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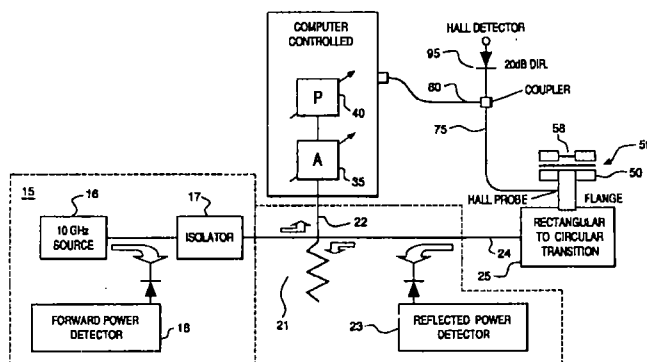
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(54) Title: METHOD AND APPARATUS FOR NONDESTRUCTIVE MEASUREMENT AND MAPPING OF SHEET MATERIALS



(57) Abstract: An apparatus for contactless measurement of carrier concentration and mobility includes a microwave source (16), a circular waveguide (50) for transmitting microwave radiation to a sample (59), such as a semiconductor wafer or panel for flat panel displays, at a measurement location, a first detector (18) for detecting the forward microwave power, a second detector (23) for detecting the microwave power reflected from the sample, and a third detector (95) for detecting the Hall effect power. A circular waveguide (50), carrying only the TE<sub>11</sub> mode, is terminated by the sample (59) behind which a short (58) is located. Perpendicular to the plane of the sample (and along the axis of the circular waveguide (50)), a magnetic field is applied. In this configuration, a given incident TE<sub>11</sub> wave will cause two reflected waves. One is the ordinary reflected wave in the same polarization as the incident one. A detector is provided to measure this reflected radiation. The other reflected wave is caused by the Hall effect. Its polarization is perpendicular to the former wave and a probe (70) is provided to detect this as well. This reflected wave is detected by a probe (70), the output of which is combined with an attenuated and phase shifted portion of the forward radiation at a single detector.

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