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 obtained by writing directly to the author or to the source quoted.

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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."

63
A Note on Transmission-Line Directional Couplers, by I. Otawara (Faculty of Engineering, Tohoku University, Sendai-shi, Miyagi); *J. IEEJ*, vol. 90, pp. 469–476, March 1970.

The relation between the directivity and the error in design parameters is analyzed using a computer. It is shown that the accuracy requirement is severe; for example a 1-percent error in the coupling reduces directivity from infinity to 50 dB. Comparison of theory and experiment for a 3-dB coupler is also shown. (In Japanese.)

64
LCR Equivalent Circuit of Re-Entrant Cavity Resonator, by K. Uenakada (Technical Research Laboratories, Japan Broadcasting Corporation, Setagaya-ku, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 168–175, April 1970.

Closed-form solutions for the equivalent circuit parameters are given for wide ranges of geometrical dimensions of re-entrant coaxial and cylindrical resonators containing dielectric elements. Design charts are shown. (In Japanese.)

65
Parametric Amplifier Having Phase Regenerative effect, by T. Ohta and M. Hata (Research Laboratories, Oki Electric Industry Co. Ltd., Minato-ku, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 202–209, April 1970.

The phase-regenerative amplification for an ultra-high-speed PCM-PM signal is usually done in the IF stage. This paper proposes a microwave parametric amplifier having the phase regeneration property. Theory and experiment. (In Japanese).

66
An effect of a Curve in Dielectric Circular Rod Waveguide, by M. Inamura (Kogakuin University, Shinjuku-ku, Tokyo); *Trans. IECEJ* (Correspondence), vol. 53-B, pp. 212–213, April 1970.

The increase in attenuation is measured at 9 GHz, 34 GHz, and 68 GHz. Experiment only. (In Japanese.)

67
Fluctuations of Gaussian Light Beams Due to Turbulence of Lens-like Medium, by M. Imai (Research Institute of Applied Electricity, Hokkaido University, Sapporo, Hokkaido) and T. Matsumoto, (Faculty of Engineering, Hokkaido University, Sapporo); *Trans. IECEJ*, vol 53-B, pp. 217–222, May 1970.

A lens-like semioptical transmission line having refraction index proportional to $(a-br^2)$ where r is the off-axis distance is considered. A small fluctuation of the refraction index is assumed to be superposed. The variation of the spot size is computed. Theory only. (In Japanese.)

68
Numerical Methods for Computing Cutoff Frequencies and Modes of Waveguides, by M. Hashimoto and K. Fujisawa (Faculty of Engineering Science, Osaka University, Toyonaka, Osaka); *Trans. IECEJ*, vol. 53-B, pp. 270–276, May 1970.

A numerical method based upon the integral equation expressing the transverse modes of a waveguide is proposed. The computation is performed in a matrix form for N sampling points along the waveguide wall. The relation of N and the error is discussed. (In Japanese.)

69
A Numerical Method for Large Boundary n field Problems, by M. Hashimoto and K. Fujisawa (Faculty of Engineering Science, Osaka University, Toyonaka-shi, Osaka); *Trans. IECEJ*, vol. 53-B, pp. 277–282, May 1970.

A new numerical method for solving a matrix equation representing the boundary condition in a waveguide is proposed. Special emphasis is given to cases where the waveguide size is much larger than the wavelength. The method of reducing computing time and error problems are discussed. (In Japanese.)

70
6 GHz and 4 GHz Tunable Bandpass Filter, by Y. Ito, H. Yokoguchi, and Y. Kitazawa, (Radio Transmission Laboratory, Fujitsu Laboratories Ltd., Kawasaki-shi, Kanagawa); *Trans. IECEJ*, vol. 53-B, pp. 283–288, May 1970.

Satellite communication demands tunable microwave bandpass filters which can be adjusted in a very short time. This paper describes mechanically tunable filters for 6 GHz and 4 GHz having tunable bandwidth of 300 MHz. (In Japanese.)

71
Three-Guide-Type Channel-Dropping Filter for a Guided Millimeter-Wave Communication System, by T. Nunotani, I. Nakagawa, Shimada Physical and Chemical Industrial Co., Chofu-shi, Tokyo) and S. Shimada (Electrical Communication Laboratory N.T.T., Musashino-shi, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 301–308, June 1970.

A three-guide-type channel-dropping filter has been newly developed at the millimeter-wave region. This filter is composed of a three-guide hybrid and two band-rejection filters. For a developmental model of the filter in the 50-GHz band with a 3-dB bandwidth of 530 MHz, channel-dropping loss at resonant frequency is 1.0 dB, and transmission loss over a frequency region separated far enough from the resonant frequency is 0.5 dB. A multichannel filtering system for 225.47 MB PCM-AM transmission experiments has been constructed. (In Japanese.)

72
Analytical Method for Transmission Lines with Thick Strip Conductor, Multidielectric Layers and Shielding Conductor, by K. Atsuki and E. Yamashita (Department of Applied Electronics, University of Electro-Communications, Chofu-shi, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 322–328, June 1970.

A method of analysis is proposed which can be applied to general line structures with a thick-strip conductor, multidielectric layers, and a rectangular shielding conductor. This method formulates an integral equation of the charge density distribution, and the equation is numerically solved by the discretization of integration and the use of a computer. Calculated parameters agree well with experimental and other theoretical values for the case of the microstrip line. (In Japanese.)

73
Transmission of Light Beam Waveguide with Temperature Difference Between the Center and the Periphery of the Pipe, by Y. Suematsu (Faculty of Engineering, Tokyo, Institute of Technology, Meguro-ku, Tokyo) H. Nagashima (Faculty of Engineering, Kogakuin University, Shinjuku-ku, Tokyo); *Trans. IECEJ*, vol. 53-B, pp. 345–352, June 1970.

The light-beam stability and the optimum lens spacing of the iterated-lens light-beam waveguide is discussed taking into account the temperature difference between the top and the bottom of the shield pipe. When the period of the sinusoidal temperature distribution is coincident with the characteristic pitch of the guide, the beam deflection is increased. (In Japanese.)