



## Focus on: Layout

As an E<sup>2</sup>MS system supplier, TQ can assist you at every stage of your project – whatever you may need or desire. In addition to electronics development, circuit board layout for complex and demanding designs is a good entry point into the electronic services of TQ.

### YOUR BENEFITS

- **High PCB quality**  
Through intensive contact with various circuit board manufacturers qualified by TQ and the application of defined design rules, your circuit board is produced in a high-quality and cost-effective manner.
- **High assembly quality**  
With the help and feedback of TQ's own assembly production department, we keep our pcb design rules up to date and place your components on your PCB in compliance with all electrical requirements.
- **Best possible testability of the printed board assembly**  
Test procedures are coordinated at an early stage with the TQ specialist department for test equipment development. This is how we achieve optimal test depth at low cost.
- **Rapid start of production**  
Internal review in the different design phases avoid the need for redesigns, saving you time and costs. Our overall view of your design across the entire process chain allows you to benefit from low product costs.

### OUR KNOW-HOW

- HDI/Microvia design (BGA,  $\mu$ BGA)
- Flex/Starrflex design
- EMC-compatible design
- Impedance-controlled high speed design (e.g. DDR2, DDR3, PCI Express, RapidIO, LVDS, SATA, USB 3.0, 10 GB)
- Analog design
- High-current design (500 A)/  
High-voltage design (800 V)
- Cooling of PCBs (aluminum core)
- DFM/DFT (Design for Manufacturing/Design for Testability: Layout optimized for production appropriate for testing)
- Creation of a 3D model of the assembly; also as 3D print
- Internal design reviews

### LAYOUT SYSTEMS

- Mentor Xpedition Enterprise
- Mentor PADS
- Altium Designer

### LAYOUT PROCESS

TQ assists you in every phase of the layout process:

- **Adopt circuit diagram according to your specifications**  
You receive a circuit diagram in your CAD system for product care.
- **Import netlist**  
If a circuit diagram is available, the network list can be read in (time saving).
- **Placement/Routing**  
Taking into account your specifications and all requirements for manufacturing and testing the assembly the design is created. The employee from the layout department is your direct contact and shows you optimisation possibilities.
- **Internal review of placement and routing**  
An internal review ensures that all requirements have been met.
- **Customer approval of placement and routing**  
A customer approval ensures that your requirements have been correctly implemented.
- **Creation of production data**  
Gerber data, data for manufacturing and test equipment
- **Internal review of production data**  
The review of the production data ensures that your Gerber data has been generated correctly. The placement plan of your assembly is checked for readability of the references and clear polarity.

### LAYOUT DATA

We provide our customers with the following data:

- CAD data for the circuit diagram and layout
- Circuit diagram as a PDF
- Component mounting plan as a PDF
- Placement data
- Gerber data (Extended Gerber with drilling data, PCB specifications and panel drawing)
- Data for generating test equipment

### CONTACT

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