11.1 INTRODUCTION

During this decade, the competitiveness of the electronics industry has been determined by the following six aspects: cost reduction, miniaturization of devices, function integration, product reliability, design freedom and improved environmental compatibility.

11.1.1 MIDs Integrate Electronics and Mechanical Function

Some of these demands are met by continued electrical function integration on silicon, and many others can be addressed by integration of mechanical and electrical functions on the circuit carriers. A major trend in this respect is the upcoming market for the so-called moulded interconnect devices (MIDs). This has been supported by the continuing development and commercialization of high temperature thermoplastic materials as well as the development of techniques for their selective metal plating. Combined, these have opened up new ways of circuit carrier design to the electronics industry.

MIDs can basically be described as moulded polymer-based bodies incorporating a functional metal plating on some areas of their surfaces, thereby integrating electrical functionality into what is basically a mechanical component as an additional benefit.
11.1.2 Integration Potentials and Key Markets

MIDs can unite several important functions into a single unit such as, for example, those of conventional printed circuit boards, casings, connectors, heatsinks and cables. Some of them, especially those made in the Far East, are also designed to be encapsulants for electronic components, e.g. light emitting diodes. MIDs, however, must not be considered as simple replacements for conventional assemblies, rather they complement them. In Fig. 11.2, the most important integration potentials and markets for MIDs are shown.

Currently, the key markets for MID technology are considered to be in automotive electronics and telecommunications, especially for mobile phones. These two market segments account for most of the applications realized so far. Other important markets are office automation, consumer electronics and system controls, e.g. programmable logic controls (PLCs). In addition, MIDs are also eminently suitable for use in household appliances and medical electronics. The market is currently showing an annual growth rate of about 50%.

One of the biggest challenges concerning the introduction of MID technology is that of the simultaneous engineering requirements necessary to incorporate the many possible advantages into a single product design. This makes close cooperation of various departments in a company absolutely essential for ultimate product success. Electrical and mechanical engineers...