Title (en)

MMIC-to-waveguide RF transition and associated method

Title (de)

RF-Übergang von MMIC auf Hohlleiter und dazugehöriges Verfahren

Title (fr)

Transition RF de MMIC à guide d'ondes et méthode associée

Publication

EP 1077502 A3 20020313 (EN)

Application

EP 00202837 A 20000811

Priority

US 37582499 A 19990816

Abstract (en)

[origin: EP1077502A2] An RF transition for coupling energy propagating in a waveguide transmission line into energy propagating in a monolithic microwave integrated circuit ("MMIC") is provided. The RF transition comprises a microstrip structure that includes a MMIC substrate with backside metallization and a front side microstrip. The backside metallization defines an iris, and the microstrip includes a microstrip feed formed proximate the iris. The RF transition also includes a waveguide terminating at the metallization layer around the iris to thereby convert energy propagating in the waveguide into energy propagating in the microstrip. In one embodiment, RF signal processing circuitry is monolithically formed on the MMIC substrate. The invention enables a waveguide-to-MMIC transition to be constructed at higher RF frequencies, such as millimeter wave frequencies, even with the fragile, thinner substrates and smaller device features of higher-frequency devices. The monolithic structure avoids the use of wire bonds or ribbon welds to interconnect separate substrates, such as would be used in an MIC implementation, enabling improved RF performance at higher RF frequencies. The invention enables an RF circuit to be constructed that is adapted to communicate signals with a waveguide at higher RF frequencies, such as millimeter wave frequencies, in a rugged, producible package. <IMAGE>

IPC 1-7

H01P 5/107

IPC 8 full level

H01L 23/12 (2006.01); **H01L 23/14** (2006.01); **H01P 5/107** (2006.01)

CPC (source: EP)

H01P 5/107 (2013.01)

Citation (search report)

- [XY] US 5912598 A 19990615 - STONES DAVID I [US], et al
- [X] US 5539361 A 19960723 - DAVIDOVITZ MARAT [US]
- [Y] PATENT ABSTRACTS OF JAPAN vol. 1995, no. 11 26 December 1995 (1995-12-26)
- [A] NEWMAN T ET AL: "DESIGN OF A CIRCULAR WAVEGUIDE-TO-MICROSTRIP COUPLING PROBE FOR SUBMILLIMETER-WAVE APPLICATION", MERGING TECHNOLOGIES FOR THE 90'S. DALLAS, 7 - 11 MAY, 1990, INTERNATIONAL SYMPOSIUM ON ANTENNAS AND PROPAGATION, NEW YORK, IEEE, US, vol. 4, 7 May 1990 (1990-05-07), pages 1910 - 1913, XP000167476

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