Foreword

CONSIDERABLE progress has been made over the past several years in power and low-noise GaAs FET's and circuits. Power FET's with output powers of up to 30 W at $S-C$ bands and a few hundred milliwatts at K-band have been achieved. Ultra-low-noise FET's operating at 20 GHz and beyond have been reported. Increasing interest in GaAs monolithic IC technology has also stimulated the steady improvements in discrete power and low-noise FET performance. Special circuit techniques such as large-signal characterization, modeling, and power combining have become increasingly important for realizing the ultimate performance potentials of this important and versatile solid-state microwave device.

This Special Issue covers current developments in power and low-noise GaAs FET circuit technology and applications. Specifically, those technological areas relating to low-noise, and power amplifiers, dual-gate devices, and broad-band amplifiers are covered. Characterization and performance of low-noise FET's are presented in three papers on low-noise amplifiers. Three papers are devoted to the subject of dual-gate FET's with emphasis on modeling, mixer application, and power performance. Five papers cover the important issue of broad-band amplifier design and performance. Of these five papers, two are devoted to the distributed amplifiers. Design technique and large-signal modeling are the subject of the other three papers. In the topic on power amplifiers, special power combining techniques are utilized to achieve high output powers at C- and K-band for communication applications.

The subjects covered in this Special Issue reflect the current technological trend in GaAs FET's. We hope that this Special Issue will provide important technical information for stimulating further development in GaAs FET technology into the late 1980's and beyond. We sincerely appreciate the help of the following reviewers for selecting the best papers for this Special Issue.

Y. Ayasli	H. Macksey	P. Saunier
R. Coats	R. Minasian	W. Schroeder
J. Goel	K. Niclaus	F. Sechi
J. Higgins	S. Perlow	V. Sokolov
H. Huang	W. Peterson	Y. Tajima
B. Kim	D. Poulin	H. Willing
W. Ku	R. Pucel	H. Yamasaki
R. Lehmann	C. Rauscher	B. Yarman

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Guest Editors

Hua Quen Tserng (M'70–SM'83) received the B.S. degree in electrical engineering from National Taiwan University, Taipei, Taiwan, in 1962, and the M.S. and Ph.D. degrees in electrical engineering from Rice University, Houston, TX, in 1966 and 1968, respectively.

He joined the Central Research Laboratories of Texas Instruments Incorporated in Dallas, TX, in 1968. From 1964 to 1968, at Rice University, he was engaged in research work on transport phenomena in semiconductors and optimization of thermoelectric power generators and refrigerators. From 1968 to 1969, he carried out work on thermal physics and characterization of semiconductor devices, including failure analysis and temperature-dependent properties of semiconductor devices. From 1969 to 1975, he worked on GaAs IMPATT diodes for high-power, high-efficiency microstrip oscillator and amplifier applications. Since 1975, he has been responsible for the development of microstrip and monolithic GaAs power FET amplifiers and oscillators at TI. His work has appeared in a number of scientific publications.

Charles C. Huang received the B.S. degree in 1969 from National Taiwan University and the M.S. degree in 1971 from the University of Alabama, Tuscaloosa, in electrical engineering. In 1975, he received the Ph.D. degree in electrical engineering and computer science from the University of California, Berkeley.

From 1975 to 1980, he was a member of the technical staff at Hewlett-Packard Company, San Jose, CA, where he was engaged in the development of sub-micron GaAs FET's. Since 1980, he has been employed at Avantek, Inc., Santa Clara, CA, where he is presently Manager of GaAs FET device development. As such, he is responsible for the design and development of all new gallium arsenide FET's and monolithic IC's.

Dr. Huang is a member of Eta Kappa Nu.