

## Company & Trends

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Interview

## A trendsetter in systems

Passive integration is one of the leading trends in the components industry. After all, manufacturers stand to reap significant benefits. Already world market leader for RF front-end modules for mobile phones, EPCOS is further developing its business with systems, in addition to its business with standard and customer-specific components. Dr. Werner Faber, Member of the Management Board and Chief Technology Officer at EPCOS, talks about the technological challenges.

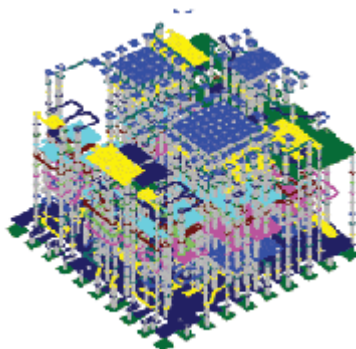
### **COMPONENTS: Does EPCOS have the technology to realize its goal of pushing further ahead into the systems business?**

**Dr. Werner Faber:** EPCOS is a technology-driven and customer-oriented company. That is what sets us apart. We are particularly well-positioned to develop and manufacture RF modules. EPCOS possesses and masters both the basic technologies, such as our interconnection and powder technologies, and the key technologies that are needed, such as sintering and multilayer technology for ceramic components. All these capabilities put us in a position to realize systems in a package, or SIPs. Our current product spectrum here ranges from ESD/EMI and front-end RF modules for mobile communications applications to wireless LAN modules for notebooks and PCs. All these modules are tailored precisely to the needs of the relevant chipsets in close collaboration with semiconductor manufacturers.

### **What benefits do modules and SIPs offer?**

These modules enable our customers to drastically increase the density of components on the circuit boards for their applications—in other words, to pack more functions into less space. This solution is then a single component that boasts all the functions of a small system while requiring up to 90 percent less space than a solution with individual components would do.

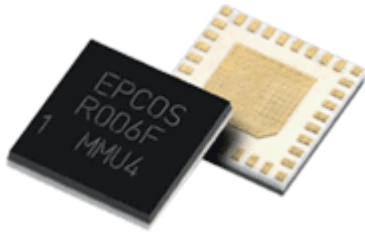
### **LTCC MODUL**



The simulation cross section show the 3D ceramics of a WLAN module with 14 LTCC layers.

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The completed module integrates more than 10 filters as well as two amplifiers (PA und LNA).

### **Still, customers are also demanding more reliable electronic products at lower cost. And they also expect professional support to help them cope with ever shorter innovation cycles...**

That's right. Equipment producers can only keep up with the accelerating pace of innovation if certain complex aspects of development work are taken off their hands. Modules can help to solve this problem. Moreover, modules also generate obvious cost benefits in the production process. Fewer components enable our customers to operate more efficient production and logistics processes. Our quad-band modules, for example, integrate 65 different component functions. Logistics costs are thus driven down, for example, as fewer components have to be kept in stock. Moreover, these integrated systems are proving much more reliable than all the individual components used to be. After all, a module behaves as though it were just a single component.

### **So EPCOS now offers its customers a range of different LTCC modules for RF applications—and hence the benefits afforded by a system provider—as well as a broad portfolio of discrete SAW components?**

Also correct. But that's not all. Take our customer-specific development work, for example, an area in which we collaborate with customers as comprehensively as possible from as early a stage as possible. Our support begins even before new applications have made it off the drawing board. This kind of joint development not only relieves customers of complex design activities, but also shortens the time to market for their products. In return, EPCOS benefits from its customers' application competence—both in mobile communications, as well as in other industries. Remember that many of our customers are innovation leaders and trendsetters in their own right.

### **What are the perspectives for our RF module business?**

Wireless LAN applications present extremely attractive growth potential. Only recently, our WLAN modules won us a new key customer—a leading manufacturer of processors for personal computers. Strong growth stimulus will also come from mobile communication devices, as well as from MP3 players and games consoles. Wireless industrial automation and machine communication could prove to be yet another promising market. EPCOS expects that, as soon as security issues with transmission protocols have been solved, the industry is far more likely to make greater use of the improved flexibility and productivity that will come from linking up factories and entire industrial plants on networks.

### **Besides RF modules, are there other interesting application areas for other modules?**

Of course. Telecommunications is a particularly good example of this. Here, we have developed the transformer protection module for DSL systems, which, per module, saves around 100 mm<sup>2</sup> of space on the circuit board. Automotive electronics is another fast-growing market, where reliability is in great demand. A further field of interest is industrial electronics, where components are also being integrated into systems—in particular in applications for the energy technology business.