

# ACTIVITIES OF THE TECHNICAL COMMITTEES ON DEI IN IEEJ

## Outline of Investigation Committees

Activities of investigation committees in the technical committees on DEI are reproduced here from the Proceedings of the 28 th Symposium on Electrical Insulating Materials (Sept. 1996).

### Digest Report of the Investigation Committee on High Electric Field Phenomena and Space Charge in Dielectric/Insulating Materials

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The committee was set up in October 1992 with 22 members in order to research the high electric field phenomena and the space charge effect on electrical conduction and breakdown in solid dielectric/insulating materials. Demands to use higher voltage in power cables and apparatuses and needs for their miniaturization as well as realization of very high field in electronic devices urged the need for better insulating materials and better insulating designs. More exact and detailed knowledge on high field phenomena in these materials is required not only for the development of the high voltage systems but also for thin film technology in electronics industry. The investigation from the theoretical point of view based on the physics and chemistry is essential to understand the intrinsic process. The recent development in data processing and measurement techniques has provided experimental results and information on the field and space charge distribution and has enabled to analyze high field conduction and breakdown phenomena more precisely and quantitatively.

The main subjects to be investigated are as follows.

- (1) Experimental results and theories of electrical conduction
- (2) Experimental results and theories of dielectric breakdown
- (3) Influence of space charge on electrical conduction and breakdown and its evaluation
- (4) Pre-breakdown phenomena in solid dielectric/insulating materials
- (5) Basic process of degradation related to electrical conduction and breakdown

Several programs were executed to accomplish the above subject: joint experiments with standard samples, survey of literature and so on.

### Digest Report of the Investigation Committee on High Reliability Insulation Technology for Printed Wiring Board

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The printed circuits on an insulating board becomes fine and high density, according to compact packaging design and high ability of electronic equipments and systems. The high density wiring design decreases the distance between the printed wires on the board. This results in high electric field strength