

Qual-Pro Corporation	Prepared By: Mike Michaels	Date: 11/25/19	Number: WI-2079
	<i>my signature</i>	Page: 1 of 2	Rev. -
Subject: PCB Panelization Layout for Manufacturability			

- **PURPOSE:** Establish guidelines to aid in the coordination of PCB panels with depaneling, stencil, wave solder, and other fixtures. Considerations for Manufacturing Engineering and Suppliers shall include the following:
  - PCB / panel procurement costs
  - PCBA barcode label application for side-1 and side-2
  - Bow and twist, sagging, and PCB bounce during processing
  - SMT print quality and throughput
  - SMT placement efficiency
  - Wave soldering efficiency and direction, and the often result of negating wave solder fixtures with an appropriate panel design.
  - Flying probe testing
  - Available depanel methods and capabilities
  - Tooling holes for secondary operations
  - Overhanging components
  - Utilization of fiducials on rails if necessary or desired
  - Component edge clearances and stress minimization
  - Panel Size, and Qty.
  
- **SCOPE:** The scope of this new work instruction is for new quotes with new PCBs, for quotes where there are significant increases in volume, Revision, or change in supplier. Additionally, the work instruction can be utilized for existing volume products where Qual-Pro decides to improve efficiencies. Any revisions to the PCB following the implementation of this process must be reviewed by Manufacturing Engineering for cost impacts for potential re quoting purposes.
  
- **RESPONSIBILITY**
  - It is the of the responsibility Quote department to ensure that this document is supplied to all PCB suppliers during the quote phase.
  - It is the responsibility of the Purchasing department to ensure that QP manufacturing Engineering receive and approve an updated panel drawing prior to PWB fabrication.
  - A panelization drawing must be submitted to Qual-Pro for approval if awarded. The approval must be provided to the supplier prior to fabrication. Unless the supplier provides a separate NRE line item in their quote, there shall be no cost-adder for this to Qual-Pro after receipt of their Quote. It is the responsibility of the Manufacturing Engineer to review and disposition, accordingly, generate an ECN with the panel drawing and submit to Document Control for processing (Engineering and Purchasing signatures required).
  
- **PROCEDURE**
  - During the quote process the Quote department ensures this document and all other relevant data is supplied to all PCB suppliers quoting.
  - Once PO is awarded the Purchasing department is to ensure that QP manufacturing Engineering receive and approve an updated panel drawing prior to PWB fabrication.

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- Engineering will review the panel drawing approve or disapprove and communicate concerns through Purchasing to the supplier.
- Once approved the Manufacturing Engineer will generate an ECN for the approval and the addition of the panel drawing into the relevant customers folder. Approval signatures required by Purchasing and Engineering only.

**Figure 1: Recommended PCB Panel considerations**

QUAL-PRO  
 PANELIZATION FOR REF ONLY  
 PCB PANELIZATION LAYOUTS FOR MANUFACTURABILITY

PANEL DESIGN STANDARD PANEL SIZES FOR REF ONLY	
1. BOARD THICKNESS: .011", PANEL APPROX SIZE 3"X3"	
2. BOARD THICKNESS: .032", PANEL APPROX SIZE 4"X6"	
3. BOARD THICKNESS: .042", PANEL APPROX SIZE 6"X8"	
4. BOARD THICKNESS: .062", PANEL APPROX SIZE 8"X10"	
5. BOARD THICKNESS: .090", PANEL APPROX SIZE 10"X10"	
6. BOARD THICKNESS: .120", PANEL APPROX SIZE 10"X10"	
7. BOARD THICKNESS: .140", PANEL APPROX SIZE 10"X10"	

NOTES:

1. IDEAL PANEL SIZES MINIMIZE MATERIAL WASTE FOR THE PCB FABRICATOR YET OPTIMIZES NUMBER OF PCBs PER PANEL FOR GOOD CONVEYER THROUGHPUT
2. V-SCORE IS NOT ALLOWED.
3. SEE DETAIL 'A' FOR MOUSE BITES TABS/ROUT.
4. SEE DETAIL 'B' FIDUCIAL MARKES.
5. TOOLING HOLES SHOULD NOT BE PLATED.
6. SUBMIT PANELIZATION FORMAT FOR QUAL-PRO APPROVAL.

