実装・送受信機関連

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東京工業大学 大学院理工学研究科

Matsuzawa & Okada Lab.

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EuMC/EuMIC03 パッケージ(SiP, IPD)

① Flip-Chip Mounted 1:4 Demultiplexer IC in InP DHBT Technology Operating up to 100 Gb/s
Camilla Karnfelt, Chalmers University of Technology, Sweden, et al.

② Embedded IC Technology for Compact Packaging Inside Aluminum Substrate (Pocket Embedded Packaging)
Kyoung-Min Kim, Jong-Min Yook, Sung-Ku Yeo, Young-Se Kwon, KAIST, Korea

③ A Differential SiP (LNA-Filter-Mixer) in Silicon Technology for the SKA Project
M.-L. Grima, Observatoire de Paris, France, et al.

④ Microstrip Thin-Film MCM-D Technology on High-Resistivity Silicon with Integrated Through-Substrate Vias ⇒高Qパッシブデバイスの内蔵が可能
G. Posada, IMEC, Belgium, et al.

★ ⑤ Novel Symmetric High Q Inductors Fabricated Using Wafer-Level CSP Technology
Yutaka Aoki, Casio Computer Co. Ltd., Shoichi Shimizu, Kazuhiko Honjo, University of Electro-Communications, Japan

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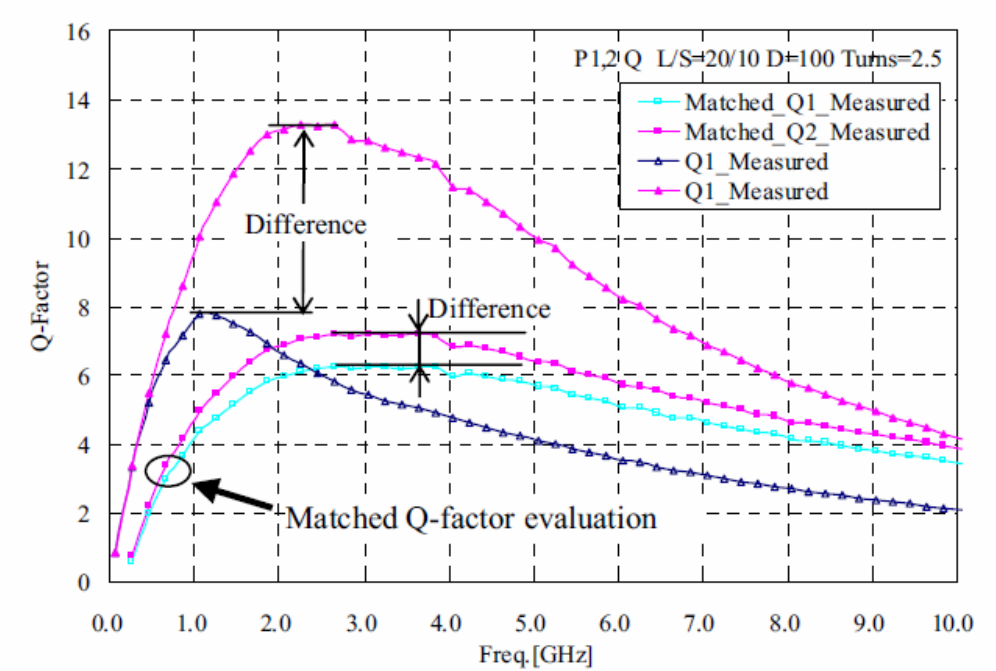
EuMC/EuMIC03⑤

Novel Symmetric High Q Inductors Fabricated Using Wafer-Level CSP Technology

Yutaka Aoki, Casio Computer Co. Ltd., Shoichi Shimizu, Kazuhiko Honjo, University of Electro-Communications, Japan



$$Q_{ind} = \frac{[2\,\mathrm{Im}\{S_{11}\}|1-S_{22}\Gamma_L|^2 + 2\,\mathrm{Im}\{S_{22}\}|S_{21}\Gamma_L|^2}{[1-|S_{11}|^2-|S_{21}|^2+|\Gamma_L|^2(|S_{22}|^2-|\Delta|^2+|S_{21}|^2)} + 4\,\mathrm{Im}\{S_{21}\}\,\mathrm{Re}\{1-S_{22}\Gamma_L S_{21}^{*}\Gamma_L^{*}\}] \cdot \quad (3)$$
$$-2\,\mathrm{Re}\{\Gamma_L(S_{22}-\Delta S_{11}^{*})\}]$$

where

$$\Delta = S_{11}S_{22} - S_{12}S_{21}. \quad (4)$$

$$\Gamma_L = \left(S_{22} + \frac{S_{12}S_{21}\Gamma_S}{1-S_{11}\Gamma_S}\right)^{*} \quad (5)$$

$$\Gamma_S = \left(S_{11} + \frac{S_{12}S_{21}\Gamma_L}{1-S_{22}\Gamma_L}\right)^{*}. \quad (6)$$

非対称インダクタをMatched Qを使って評価

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EuMC08 高周波配線 & transition

① Design and Optimization of Coax-to-Microstrip Transition and Through-Hole Signal Via on Multilayer Printed Circuit Boards
J. Nath, Harris Stratex Networks, Morrisville, USA

② Millimetre-Wave Wideband Transition from Coplanar Waveguide to Substrate Integrated Waveguide on Electrically Thick Silicon Substrate
A. Patrovsky, M. Daigle, K. Wu, Poly- Grames Research Center, Montreal, Canada

③ On the Equivalence Between Cylindrical and Rectangular Via-Holes in Electromagnetic Modeling **⇒シミュレーション時間の短縮**
M. Buchta, Arbeitsgemeinschaft industrieller, Germany, et al.

④ Feeding Structures for Packaged Multifinger Power Transistors
B. Breitkreutz, F. J. Schmueckle, W. Heinrich, Ferdinand-Braun-Institut (FBH), Berlin, Germany **⇒パワートランジスタの等長配線**

⑤ Assessment of Influence of Interconnect Parasitics on RF Performance of Multi-Finger SiGe Power HBTs
N. Jiang, University of Wisconsin-Madison, USA, et al.

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EuMIC/ECWT01 Si系のLNA, Mixer

★ ① Broadband Low Noise Amplifier with High Linearity for Software-Defined Radios
Munenari Kawashima, Yo Yamaguchi, Kenjiro Nishikawa, Kazuhiro Uehara, NTT Corporation, Japan

② Highly Compact 3.1-10.6 GHz UWB LNA in SiGe HBT Technology
J. Dederer, Sebastien Chartier, T. Feger, U. Spitzberg, Andreas Trasser, Hermann Schumacher, Universitat Ulm, Germany ⇒ **NF=2.6dB, P_{DC}=36.1mW, オペアンプ型？**

③ A 1.5-V 0.25-μm CMOS Current-Reuse Up-Converter for 3.5 GHz Low-Power WPANs
Giuseppina Sapone, Giuseppe Palmisano, Universita di Catania, Italy ⇒ **電流ブリーディング型のミキサの発表**

④ A High Linearity Mixed Signal Down Converter IC for C-Band Radar Receivers
Hakan Berg, Heiko Thiesies, Marie Hertz, Fredrik Norling, Saab AB, Sweden

⑤ Design of a [DC - 20 GHz] Buffered Track and Hold Circuit in InP DHBT Technology
H. El Aabbaoui, IEMN, France, et al.

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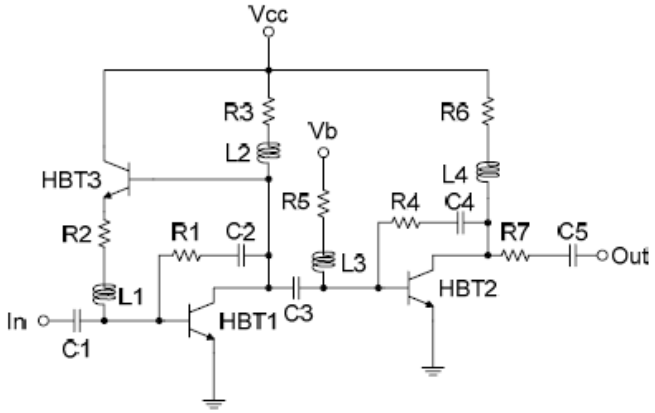
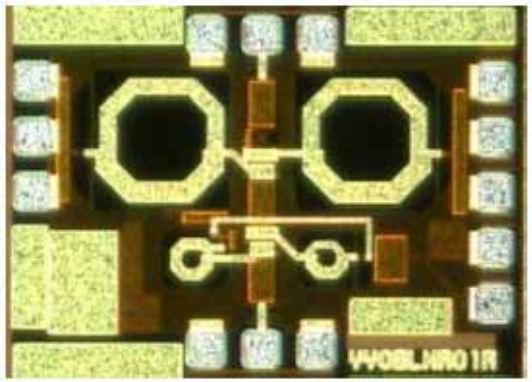
EuMIC/ECWT01 ①

Broadband Low Noise Amplifier with High Linearity for Software-Defined Radios
Munenari Kawashima, Yo Yamaguchi, Kenjiro Nishikawa, Kazuhiro Uehara, NTT Corporation, Japan





0.95 x 1.35mm^2

	This work	Ref. [3]	Ref. [4]	Ref. [5]	Ref. [6]	Ref. [7]
Gain	20 dB	12 dB	13 dB	17.5 dB	10 dB	11.8 dB
S_{11}	<-9 dB (0.8–5GHz)	<-10 dB	<-9 dB (2.9–7.8 GHz)	<-6 dB (2.4–5.2 GHz)	<-6 dB (3.4–6.9 GHz)	<-9 dB (2.5–5.5 GHz)
P_1dB (output)	6.3 dBm (2 GHz)	4.4 dBm (2 GHz)	–	0.5 dBm	0 dBm (5 GHz)	-4 dBm (4 GHz)
NF	1.5–2.7 dB (0.5–5GHz)	2.8 dB	4–4.6 dB (2.9–7.8 GHz)	3.4–5 dB (2.4–5.2 GHz)	4.5 dB	2.1–3dB (2.5–5.5 GHz)
Supply voltage	2.5 V	3.3 V	1.8 V	1.8 V	1 V	3 V
Supply current	9 mA	7.2 mA	5 mA	3.4 mA	3.5 mA	3 mA
Technology	0.25 µm SiGe	0.5 µm SiGe	0.25 µm SiGe	0.18 µm CMOS	0.25 µm SiGe	0.35 µm SiGe

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ECWT04 Front-end雑多

① GALANT - Galileo Antenna and Receiver Demonstrator for Safety-Critical Applications
M. Cuntz, A. Konovaltsev, A. Hornbostel, E. Schittler Neves, Achim Dreher, DLR, Germany

② The Effect of Spatial Axial Ratio Variation on QPSK Modulation Encoded Using Orthogonal Circularly Polarized Signals
M. Amin, Shahid Ahmed, Vincent F. Fusco, H.I. Cantu, T. Ratnarajah, Queen's University Belfast, UK **⇒ 偏波にI/Qを乗せる変調方式の提案**

③ On the Design of a Highly Digital Multimode UMTS/GNSS Receiver
Rainer Stuhlberger, Johannes Kepler Universitat Linz, Austria, et al.
⇒ UMTSはzero-IF, GNSSはlow-IF. Digital Front End(DFE)技術の提案

④ Novel Digital Front End Based Interference Detection Methods
Andreas Mayer, DICE, Austria, et al. **⇒ 妨害波検知**

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ECWT08 SDR & MIMO-OFDM

① Multi-Mode Receiver Design for Wireless Terminals
Gernot Hueber, DICE, Austria, et al. ⇒ **quad-band GSM + WCDMAのアーキ提案**

② Concepts for RF Front-Ends for Multi-Mode, Multi-Band Cellular Phones
Ulrich Bauernschmitt, EPCOS AG, Germany, et al.


③ An OFDM MIMO Transmitter for Wireless Gigabit with Advanced Multimedia (WIGWAM)
Martin Simon, Friedrich-Alexander-Universitat Erlangen-Nurnberg, Germany, et al.

④ 24GHz Software-Defined Radar System for Automotive Applications
Hui Zhang, Lin Li, Ke Wu, Ecole Polytechnique de Montreal, Canada

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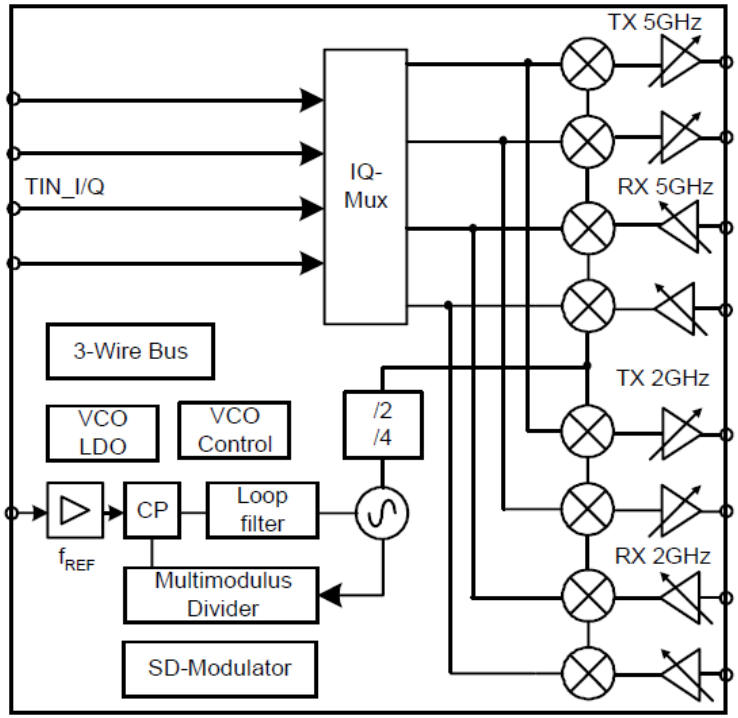
ECWT08③

An OFDM MIMO Transmitter for Wireless Gigabit with Advanced Multimedia (WIGWAM)

Martin Simon, Friedrich-Alexander-Universitat Erlangen-Nurnberg, Germany, et al.



5GHz帯 80MHz-BW
256QAM 2x2 MIMO
970Mbps

Matsuzawa & Okada Lab.

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EuMC/EuMIC07 商用IC

① X-Band Phase Shifting Power Amplifier MMIC for Phased Array Transmit Modules
G. van der Bent, M. W. van der Graaf, F. E. van Vliet, TNO , Den Haag, The Netherlands

② A Fully Integrated Fully Differential Low-Noise Amplifier for Short Range Automotive Radar Using a SiGe:C BiCMOS Technology
S. Chartier, University of Ulm, Germany, et al.
⇒ 81GHz, PG=13dB, P1db,in=-14dBm, NF=8.8dB(sim) P_{DC}=90mW(3V Vdd)のLNA

③ Two High Dynamic Range mmW Amplifiers in SMT Package with ESD Protection
K. Phan, K. Fujii, H. Morkner, Avago Technologies, San Jose, USA
⇒ 7-21GHz, PG=20dB, NF=2.3dB, OIP3=28dBmのLNA,
18-32GHz, PG=20dB, NF=2.8dB, OIP3=28dBmのLNA

④ 30GHz (Kaband) VSAT DVB-RCS Mixer-Driver Multifunction MMIC
I. Hardcastle, Filtronic Compound Semiconductors, England, et al.

⑤ Single-Chip RF Front-End MMIC Using InGaAs E/D-pHEMT for 3.5 GHz WiMAX Applications
Y. Hsu, Industrial Technology Research Institute, Hsinchu, Taiwan, et al.

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EuMC/ECWT04 リコンフィギュラブルＲＦ

① Concurrent, Reconfigurable, and Adaptable Oscillators for Multi-Band Multi-Mode Communication Systems ⇒ **2250-2850MHz帯と4600-5900MHz帯の出力**
Ulrich L. Rohde, Ajay K. Poddar, Brandenburg University of Technology Cottbus, Germany, Synergy Microwave Corporation, USA

② Reconfigurable PA Networks Using Switchable Directional Couplers as RF Switch
Thomas Lehmann, Falk Hettstedt, Reinhard Knochel, Christian-Albrechts-Universitat Kiel, Germany ⇒ **PINダイオードによる切替**

★ ③ MEMS-Based Reconfigurable RF Front-End Architecture for Future Band-Free Mobile Terminals
Hiroshi Okazaki, Atsushi Fukuda, Kunihiro Kawai, Takayuki Furuta, Shoichi Narahashi, NTT DoCoMo Inc., Japan

④ Tunable Antenna Design Procedure and Harmonics Suppression Methods of the Tunable DVB-H Antenna for Mobile Applications ⇒ **PINダイオードで切替**
Libo Huang, Peter Russer, Technische Universitat Munchen, Germany

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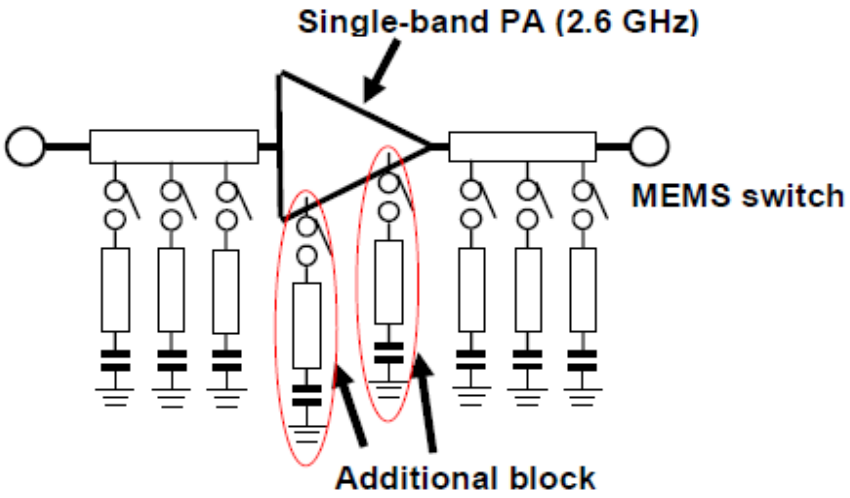
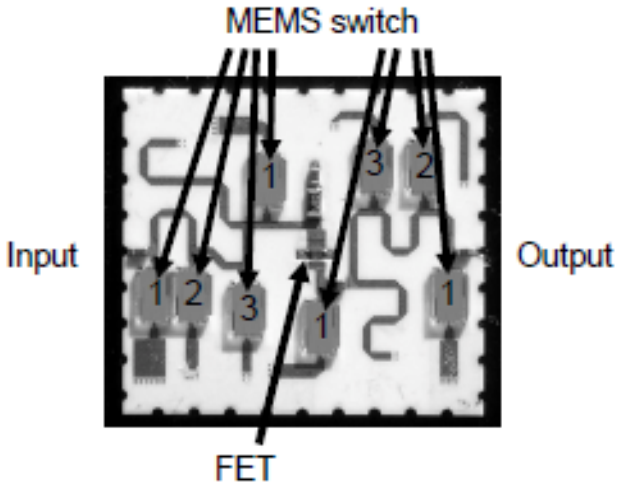
EuMC/ECWT04③

MEMS-Based Reconfigurable RF Front-End Architecture for Future Band-Free Mobile Terminals

Hiroshi Okazaki, Atsushi Fukuda, Kunihiro Kawai, Takayuki Furuta, Shoichi Narahashi, NTT DoCoMo Inc., Japan





0.9GHz, 1.5GHz, 2.0GHz, 2.6GHz**対応**PA

PAE=44%-50%, **飽和出力電力** 30dBm**以上**

Matsuzawa & Okada Lab.