

# PIC32 Graphics Solutions

Use the Power of PIC32 MCUs to Add Graphics to Your Design

Microchip provides several visual design tools to help you with the development of graphics firmware. These GUI-based tools reduce the need to memorize graphics object information, improve the edits-compile-execute cycle and allow developers to work in the same space as users.



## MPLAB® Harmony Aria Graphics Library

The MPLAB Harmony Graphics Library is a free, modular library optimized for Microchip 32-bit microcontrollers. The library includes features such as alpha blending, gradient fills and anti-aliased fonts. Applications can take advantage of these features to enhance the user experience while delivering performance required by the application. The Graphics Library features:

- Up to 24-bit or 16.7M Colors
- Parent-child tree system allows for modular assembly of advanced GUI design
- Modern input widgets such as buttons, panels, list wheel, radio buttons or sliders
- Run-length encoding image compression and basic procedural motion
- Capacitive and resistive touch screen, keypad
- World-class multi-lingual localization system

## SEGGER emWin Pro Library

emWin from SEGGER Microcontroller GmbH and Co. KG is a software graphics library that provides efficient GUI building blocks for applications that operate with a graphical LCD.

- Completely replaces the object library and primitive layer of Microchip Graphics Library
- Robust graphics widget and shape drawing library
- Use SEGGER development tool chain and utilities
- RTOS independent

## MPLAB Harmony Graphics Composer (MHGC) Suite

The MPLAB Harmony Graphics Composer is a graphical user interface design tool that is integrated as part of the MPLAB Harmony Configurator (MHC). This tool allows you to easily configure and visually design for the MPLAB Harmony Aria Graphics Library. The MPLAB Harmony Graphics Composer Suite features:

- What You See Is What You Get (WYSIWYG) design
- Integrated display manager tool for automated display driver generation
- Integrated asset management system
- Multi-platform (Windows®, Linux® and Mac OS® operating systems)
- Enhanced design tools
  - Drawing grids, auto widget alignment and other drawing shortcuts/productivity features
  - Comprehensive asset management system to maximize performance with optimized resource utilization

MHGC is fully integrated into MHC which is available as an MPLAB X IDE plug-in.

## PIC32MZ DA with Integrated Graphics Controller and Graphics Processor

The PIC32MZ “DA” series, with its integrated graphics controller, graphics processor and available on-chip 32 MB of DDR2 DRAM, lifts Graphical User Interface (GUI) designs to performance and quality levels not yet seen in embedded microcontroller applications. The PIC32MZ DA series provides microprocessor-like graphics quality with the ease of design of an MCU. Additionally, with MPLAB Harmony Graphics 2.0, you can finish and display your GUI design faster than you’d ever thought possible.

- 3-Layer Graphics Controller capable of driving 24-bit color SXGA
- High-performance 2D Graphics Processing Unit (GPU)
- 32 MB integrated DDR2 DRAM or 128 MB externally addressable
- Up to 2 MB Flash and 640 KB RAM
- 12-bit ADC Throughput at 18 Msps
- Full-featured hardware crypto engine with Random Number Generator (RNG) for data encryption/decryption and authentication

## Multimedia Expansion Board II (MEB II)



Multimedia Expansion Board II  
(DM320005-5)

The Multimedia Expansion Board II (MEB II) is a highly integrated, compact and flexible development platform which works with PIC32MZ Starter Kit. The MEB II kit features a 4.3" WQVGA PCAP touch display daughter board. The kit also has an on-board 24-bit stereo audio codec, VGA camera, 802.11 b/g wireless module, Bluetooth® HCI transceiver, temperature sensor, microSD™ slot and analog accelerometer.

Suggested Development Tool Kits	Part Number
Multimedia Expansion Board II	DM320005-5
PIC32MZ with FPU Embedded Connectivity Starter Kit	DM320007 or DM320007-C
PIC32MZ integrated graphics with stacked DRAM (DA) Starter Kits	DM320010 or DM320010-C
PIC32MZ integrated graphics with external DRAM (DA) Starter Kits	DM320008 or DM320008-C
PIC32 GUI Development Board with PCAP Touch	DM320015

## Low-Cost Controllerless Graphics (LCCG)

Microchip’s PIC32 microcontrollers offer up to 2 MB Flash, up to 512 KB RAM, up to 330 DMIPS and high-performance DMA to render graphics directly to displays. All of Microchip’s PIC32 MCUs include a Parallel Master Port (PMP) which is used to connect external SRAM and LCD. This enables PIC32 devices to drive a display without an external graphics controller.

- Uses <5 MIPS and DMA to render graphics
- Direct interface to STN, TFT displays
- Integrated up to 512 KB RAM for frame buffering

Suggested Development Tool Kits	Part Number
Multimedia Expansion Board II	DM320005-5
PIC32MZ with FPU Embedded Connectivity Starter Kit	DM320007, DM320007-C
PIC32MZ Integrated Graphics with External DRAM (DA) Starter Kits	DM320008, DM320008-C
PIC32MZ Integrated Graphics with Stacked DRAM (DA) Starter Kits	DM320010, DM320010-C
PIC32 GUI Development Board with PCAP Touch	DM320015
LCCG PICtail™ Plus Board	AC164144
PIC32 USB Starter Kit II	DM320003-2
WQVGA LCD or VGA LCD*	AC164127-6, AC164127-8
PIC32MZ Embedded Connectivity Adaptor Board	AC320006

\*Can only be driven by DM320007/7-C for an LCCG setup

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