Abstracts

Design of an LTCC integrated tri-band direct conversion receiver front-end module

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This paper presents the results of a front-end receiver module integrating GSM/DCS/PCS band select functions and a direct conversion IC on a low temperature cofired ceramic (LTCC) substrate. The front-end-module (FEM) integrated a SP3T GaAs PHEMT switch for band selection, three SAW filters for pre-selection, and a direct conversion IC for down conversion of the RF signal. Integrated passives included a PCS balun, direct conversion IC matching elements and structures to improve the performance of differential SAW filters. The LTCC module contained 24 embedded passives and 15 surface mount components integrated on a 328 mil/spl times/586 mil, 19-layer multi-layer integrated circuit (MLIC). Receiver sensitivity was better than -114 dBm, the system noise figure was less than 9 dB, and the return loss characteristics measured at the antenna input port were better than 10 dB for all three bands. EM simulation was used to achieve first pass design success and the modeling approach yielded excellent agreement between measured and simulated results.

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