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(54) Title: CONFORMAL SHIELDING PROCESS USING PROCESS GASES

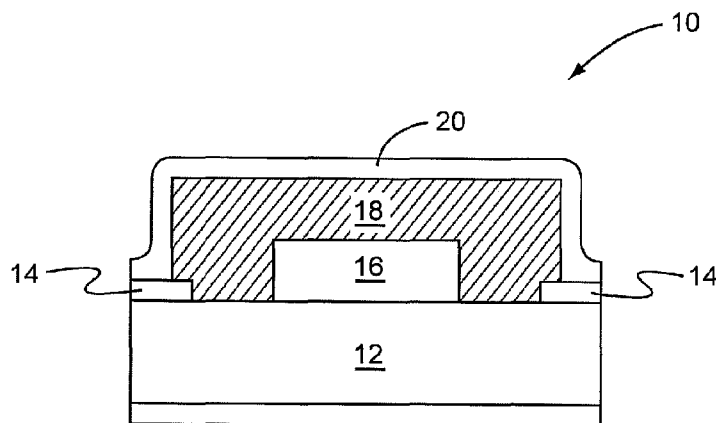


FIG. 1B

(57) Abstract: In one embodiment, a meta-module having circuitry for two or more modules is formed on a substrate, which is preferably a laminated substrate. The circuitry for the different modules is initially formed on the single meta-module. Each module will have one or more component areas in which the circuitry is formed. A metallic structure is formed on or in the substrate for each component area to be shielded. A single body, such as an overmold body, is then formed over all of the modules on the meta-module. At least a portion of the metallic structure for each component area to be shielded is then exposed through the body by a cutting, drilling, or like operation. Next, an electromagnetic shield material is applied to the exterior surface of the body of each of the component areas to be shielded and in contact with the exposed portion of the metallic structures.



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**A. CLASSIFICATION OF SUBJECT MATTER**  
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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
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.
Y	EP 1 717 857 A (SHINKO ELECTRIC IND CO [JP]) 2 November 2006 (2006-11-02) paragraphs [0006], [0007], [0024] - [0033]; figure 1	1-23
Y	US 2003/011049 A1 (NUYTKENS PETER R [US] ET AL) 16 January 2003 (2003-01-16) paragraph [0012]	1-23
A	JP 2005 109306 A (MATSUSHITA ELECTRIC IND CO LTD) 21 April 2005 (2005-04-21) abstract; figure 3	1-23

Further documents are listed in the continuation of Box C.

See patent family annex.

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1717857	A	02-11-2006	CN 1855451 A JP 2006310629 A KR 20060113412 A US 2006244131 A1	01-11-2006 09-11-2006 02-11-2006 02-11-2006
US 2003011049	A1	16-01-2003	US 2005153061 A1	14-07-2005
JP 2005109306	A	21-04-2005	NONE	