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Baliga

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[54] **TRENCH GATE LATERAL MOSFET**

[75] Inventor: **B. Jayant Baliga**, Raleigh, N.C.

[73] Assignee: **North Carolina State University**, Raleigh, N.C.

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[52] **U.S. Cl.** **257/141**; 257/332; 257/339; 257/491

[58] **Field of Search** 257/330, 331, 332, 333, 257/334, 401, 622, 623, 487, 489, 491, 141, 139, 140, 329, 339

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Primary Examiner—Robert P. Limanek
Assistant Examiner—Wael M. Fahmy
Attorney, Agent, or Firm—Richard E. Jenkins

[57] **ABSTRACT**

A trench gate lateral MOSFET structure has the voltage supported along side walls and the bottom surface of the trench. With narrow source and drain mesa regions that are optimally doped, a uniform electric field is obtained vertically in the mesa regions and horizontally at the bottom of the trench, allowing a relative high doping level in an N-drift region resulting in specific on-resistances well below those of conventional lateral MOSFETs at a high breakdown voltage.

21 Claims, 7 Drawing Sheets