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# Development Procedure



FOR EDUCATIONAL USE ONLY

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This document is available for free as a download from the GitHub repository:

<https://github.com/miniPCB>

This document is associated with the miniPCB Channel on YouTube:

<https://www.youtube.com/@minipcb>

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## 1. PURPOSE

The purpose of this document is to provide a development procedure for developing miniPCBs.

## 2. SCOPE

This document applies to development activities related to the miniPCB project.

## 3. RESPONSIBILITIES

**Chief Engineer** is responsible for maintaining this procedure.

**Engineer** developing miniPCBs is responsible for adhering to this procedure.

## 4. TERMINOLOGY AND ABBREVIATIONS

Terminology and abbreviations used throughout the miniPCB project are consistent with the definitions presented in this section.

*Table 1 – Definitions and Abbreviations*

TERM	DEFINITION
PCB	Printed Circuit Board, Bare Board
PCBA	Printed Circuit Board Assembly, Bare Board + Parts + Assembly
SMD	Surface mount device
THD	Through hole device

## 5. PROCEDURAL NOTES

### 5.1. ORDER OF OPERATIONS

The development procedure starts at kickoff, EE0.0, and proceeds forward through the milestones EE1.0, EE2.0, EE3.0, and EE4.0. Any milestone may be repeated as many times as necessary, and any project can be cancelled, to ensure that Quality Objectives are satisfied.

### 5.2. DESIGN STANDARDS

The miniPCB Design Standard shall be maintained and adhered to.

### 5.3. COLLABORATION

Collaborator(s) are welcome at every development stage.

### 5.4. ENGINEERING RELEASE

Approval on the ECObase engineering change order is the action that releases the miniPCB design.

### 5.5. YOUTUBE VIDEOS

Videos of work may be recorded.

### 5.6. YOUTUBE CHANNEL

Videos may be uploaded to a YouTube channel.

## 6. PROCEDURE

### 6.1. EE0.0 KICKOFF

EE0.0 milestone deliverables list:

- Engineering Change Order, Requested
- GitHub update

### 6.2. EE1.0 PRELIMINARY DESIGN REVIEW

EE1.0 milestone deliverables list:

- EAGLE project
- Schematic
- Layout
- Datasheet
- Fabrication files
- GitHub update
- Datasheet with Parts List
- Engineering Change Order, DR approval

### 6.3. EE2.0 CRITICAL DESIGN REVIEW

EE2.0 milestone deliverables list:

- Developmental Test Plan created
- Developmental Test Report created
- Datasheet with Test Results
- Engineering Change Order, DR approval

## 6.4. EE3.0 FINAL DESIGN REVIEW

EE3.0 milestone deliverables list:

- Developmental Test Plan
- Developmental Test Report
- Datasheet complete
- Engineering Change Order, ENG approval

## 6.5. EE4.0 HARDWARE RELEASE

EE4.0 milestone deliverables list:

- Engineering Change Order, QA approval

The development work is complete.

## 7. REFERENCES

miniPCB™ Design Standard

miniPCB™ Product Catalog

ECObase Template

TESTbase Template

## 8. CHANGE AND LIABILITY NOTICE

This document is subject to change without notice. While effort has been made to ensure the accuracy of the material contained within this document, Nolan Manteufel shall under no circumstances be liable for incidental or consequential damages or related expenses resulting from the use of this document.

## 9. TRADEMARK NOTICE

miniPCB is a trademark of Nolan Manteufel.

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## 10. REVISION HISTORY

REV	DESCRIPTION	ECO	DATE
A	Initial Release	1013	15JAN2023
B	Moved sections included in Initial Release to the miniPCB Quality Manual. Added sections Idea, Prototype, Released, and Obsolete phases.	1015	16JAN2023
C	Removed sections related to product life cycle and added procedural notes, EE# milestones with lists of deliverables, incorporated ECObase, and added related content section.	1022	28FEB2023
D	Rewrote the procedure.	1024	29OCT2023

## 11. RELATED CONTENT

#	TYPE	DESCRIPTION	LOCATION
1	Video	Initial drafting	<a href="https://youtu.be/Nu3xy9QKs2k">https://youtu.be/Nu3xy9QKs2k</a>
2	Video	Initial release	<a href="https://youtu.be/nyEXWn2ROAk">https://youtu.be/nyEXWn2ROAk</a>
3	Video	Drafting, Rev C	<a href="https://youtu.be/oAd69bdk28s">https://youtu.be/oAd69bdk28s</a>
4	Video	Release, Rev C	<a href="https://youtu.be/yXWtaEAUBHY">https://youtu.be/yXWtaEAUBHY</a>