

PUBLICATIONS

Stephen A. Maas, Ph. D., P. E.

October, 2019

I. Books

1. S. Maas, *Microwave Mixers*, Artech House, Norwood, MA, 1986.
2. S. Maas, *Nonlinear Microwave Circuits*, Artech House, Norwood, MA, 1988.
3. S. Maas, *Microwave Mixers, Second Edition*, Artech House, Norwood, MA, 1992.
4. S. Maas, *The RF and Microwave Circuit Design Cookbook*, Artech House, Norwood, MA, 1998.
5. S. Maas, *Nonlinear Microwave and RF Circuits*, Artech House, Norwood, MA, 2003.
6. S. Maas, *Noise in Linear and Nonlinear RF and Microwave Circuits*, Artech House, Norwood, MA, 2005.
7. S. Maas, *Practical Microwave Circuits*, Artech House, Norwood, MA, 2014.

II. Book Chapters

1. S. Maas, "Mixers for Wireless Applications," in L. Larson, ed., *RF and Microwave Circuit Design for Wireless Communications*, Artech House, Norwood, MA, 1996.
2. S. Maas, "Computer-Aided Design of Power Amplifiers," in J. Walker, *Power Amplifiers*, Cambridge University Press, London, 2012.

III. Publications in Refereed Journals

1. S. Weinreb, M. Balister, S. Maas, and P. J. Napier, "Multiband Low Noise Receivers for a Very Large Array," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-25, no. 4, pp. 243-8 (April, 1977).
2. N. Alexopoulos and S. Maas, "Characteristics of Microstrip Directional Couplers on Anisotropic Substrates," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-30, no. 8, pp. 1267-70 (Aug., 1982).
3. N. Alexopoulos and S. Maas, "Performance of Microstrip Couplers on an Anisotropic Substrate with an Isotropic Superstrate," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-31, no. 8, pp. 671-74 (Aug., 1983).
4. S. Maas, "Theory and Analysis of GaAs MESFET Mixers," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-32, no. 10, pp. 1402-6 (Oct., 1984).
5. S. Maas, "A 45 GHz Active HEMT Mixer," *Electronics Letters*, Vol. 21, no. 3, pp. 104-5 (Jan. 31, 1985).
6. S. Maas, "Design and Performance of a 45 GHz Active HEMT Mixer," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-34, no. 7, pp. 799-803 (July, 1986).

7. S. Maas, "Two-Tone Intermodulation in Diode Mixers," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-35, no. 3, pp. 307-14 (March, 1987).
8. S. Maas, "A GaAs MESFET Mixer with Very Low Intermodulation," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-35, no. 4, pp. 425-9 (April, 1987).
9. S. Maas and A. M. Crosmun, "Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-37, no. 7, pp. 1134-6 (July, 1989).
10. A. M. Crosmun and S. Maas, "Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-37, no. 9, pp. 1411-7 (Sept., 1989).
11. S. Maas and D. Neilson, "Modeling MESFETs for Intermodulation Analysis of Mixers and Amplifiers," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-38, no. 12, pp. 1964-1971 (Dec., 1990).
12. S. A. Maas, D. Tait, and B. Nelson, "Intermodulation in Heterojunction Bipolar Transistors," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-40, no. 3, pp. 442-8, (March, 1992).
13. S. G. Mitra and S. A. Maas, "A Diode Mixer with Harmonic-Distortion Suppression," *IEEE Microwave and Guided-Wave Letters*, vol. 2, no. 10, pp. 417-8 (Oct. 1992).
14. S. A. Maas and D. Tait, "Parameter-Extraction Method for Heterojunction Bipolar Transistors," *IEEE Microwave and Guided-Wave Letters*, vol. 2, no. 12, pp. 502-4, (Dec., 1992).
15. S. Basu and S. A. Maas, "Design and Performance of a Planar Star Mixer," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-41, no. 11, page 2028-30, (Nov. 1993).
16. S. A. Maas and K. W. Chang, "A Broadband, Planar, Doubly Balanced Monolithic Ka-Band Diode Mixer," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-41, no. 12, pp. 2330-2335, (December, 1993).
17. R. S. Virk and S. A. Maas, "Modeling MESFETs for Intermodulation Analysis in RF Switches," *IEEE Microwave and Guided-Wave Letters*, vol. 4, no. 11, pp. 376-8 (Nov., 1994).
18. F. De Flaviis and S. A. Maas, "X-Band Doubly Balanced Resistive FET Mixer With Very Low Intermodulation," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-43, no. 2, pp. 457-60, (Feb., 1995).
19. S. Basu, S. A. Maas, and T. Itoh, "Piecewise Stability Analysis of Microwave Circuits," *IEEE Microwave and Guided-Wave Letters*, vol. 5, no. 5, pp. 159-63, May, 1995.
20. S. A. Maas, "Third-Order Intermodulation Distortion in Cascaded Stages," *IEEE Microwave and Guided-Wave Letters*, vol. 5, no. 6, pp. 189-91, June, 1995.
21. S. Basu, S. A. Maas, and T. Itoh, "Quasi-Periodic Route to Chaos in a Microwave Doubler," *IEEE Microwave and Guided-Wave Letters*, vol. 5, no. 7, pp. 224-6, July, 1995.

22. S. Basu, S. A. Maas, and T. Itoh, "Experimental and Numerical Verification of the Cause of Hopf Bifurcation in a Microwave Doubler," *IEEE Microwave and Guided-Wave Letters*, vol. 5, no. 9, pp. 293-5, Sept., 1995.
23. S. Basu, S. A. Maas, and T. Itoh, "Stability Analysis for Large Signal Design of a Microwave Frequency Doubler," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-43, no. 12, pp. 2890-98, Dec., 1995.
24. S. A. Maas, "Volterra Analysis of Spectral Regrowth," *IEEE Microwave and Guided-Wave Letters*, vol. 7, no. 7, pp. 192-3, July., 1997.
25. R. S. Virk, S.A. Maas, et al., "Low-Cost W-Band MIC Mixer Using Flip-Chip Technology," *IEEE Microwave and Guided-Wave Letters*, vol. 7, no. 9, pp. 294-6, Sept., 1997.
26. S. A. Maas, "Ill Conditioning in Self-Heating FET Models," *IEEE Microwave and Wireless Components Letters*, vol. 12, no. 3, pp. 88-89, March, 2002.
27. S. Maas, "Why I Hate Base Resistance," *IEEE Microwave Magazine*, vol. 5 no. 2, pp. 54-60, June, 2004.
28. J. C. Pedro and S. A. Maas, "A Comparative Overview of Microwave and Wireless Power Amplifier Behavioral Modeling Approaches," *IEEE Trans. Microwave Theory Tech.*, vol. 53, no. 4, pp. 1150-1163, April, 2005.
29. S. A. Maas, "Software Architecture for Circuit Simulation," *Microwave Review*, vol. 11, no. 1, pp. 25-28, June, 2005.
30. C.-C. Kuo, C.-L. Kuo, C.-J. Kuo, S. A. Maas, H. Wang, "Novel Miniature and Broadband Millimeter-Wave Monolithic Star Mixers," *IEEE Trans. Microwave Theory. Tech.*, vol. MTT-56, no. 4, pp. 793-802, April, 2008.
31. S. A. Maas, "Division by Current: A New Approach to FET Capacitance Modeling," *International Journal of Microwave and Wireless Technologies*, vol. 3, no. 1, pp. 1-9, January, 2011.
32. C. M. Holler, M. E. Jones, A. C. Taylor, A. I. Harris, and S. A. Maas, "A 2–20 GHz Analog Lag-Correlator for Radio Interferometry," *IEEE Trans. Instrumentation and Measurement*, vol. 61, no. 8, pp. 2253-2261, August, 2012.

IV. Conference Publications

1. S. A. Maas, "Analysis and Design of GaAs MESFET Mixers," *IEEE MTT-S International Microwave Symposium Digest*, pp. 432-4, 1984.
2. S. A. Maas, "A 45 GHz Low-Noise HEMT Mixer," *European Microwave Conference Digest*, 1985.
3. S. A. Maas et. al., "Low-Noise Integrated EHF Components," *GOMAC Conf. Digest*, pp. 163-5, (Nov. 1985).
4. M. Sholley, B. Allen, S. A. Maas, and A. Nichols, "HEMT Millimeter-Wave Amplifiers, Mixers, and Oscillators," *Conference Proceedings of Military Microwaves 86*, pp. 517-22, (June, 1986).

5. S. A. Maas, "A GaAs MESFET Balanced Mixer with Very Low Intermodulation," *IEEE MTT-S International Microwave Symposium Digest*, pp. 895-8, 1987.
6. S. A. Maas, "A General-Purpose Computer Program for the Volterra-Series Analysis of Nonlinear Microwave Circuits," *IEEE MTT-S International Microwave Symposium Digest*, pp. 311-314, 1988.
7. A. Nakatani, S. A. Maas, and J. Castaneda, "Modeling of High-Frequency MMIC Passive Components," *IEEE MTT-S International Microwave Symposium Digest*, pp. 1139-42, 1989.
8. S. A. Maas and D. Neilson, "Modeling MESFETs for Intermodulation Analysis of Mixers and Amplifiers," *IEEE MTT-S International Microwave Symposium Digest*, pp. 1291-4, 1990.
9. S. A. Maas and D. Neilson, "Modeling MESFETs and Diodes for Intermodulation Calculations," *Proceedings of the First International Workshop on Integrated Nonlinear Microwave and Millimeter-Wave Circuits*, University of Duisburg, Duisburg, W. Germany 1990 (Invited Paper).
10. S. A. Maas, B. Nelson, and D. Tait, "Intermodulation in Heterojunction Bipolar Transistors," *IEEE MTT-S International Microwave Symposium Digest*, pp. 91-3, 1991.
11. S. A. Maas, "How to Model Intermodulation Distortion," *Invited Paper, IEEE MTT-S International Microwave Symposium Digest*, pp. 149-151, 1991.
12. K. W. Chang, T. H. Chen, H. Wang, and S. A. Maas, "Frequency Upconversion Behavior of Singly Balanced Diode Mixers," *IEEE AP-S International Symposium Digest*, 1991.
13. D. Neilson, B. Allen, M. Kintis, M. Hoppe and S. A. Maas, "A Broadband Upconverter IC," *IEEE MTT-S International Microwave Symposium Digest*, pp. 455-8, 1992.
14. S. A. Maas and K. W. Chang, "A Broadband, Planar, Doubly Balanced Monolithic Ka-Band Diode Mixer," *IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest*, pp. 53-55, 1993.
15. K. W. Chang and S. A. Maas, "High-performance Monolithic Mixers for System Insertion," *GOMAC Conf. Digest*, 1993.
16. S. A. Maas and Y. Ryu, "A Broadband, Planar, Monolithic Resistive Frequency Doubler," *IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest*, pp. 443-6, 1994.
17. R. Katz, S. Maas, A. Sharma, and D. Smith, "A Novel Monolithic HEMT Harmonic Mixer at Q-Band," *IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest*, pp. 39-42, 1995.
18. K. Hubbard, K. MacGowan, C. Kau, D. Smith, and S. Maas, "A Family of Low Cost, High Performance HEMT MMICs for Commercial DBS Applications," *IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest*, pp. 133-136, 1995.

19. S. Basu and S. A. Maas, "Predicting the Onset of Instabilities in a Frequency Multiplier," *IEEE MTT-S International Microwave Symposium Digest*, pp.1511-14, 1995.
20. R. Virk and S. A. Maas, "Modeling MESFETs for Intermodulation Analysis of Resistive FET Mixers," *IEEE MTT-S International Microwave Symposium Digest*, pp. 1247-50, 1995.
21. S. Maas, "Planar Monolithic Microwave and Millimeter-Wave Circuits," *Invited Paper, Proceedings of the ESA Workshop on Millimeter-Wave Technology and Applications*, p. 8.1.1, ESTEC, Noordwijk, The Netherlands, 1995.
22. L. Larsen, M. Case, S. Rosenbaum D.Rensch, P. MacDonald, M. Matloubian, M. Chen, D. Haramé, J. Malinowski, B. Meyerson, M. Gilbert, S. Maas, "Si/SiGe HBT Technology for Low-Cost Monolithic Microwave Integrated Circuits," *IEEE Solid State Circuits Conference Digest*, 1996.
23. M. Case, S. A. Maas, et al., "An X-Band Monolithic Active Mixer in SiGe HBT Technology," *IEEE MTT-S International Microwave Symposium Digest*, pp. 655-8, 1996.
24. S. A. Maas, M.Kintis, F. Fong, and M. Tan, "A Broadband Planar Monolithic Ring Mixer," *IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest*, pp. 51-4, 1996.
25. S. A. Maas et al., "An 18-40 GHz Monolithic Ring Mixer," *IEEE RF IC Conference Digest*, 1998.
26. S. A. Maas, "Broadband Planar Monolithic Balanced Mixers and Frequency Multipliers," *5th International Workshop on Integrated Nonlinear Microwave and Millimeter-Wave Circuits Digest*, pp. 129-137, 1998.
27. S. A. Maas, "Broadband Planar Monolithic Balanced Mixers and Frequency Multipliers," 1998 Asia-Pacific Microwave Conference Proceedings, p. 647-50, 1998.
28. S. A. Maas, "Measurements and Nonlinear Modeling," Keynote Address, 1999 *ARFTG Conference Digest*, p. 1, June 18, 1999.
29. S. A. Maas, F. Yamada, and A. Oki, "16-45 Planar Monolithic Balanced and Image-Rejection Mixers," *Proceedings, GHz2000 Symposium*, Swedish National Symposium on GigaHertz Electronics, Göteborg, Sweden, pp. 89-92, March, 2000.
30. D. Sawdai, D. Ko, M. Kintis, S. Maas, X. Zhang, S. Valdes, E. Garber, G. Barber, E. Quach, J. Newman, and F. Fong, "GaAs Schottky Varactor Diode Optimization for High-Performance Nonlinear Transmission Lines" *Digest of Papers, 60th Device Research Conference*, Santa Barbara, California, 2002.
31. S. Maas, "Software Architecture for Circuit Simulation," Conference Digest, *Integrated Nonlinear Microwave and Millimetre-wave Circuits Workshop (INMMIC)*, 2004.
32. S. Maas, "Ballasting HBTs For Wireless Power Amplifier Operation," Conference Digest, *Integrated Nonlinear Microwave and Millimetre-wave Circuits Workshop (INMMIC)*, 2006.

33. S. Maas, "Software Technology for Communication ICs," (invited) TELSIKS Conference, Nis, Serbia, 2007.
34. S. Maas, "Methods for Nonlinear RF Circuit Design and Analysis," (invited) TELSIKS Conference, Nis, Serbia, 2007.
35. S. Maas, M. Kintis, F. Fong, "Reduction of Diode-Mixer Distortion by NLTL Waveshaping," *ISMOT Conference Digest*, December, 2007.
36. S. A. Maas and J. C. Pedro, "Implementation of a Volterra Behavioral Model for System Simulation," *IEEE MTT-S International Microwave Symposium Digest*, 2008.
37. S. Maas and D. Vizard, "Square-Law Accuracy of Microwave Radiometers," *Integrated Nonlinear Microwave and Millimetre-wave Circuits Workshop (INMMIC)*, 2008.
38. S. Maas and A. Wallace, "Modelling of Memory Effects in Devices and Circuits with an Emphasis on Power Amplifiers," *ARMMS Conference Digest*, Nov. 2008.
39. S. Maas, "Division by Current: A New Approach to FET Capacitance Modeling," Conference Digest, *Integrated Nonlinear Microwave and Millimetre-wave Circuits Workshop (INMMIC)*, 2010.
40. S. Maas, "Historical Trends and Evolution of Circuit-Simulation Technology" (invited), *IEEE MTT-S International Microwave Symposium Digest*, 2010.
41. S. A. Maas, "Division by Current: A New Approach to FET Capacitance Modeling," *International Nonlinear Microwave and Millimeter Wave Circuits Workshop (INMMIC)*, 2010.
42. S. A. Maas, "Modeling for Wireless PA Development," *Semiconductor Conference Dresden (SCD 2011) Digest*, 2011.
43. S. A. Maas, "Linearity and Dynamic Range of Carbon Nanotube Field-Effect Transistors," *IEEE MTT-S International Microwave Symposium Digest*, 2017.

V. Publications in Trade Journals

1. S. A. Maas, "Design EHF Mixers with Minimal Guesswork," *Microwaves*, vol. 18, no. 8, p. 66 (Aug., 1979).
2. S. A. Maas, "Design FET Amps with Transformer Feedback," *Microwaves*, vol. 20, no. 11, p. 95 (Oct., 1981).
3. S. A. Maas, "Analysis and Design of GaAs MESFET Mixers," in C. G. Masai, "Device Modeling and Microwave Test," *Test & Measurement World*, Vol. 5, no. 4, pp. 76-81 (April, 1985).
4. M. Sholley, S. A. Maas, et. al., "HEMT mm-Wave Amplifiers, Mixers, and Oscillators," *Microwave J.*, vol. 26, no. 8, pp. 121-131 (Aug. 1985).
5. S. A. Maas, "A Low-Distortion GaAs MESFET Balanced Mixer," *Microwave J.*, vol. 29, no. 3, pp. 213-20 (March, 1988).
6. S. A. Maas, "Analysis and Optimization of Nonlinear Microwave Circuits by Volterra Series," *Microwave J.*, vol. 33, no. 4, p. 245 (April, 1990).

7. S. A. Maas, "Microwave Mixers in the 90s," *Microwave J.*, (Invited paper for a special issue, Sept. 1990).
8. S. A. Maas, D. Neilson, "Modeling GaAs MESFETs for Intermodulation Analysis," *Microwave J.*, vol. 34, no. 5, pp. 295-300 (May, 1991).
9. S. A. Maas, "The Star Mixer," *Microwave J.*, vol. 36, no. 7, pp. 36-46 (July, 1993).
10. S. A. Maas, "The Diode Ring Mixer," *RF Design*, vol. 16, no. 11, p. 54 (Dec. 1993).
11. S. A. Maas and Y. Ryu, "Schottky Octave-Band LO Doubler," *Applied Microwaves*, pp. 58-64, Summer, 1994.
12. S. A. Maas, "Nonlinear RF Circuit Analysis," *RF Design*, vol. 18, no. 3, p. 58 (March, 1995).
13. S. A. Maas, "Accurate Design of Lange Couplers on GaAs," *Microwave J.*, vol. 39, no. 8, p. 90 (Aug. 1996).
14. S. Maas, "FET Models for Volterra-Series Analysis," *Microwave J.*, vol. 42, no. 5, p. 260 (May 1999).
15. S. A. Maas, "Applying Volterra Series," *Microwaves and RF*, vol. 38, no. 5, p. 55, June, 1999.
16. S. Maas, "Broadband VHF Lumped-Element Couplers Using Imperfect Transformers," *Applied Microwaves and Wireless*, Nov., 1999, p.70.
17. S. A. Maas, J. Delacueva, J. Li and S. White, "A Low-Cost, Cavity-Stabilized 5.8 GHz Oscillator Realized in LTCC," *Microwave J.*, vol. 44, no. 4, p. 130, April, 2001.
18. S. Maas, "Fixing the Curtice Model," *Microwave J.*, March, 2002.
19. S. Maas, "Harmonic Balance Simulation Speeds RF Mixer Design," *Microwave Engineering Europe*, March 28, 2002.
20. S. A. Maas and T. Miracco, "Using Load Pull Analysis and Device Model Validation to Improve MMIC Power Amplifier Design Methodologies," *Microwave J.*, 2002.
21. S. Maas, "Amplifiers and Oscillators: The Landscape in 2007," (invited) *Microwave J.*, p. 24, April, 2007.
22. S. Maas, "Why Is Everything So Damned Difficult?" *IEEE Microwave Magazine*, p. 26, October, 2011.
23. S. Maas, "Circuit Simulation in the Dark Ages," *IEEE Microwave Magazine*, p. 89, June, 2012.
24. S. Maas, "Armstrong and the Superheterodyne," *IEEE Microwave Magazine*, p. 34, October, 2013.
25. P. F. Marsh, C. Rutherglen, A. A. Kane, T. A. Cain, K. Galatsis, S. A. Maas, and M. R. Alshareef, "Solving the Linearity and Power Conundrum: Carbon Nanotube RF Amplifiers," *Microwave J.*, June, 2019.

VI. Published Software

1. S. A. Maas, *C/NL: Linear and Nonlinear Microwave Circuit Analysis and Optimization*, Artech House, Norwood, MA, 1991.
2. S. A. Maas, *C/NL2 for Windows: Linear and Nonlinear Microwave Circuit Analysis and Optimization*, Artech House, Norwood, MA, 1993.

VII. Other Scholarly Publications

1. S. A. Maas, Review of *Introduction to Computer Methods for Microwave Circuit Design*, by J. A. Dobrowolski; *Int. J. Microwave and Millimeter-Wave Comp. Aided Design*, vol. 2, no. 4, pp. 343-5 (Oct., 1992).
2. S. A. Maas, D. Tait, and B. Nelson, "Comments on 'Mechanisms Determining Third-Order Intermodulation Distortion in AlGaAs/GaAs Heterojunction Bipolar Transistors'," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-41, no. 11, pp. 2038-9, (Nov., 1993).