Microwave Abstracts

Based on technical merit and timeliness, microwave papers in journals published outside the United States have been selected and compiled below, generally with brief abstracts. Reprints of the papers may be obtainable by writing directly to the author or to the source quoted.

—F. G. R. Warren, *Associate Editor for Abstracts*
RCA Limited, Montreal, Canada

Papers from Journals Published in Japan

Compiled by Prof. T. Okoshi, Department of Electrical Engineering, University of Tokyo. Prof. Okoshi points out that, where articles in Trans. IECEJ, in Japanese, are referenced, these may be available in English translation, with a few months' delay, in "Electronics and Communications in Japan."

22
A Proposed Analysis of the Space Charge Wave and Negative Resistance of Group IV Bulk Semiconductor, by M. Kawamura and S. Morishita (Tokyo Institute of Technology, Faculty of Engineering, Meguro-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 563–570, October 1969.

The space charge wave is analyzed by taking into account the effects of the thermal velocity of electrons and of the electron scattering. The dispersion relation is shown. (In Japanese.)

23
Small Signal Admittance of Gunn Diodes, by T. Tsukada[1] and J. Hamasaki (Institute of Industrial Science, University of Tokyo, Minato-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 594–600, October 1969.

The small signal admittance at frequencies different from the oscillation frequency is measured and compared with theory. Theory and experiment show good agreement. (In Japanese.)

24
Semiconductor Diode Mixer for Millimeter Wave Region, by M. Akaike[2] and S. Okamura (Department of Electronic Engineering, University of Tokyo, Bunkyo-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 601–609, October 1969.

The conversion loss and noise temperature ratio are measured and compared with computer calculations. Theory and experiment show good agreement. The optimum design is also discussed. (In Japanese.)

[1] Presently with Central Research Labs., Hitachi Ltd., Kokubunji, Tokyo.
[2] Presently with the Electrical Communication Lab., N.T.T., Musashino-Shi, Tokyo.

25
A New Method of Analysis of the Waveguide Consisting of Lens-Like Medium, by S. Sawa and N. Kumagai (Faculty of Engineering, Osaka University, Suita); *Trans. IECEJ*, vol. 52-B, pp. 624–631, October 1969.

A new method of analysis is proposed, and is applied to a circular bend and a sinusoidal serpentine bend. A bend design method is proposed which minimizes the beam undulation. (In Japanese.)

26
Analytical Theory of the Resonant Domain Mode of Gunn Oscillations and Related Experiments, by T. Ikoma (Institute of Industrial Science, University of Tokyo, Minato-Ku, Tokyo), H. Toritsuka and H. Yanai (Department of Electronic Engineering, University of Tokyo, Bunkyo-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 632–639, October 1969.

The oscillation power, efficiency, and oscillation frequency are computed as functions of a diode's characteristics, bias voltage, and circuit parameters. The validity of the assumed model is investigated through current-waveform measurement. (In Japanese.)

27
Measurement of AM and FM Noises and Their Correlation in Gunn Oscillators—I (Effects of Bias Fluctuations), by S. Hashiguchi and T. Okoshi (Department of Electronic Engineering, University of Tokyo, Bunkyo-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 641–642, October 1969.

The correlation between AM and FM noises gives information on the noise generation mechanism. The measured correlations are shown and discussed. (Correspondence, in Japanese.)

28
Wideband Linear Amplification with Bulk GaAs Devices and IMPATT Diodes, by K. Kohiyama (Electrical Communication Lab., Musashino-Shi, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 642–643, October 1969.

Bulk GaAs amplifiers with 3–5 dB gain, linear output range up to 100 mW, 17 dB noise figure have been attained. The amplification band covers 9–12 GHz. For IMPATT diodes, gain ranges from 11–13 dB and noise figure is above 30 dB. (Correspondence, in Japanese.)

29
Broadband Parametric Amplifier Design, by M. Yamaguchi and T. Takei (Research Laboratory, Kokusai Denshin Denwa (KKD) Co., Ltd., Meguro-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 655–662, November 1969.

A reflection-type parametric amplifier can be broad-banded by inserting a broad-banding circuit between the varactor and the circulator. In this paper the realization of Wagner and Tchebysheff characteristics is discussed. (In Japanese.)

30
Extended Range Phase-Locked Demodulator Using Esaki Diode as VCO and Phase-Detector, by T. Watanabe and G. Sato (Kokusai Denshin Denwa (KDD) Co., Ltd., Research Lab., Meguro-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 681–688, November 1969.

A new-type phase-locked demodulator for television FM signals is proposed. A test circuit for 4 GHz signal with 7.5 MHz deviation (p-p) has been constructed. (In Japanese.)

31
Experimental Considerations for Millimeter-Wave Wideband Down-Converter, by M. Sugiyama and S. Sugimoto, (Central Research Labs., Nippon Electric Co., Ltd., Kawasaki, Kanagawa); *Trans. IECEJ*, vol. 52-B, pp. 705–712, November 1969.

A wide-band converter from 50 GHz to 4 GHz has been constructed. Conversion loss of 8 dB and overall noise figure of 15 dB can be obtained. (In Japanese.)

32
A Design Consideration of the Circular Bend of the Waveguide Consisting of Lens-Like Media, by S. Sawa and N. Kumagai (Faculty of Engineering, Osaka University, Suita, Osaka); *Trans. IECEJ*, vol. 52-B, pp. 718–719, November 1969.

A new method of design is proposed, which minimizes the spot size fluctuation as well as the beam undulation. (Correspondence, in Japanese.)

33
Light Beam Instability in Sequential Lens Guide with Fourth Order Aberration, by Y. Suematsu (Faculty of Engineering, Tokyo Institute of Technology, Meguro-Ku, Tokyo) and H. Nagashima (Department of Electronics, Kogakuin University, Shinjuku-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 733–738, December 1969.

The effects of the fourth order aberration of a sequential-lens beam waveguide upon the mode conversion and the stability of the light-beam trajectories are discussed. A theoretical analysis. (In Japanese.)

34
Design Theory of a Self-Excited Frequency Multiplying Oscillator, by S. Furukawa and T. Nakagami (Faculty of Engineering, Tokyo Institute of Technology, Meguro-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 739–746, December 1969.

The frequency multiplying oscillator can be constructed by using a Gunn oscillator, an IMPATT, a tunnel diode, or a transistor. In this paper the optimum design theory of frequency multiplying oscillator is proposed. Experiments with a transistor and a tunnel diode are also described. (In Japanese.)

35
Analysis of Stabilityand Noise of Oscillators in Free-Running, Synchronized-Running and Parallel Running Conditions, by Y. Okabe and S. Okamura (Department of Electronic Engineering, University of Tokyo, Bunkyo-Ku, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 755–762, December 1969.

A generalized analysis of oscillators including injection locking, mutual locking, stability and noise problems. The frequency dependence and amplitude dependence of the oscillator impedance are taken into account. (In Japanese.)

36
Cosine-Type Cutoff Filter for Millimeter Waves, by N. Suzuki and S. Shimada (The Electrical Communication Laboratory, N.T.T., Musashino-Shi, Tokyo); *Trans. IECEJ* vol. 52-B, pp. 768–775, December 1969.

The cosine-type cutoff filter proposed in this paper has an advantage, when used in the channel divider in a millimeter wave communication system, in that it facilitates a very sharp cutoff characteristic. The proposal, design theory, and experiments are described. (In Japanese.)

37
Pseudo Transmission Line for the Millimeter Wave Communication System Using Cutoff Tapered Waveguide, by N. Ishida (The Electrical Communication Laboratory, N.T.T., Musashino-Shi, Tokyo); *Trans. IECEJ*, vol. 52-B, pp. 776–783, December 1969.

A small-size pseudoline for millimeter wave transmission lines is proposed and discussed. The constructed model is 6.5 meters long and simulates a 15 kilometer line. It is used in a pulse transmission experiment on the communication system.

38
Influence of White and $1/f$ Noises on Frequency Stabilization by Injection Locking in Oscillators, by T. Saito, T. Takagi, and K. Mano (Faculty of Engineering, Tohoku University, Sendai, Miyagi); *Trans. IECEJ*, vol. 52-B, pp. 784–785, December 1969.

A comparison of a theoretical analysis and an experiment on an IMPATT oscillator. (Correspondence, in Japanese.)

39
A Note on the Field Distribution of an Inhomogeneous Dielectric Thin-Film Waveguide, by S. Sawa and N. Kumagai, (Faculty of Engineering, Osaka University, Suita, Osaka); *Trans. IECEJ*, vol. 52-B, pp. 785–786, December 1969.

A theoretical field analysis of the new-type waveguide for submillimeter waves proposed by the authors in 1968. (Correspondence, in Japanese.)

40
Conversion efficiency from Electromagnetic Waves to Electrostatic Waves, by T. Ohta, N. Ogasawara, M. Yanagibori, and Y. Kaji (Faculty of Engineering, Tokyo Metropolitan University, Meguro-Ku, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 18–25, January 1970.

The conversion efficiency from an exciting electromagnetic wave to an electrostatic wave in a YIG single crystal is investigated both theoretically and experimentally. An efficiency improvement of 2.5–4.9 dB is achieved by using a newly proposed structure. (In Japanese.)

41
On the Broadbanding of Degenerate Parametric Amplifiers, by T. Takei and M. Yamaguchi (Research Laboratory, K.D.D. Co., Ltd., Meguro-Ku, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 51–53, January 1970.

A reflection-type parametric amplifier (degenerate type) can be broad-banded by inserting a broad-banding circuit between the varactor and the circulator. In this paper the gain-bandwidth product of such a broad-banded amplifier is discussed. (Correspondence, in Japanese.)