Aero™ GSM Transceiver Chipset

INTEGRATED TRANSCEIVER FOR GSM900, DCS1800 AND PCS1900 WIRELESS COMMUNICATIONS

PRODUCT DESCRIPTION

The Aero transceiver is the industry’s most integrated RF front-end for dual and triple band GSM digital cellular handsets and wireless data modems. The highly integrated solution eliminates the IF SAW filter, low noise amplifiers (LNAs) for three bands, transmit and RF voltage controlled oscillator (VCO) modules, and more than 60 other discrete components found in conventional GSM handset designs.

The receive section uses a digital low-IF architecture which avoids the difficulties associated with direct conversion receivers while delivering on the promises of lower cost and reduced complexity. The universal analog baseband interface is compatible with any supplier’s baseband subsystem. The transmit section is a complete up-conversion path from the baseband subsystem to the power amplifier, and uses an offset phase-locked loop (PLL) with a fully integrated transmit VCO. The frequency synthesizer uses Silicon Labs’ proven technology, which includes integrated RF and IF VCOs, varactors, and loop filters.

AERO TRANSCEIVER BLOCK DIAGRAM

FEATURES

- Complete triple-band GSM cellular radio front end using CMOS RF technology
- Unparalleled integration
  - 50% less board area
  - 80% fewer components
- Low-IF receiver
  - Dual or triple band LNA
  - Image-reject down-converter
  - High performance A/D converter
- Universal analog baseband interface
  - Digital IF to baseband converter
  - Digital channel select filter
  - Digital programmable gain control
  - Works with any baseband solution
- Offset PLL transmitter
  - High precision I/Q up-converter
  - Integrated transmit VCO
- Proven frequency synthesizer technology
  - Integrated RF and IF VCOs
- GPRS class 12 compliant
- EDGE downlink compatible
- 2.7 to 3.3V operation
- Low profile packages
  - Si4200: 5x5mm MLP32
  - Si4201: 4x4mm MLP20
  - Si4133T: 5x5mm MLP28

APPLICATIONS

- Dual and triple band GSM cellular handsets
- GPRS voice and data modems

PRODUCT BRIEF

SILICON LABORATORIES’
AERO TRANSCEIVER:
RAISING CMOS
TO THE POWER OF RF
Unparalleled Integration:
The Aero transceiver’s innovative architecture eliminates the IF SAW filter, transmit and RF VCO modules and more than 60 other discrete components found in conventional GSM handset designs. This level of integration is an enabling force in lowering the cost, simplifying the design and manufacturing, and shrinking the form factor of the RF circuitry in next-generation GSM voice and data terminals.

100% CMOS Technology:
While conventional solutions use BiCMOS or other bipolar process technologies, the Aero chipset is the industry’s first cellular transceiver to be implemented in a 100% CMOS process. This brings the dramatic cost savings and extensive manufacturing capacity of CMOS to the GSM market.

Universal Baseband Interface:
A software-programmable baseband interface enables the Aero transceiver to operate with any baseband subsystem. This programmability gives the handset designer the ability to use the latest RF technology without redesigning the baseband portion of the phone.

Digital Low-IF Receiver:
The Aero transceiver uses a patented digital low-IF receive architecture which avoids the difficult problems associated with direct conversion while delivering the promises of lower cost and reduced complexity.

50% Area Reduction / 80% Fewer Components

<table>
<thead>
<tr>
<th>Total Area</th>
<th>Modules</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Laboratories Aero</td>
<td>400 mm²</td>
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<tr>
<td>Conventional RF Front End</td>
<td>900 mm²</td>
<td>2</td>
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</tbody>
</table>

**TYPICAL SIZE COMPARISON**

**CONTACT INFORMATION**

**PRODUCTS**

- Si4200-BM: GSM/DCS/PCS Triple-band Aero Transceiver Chipset (Includes Si4200, Si4201 & Si4133T)
- Si4200GD-BM: GSM/DCS Dual-band Aero Transceiver Chipset
- Si4200GP-BM: GSM/PCS Dual-band Aero Transceiver Chipset
- Si4200-EVB: Aero Transceiver Evaluation Board
- Si4200-DS: Aero Transceiver Data Sheet (Includes Si4200/Si4201)
- Si4133T-DS: RF Synthesizer Data Sheet

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