

Apollo4 Plus Display Kit

Product Brief

The Apollo4 Plus is the latest addition to Ambiq's portfolio of power efficient processors engineered for battery-powered endpoint devices. An integrated GPU and display controller supports vector graphics, anti-aliasing, four layers of alpha blending, and dithering. Operating at up to 192 MHz and with 4.75 MB of combined memory, developers can differentiate their products with bigger and richer display user interfaces without sacrificing battery life.

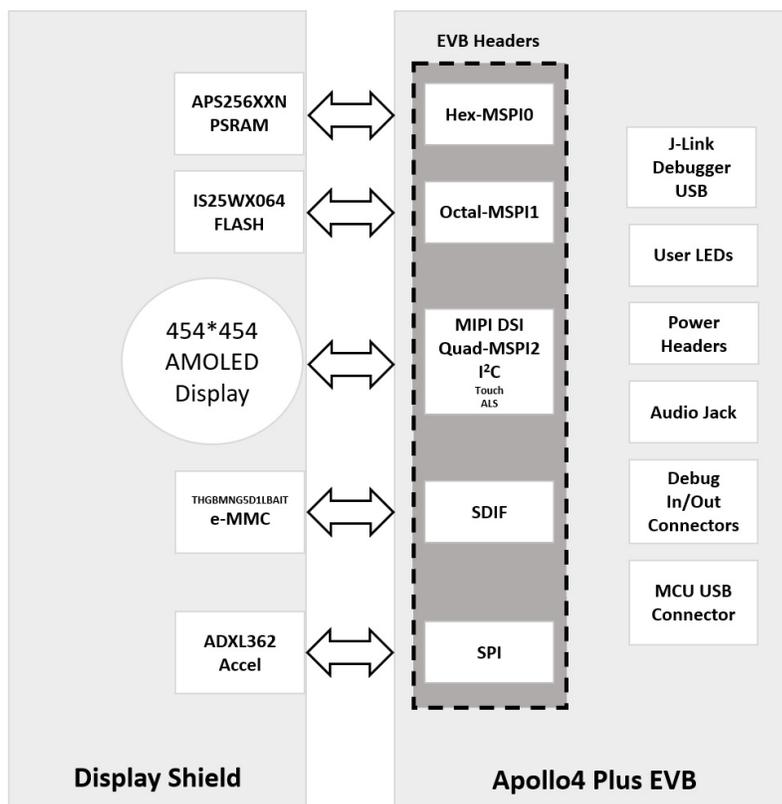
The Apollo4 Plus display kit includes an Apollo4 Plus EVB baseboard and Apollo4 Plus display shield that includes an AMOLED 454x454 display with a MIPI DSI interface. Use I²C for touch capability on the display. The kit also contains a Hex-MSPI interface for fast access to external PSRAM.



Apollo4 Plus Display Kit

Feature Highlights:

- Fully programmable engine with a very long instructions word (VLIW) instruction set
- Command list based direct memory accesses (DMAs) to minimize CPU overhead
- 4:1, 4:1 with alpha and 6:1 Compression
- 2D drawing:
 - Pixel/line drawing
 - Filled rectangles
 - Triangles (Gouraud shaded)
- Blit support for rotation, mirroring, stretch, source and/or destination color keying, and format conversions
- Color formats: 32/16/8-bit with/out alpha, Grayscale, RGB
- Full alpha blending with programmable blending modes
- Image transformation
 - Anti-aliasing, dithering, and vector graphics
 - MSPI with HexSPI high throughput interface to PSRAM
 - MIPI DSI interface
 - 3D perspective correct projections
 - Texture mapping
- OS support
 - FreeRTOS support
 - No OS (BareMetal)



Apollo4 Plus Display Kit System Diagram

Features and Specifications

High-Performance Arm Cortex-M4 with FPU Processor

- Up to 192 MHz frequency operation

Ultra-low Power Memory

- 2MB of embedded non-volatile memory
- 2.75MB of low power RAM
- 64KB 2-way Associative/Direct-Mapped Cache

Display

- MIPI DSI 1.2 with 2 data lanes up to 500 Mbps
- 4 layers with alpha blending
- Frame buffer decompression
- 454x454 screen size:
 - Dual TSC6 frame buffers in SSRAM, assets TSC-compressed in PSRAM, DSI interface targeting 60fps

Graphics

- 2D/2.5D graphics accelerator
- Rasterizer
- Full alpha blending
- Texture mapping
- Texture and frame buffer compression
- Anti-Aliasing
- Dithering
- Vector Graphics

Hardware Display Shield

- 1.4" 454x454 Pixel MIPI/SPI/QSPI AMOLED display
- Display laminated ambient light sensor – TSL2540
- Display laminated capacitive touch sensor – TMA525C
- 256Mb Hex-SPI double-data-rate (DDR) enabled PSRAM – APS256XXN
- 64Mb Octal-SPI DDR enabled flash memory – IS25WX064
- 4GB x1/x4/x8 e-MMC module – THGBMNG5D1LBAIT
- 3-Axis MEMS accelerometer – ADXL362

Apollo4 Plus AMAP4PEVB Evaluation Board

- USB Type C connector for power/download/debug
- USB Type C connector for power/data to Apollo4 Plus
- Segger J-Link debugger
- Debugger-in port (SWD or ETM)
- Debugger-out port with connection-indication LED
- Three user-controlled LEDs
- Two push buttons for application use, plus a reset push button
- Power slide switch with LED power indicator
- 3.5mm audio jack (SJ-435107) for evaluating low power analog audio interface

Software

- Ambiq
 - AmbiqSuite SDK
 - Multiple display examples
- NemaGFX API

Applications

- Smart watches/bands
- Smart home appliances
- Automation/industrial applications
- Activity and fitness monitors
- Consumer medical devices

Ordering Information

- AMAP4PDISP

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