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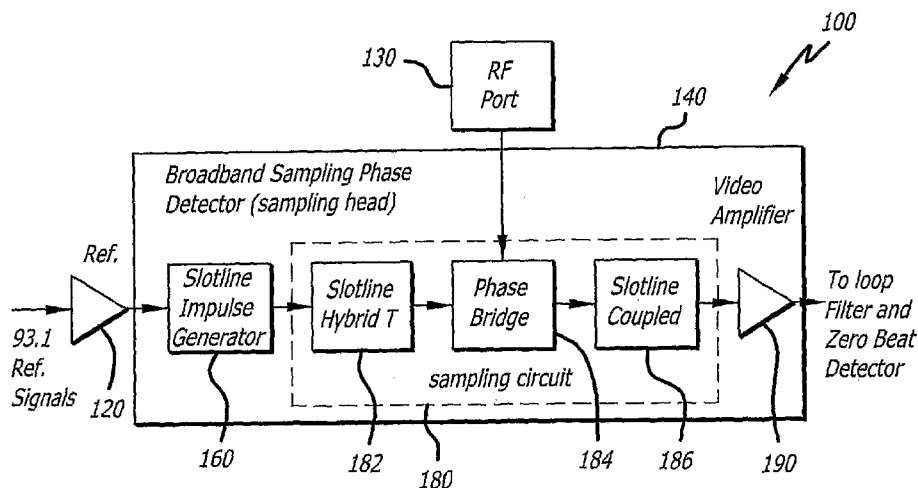
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(54) Title: BROADBAND SUBHARMONIC SAMPLING PHASE DETECTOR



(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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