DTUsat Guidelines for PCB Layout and Assembly Preparations

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1 PCB Layout

PCBs for DTUsat must obey the following guidelines regarding minimum dimensions etc. Guidelines have been drawn up by Jonas Sølvhøj, c973442 and Klaus Krogsgaard, c991365, to whom additional questions can be submitted.

1.1 Track and Via Dimensions

- Default track width is 10 mill[1], and minimum width is 8 mill. Where possible tracks carrying currents in the mA region ought to be at least 20-30 mill.
- Default via diameters are defined as 20 mill hole and 40 mill pads. No vias must be placed in component pads or other areas for soldering; only exception is the areas for soldering the PCBs together.
- Minimum clearance is 8 mill.

1.2 Edge Solder Areas

Areas along edges for soldering PCBs together are 100 mill wide. They are placed on both top and bottom layers with vias along the center line for every 100 mill. No electrical connections must be made to these areas.

1.3 Manufacturing Preparations

Flight PCBs must be without lacquer and silkscreens - usually handled when generating Gerber output for PCB order.

Four-layer PCBs are preferably designed with supply in middle layers to minimise current loops and radiated noise; track layers when using Protel must be “Top”, “Mid1”, “Mid2” and “Bottom”, and board outline in ”Mech1” to minimise needed work prior to ordering.

[1] 1 mill = 0.001 inch = 25.4μm

2 Assembly Preparations

For external assembly of PCBs for test purposes and flight/flight spare models, the material contained in the file send to the external source must follow the following guidelines.

2.1 Flight and Flight Spare assembly

The current agreement made with DSRI for assembly of flight/flight spare models requires additional confirmation and expected date of completion from DSRI prior to each shipment for assembly; expected assembly time for a single PCB containing approximately 250 components is one week. Contact person at DSRI is Flemming Hansen.

2.2 Documentation

The first section of the file contains the documentation relevant for the specific PCB. This includes:

- Work bill with information of which components to mount, and dates of delivery and completion.
- Component placement for both sides of the PCB with marking of the components to be mounted.
- Complete set of diagrams for all circuitry on the PCB.
- Complete bill of material for a fully mounted PCB.
- Assembly order for the mounting of the PCB, corresponding to the work bill. The components on the side with smallest/fewest components are preferably mounted before starting the mounting on the other, which the order must take into account.

2.3 PCBs and Components

Second section contains the PCBs and all components with each value placed in a separate charteque. Along with the components each charteque must contain the component placements with indications of the placing for the value. Electrostatic sensitive devices must be packed and marked accordingly.

The preferred order of the charteques correspond largely to the assembly order.