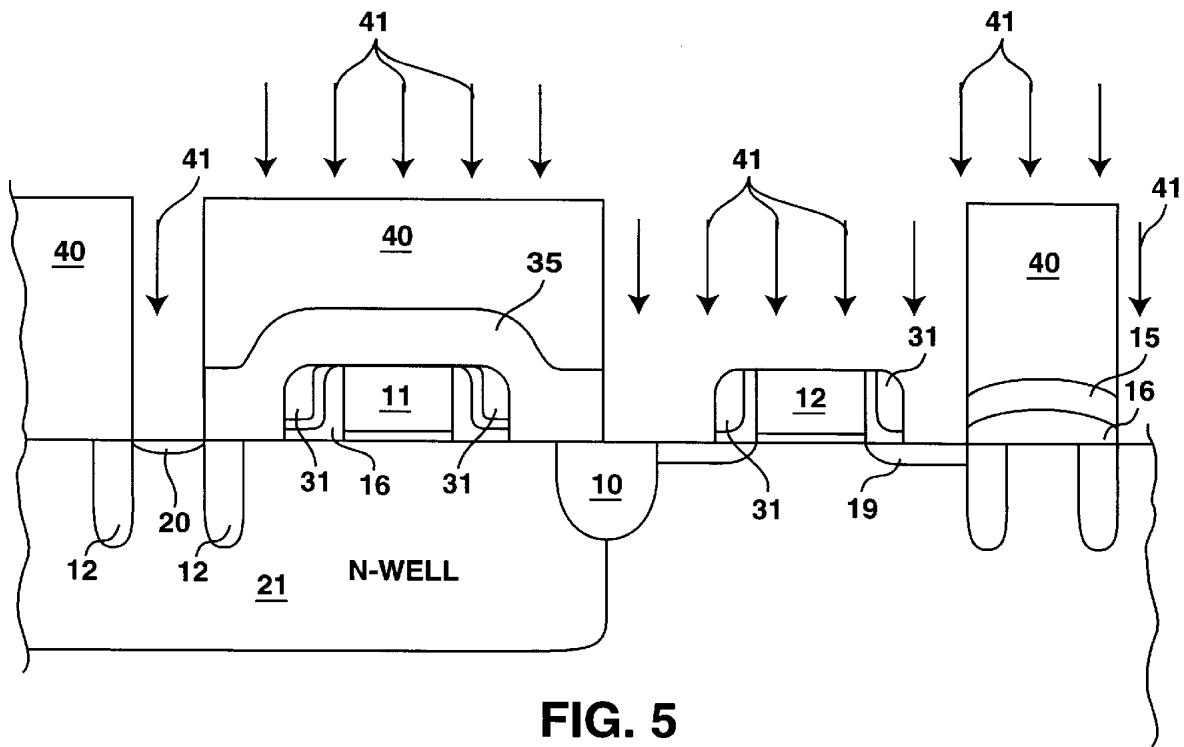


FIG. 5

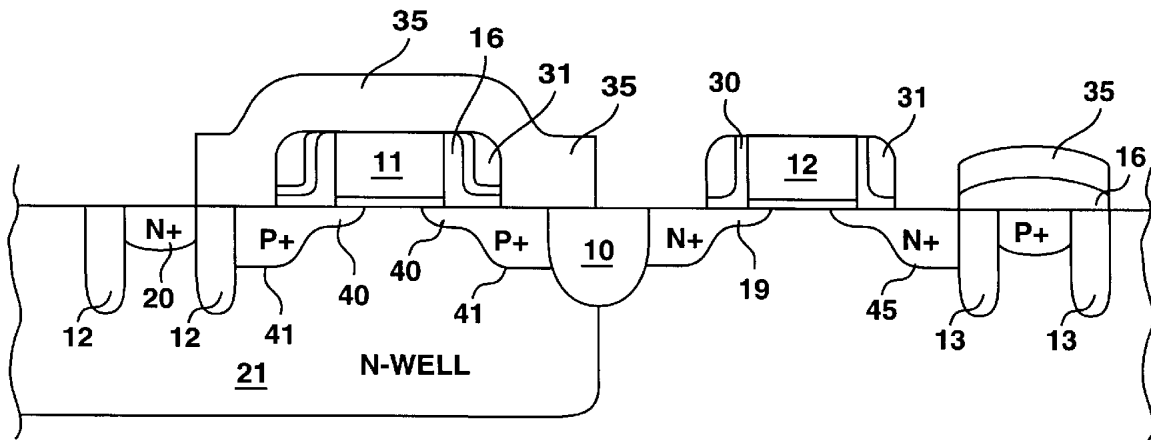


FIG. 6

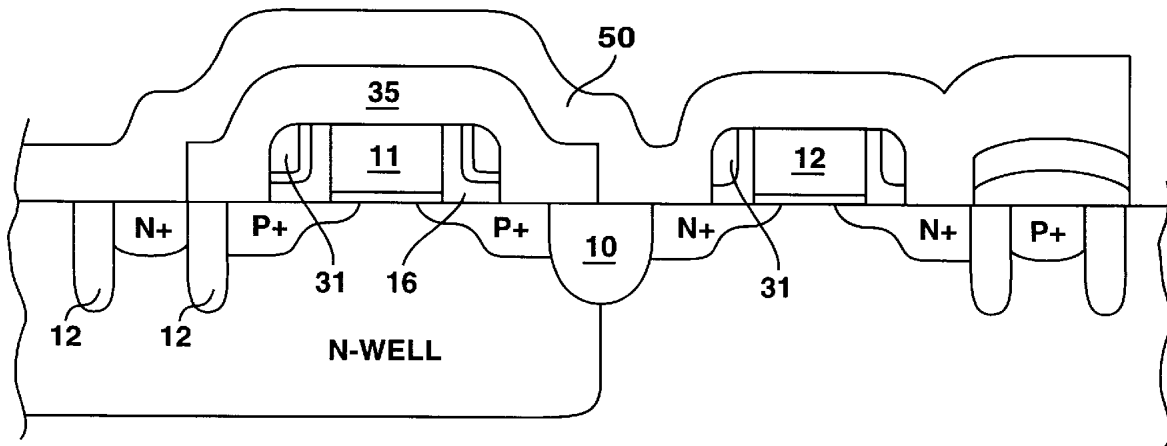


FIG. 7

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.