6-18 GHz 8-Element SiGe Phased Array Beamformer Chip

Tech ID: 19226 / UC Case 2009-820-0

TECHNOLOGY DESCRIPTION

This invention is a 6-18 GHz 8-element SiGe phased array beamformer chip, including GSDII layout files, design-files compatible with Jazz Semiconductor's SBC18Hx process detailing circuit design, and the following supporting published literature:

Kwang-Jin Koh; Rebeiz, G.M.; "An X- and Ku-Band 8-Element Phased-Array Receiver in 0.18um SiGe BiCMOS Technology" Solid-State Circuits, IEEE Journal of, Volume 43, Issue 6, June 2008 Page(s):1360 – 1371.

Sample chips are available. Additional chips may be ordered as-is for manufacture by Jazz Semiconductor.

Specifics of the proto-type phased-array chips are as follows:

- 8-element phased array receiver in a standard 0.18- um SiGe BiCMOS technology for 6-18 GHz applications.
- The array receiver adopts the All-RF architecture, where the phase shifting and power combining are done at the RF level.
- With the integration of all the digital control circuitry and ESD protection for all I/O pads, the receiver consumes a current of 100-200 mA from a 3.3 V supply voltage.
- The receiver shows 1.5-24.5 dB of power gain per channel from a 50 ohm load at 12 GHz with bias current control, and an associated NF of 4.2 dB (at maximum gain) to 13.2 dB (at minimum gain).
- The RMS gain error is < 0.9 dB and the RMS phase error is < 6 deg. at 6–18 GHz for all 4-bit phase states.
- The measured group delay is 162.5+/- 12.5 ps for all phase states at 6–18 GHz. The RMS phase mismatch and RMS gain mismatch among the eight channels are < 3 deg. and 0.4 dB, respectively, for all 16 phase states, over 6–18 GHz.
- The 8-element array can operate instantaneously at any center frequency and with a wide bandwidth (3 to 6 GHz, depending on the center frequency) given primarily by the 3 dB gain variation in the 6–18 GHz range.
- The chip size is 2.2 x 2.45 mm^2 including all pads.

INTELLECTUAL PROPERTY INFO

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OTHER INFORMATION

CATEGORIZED AS

- Semiconductors
  - Materials
  - Other

RELATED CASES

2009-820-0

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