

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
1 September 2005 (01.09.2005)

PCT

(10) International Publication Number
WO 2005/081595 A3

(51) International Patent Classification⁷: **H05K 1/11**, 1/02,
H01L 23/64, 23/66, H01R 24/00, 12/16

(21) International Application Number:
PCT/US2005/004468

(22) International Filing Date: 14 February 2005 (14.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/544,522 13 February 2004 (13.02.2004) US

(71) Applicant: **MOLEX INCORPORATED** [US/US]; 2222
Wellington Court, Lisle, IL 60532 (US).

(72) Inventors: **REGNIER, Kent, E.**; 541 South Grace Street,
Lombard, IL 60148 (US). **BRUNKER, David, L.**; 407
Verbena Court, Naperville, IL 60565 (US). **OGBUOKIRI,**
Martin, U.; 502 Spruce Street, Aurora, IL 60506 (US).

(74) Agent: **PAULIUS, Thomas, D.**; Molex Incorporated,
2222 Wellington Court, Lisle, IL 60532 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ,
TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA,
ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

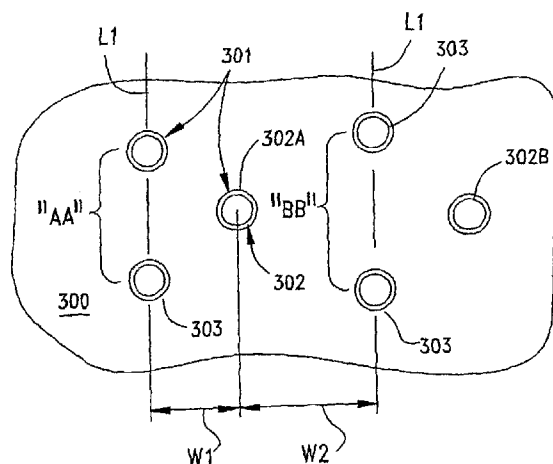
Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
15 December 2005

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: **PREFERENTIAL ASSYMMETRICAL VIA POSITIONING FOR PRINTED CIRCUIT BOARDS**



(57) Abstract: A circuit board (200, 300, 400) design is disclosed that is useful in high speed differential signal applications uses either a via arrangement or a circuit trace exit structure. In the via arrangement, sets of differential signal pair vias (301, 303, 401, 402) and an associated ground (302) are arranged adjacent to each other in a repeating pattern. The differential signal vias (301, 303, 591) of each pair are spaced closer to their associated ground via (302a, 593a) than the spacing between the adjacent differential signal pair associated ground (302b, 593b) so that differential signal vias exhibit a preference for electrically coupling to their associated ground vias. The circuit trace exit structure involves the exit portions of the circuit traces (420, 550) of the differential signal vias (401, 402, 591) to follow a path where the traces then meet with and join to the transmission line portions (552) of the conductive traces.

WO 2005/081595 A3