

NOISE IN MICROWAVE TRANSMISSION APPLICATIONS OF GUNN AND IMPATT DIODES

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Framework of Panel Session

The Gunn and the IMPATT diode are finding an increasing range of applications in radio communication systems for terrestrial line-of-sight transmission. The receiver local oscillator (with or without automatic frequency control), which came first, was followed by three transmitter applications, namely, the up-converter pump, the power amplifier (stable or injection locked), and the high-linearity, frequency-modulated oscillator.

These developments were accompanied by a steady progress in the understanding of noise phenomena, their diagnostic measurements and calculation of obtainable system noise performance. It appears that a discussion of these and some related topics would be most beneficial at this stage in offering a better insight into the entire problem area and in promoting the pursuit of optimum noise solutions. The effect of the device design parameters on its noise performance may well be the least understood single problem area requiring clarification.

The main objectives of the panel session are:

- Project a clear, coordinated picture of the existing theoretical knowledge and experimental evidence in the specific area of noise under consideration.
- Summarize available system application experience and identify the most promising future applications of Gunn and IMPATT diodes in microwave communications systems, which hinge on noise performance.
- Discuss possibilities of improving noise performance through proper choice of device design parameters.

The selection of IMPATT and Gunn diode noise topics and the panel composition are coordinated in the interest of a balanced discussion, as follows:

- The system/circuit interface: 2 panelists specialized in IMPATT and Gunn systems applications, respectively.
- The circuit/device interface: 2 panelists specialized in IMPATT and Gunn diode applications, respectively.
- Noise diagnostics: 1 panelist.
- Theoretical aspects of IMPATT and Gunn diode noise: 1 panelist.