

Module Technologies for RF Telecom Radios: Status and Trends

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There is an overall growing demand on broadband wireless access systems and multi-media services such as LMDS, MVDS, and VSAT applications. The market for high data bit rate communication links and broadband mm-wave mobile communication network radio links is rapidly growing.

However, these emerging volume markets also force the manufacturer of RF front-ends to significantly reduce cost and react faster on market trends. The cost driver on the RF front-end is the mm-wave unit (MWU), i.e. the RF module part. Price drivers on the MWU are the GaAs MMICs (#1) and the packaging/assembly effort (#2).

Based on the proven state-of-the-art chip-by-wire ceramics substrate technology the presentation gives an overview on new trends on

- 1) advanced multichip module approaches on LTCC technology and present trends on
- 2) single packaged RF MMICs with ball grid array (BGA) and land grid array (LGA) suitable for SMD-type reflow soldering on an RF-suitable PCB carrier.

A combination of single RF packages and macro modules suitable for volume SMD fabrication will result in a near-future box-of-bricks approach for Telecom transceiver radios and innovative module designs.