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(71) Applicant *(for all designated States except US)*: ATMEL CORPORATION [US/US]; 2325 Orchard Parkway, San Jose, CA 95131 (US).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: ENICKS, Darwin, G. [US/US]; 6845 Snowbird Drive, Colorado Springs, CO 80918 (US).

(74) Agent: STEFFEY, Charles, E.; Schwegman, Lundberg & Woessner, P.A., P.O. Box 2938, Minneapolis, MI 55402 (US).

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Declarations under Rule 4.17:
— as to applicant's entitlement to apply for and be granted a patent *(Rule 4.17(ii))*
— as to the applicant's entitlement to claim the priority of the earlier application *(Rule 4.17(iii))*

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(54) Title: A HETEROJUNCTION BIPOLAR TRANSISTOR (HBT) WITH PERIODIC MULTI LAYER BASE

Fig._ 2

(57) Abstract: A method and resulting electronic device utilizing periodic multi-layer (ML) (500) and/or superlattice (SL) structures in the base of a SiGe heteroj unction bipolar transistor (HBT) is disclosed. The SL is a special case of an ML, in which layers that are chemically different from adjacent neighbors are successively repeated. The use of the ML (500) in electronic and photonic devices enables strategic engineering of the energy band gap (551, 553) and carrier mobilities. Principles disclosed herein relate to npn- and pnp-type SiGe HBTs as well as HBTs made with other compound semiconductor materials (e.g., other Group III-V or II-VI materials). Additionally, technology and methods disclosed herein benefit other devices types such as, for example, metal oxide semiconductor field effect transistors (MOSFETs), high electron mobility transistors (HEMTs), high hole mobility transistors (HHMTs), bipolar junction transistors (BJTs), and FINFETs.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/74232

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **H01L 31/11(2006.01)**

USPC: 257/187

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
    U.S. : 257/187

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- A	US 6,759,694 B1 (Hsu et al.) 06 July 2004 (06.07.2004), figs. 1-6 and col. 1, lines 44-64; col. 3, line 8-col. 5, line 50.	1-17 ---------- 18-22

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
05 May 2008 (05.05.2008)	**18 JUN 2008**
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer /Dao H. Nguyen/ Telephone No. 571-272-1791

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