

Yahboom MSPM0G3507

Yahboom MSPM0G3507 Core Development Board User Manual

Model: MSPM0G3507
Brand: Yahboom

1. INTRODUCTION

The Yahboom MSPM0G3507 Core Development Board is a versatile microcontroller platform designed for electronic design, robotics, and various embedded projects. It features a built-in 128KB flash memory and 32KB SRAM, supporting the execution of complex applications. This manual provides essential information for setting up, operating, and understanding the board's capabilities.

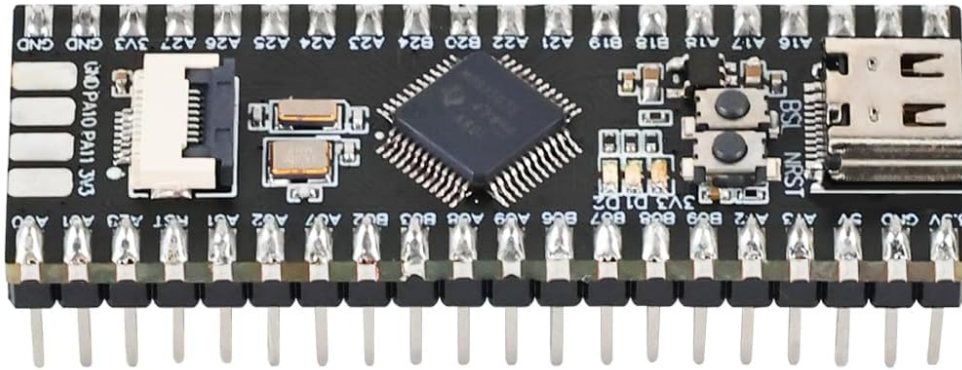
This board supports multiple standard I/O interfaces including GPIO, SPI, UART, and I2C, ensuring compatibility with a wide range of peripheral sensor modules. It also includes onboard reset and custom buttons, along with LED indicators for enhanced user interaction and feedback.

2. PRODUCT FEATURES

- **High Performance:** Equipped with 128KB flash memory and 32KB SRAM to support advanced applications.
- **Versatile I/O:** Features GPIO, SPI, UART, and I2C interfaces for broad compatibility with various sensors and modules.
- **User-Friendly Interaction:** Includes onboard reset, custom buttons, and LED lights for direct control and status indication.
- **Integrated TFT Display Support:** An 8P FPC connector allows for easy connection of a 0.96-inch TFT color display, suitable for displaying text and graphics.
- **Efficient Programming:** A standard Type-C interface with CH340 chip enables convenient, driver-free program writing and downloading.
- **Debugging Capabilities:** A reserved SWD debugging interface supports DP-LINK emulation and online code debugging.
- **Quality Manufacturing:** Constructed using a lead-free tin-spraying PCB process for reliability and environmental compliance.

3. PACKAGE CONTENTS

The standard package for the Yahboom MSPM0G3507 Core Development Board with TFT screen includes the following items:



MSPM0G3507 development board

(Pin headers soldered by default)



0.96-inch TFT
color screen



4Pin double-row pin
(SWD debugging pins needs
to be soldered by yourself)



Type-C
data cable
(30cm)



4Pin
Dupont cable
(Female to female)

MSPM0G3507 development board + TFT color screen

Image: Package contents including the MSPM0G3507 development board, 0.96-inch TFT color screen, 4-pin double-row pin, Type-C data cable, and 4-pin Dupont cable.

- MSPM0G3507 Development Board (pin headers soldered by default)
- 0.96-inch TFT Color Screen
- 4-Pin Double-Row Pin (for SWD debugging, requires self-soldering)
- Type-C Data Cable (30cm)
- 4-Pin Dupont Cable (Female to female)

If you have purchased the version with the MSPM0 robot expansion board, your package will additionally include the MSPM0 robot expansion board and copper column screws, replacing the TFT screen.

4. SETUP GUIDE

4.1 Initial Connection

To begin using your MSPM0G3507 development board, connect it to your computer using the provided Type-C data cable. The board is equipped with a CH340 chip, allowing for driver-free connection for program writing and downloading.

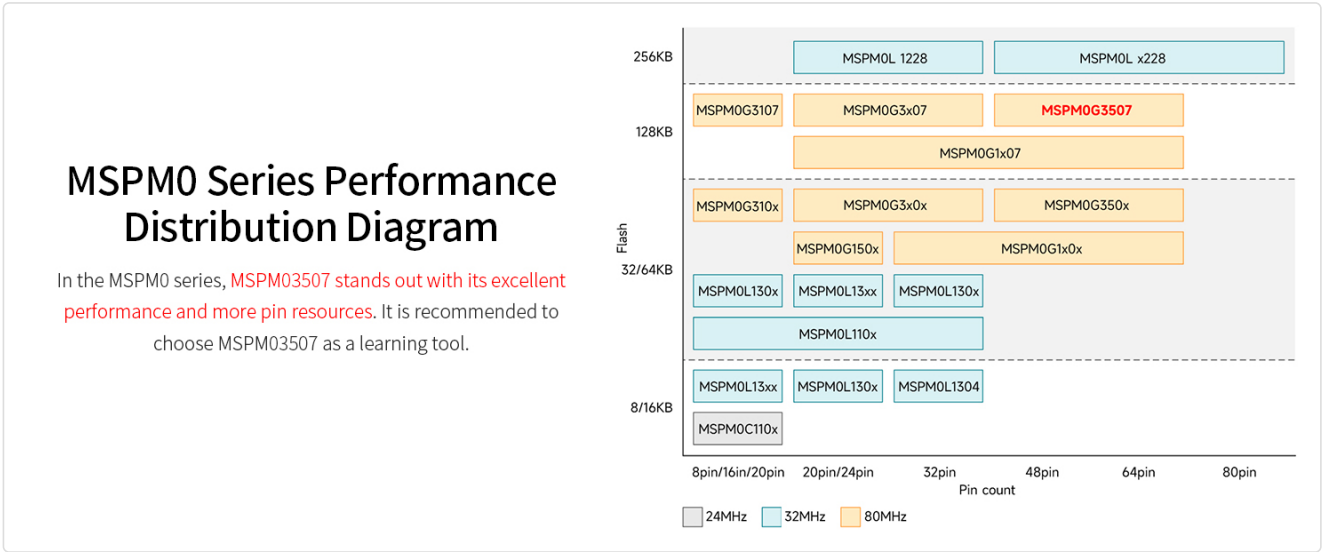


Image: The MSPM0G3507 development board connected to a computer via its multi-function Type-C interface for power, data, and communication.

4.2 Power Supply Methods

The development board can be powered via the Type-C interface, which is convenient for both power and data transfer, or through a dedicated pin power supply for integration into larger systems.

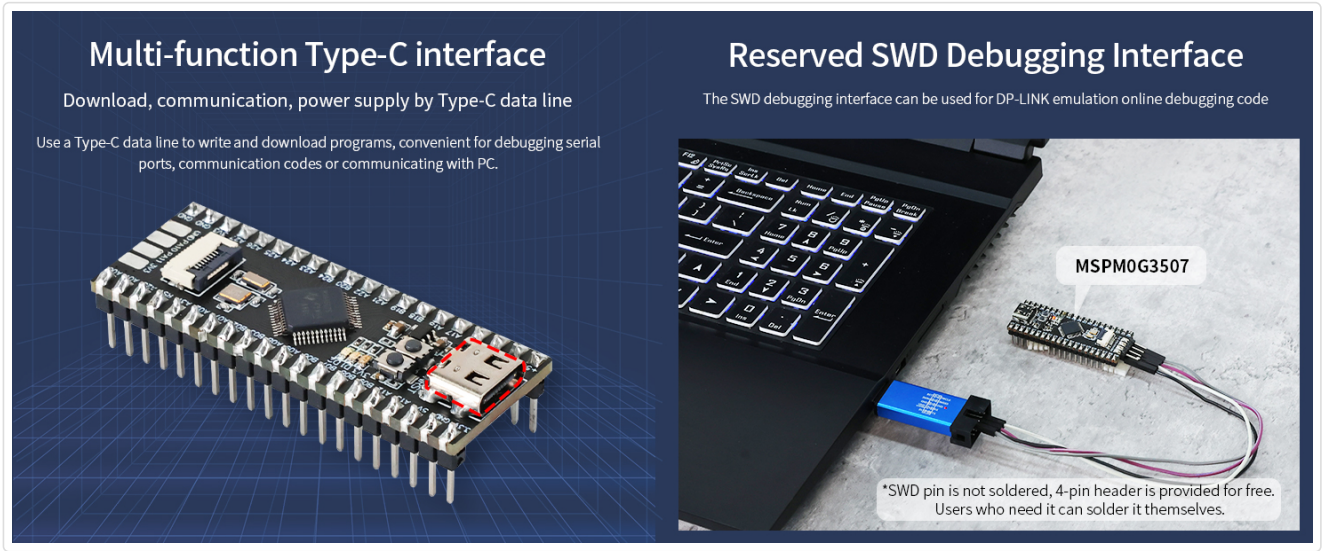
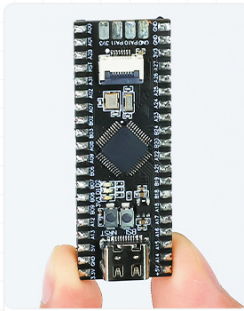


Image: Demonstrates Type-C power supply (left) and pin power supply (right) for the MSPM0G3507 development board.

4.3 Connecting the TFT Screen

If your package includes the 0.96-inch TFT color display, connect it to the onboard 8P FPC connector. Ensure correct orientation. This display can be used to show Chinese characters, strings, and images, providing visual feedback for your projects.

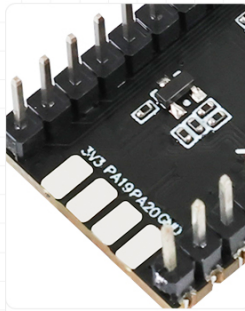
Product Features



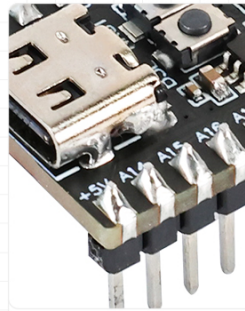
Small size, compatible with breadboard, 40 pins, half-hole process, convenient for welding and connecting modules.



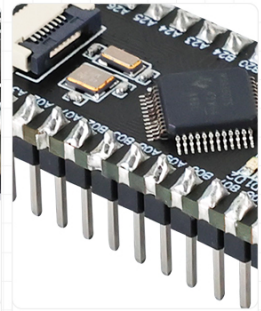
Supports multiple development environments CCS/IAR/KEIL.



Provides multiple peripheral interfaces such as UART, SPI, I2C, and a wide range of GPIO pins.



On board CH340, serial port debugging or writing and downloading can be directly performed via Type-C.



On board custom buttons and LED*2, LCD display interface, 4M external Flash, reserved SWD debugging interface.

Image: The MSPM0G3507 development board with a 0.96-inch TFT color display connected and active, showing a sample message.

4.4 SWD Debugging Interface

The board features a reserved SWD debugging interface. The 4-pin header for SWD debugging is not soldered by default. Users who require this functionality for advanced debugging will need to solder the provided 4-pin double-row pin themselves. This interface is used for DP-LINK emulation and online debugging of code.

On board TFT color display interface

On board 8P FPC connector, supports connection to 0.96-inch TFT color display, which can be used to display Chinese characters, strings, and pictures.

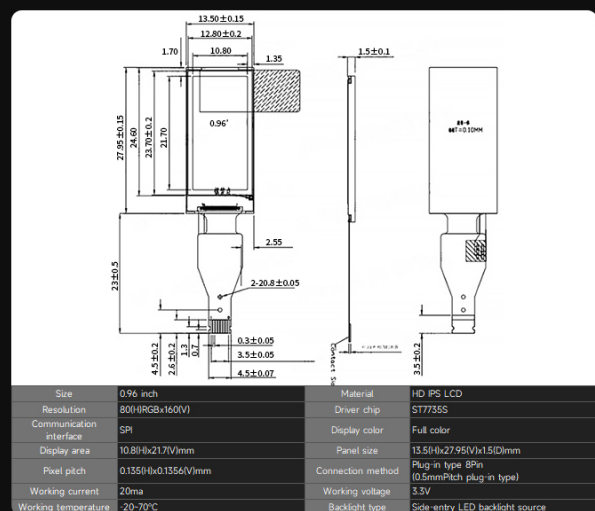
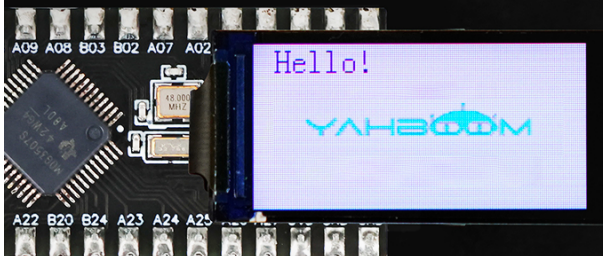


Image: The MSPM0G3507 development board connected to an SWD debugger for code emulation and debugging purposes.

5. OPERATING INSTRUCTIONS

5.1 Programming and Downloading

Connect the development board to your computer via the Type-C cable. Utilize compatible development environments such as Code Composer Studio (CCS), IAR Embedded Workbench, or Keil MDK to write and compile your code. The Type-C interface facilitates convenient and fast program downloading to the board's microcontroller.

5.2 Utilizing I/O Interfaces

The MSPM0G3507 board provides various standard I/O interfaces for connecting external components and sensors:

- **GPIO:** General Purpose Input/Output pins for digital control and sensing.
- **SPI:** Serial Peripheral Interface for high-speed synchronous serial communication with peripherals like sensors

or memory.

- **UART:** Universal Asynchronous Receiver/Transmitter for serial communication with devices like GPS modules or Bluetooth modules.
- **I2C:** Inter-Integrated Circuit for multi-master, multi-slave serial communication with various sensors and EEPROMs.

Refer to the board's pinout diagram for specific pin assignments and functions to ensure correct connections.

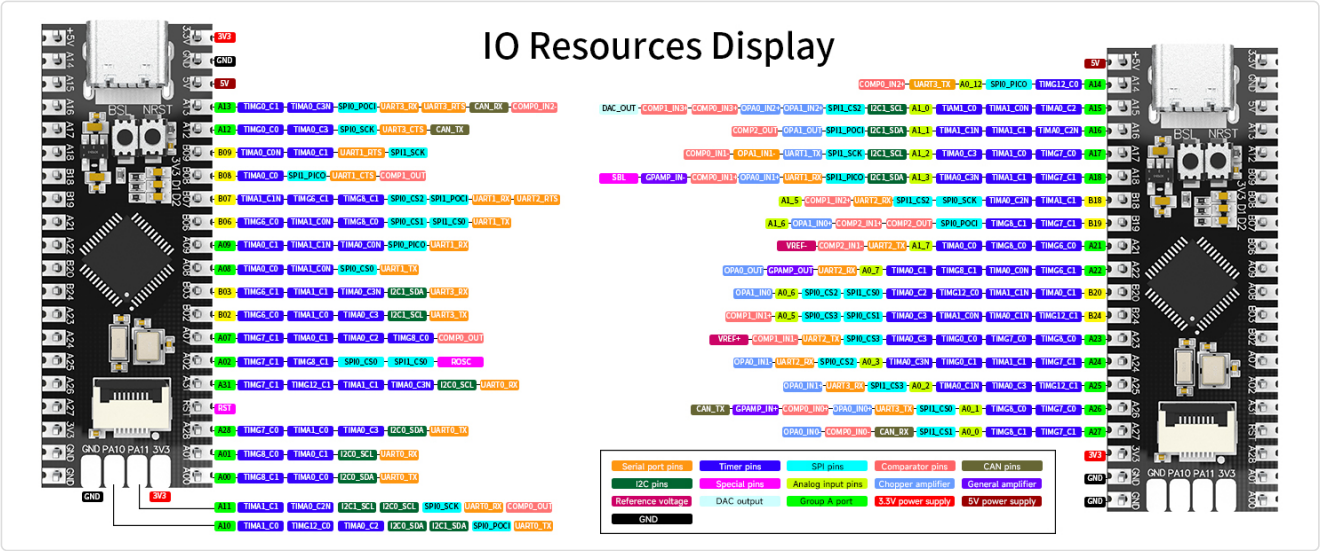


Image: Detailed pinout and IO resource map of the MSPM0G3507 development board, indicating GPIO, SPI, UART, I2C, and other interfaces for connection guidance.

5.3 Onboard Components

The board includes several onboard components for direct interaction and feedback:

- **Reset Button:** Used to restart the microcontroller, typically labeled 'NRST'.
- **Custom Buttons (PB2, PB3):** User-definable buttons that can be programmed for various functions within your application.
- **LED Lights:** Includes a power indicator light and user-defined LEDs (D1, D2) for status feedback and debugging.

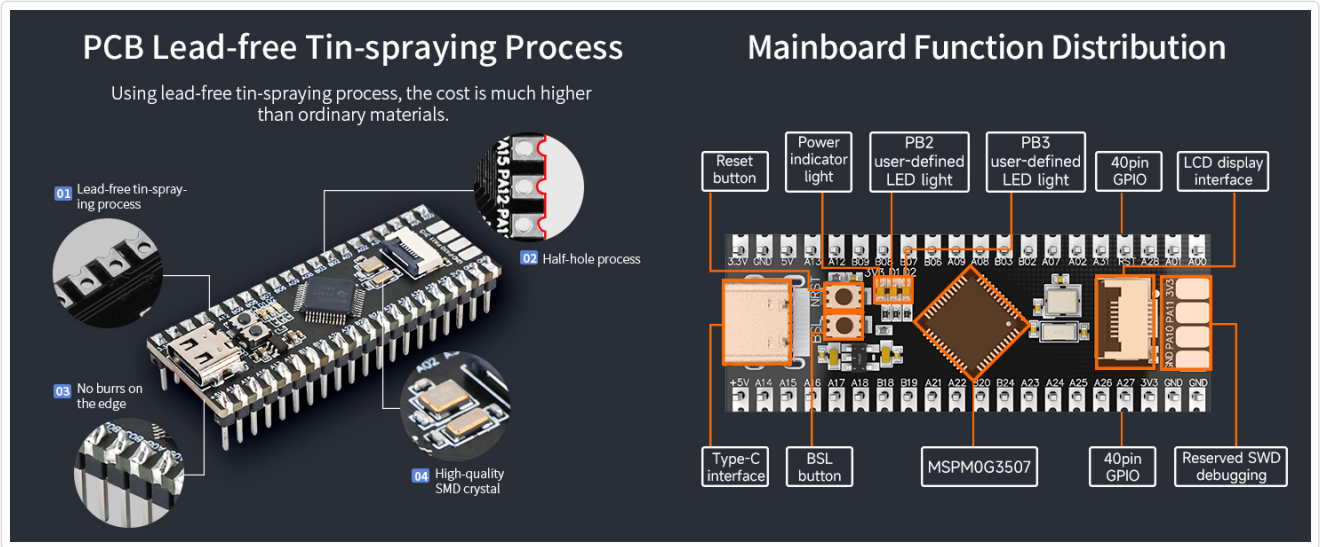


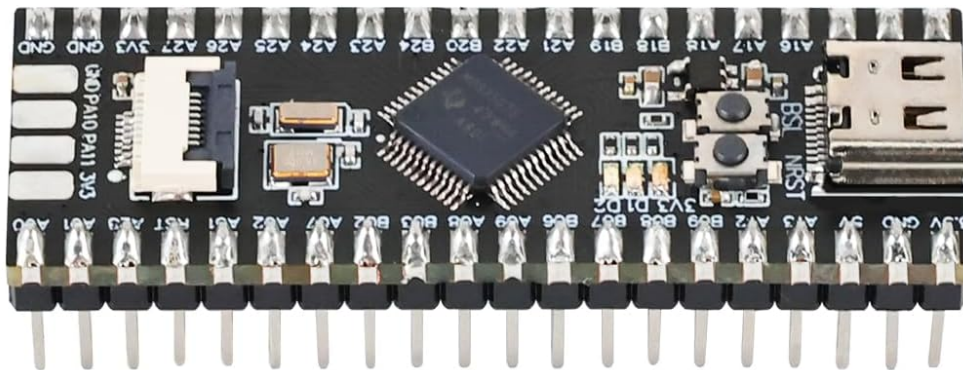
Image: Mainboard function distribution diagram, highlighting the locations of the reset button, power indicator, user-defined LEDs, GPIO pins, LCD display interface, Type-C interface, BSL button, MSPM0G3507 chip, and SWD debugging interface.

6. SPECIFICATIONS

6.1 General Specifications

- **Brand:** Yahboom
- **Model Name:** MSPM0G3507 Development Board
- **Microcontroller:** MSPM0G3507 (Cortex M0 core)
- **Internal Flash:** 128KB
- **SRAM:** 32KB
- **External Flash:** 4MB
- **Main Frequency Clock:** 80MHz
- **Interface Resources:** 2x SPI, 4x UART, 2x I2C, 1x CAN, 32x I/O, 1x DAC
- **ADC:** 2x ADC (12-bit/17-channel)
- **Voltage Range (ADC):** External voltage: 1.62V - 3.6V, Core voltage: 2.5V
- **Power Consumption (Operation):** 8mA/80M
- **Dimensions:** 18.89 x 51.12 mm
- **Weight:** 7g

6.2 TFT Display Specifications (0.96-inch)



MSPM0G3507 development board

(Pin headers soldered by default)



0.96-inch TFT
color screen



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Type-C
data cable
(30cm)



4Pin
Dupont cable
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MSPM0G3507 development board + TFT color screen

Image: Detailed specifications and dimensional drawing for the 0.96-inch TFT color display, including size, resolution, and interface type.

- **Size:** 0.96 inch
- **Resolution:** 80(RGB)x160(V)
- **Communication Interface:** SPI
- **Display Area:** 10.8(H)x21.7(V)mm
- **Pixel Pitch:** 0.135(H)x0.1356(V)mm
- **Working Current:** 20mA
- **Working Temperature:** -20~70°C
- **Material:** HD IPS LCD
- **Driver Chip:** ST7735S
- **Panel Size:** 13.5(H)x27.95(V)x1.5(D)mm
- **Connection Method:** Plug-in type 8Pin (0.5mm pitch plug-in type)
- **Working Voltage:** 3.3V
- **Backlight Type:** Side-entry LED backlight source

6.3 PCB Manufacturing Process

The development board's PCB is manufactured using advanced techniques to ensure durability and performance.

Product model	MSPM0G3507 	STM32F103C8T6 	STM32F103RCT6 
Kernel	Cortex M0		Cortex M3
Number of pin packages	48		64
Interface resources	2 x SPI, 4 x UART, 2 x I2C, 1 x CAN, 32 x I/O, 1 x DAC		2 x SPI, 3 x USART, 2 x I2C, 2 x I2S, 1 x CAN, 51 x I/O, 2 x DAC
Timer	7		8
ADC	2 x ADC(12 bit/17 channel)		3 x ADC(12 bit/16 channel)
SRAM	32K		48K
Internal FLASH	128k		256K
External FLASH	4M		8M
Pin package	LQFP48		LQFP64
Compilation Tools	KEIL MDK, CCS		KEIL MDK, STM32CubeMX
Voltage range (ADC)	External voltage: 1.62V - 3.6V, Core voltage: 2.5V		External voltage: 2.0-3.6V, Core voltage: 1.8V
BOOT0 pin	No boot0 pin		When the Flash program is running, BOOT0 can be left floating
Main frequency clock	80MHz		72MHz
Power consumption	Sleep mode: 2.76mA/80MHz, Standby mode: 1.5uA Operation power consumption: 8mA/80M		Sleep mode: 7.5mA, Standby mode: 3.4uA Operation power consumption: 52mA/72M
Program download	SWD or serial port one-key download		
6-axis IMU	None		On board 6-axis IMU
LED	Red power indicator, custom LED light*2	Power red indicator, PC13 user-defined blue LED light	Power red indicator, PB4 user-defined blue LED light, 3-color RGB light
Button	Reset button, custom button	BOOT0 button, reset button	BOOT0 button, reset button, KEY1 button
Interface	SWD debugging interface, typeC interface, LCD display interface		
Size	18.89*51.12mm	18*51mm	35*55mm
Weight	7g	6.7g	11.8g

Image: Visual representation of the PCB manufacturing process, highlighting lead-free tin-spraying, half-hole process, absence of burrs on edges, and high-quality SMD crystals.

- **Process:** Lead-free tin-spraying process for environmental safety and improved solderability.
- **Edge Finish:** Precision manufacturing ensures no burrs on the edges.
- **Components:** Utilizes high-quality SMD crystals for stable clock generation.

7. SUPPORT AND RESOURCES

Yahboom provides comprehensive open-source development materials and technical support for the MSPM0G3507 Core Development Board. These resources include source code, schematics, and detailed tutorials to assist with your projects and learning.



Image: A visual representation of the online resources available, including development environment guides, basic case studies, and module-specific information, accessible via the Yahboom website.

For detailed documentation, example code, and community support, please visit the official Yahboom website or the dedicated product repository. Contact information for technical support can typically be found on the official website.

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Question

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Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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