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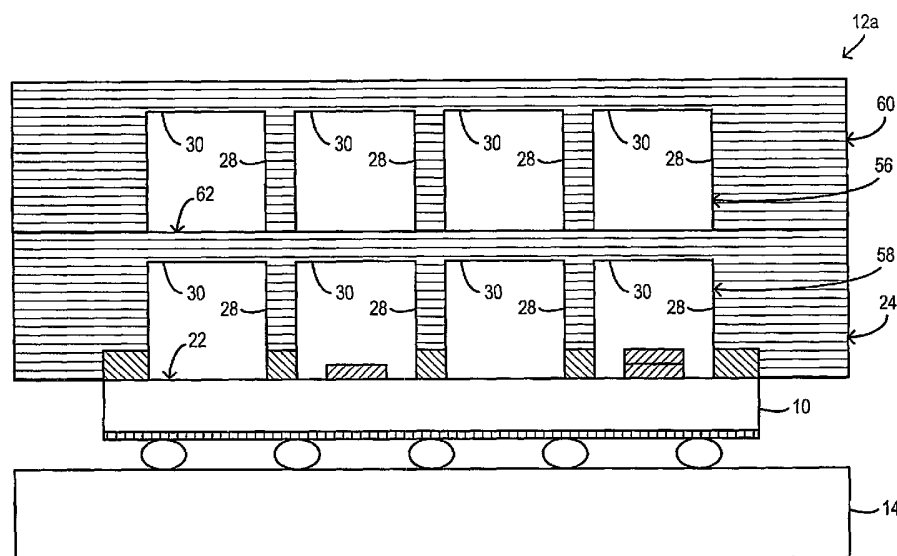
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[Continued on next page]

(54) Title: COOLING AN INTEGRATED CIRCUIT DIE WITH COOLANT FLOW IN A MICROCHANNEL AND A THIN FILM THERMOELECTRIC COOLING DEVICE IN THE MICROCHANNEL



(57) Abstract: An apparatus includes an integrated circuit (IC) die that has a front surface on which an integrated circuit is formed. The IC die also has a rear surface that is opposite to the front surface. The apparatus also includes a microchannel member to define at least one microchannel at the rear surface of the IC die. The microchannel is to allow a coolant to flow through the microchannel. The apparatus further includes at least one thin film thermoelectric cooling (TFTEC) device in the at least one microchannel.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L23/473 H01L23/38

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)
IPC 7 H01L

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 2002/174660 A1 (VENKATASUBRAMANIAN RAMA) 28 November 2002 (2002-11-28) abstract; figures 1,3,6,7,9	1-28
A	US 5 457 342 A (HERBST, II ET AL) 10 October 1995 (1995-10-10) abstract; figure 4	1-28
A	US 6 424 533 B1 (CHU RICHARD C ET AL) 23 July 2002 (2002-07-23) abstract; figures 2,3	1-28
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Date of the actual completion of the international search 30 September 2005	Date of mailing of the international search report 10/10/2005
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 894 709 A (PHILLIPS ET AL) 16 January 1990 (1990-01-16) abstract; figures 4,5 -----	1-28
A	WO 02/39241 A (VODAFONE PILOTENTWICKLUNG GMBH; THEISEN, SVEN; P21 GMBH) 16 May 2002 (2002-05-16) abstract; figure 1 -----	1-28

INTERNATIONAL SEARCH REPORT

Information on patent family members

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