



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
6 October 2005 (06.10.2005)

PCT

(10) International Publication Number
WO 2005/093945 A1

(51) International Patent Classification⁷: **H03D 13/00**, 9/06

(21) International Application Number:
PCT/US2005/007529

(22) International Filing Date: 4 March 2005 (04.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/792,959 4 March 2004 (04.03.2004) US

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(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, GR, 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.

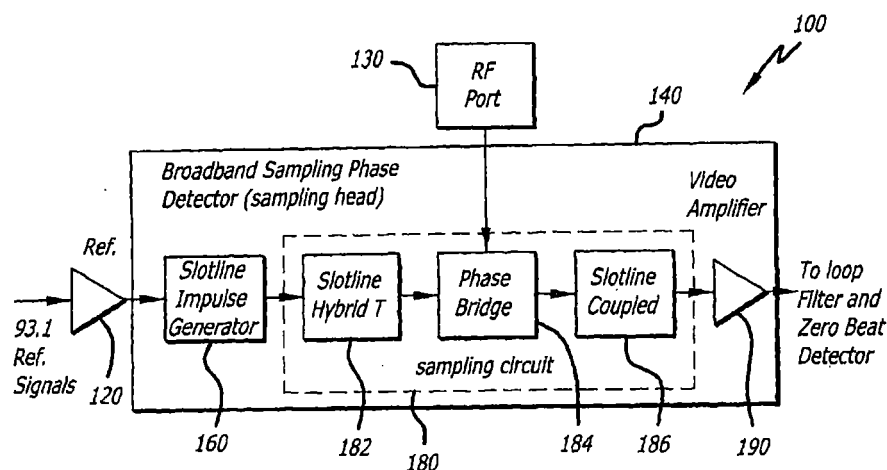
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, 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

[Continued on next page]

(54) Title: **BROADBAND SUBHARMONIC SAMPLING PHASE DETECTOR**



(57) **Abstract:** A phase detector and method of phase detection. The detector (140) includes a substrate; an impulse generator (160) fabricated on the substrate; and a sampling circuit (180) operationally coupled to the generator and disposed on the substrate. In the best mode, the impulse generator and the sampling circuit are fabricated on the substrate using grounded slotline technology and coplanar waveguide technology. In more specific embodiments, the generator is a slotline impulse generator with a step recovery diode (162). In this embodiment, the impulse generator (160) further includes a coplanar waveguide to slotline transition at an input port thereof and a slotline to coplanar waveguide at an output port thereof. In addition, in the illustrative embodiment, the sampling circuit (180) further includes a slotline hybrid T junction (182). The sampling circuit further includes a phase bridge (184) coupled to the hybrid T junction and a grounded slotline coupled delay (186). In the specific embodiment, the sampling circuit also includes a broadband transition from coplanar waveguide to coupled slotline.



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