



US008729673B1

(12) **United States Patent**  
**Okandan et al.**

(10) **Patent No.:** **US 8,729,673 B1**  
(45) **Date of Patent:** **May 20, 2014**

(54) **STRUCTURED WAFER FOR DEVICE PROCESSING**

(75) Inventors: **Murat Okandan**, Edgewood, NM (US);  
**Gregory N. Nielson**, Albuquerque, NM (US)

(73) Assignee: **Sandia Corporation**, Albuquerque, NM (US)

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

(21) Appl. No.: **13/239,181**

(22) Filed: **Sep. 21, 2011**

(51) **Int. Cl.**  
**H01L 29/06** (2006.01)

(52) **U.S. Cl.**  
USPC ..... **257/618**; 438/113; 257/E21.499

(58) **Field of Classification Search**  
USPC ..... 257/618, 774, 678, 690, 723;  
438/460-465

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,777,267 B2 *	8/2004	Ruby et al. ....	438/113
8,236,611 B1 *	8/2012	Anderson et al. ....	438/113
2006/0068567 A1 *	3/2006	Beyne et al. ....	438/460
2010/0330506 A1 *	12/2010	Knechtel ....	430/314

\* cited by examiner

*Primary Examiner* — Yu-Hsi D Sun

*Assistant Examiner* — Christina Sylvia

(74) *Attorney, Agent, or Firm* — Blakely Sokoloff Taylor & Zafman LLP; W. Thomas Babbitt; Olivia J. Tsai

(57) **ABSTRACT**

A structured wafer that includes through passages is used for device processing. Each of the through passages extends from or along one surface of the structured wafer and forms a pattern on a top surface area of the structured wafer. The top surface of the structured wafer is bonded to a device layer via a release layer. Devices are processed on the device layer, and are released from the structured wafer using etchant. The through passages within the structured wafer allow the etchant to access the release layer to thereby remove the release layer.

**13 Claims, 7 Drawing Sheets**

