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Central Research Laboratory
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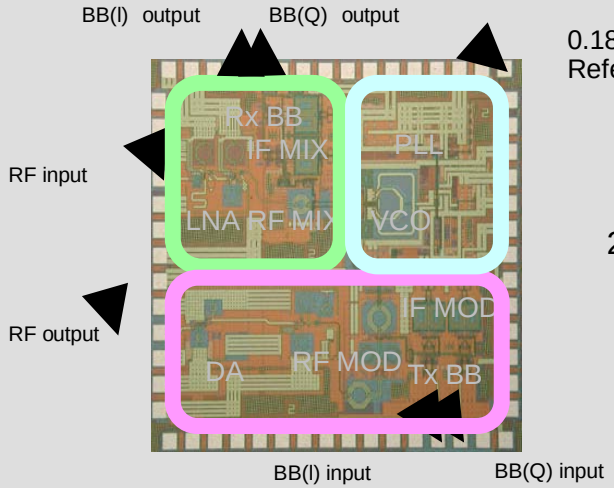
Low-cost low-power-consumption transceiver circuit technology for quasi-millimeter-wave-band wireless-communication systems



0.18-mm SiGe BiCMOS
Reference clock input

2.6 × 2.4 mm

Transceiver circuit technology was developed for quasi-millimeter-wave-band (frequency band from 10 to 30 GHz) wireless communication systems using low-cost silicon semiconductor technology. As the current frequency band of 6 GHz and below, used for mobile phones and wireless LANs, is becoming crowded, the use of other relatively un-crowded frequency bands such as quasi-millimeter is being considered. The technology developed is basic technology required for the proliferation of quasi-millimeter waveband wireless communication systems.

This work was supported by "The Research and Development Project for the Expansion of Radio Spectrum Resources" of the Ministry of Internal Affairs and Communications, Japan.

■ Features of the prototype transceiver circuit (MMIC: Monolithic microwave integrated circuit)

- Use of low-cost silicon-based semiconductor materials
- Single chip MMIC operating at a bandwidth of 24 GHz
- Operating at 100 milliwatts - one-third the power consumption compared to conventional compound semiconductor circuits

■ Future directions

As this technology supports even higher-speed larger-capacity data transmission than provided by current wireless communication, it is expected to find application in various communication systems.

■ Conference presentation

These results were presented on the 14th September at the European Solid-State Circuits Conference, held from 13th to 17th September 2010 in Seville, Spain.

■ A word from the development team

Various applications for this technology will be investigated.

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