



US006258648B1

(12) **United States Patent**  
**Lee**

(10) **Patent No.:** **US 6,258,648 B1**  
(45) **Date of Patent:** **Jul. 10, 2001**

(54) **SELECTIVE SALICIDE PROCESS BY REFORMATION OF SILICON NITRIDE SIDEWALL SPACERS**

5,672,527	9/1997	Lee	437/41
5,719,079	2/1998	Yoo et al.	438/238
5,792,684	* 8/1998	Lee et al.	438/238
5,807,779	* 9/1998	Liaw	438/279
6,025,267	* 2/2000	Pey et al.	438/656

(75) Inventor: **Yong Meng Lee**, Singapore (SG)

\* cited by examiner

(73) Assignee: **Chartered Semiconductor Manufacturing Ltd.**, Singapore (SG)

*Primary Examiner*—Jey Tsai

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(74) *Attorney, Agent, or Firm*—George O. Saile; Rosemary L. S. Pike

(21) Appl. No.: **09/246,292**

(22) Filed: **Feb. 8, 1999**

(51) **Int. Cl.**<sup>7</sup> ..... **H01L 21/8242**

(52) **U.S. Cl.** ..... **438/238**; 438/649; 438/253

(58) **Field of Search** ..... 438/238, 253–256, 438/648–686

(57) **ABSTRACT**

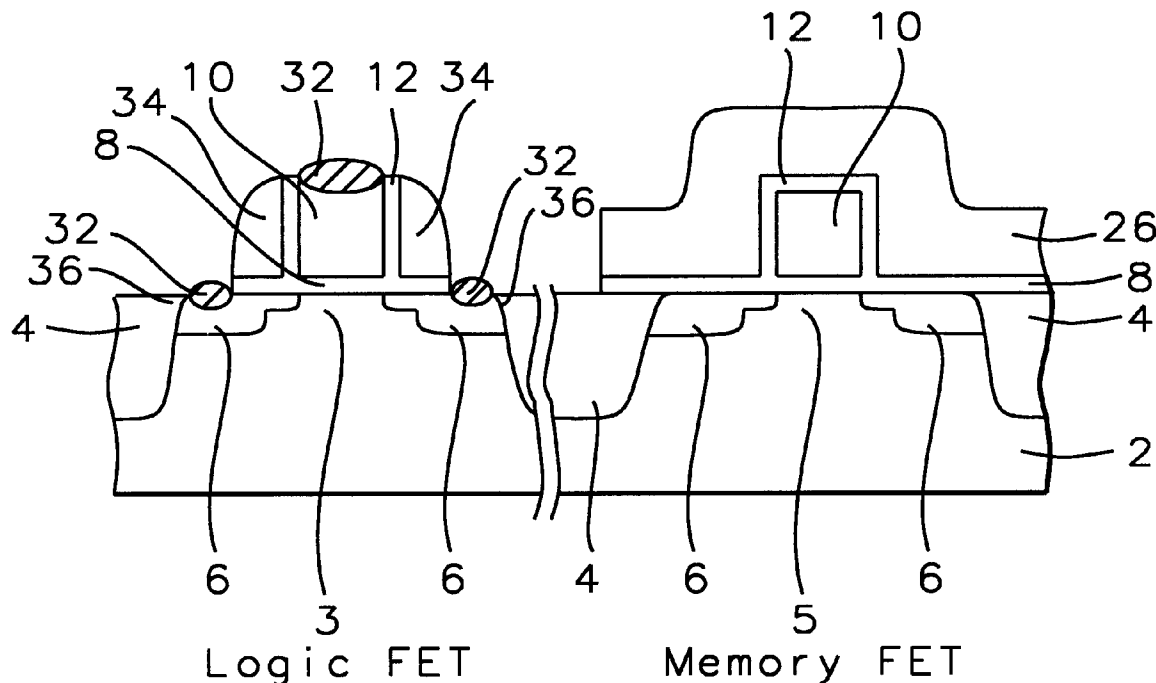
A new method of forming selective salicide structures is described whereby robust salicide structures are formed on exposed logic FET's, while blocking salicide formation on memory FET's. Thus, yielding logic FET's with robust salicide structures which exhibit low sheet rho lines and contacts, while blocking salicide formation on the sensitive memory FET's which operate at low voltage and have low leakage, shallow junctions. A conformal layer of thick silicon nitride in conjunction with a salicide blockout mask forms robust selective salicide structures. These structures exhibit low leakage and lack leakage problems caused by bridging, silicide ribbons or stringers.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,912,061	3/1990	Nasr	437/44
5,510,648	4/1996	Davies et al.	257/657
5,668,024	9/1997	Tsai et al.	438/199

**8 Claims, 4 Drawing Sheets**



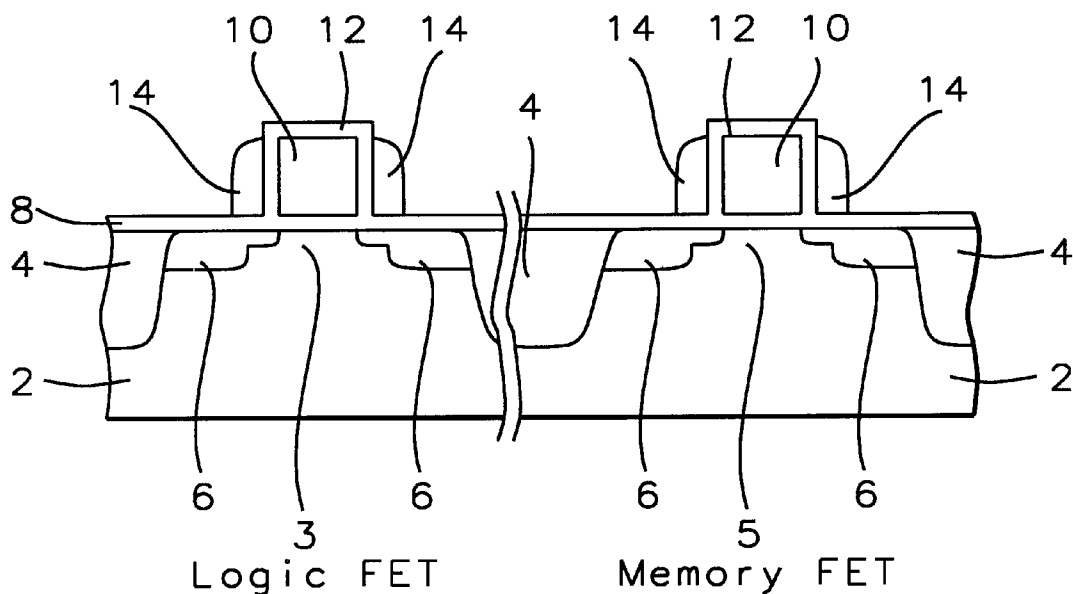


FIG. 1A - Prior Art

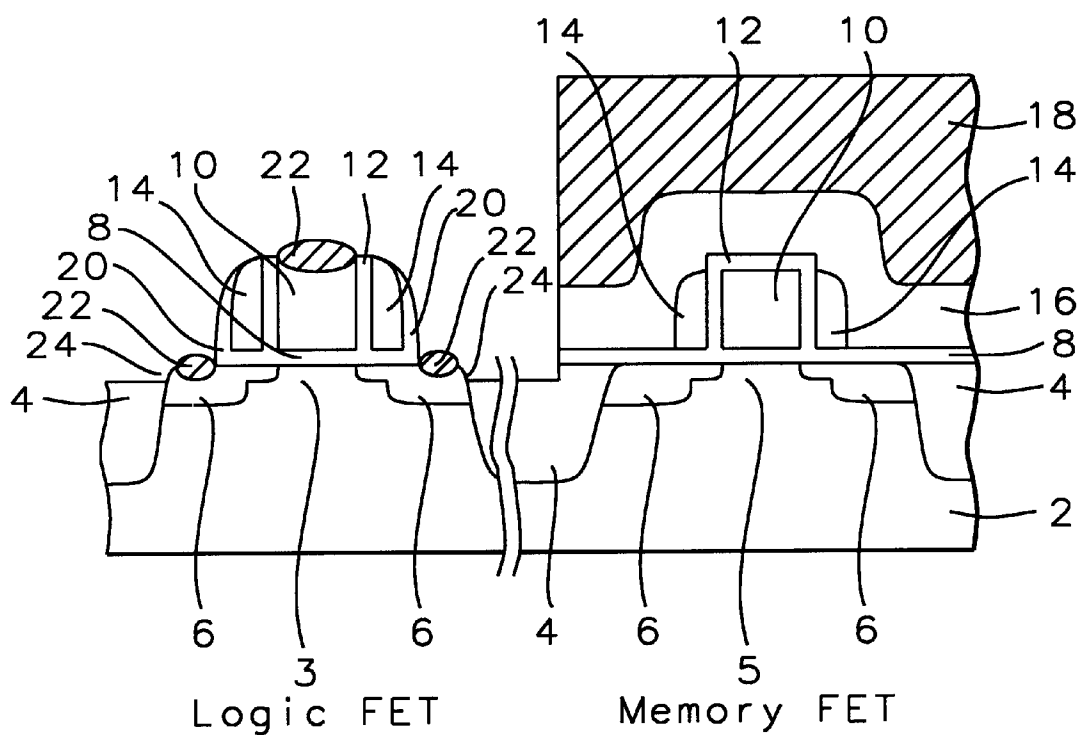


FIG. 1B - Prior Art

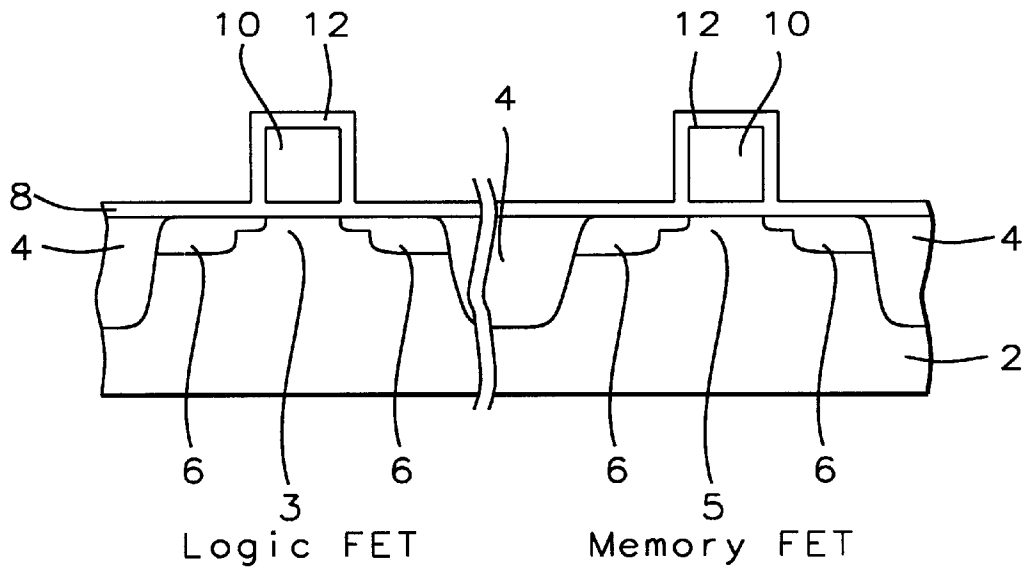


FIG. 2

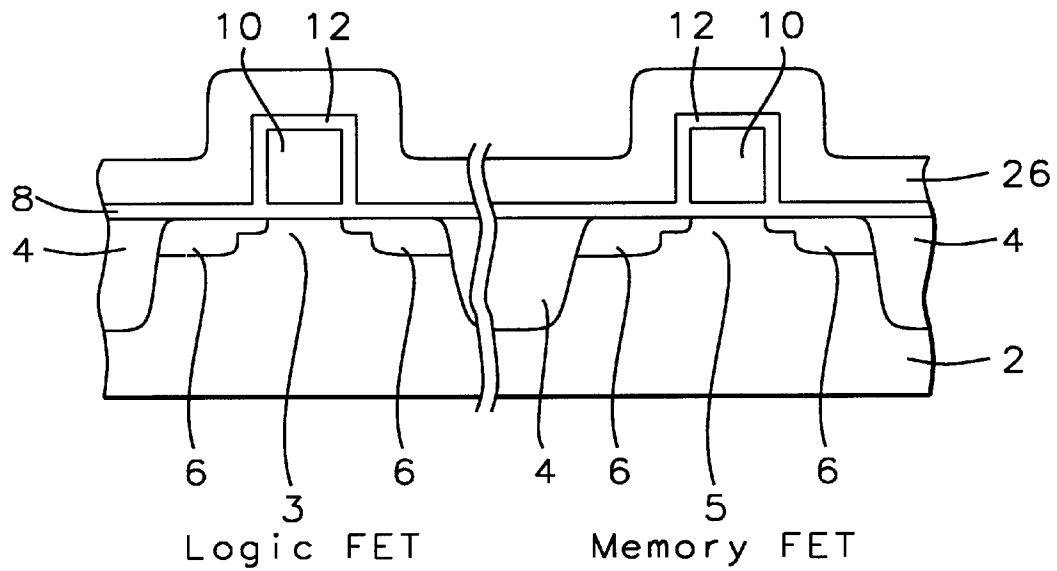


FIG. 3

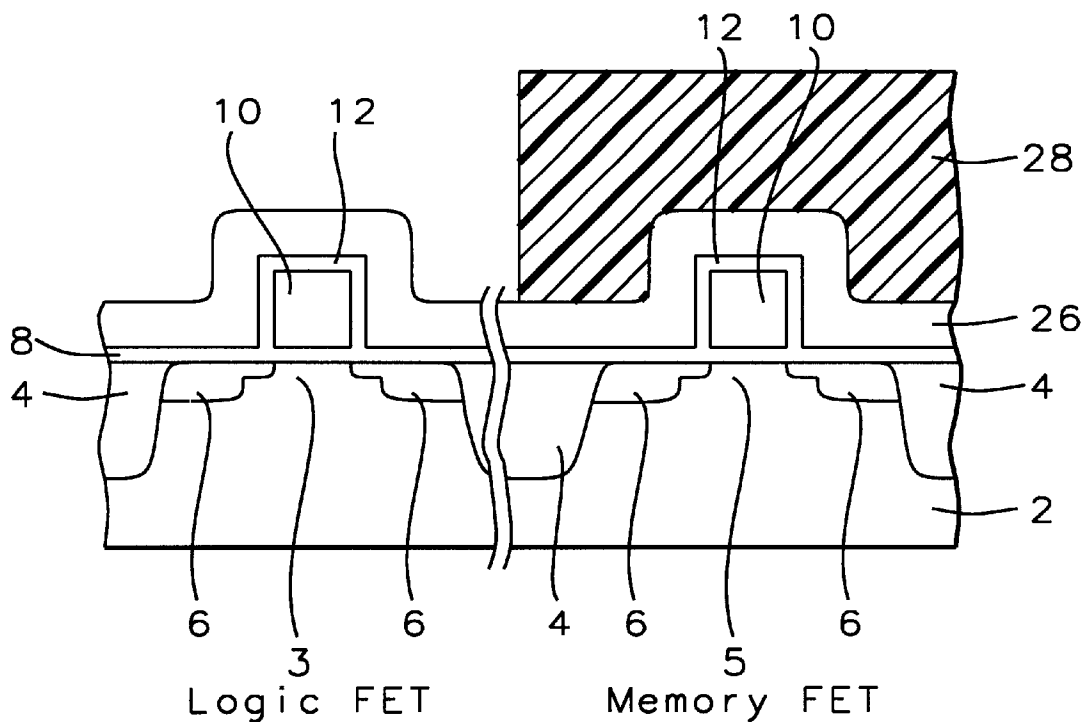


FIG. 4

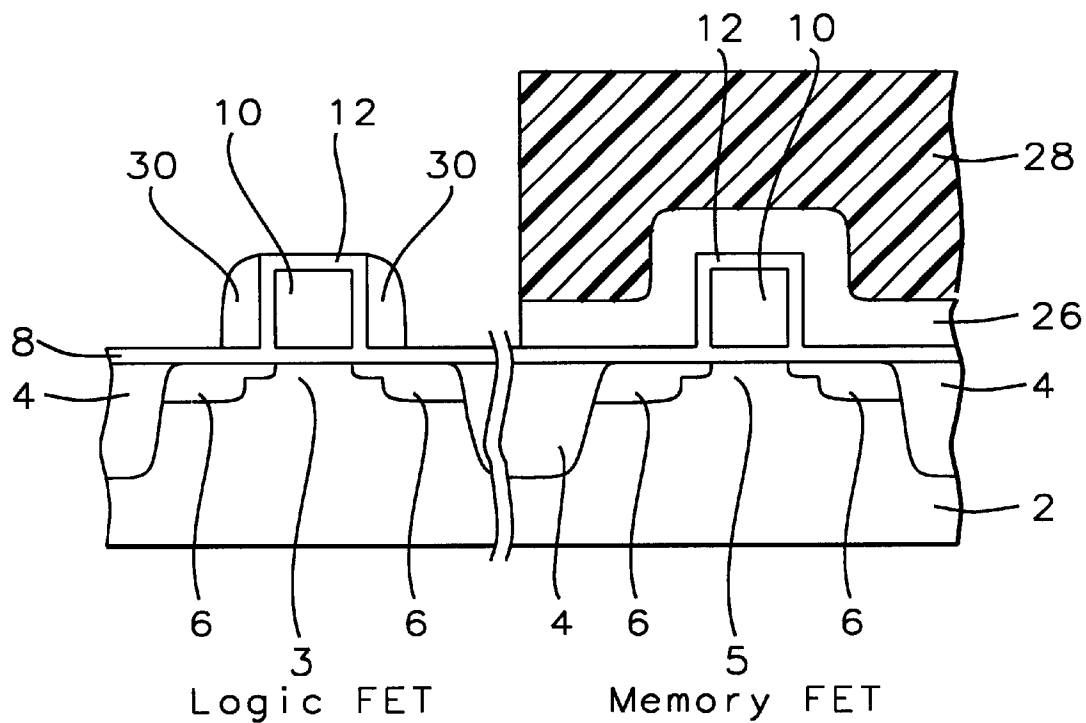


FIG. 5

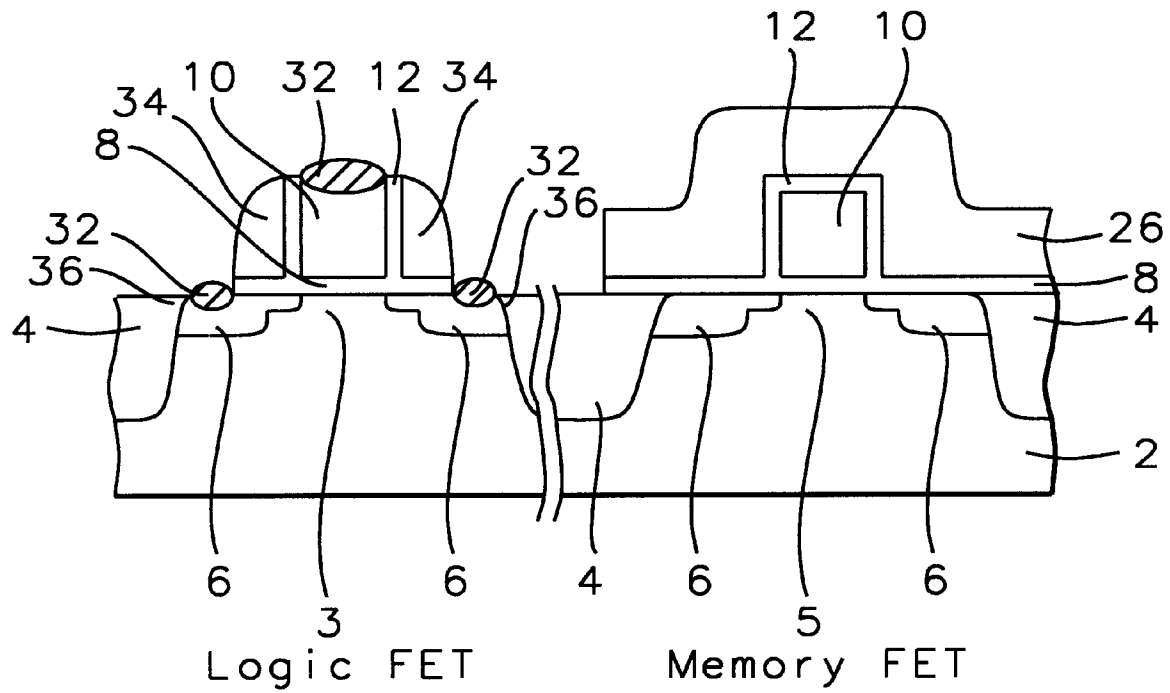


FIG. 6

# 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.