

SANTANA

DBF SATCOM FRONTEND FOR K/Ka-BAND



8x8 LTCC Tx-Module with integrated cooling channels



Close-up view



Simulation model

OVERVIEW

The project SANTANA, funded by the German Ministry of Education and Research (BMBF/DLR), focuses on Digital Beam Forming (DBF). The project was carried out by IMST GmbH in cooperation with the Technical University of Hamburg, DLR and Astrium. The DBF-frontend is divided into separate Tx (30 GHz) and Rx (20 GHz) circularly polarised antenna arrays. The frequency bands are chosen to match upcoming satellite multimedia applications, for example an airborne Ka-band satellite frontend for broadband multimedia services (internet in the sky).

The Tx antenna and the corresponding electronics are realised in modules of 8x8 patches, using an LTCC (Low-Temperature Co-fired Ceramics)

multilayer buildup. One single LTCC Txmodule consists of 17 layers of FERRO A6 LTCC material. The modular approach allows adapting the size of the antenna to different applications and data rates.

The design of the basic antenna element is based on circularly polarised patches. The circular polarisation of the patch elements is achieved by using two decoupled feeds and one 90° hybrid ring per element. In addition, the antenna elements are sequentially rotated to further enhance the polarisation behaviour of the array. A very wide scan range of 60° from boresight is achieved.

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