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**THIS DOCUMENT FORMS PART OF THE PURCHASING CONDITIONS AND SUPPLIERS MUST NOTE THAT GOODS WILL NOT BE ACCEPTED UNLESS THEY COMPLY WITH THE FOLLOWING REQUIREMENTS:**

**THIS DOCUMENT OVERRIDES ALL OTHER DOCUMENTATION WITH THE EXCEPTION OF THE 'READ ME' FILE AND DRAWING SUPPLIED WITH THE DATA.**

1. The following items unless stated within the data supplied can be assumed as:  
PCB Final Thickness: 1.60mm  
Copper weight: 1oz  
Solder Resist: Green  
Silkscreen: White  
Surface Finish: Hot Air Solder Level.  
ROHS Compliancy is required

**These are for quoting purposes only and must be confirmed before Manufacturing can commence.**

2. The technology level of the PCB must be detailed on all quotes provided, e.g. Standard DS/ML, HDI, RF / Special Materials, IMS (Metal Backed), Flexi or Flexi Rigid.
3. All PCB's supplied must be UL approved.
4. Suppliers must only use materials and processes covered by their UL File.
5. Suppliers must Silkscreen their UL identification mark on all PCB's supplied to Speedboard unless otherwise stated in the 'Read Me' file supplied with the Data.
6. All PCB's must employ material with a UL94 V0 rating.
7. Manufacturers must check that artworks comply with their UL file, i.e. minimum track width, maximum copper area, minimum edge width etc.
8. The Supplier must inform Speedboard of any changes to their UL files.
9. Suppliers must comply with instructions laid down in the latest 'Read Me'
10. The Supplier must inform Speedboard before any modifications are made to the Data supplied.
11. Assembly modules when stated in the 'Read Me' / Enquiry must follow the drawing supplied, if this is not present the design requirements should be as per illustration 1.0 with fiducials and board retention lugs as per illustrations 1.1 and 1.2.
12. Do Not Plate Module Tooling Holes.
13. Silkscreen clipping is only acceptable when it is not removing complete traces or complete text, if in doubt refer back to Speedboard.
14. Track repairs/welds are only permitted when authorized in writing from Speedboard and if approved must comply with our cosmetic requirements.
15. Suppliers to 'bare board test' in accordance with their procedures to ensure all PCB's are delivered fault free, please mark all test pass boards with a black line on the edge.

16. Speedboard will not accept any scrap unless by concession only. IF Speedboard agree to the delivery containing x-outs Speedboard will detail how the x-outs are to be marked so that our placement equipment can detect them automatically. Failure to apply for a concession or failure to mark the x-outs as detailed will result in a rejection of the goods.
17. Bow and Twist of board 0.70% max deviation from true flatness.
18. Hole Size Tolerances unless otherwise stated are to be + / - 0.10mm
19. All PCBs supplied with Impedance Control must be supplied with Relevant Test Results confirming the Boards are within tolerance.
20. Manufacturer to add [www.speedboard.co.uk](http://www.speedboard.co.uk) in approximate position shown on component side.
21. Manufacturer to add the PCB part number in approximate position shown on component side.
22. Speedboard require all PCB's to meet IPC-A-600 Class 2 unless otherwise specified.
23. All silver boards must be wrapped in sulphur free paper before any other packaging is placed around them.
24. The maximum weight for boards despatched to Speedboard must not exceed 25 kg per package.
25. All packages must be labelled with Quantity, Part number and Order number.
22. When a PCB is required to be supplied Lead Free (Pb-Free) / ROHS Compliant it requires that the following banned substances meet the requirements of the ROHS Regulations 2011/65/EU.

The Restricted Substances in the ROHS Regulations and maximum concentration levels are:

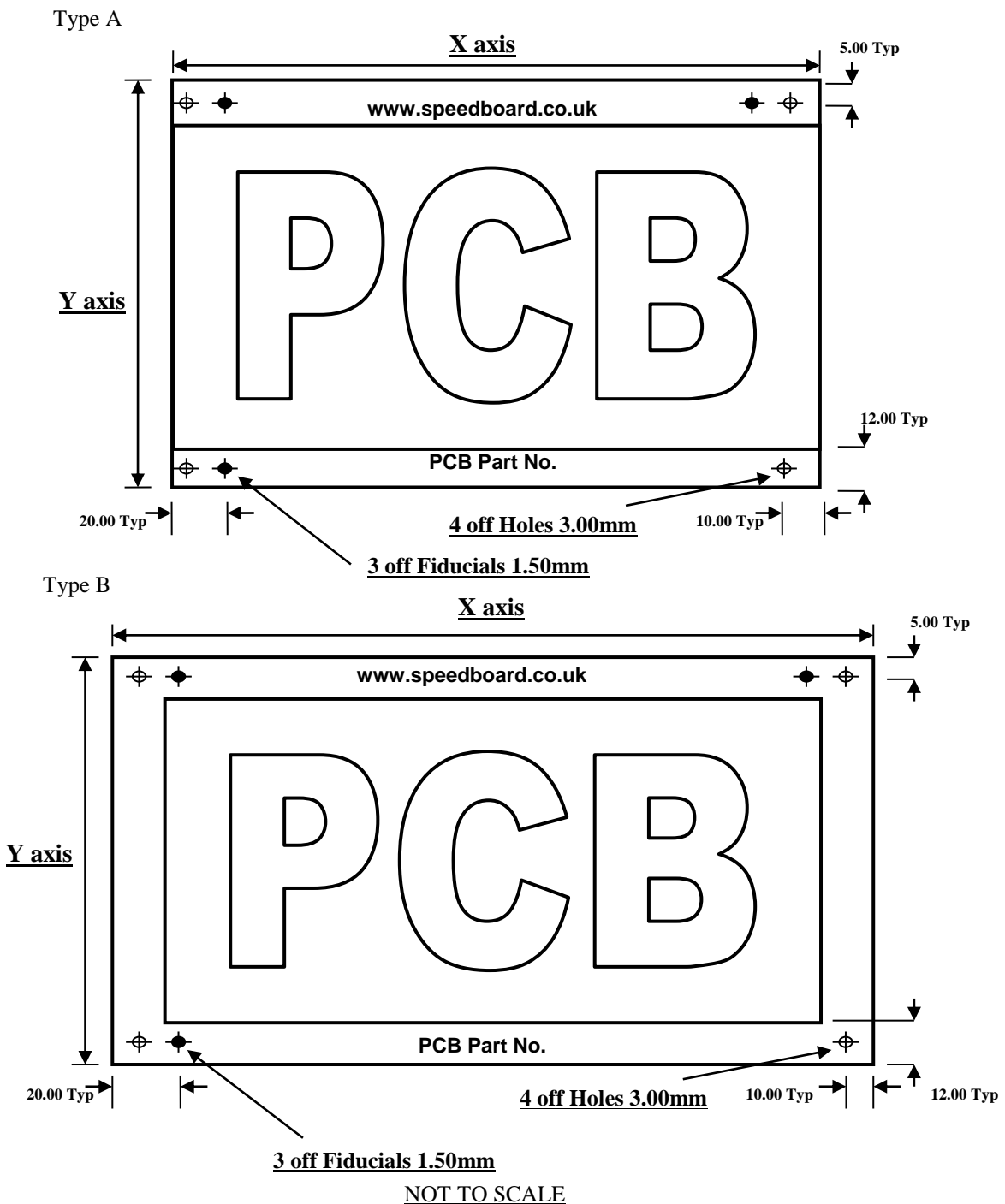
- Lead (Pb) - 0.1% by weight in homogeneous materials
  - Mercury (Hg) - 0.1% by weight in homogeneous materials
  - Cadmium (Cd) - 0.01% by weight in homogeneous materials
  - Hexavalent chromium (CrVI) - 0.1% by weight in homogeneous materials
  - Polybrominated biphenyls (PBB) - 0.1% by weight in homogeneous materials
  - Polybrominated diphenyl ethers (PBDE) – PBDE comprises a range of flame retardants including:
    - 0.1% by weight in homogeneous materials
      - Tetrabromodiphenyl ether (Tetra-BDE).
      - Pentabromodiphenyl ether (Penta-BDE)
      - Octabromodiphenyl ether (Octa-BDE)
      - Decabromodiphenyl ether (Deca-BDE)
  - Bis(2-ethylhexyl) phthalate (DEHP) - 0.1% by weight in homogeneous materials
  - Butyl benzyl phthalate (BBP) - 0.1% by weight in homogeneous materials
  - Dibutyl phthalate (DBP) - 0.1% by weight in homogeneous materials
  - Diisobutyl phthalate (DIBP) - 0.1% by weight in homogeneous materials
23. All PCBs that are required to be Lead Free (Pb-Free) / ROHS Compliant must have the 'Lead Free Symbol' on the Bare board or on the Scrap Area of the Module as per illustration 2.1. (Ref JEDEC)
  26. All PCBs that are required to be Lead Free (Pb-Free) / ROHS Compliant must have the 'Lead Free Symbol' on the Lowest Level Packaging as per illustration 2.2.

27. If the PCB supplier uses 'Direct Imaging' the outer layers of the PCB must not be scaled, they must be 1:1 with the gerber data supplied, so that the stencil Speedboard orders matches the PCB pads.

1.0

- Module Type A is preferable, but take into account components close to or overhanging the ends.
- Circuits may be stepped up within the module with a 2.40mm gap between images.
- Overall Module dimensions must be no smaller than 50mm x 50mm and must not exceed 430mm x 430mm.

**STANDARD MODULE**



## Fiducial Mark Vision Clearances

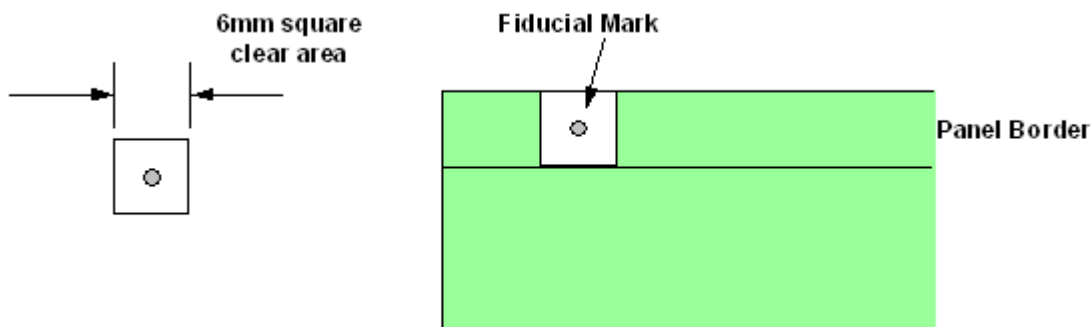
The placement/printing machines used within the PCB assembly area use a vision alignment system to accurately locate where the board is positioned relative to the machine's moving axis. Once located the software automatically compensates for any slight miss positioning of the board within the clamping rails.

The vision alignment is performed via camera on the machines and unique marks on the boards referred to as fiducial marks. To avoid any miss interpretation of the marks they need to be located centrally within a 6.0 mm free area clear of any other marks/pads or tracks that could confuse the vision system.

Ideally the area should also be free of solder resist to aid the vision by enhancing the contrast between fiducial mark and the background. If this is unachievable then normal resist clearance rules should be applied.

No Copper balancing features are to be added in the scrap area.

### 1.1

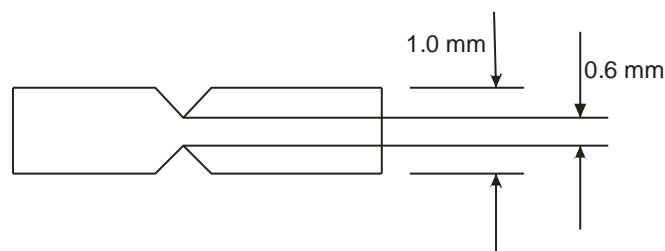


**NOT TO SCALE**

### 1.2 Circuit Breakout.

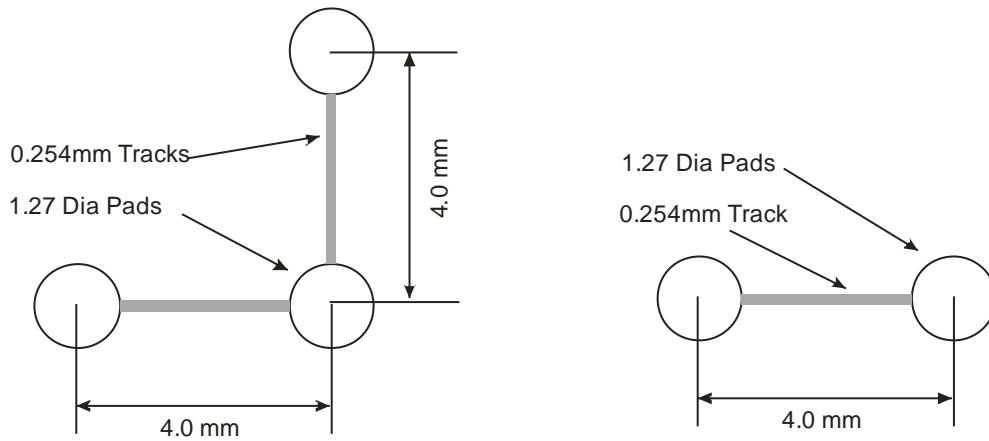
Speedboard's preferred method of circuit removal from the panel is breakout via scored edges as it gives a cleaner edge and removes the requirement to smooth off pips left by breakout lugs. When deciding to score or use breakout lugs consideration has to be made for the following to determine if scoring is acceptable.

- No connectors or features can over hang the circuit.
- No tracks to be close to the score/breakout line.
- No SMD components to be close to the score/breakout line.
- Boards thinner than 1.0 should not be scored.
- Score depth to total 1/3 board thickness split evenly per side and must be equal i.e 1mm board will still have 0.6 mm of material retaining the circuits in place.



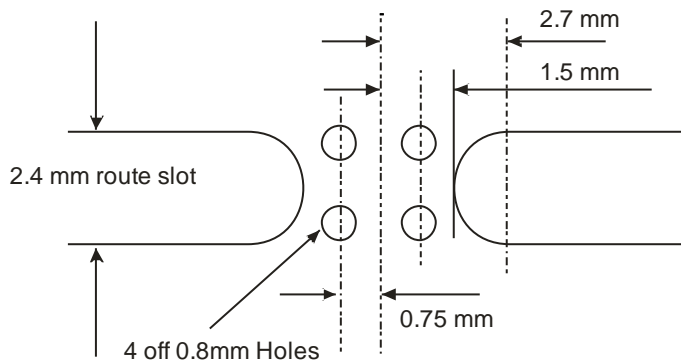
**NOT TO SCALE**

- Board manufacturer to add score check tracks and pads to both component and solder sides of the panel. Pad diameter to be 1.27mm with a track width of 0.254, resist aperture to be 1.6mm. pads to be tested to confirm score lines are in place.



**NOT TO SCALE**

### **Retention Lug Design**



**NOT TO SCALE**

2.1

**Pb-Free Symbol**



NOT TO SCALE

2.2

**Pb-Free Logo**



NOT TO SCALE

**Size**

**Symbol**

The 'Pb-Free symbol' must be of sufficient size to be seen clearly by the naked eye without magnification.

**Logo**

It is recommended the size of the 'Pb-Free Logo' be a minimum of 22mm x 25mm with the minimum diameter of the circle being 18mm.

**Colour**

**Symbol**

The Pb-Free Symbol will be either the colour of the Silkscreen layer or White.

**Logo**

The 'Pb-Free Logo' shall be black letters/symbols on a white background.