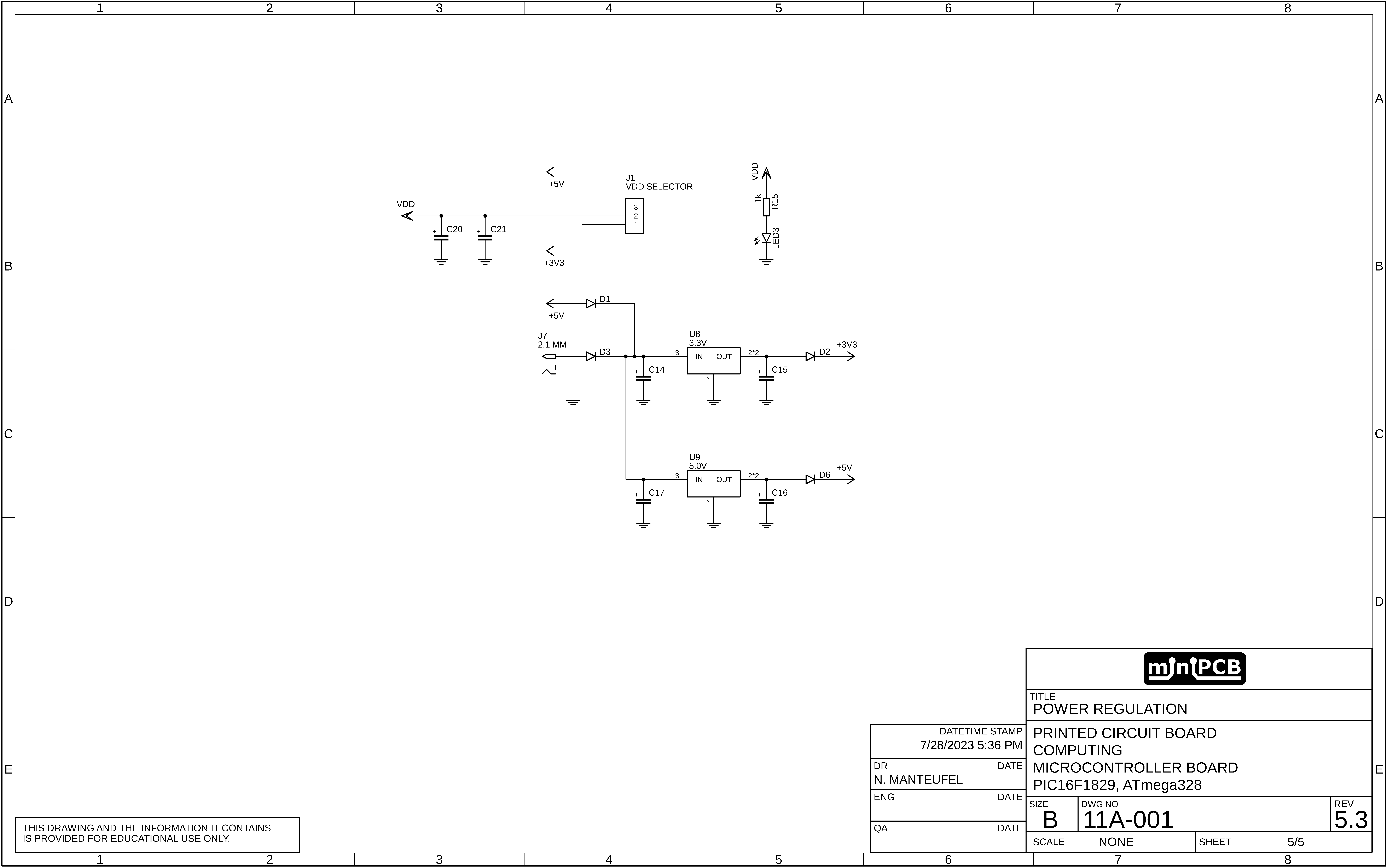
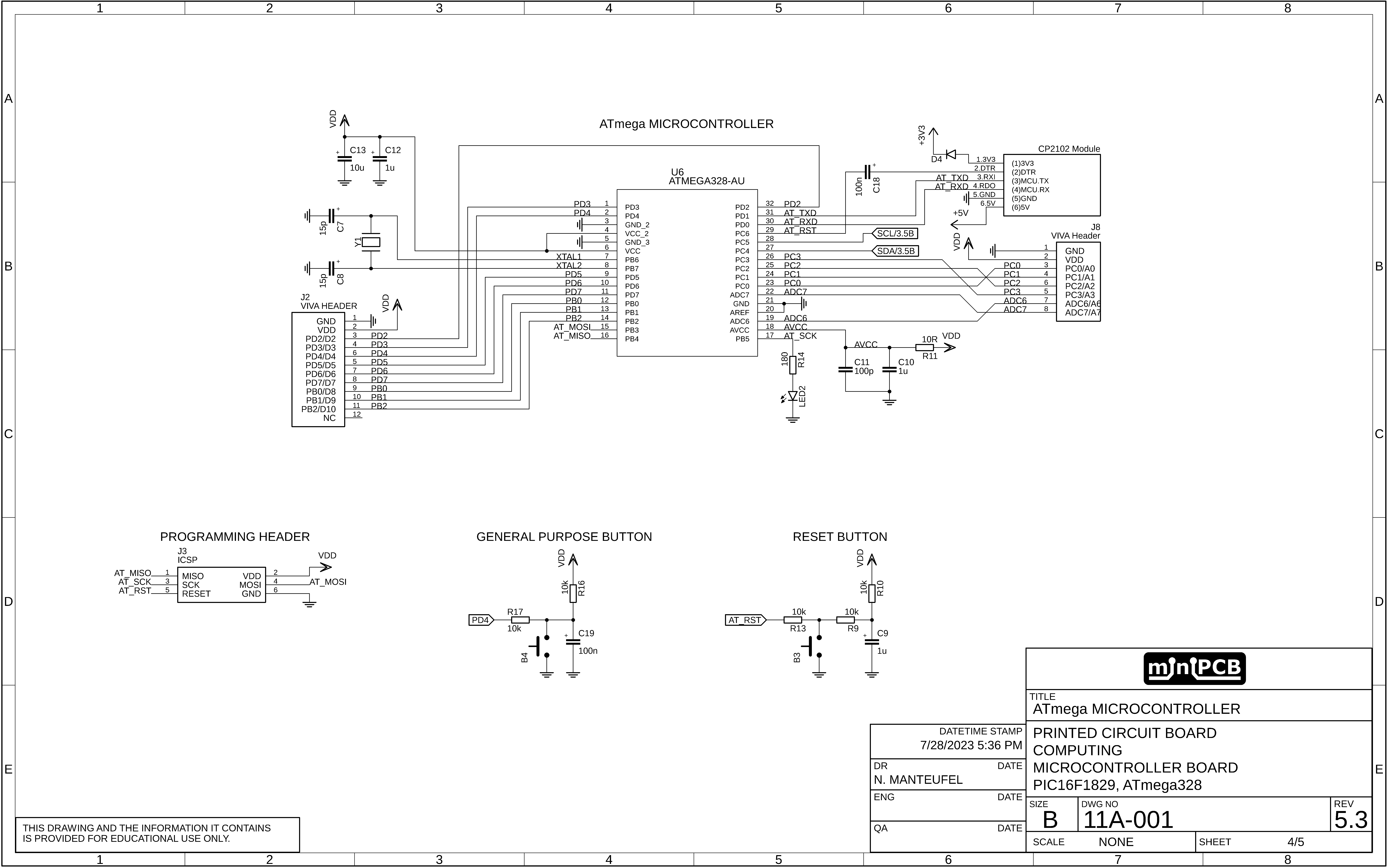
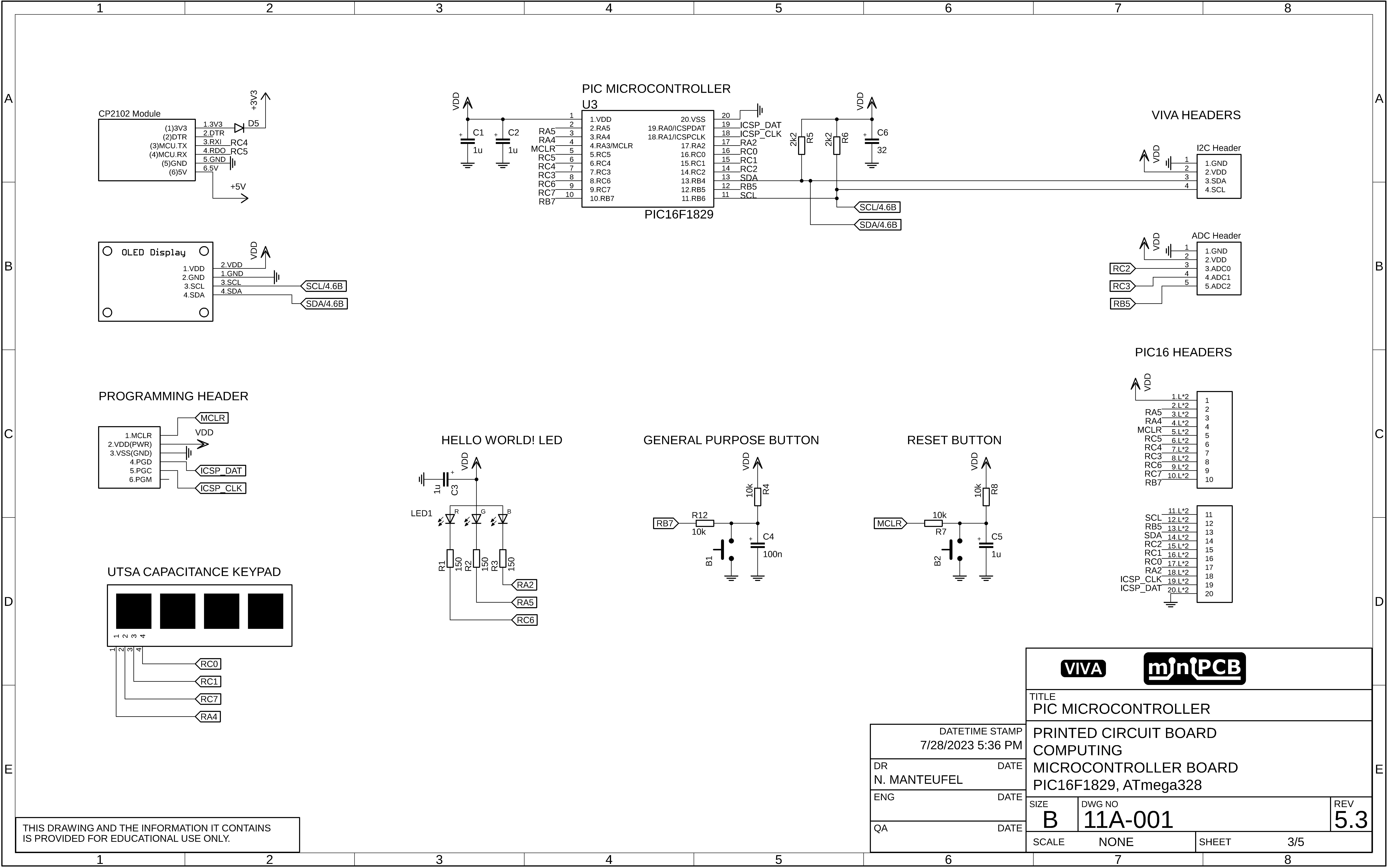
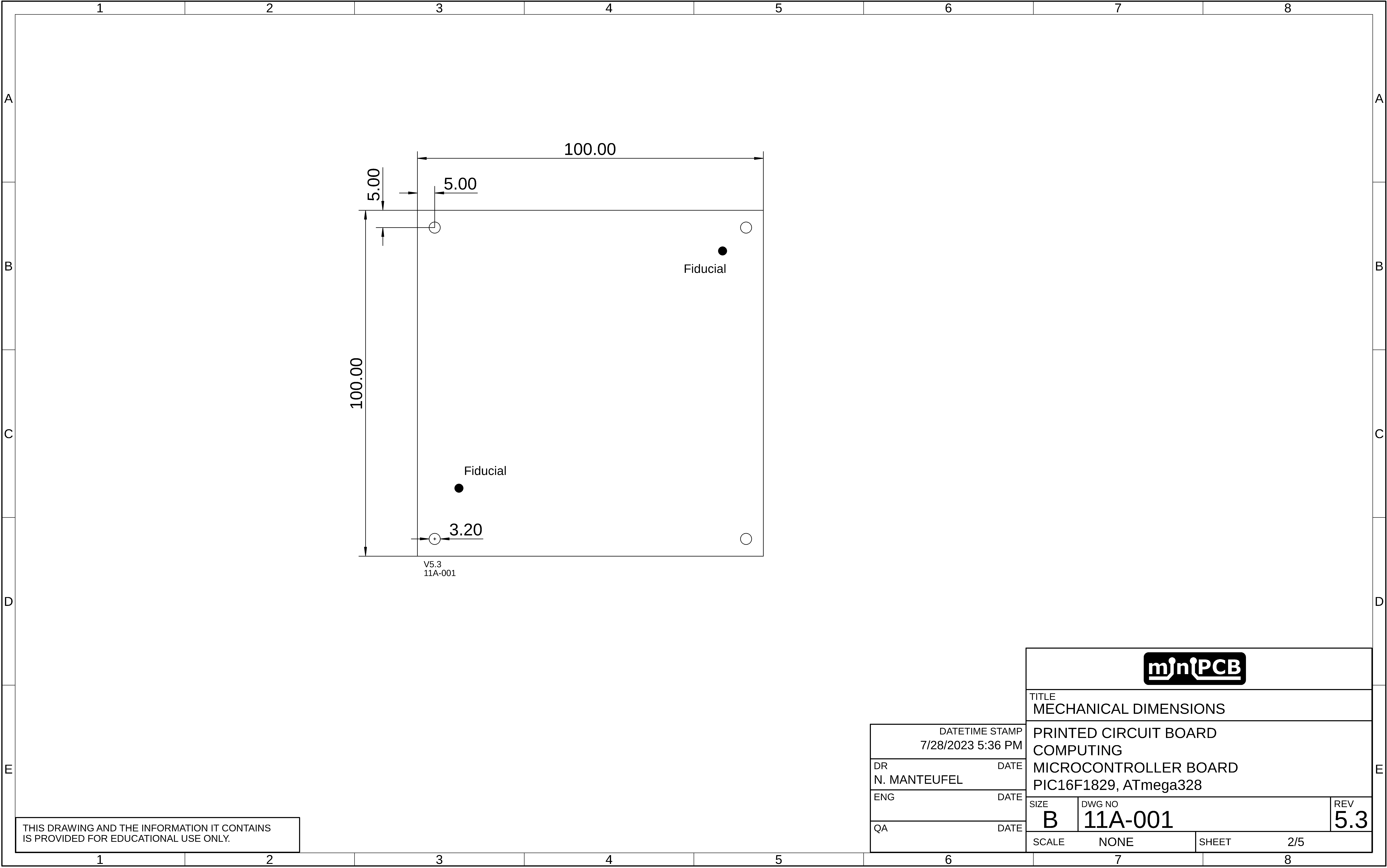
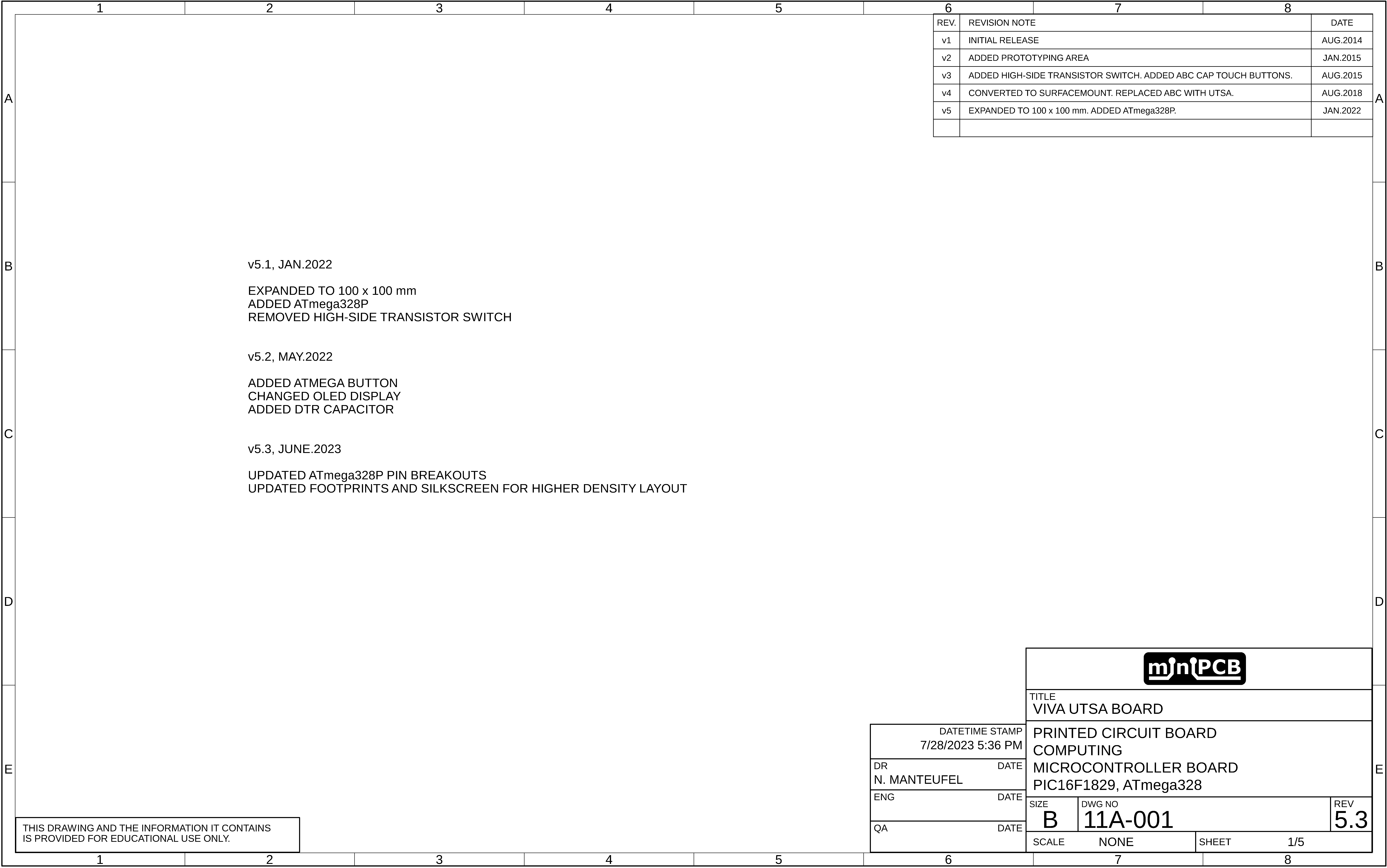
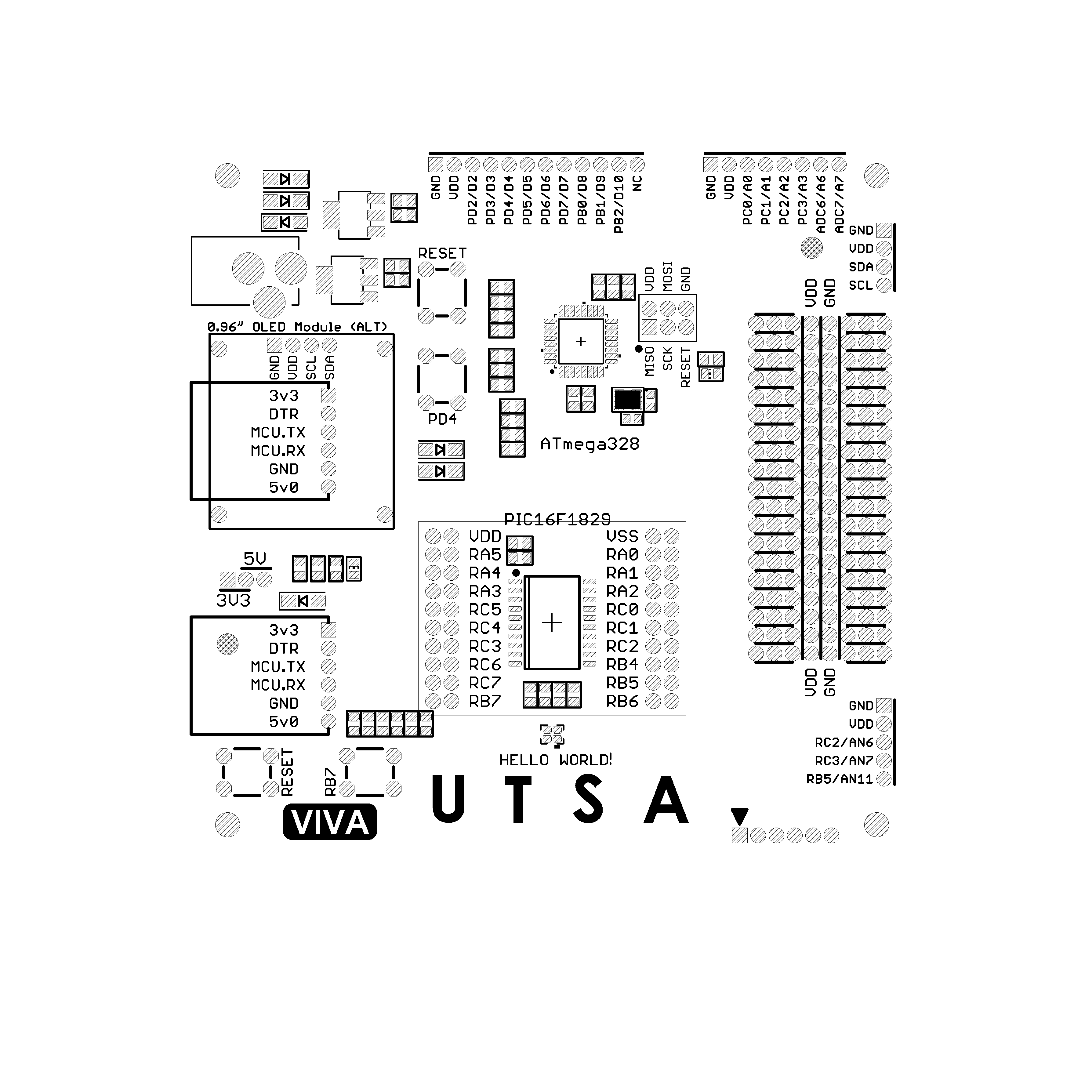
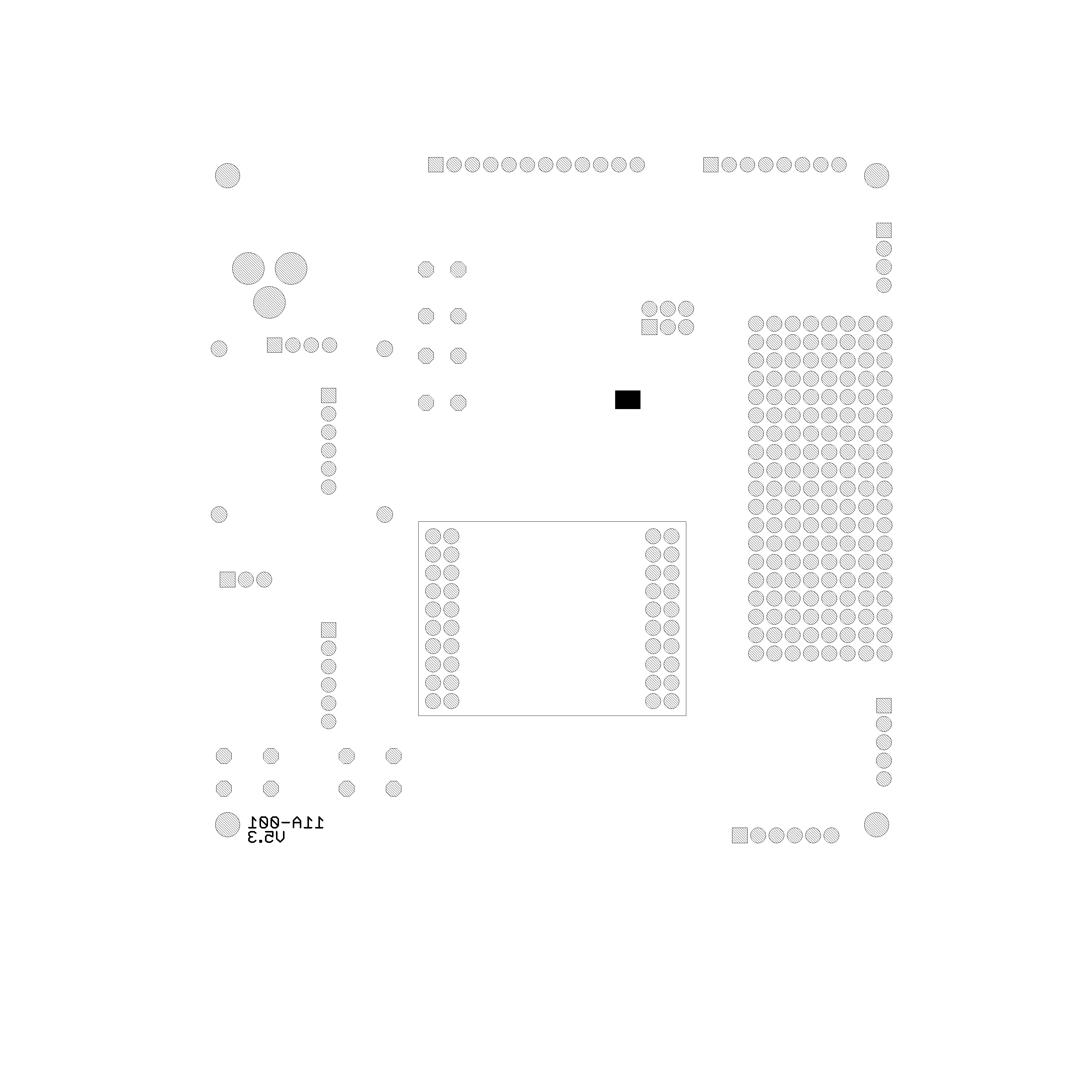
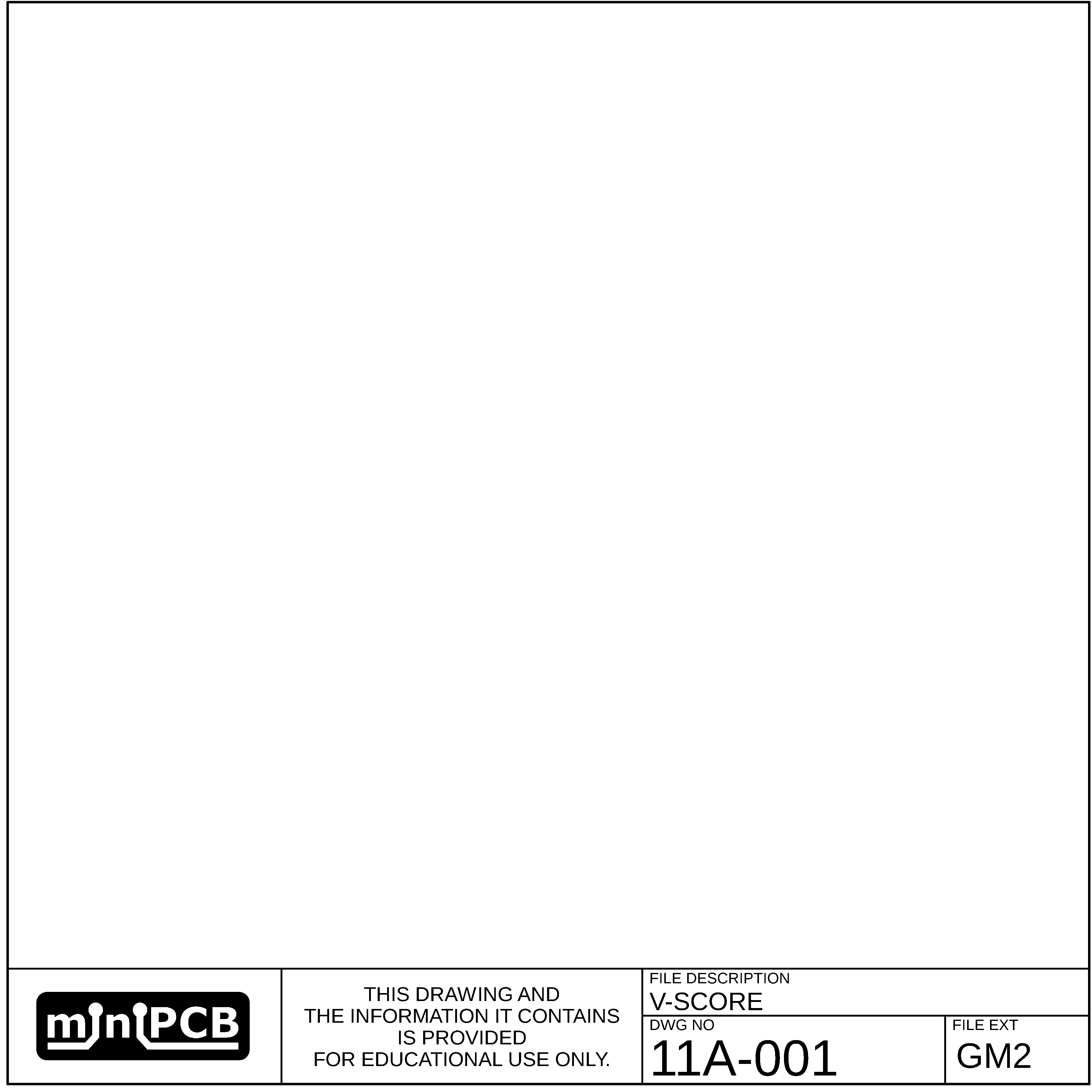
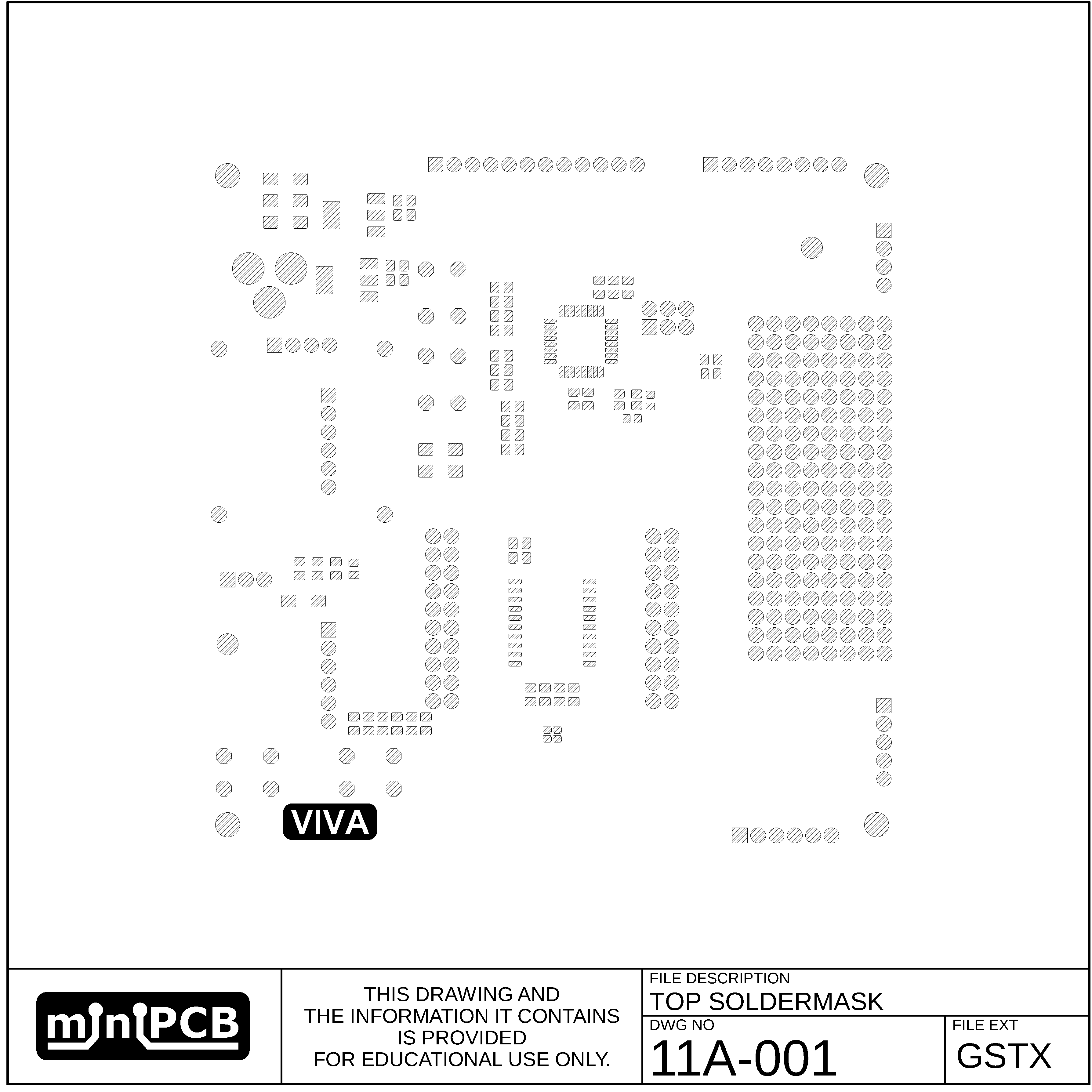
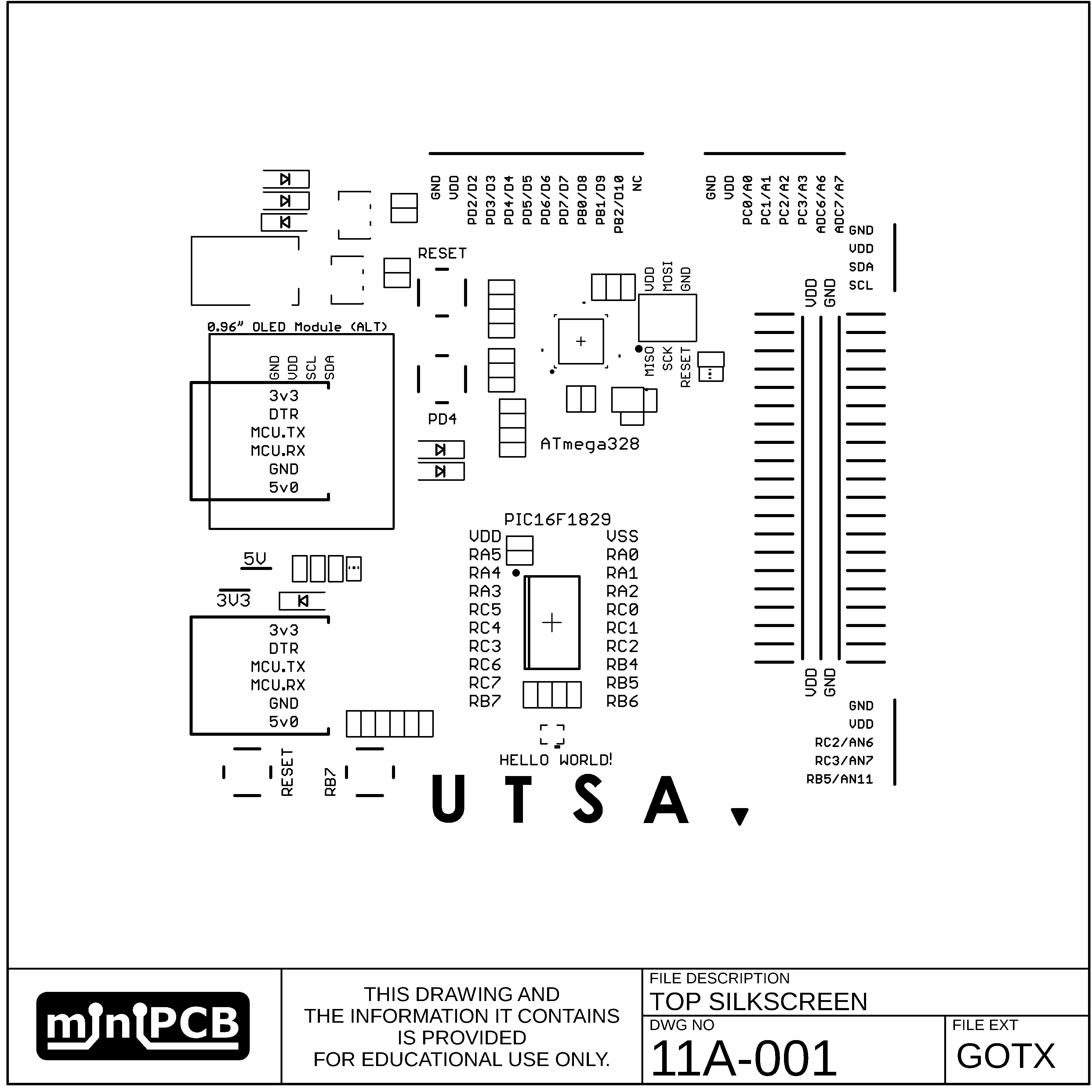
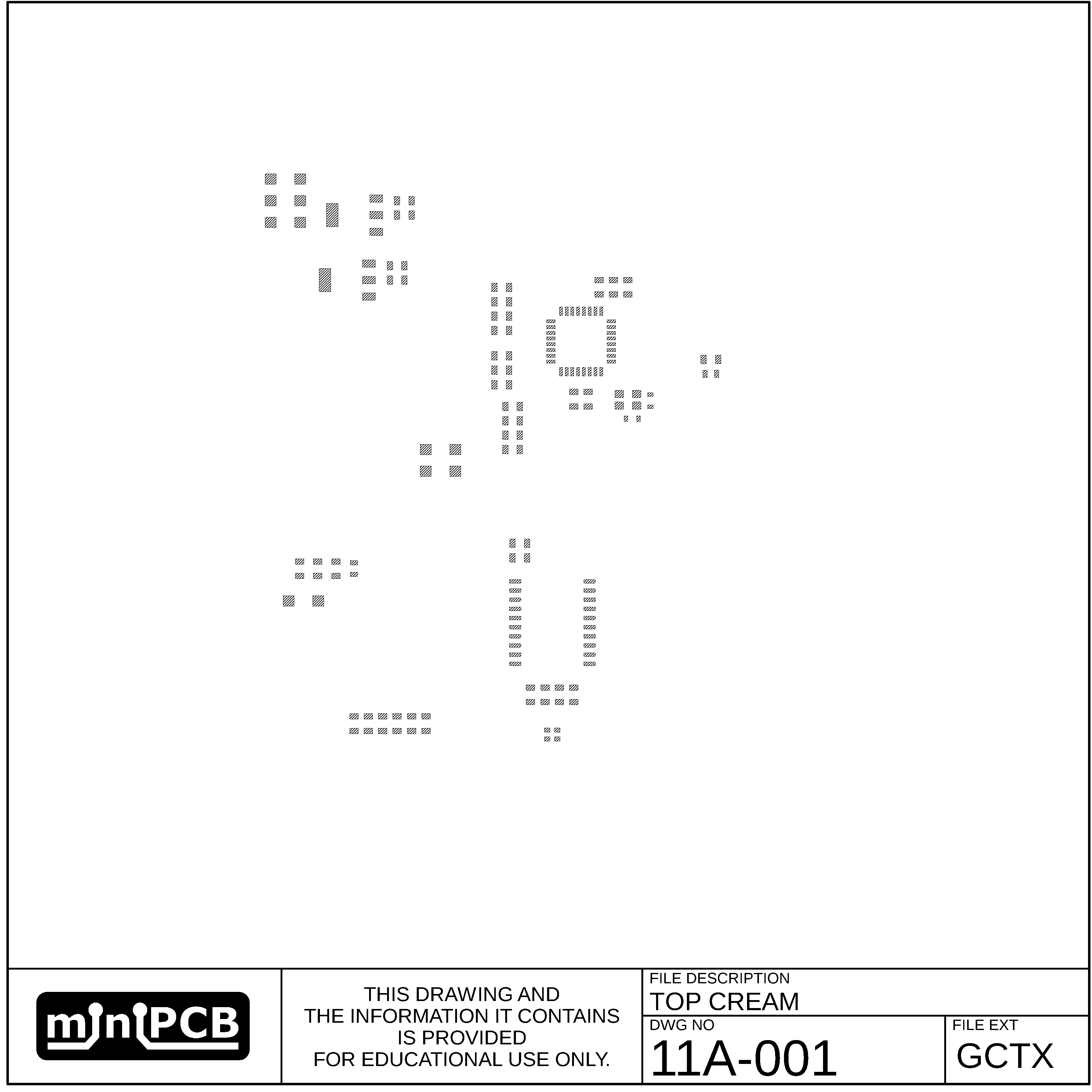
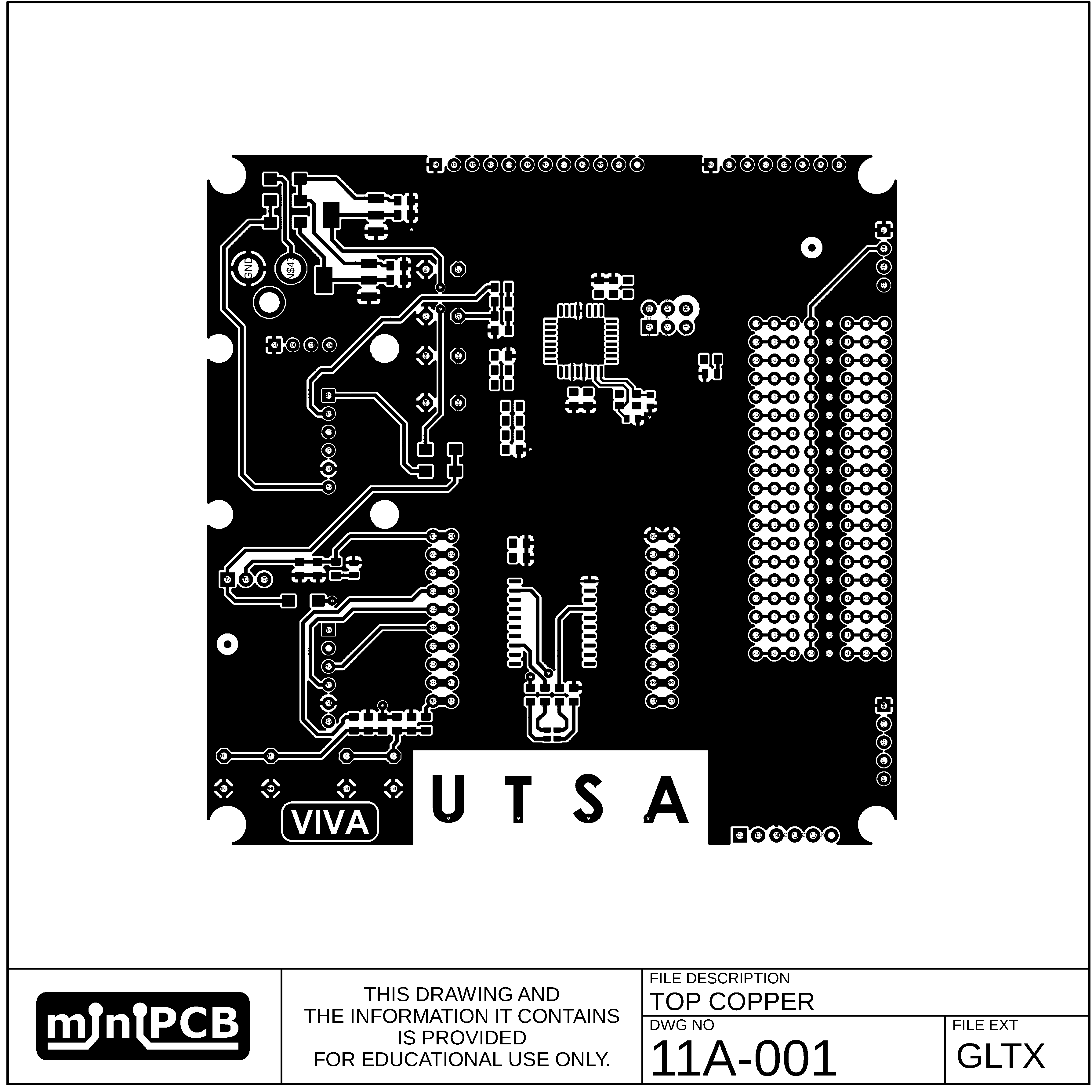
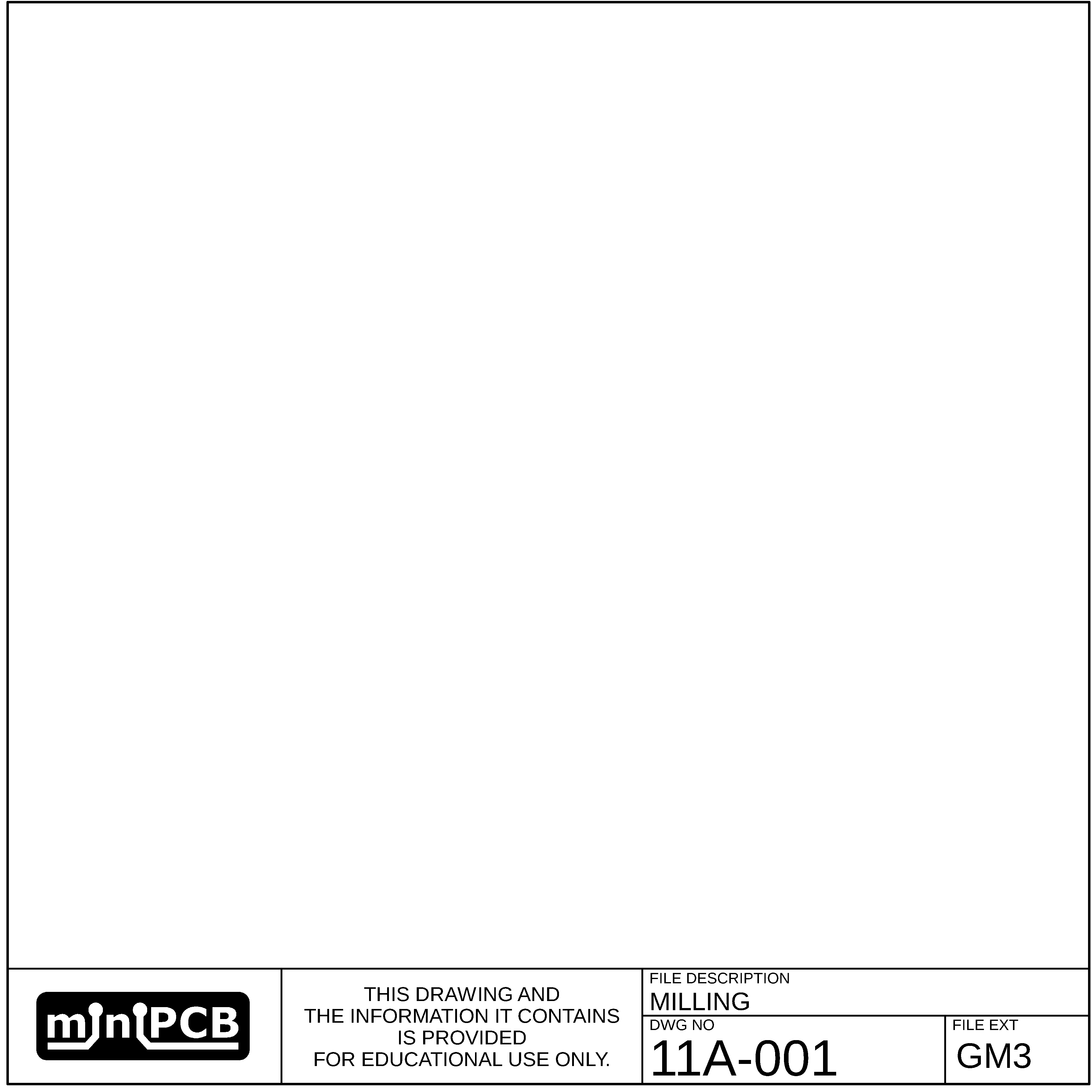
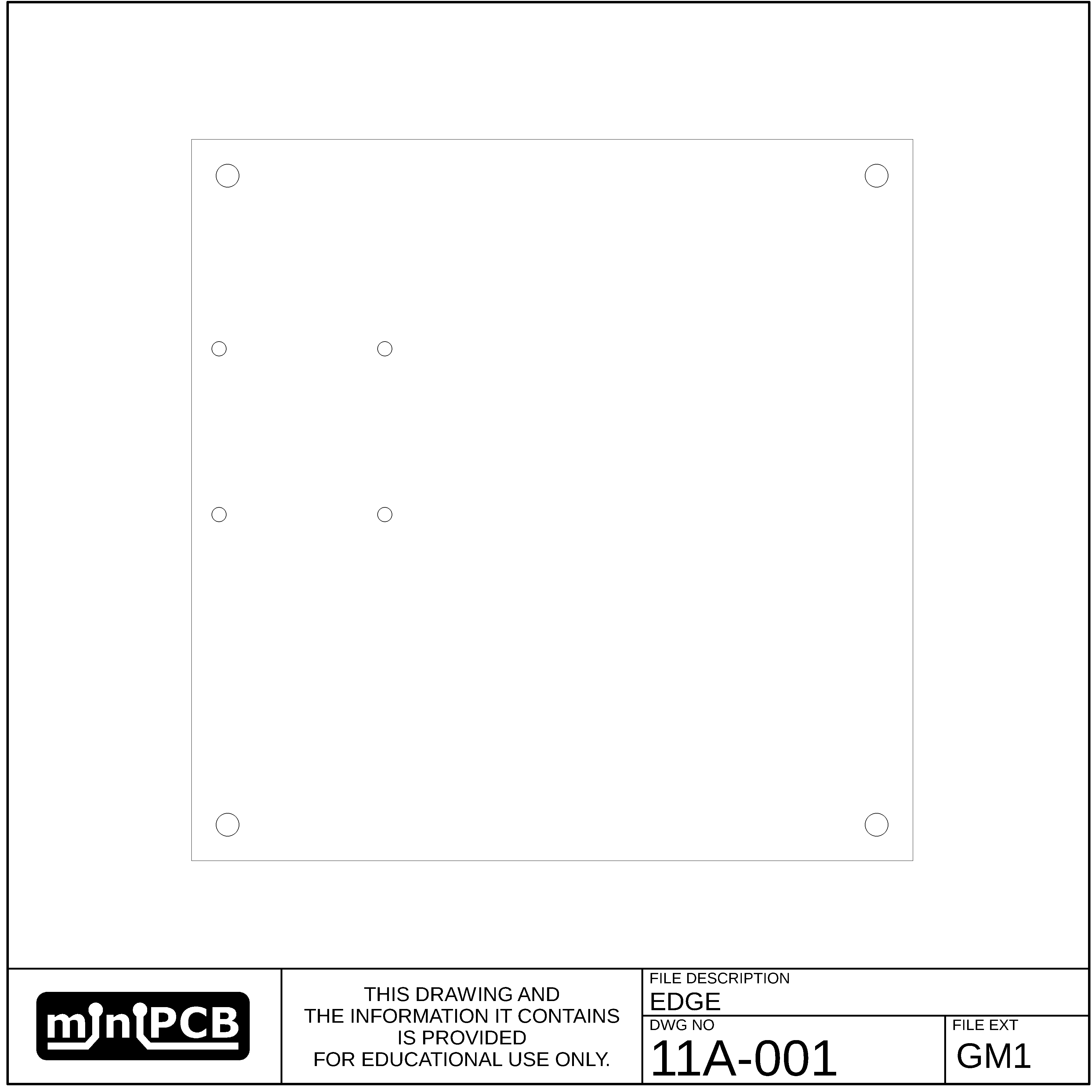
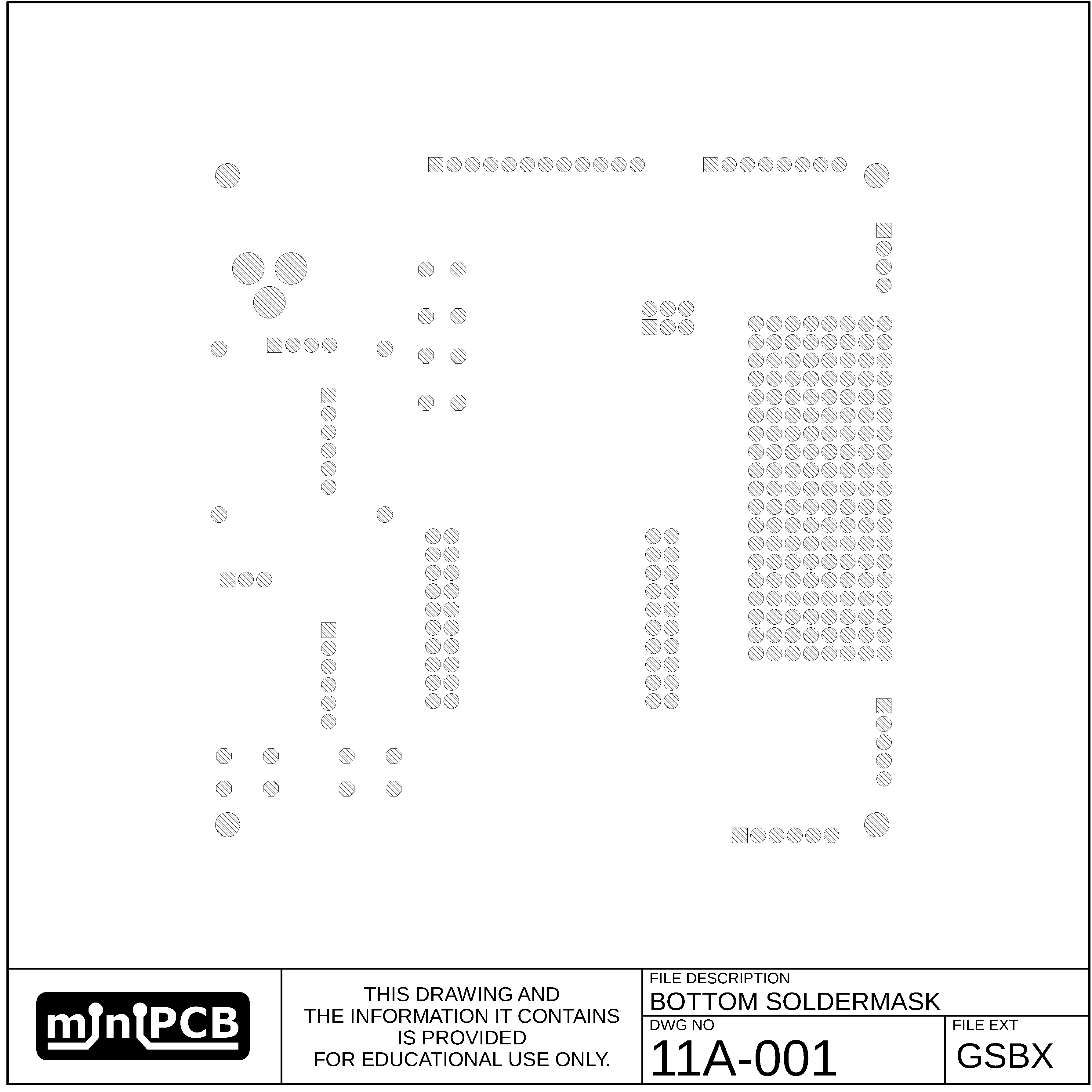
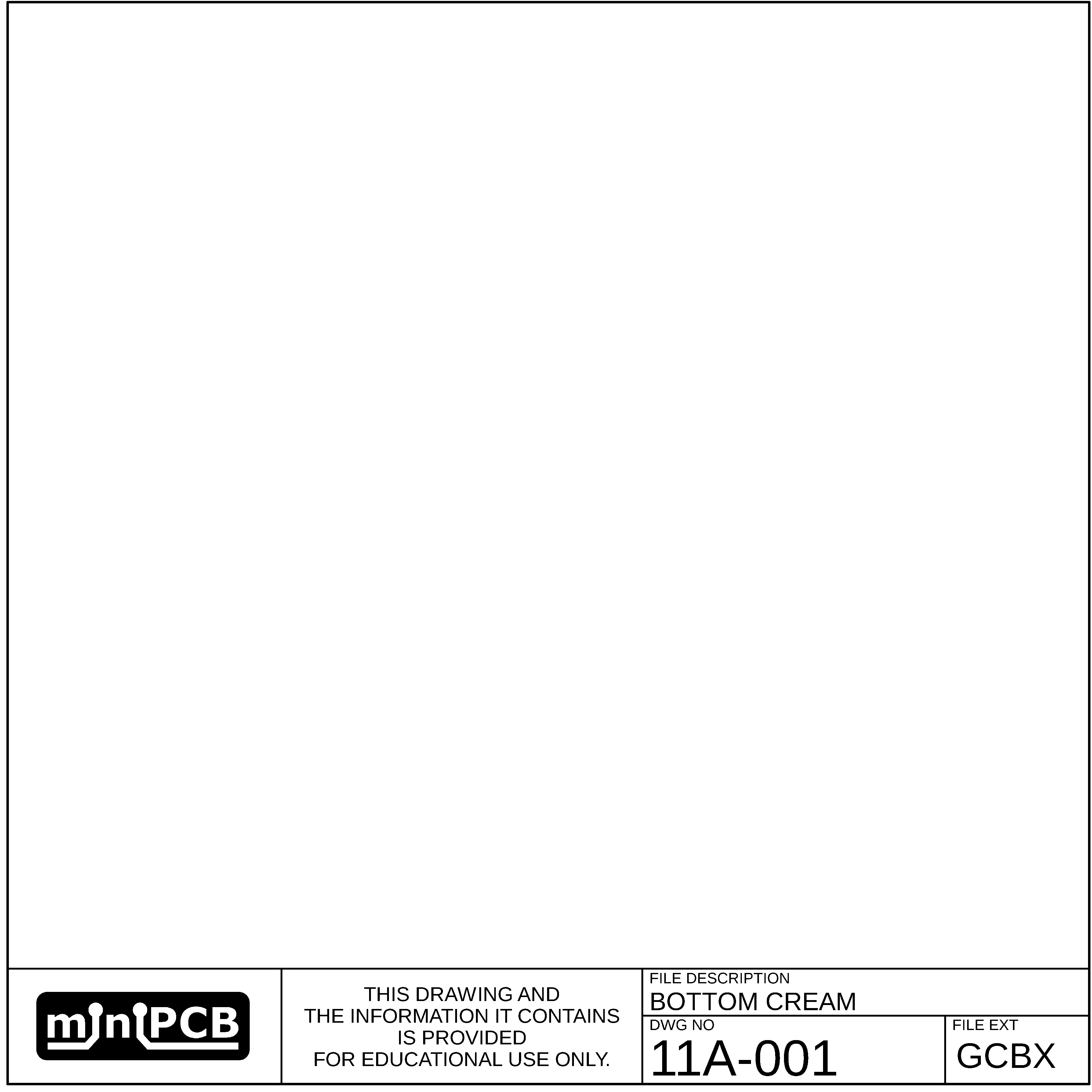
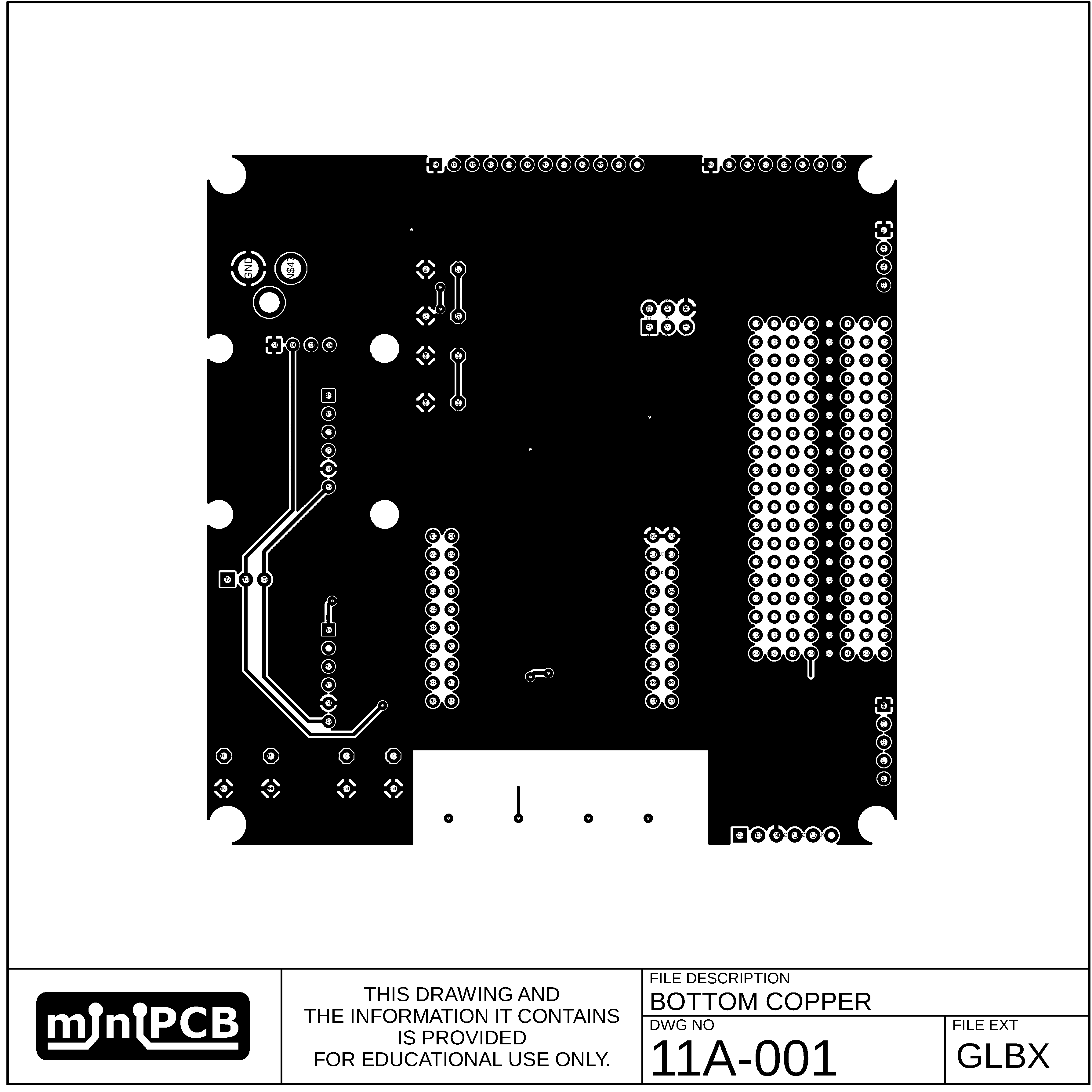
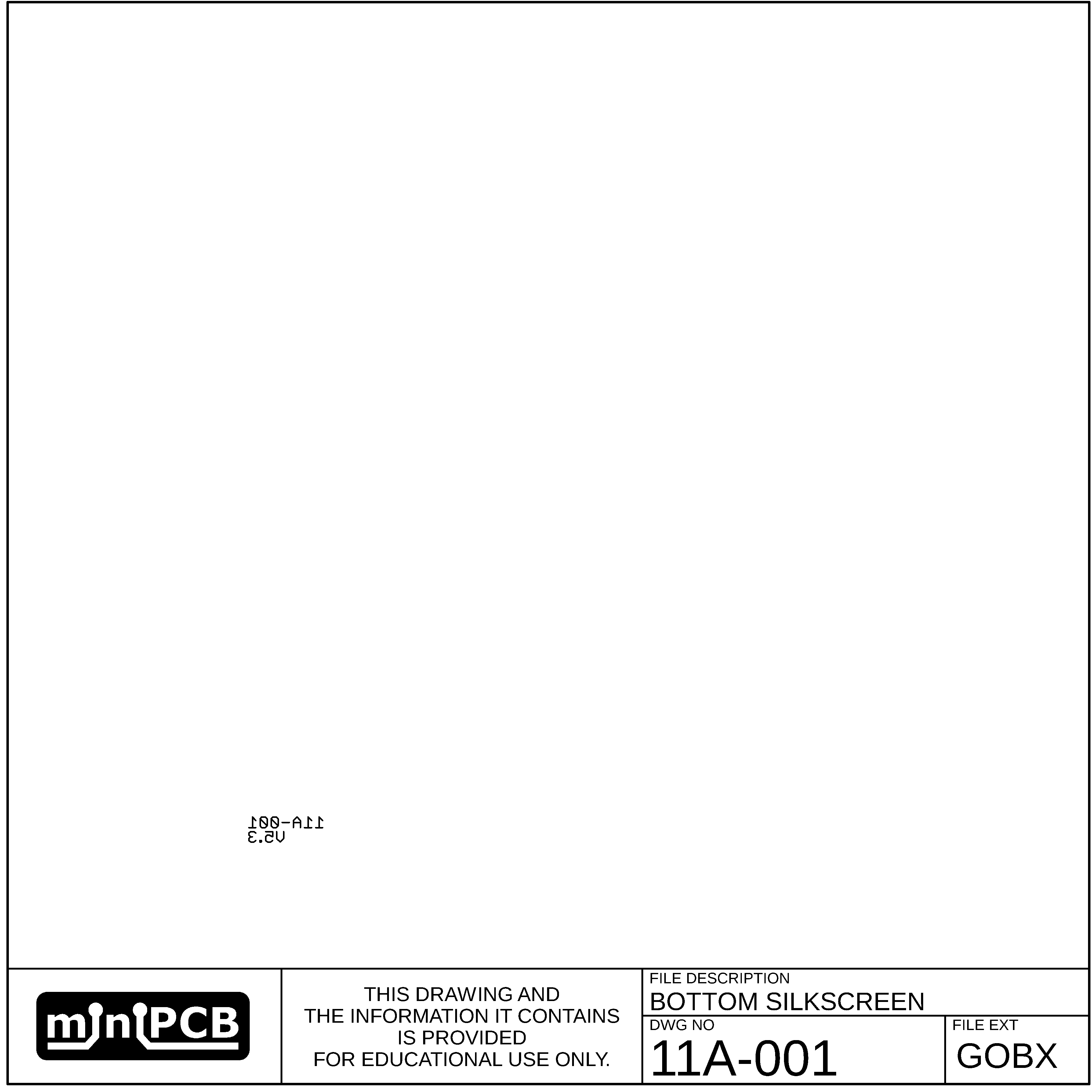
|  |  |
| --- | --- |
| INSERT PICTURES HERE | |
| Description The VIVA board is a hardware platform designed specifically for students and beginners to learn and experiment with microcontroller-based systems. It is equipped with two (2) microcontrollers and comes with various built-in peripherals and features that make it easier for students to start their journey in embedded systems and programming. If the Arduino bootloader is programmed onto the ATmega328, the ATMEL microcontroller is compatible with many Arduino sketches. | |
| Features  * Microcontrollers: 8-bit, RISC   + PIC: PIC16F1829   + ATMEL: ATmega328 * Hello World! LEDs * Programming interfaces: JTAG, and ICSP * Capacitance keypad: UTSA letters * Buttons: reset and interrupt signals * Pin breakouts: 0.1” (2.54 mm) pin headers * Communication bus: I2C * USB-to-UART modules: CP2102 * OLED module: I2C * Prototyping area: 0.1” pitch, plated through holes * VDD selector: 3.3V or 5.0V | Applications  * Learning Embedded Systems * Programming Practice * Experimentation and Prototyping * Understanding Peripherals * Project Building * Debugging and Troubleshooting * Educational Resources * Cross-Platform Compatibility * Preparing for Industry |









# What does ChatGPT say?

By Nolan Manteufel, 26JUL2023

The PIC16F1829 microcontroller is commonly used in a wide range of applications, including embedded systems, home automation, motor control, industrial automation, sensor interfacing, and more. PIC microcontroller popularity stems from their robustness, affordability, and the extensive community support and resources available for programming and development.

The ATmega328 microcontroller is famously known for being used on the Arduino Uno board, one of the most popular microcontroller development boards for hobbyists, students, and professionals. The Arduino ecosystem, along with the ATmega328, has fostered a large community of enthusiasts who have created countless projects and libraries, making it an excellent choice for anyone interested in learning about embedded systems, electronics, and programming. Due to its versatility and wide-ranging support, the ATmega328 is also found in various other custom-designed boards and commercial products.

The PIC16F1829 and ATmega328 are both manufactured by Microchip Technologies. Microchip’s PIC and ATmega microcontroller families are popular for various applications due to their ease of use, low cost, and versatility.

Microchip is a prominent player in the semiconductor industry and is well-known for its PIC microcontrollers and AVR microcontrollers, which are widely used in embedded systems, IoT (Internet of Things) devices, consumer electronics, automotive applications, industrial automation, and more. The company has a strong focus on providing cost-effective and energy-efficient solutions to its customers.

Here are some common uses and benefits of microcontroller student development boards:

**Learning Embedded Systems**: These boards provide an excellent starting point for students to learn about embedded systems and the fundamentals of microcontroller programming. They offer a hands-on experience, allowing students to interact with the hardware directly.

**Programming Practice**: Students can practice programming in the language supported by the microcontroller (e.g., C, C++, or assembly language). They can write code to control the board's peripherals, such as LEDs, sensors, motors, and displays.

**Experimentation and Prototyping**: Development boards are ideal for quickly prototyping and testing ideas. Students can interface the board with various components and sensors to create interactive projects.

**Understanding Peripherals**: The boards typically come with a range of onboard peripherals such as GPIO (General Purpose Input/Output) pins, timers, UART, ADC, PWM, and more. Students can learn how these peripherals work and how to utilize them effectively.

**Project Building**: Students can use the development board as the heart of their own projects, building upon the provided features and adding external components as needed.

**Debugging and Troubleshooting**: The boards often include debugging features like debuggers, built-in LEDs, and UART interfaces, which help students understand and troubleshoot their code and hardware.

**Educational Resources**: Many development boards are supported by extensive educational resources, tutorials, and example projects. These resources can help students grasp complex concepts and provide inspiration for their projects.

**Cross-Platform Compatibility**: Some development boards are designed to be compatible with different programming environments and Integrated Development Environments (IDEs), allowing students to work with the tools they are comfortable with.

**Preparing for Industry**: Familiarity with microcontrollers and development boards is valuable in many engineering fields, such as electronics, robotics, automation, IoT (Internet of Things), and more. Experience with development boards can give students an edge when transitioning to real-world projects and job opportunities.

# 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.

# Trademark Notice

miniPCB is a trademark of Nolan Manteufel.

This datasheet does not constitute permission to use the miniPCB trademark.

|  |  |  |
| --- | --- | --- |
| WORDMARK | FIGUREMARK | FIGUREMARK |
| miniPCB™ | A picture containing drawing  Description automatically generated™ | Icon  Description automatically generated™ |

# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| REV | DESCRIPTION | ECO | DATE |
| A | Initial Release |  |  |
|  |  |  |  |

# Related Content

|  |  |  |  |
| --- | --- | --- | --- |
| # | TYPE | DESCRIPTION | LOCATION |
| 1 | Sale Posting | eBay |  |
| 2 | Sale Posting | Mouser |  |
| 3 | Repository | Engineering Files |  |
| 4 | Repository | Datasheet |  |
| 5 | Video | Development |  |
| 6 | Video | Development |  |
| 7 | Video | Testing |  |
| 8 | Video | Engineering Release |  |

# Student Challenge!

Welcome to the UTSA Student Challenge! You are invited to submit a copy your student report to [nolan@minipcb.com](mailto:nolan@minipcb.com).

The goal is to incorporate feedback from your experience in future versions of this document. We would like to create a collection of popular UTSA student projects. Junior classmates might be inspired to recreate your project, or attempt something more challenging!

# Appendix

|  |  |
| --- | --- |
| **PART NUMBER** | 11A-001 |
| **GROUP NAME** | Computing (11A) |
| **CIRCUIT NAME** | Microcontroller Board |
| **VARIANT DESCRIPTION** | UTSA, PIC16, ATmega328 |
| **BOARD DESIGN** | PCB100 |
| **PRODUCT DESCRIPTION** | This board was developed for electrical engineering classes at the University of Texas at San Antonio and is only available for sale to professors and student organizations. |