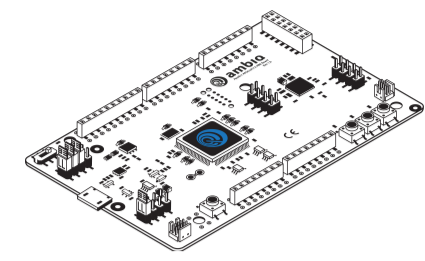
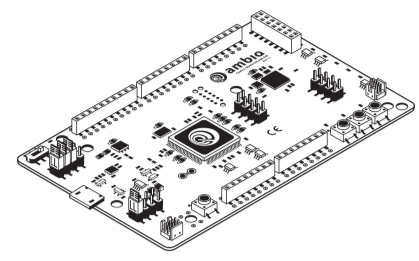


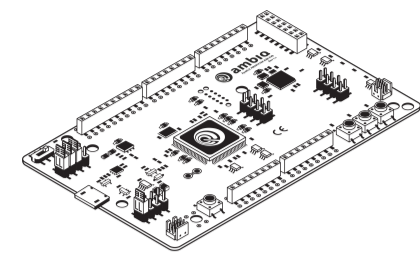
# MCU and SoC Products Overview



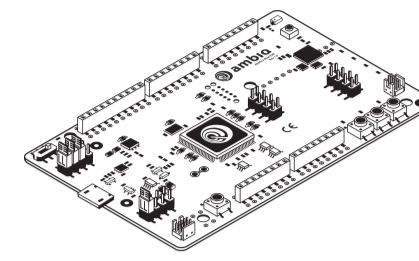
Apollo



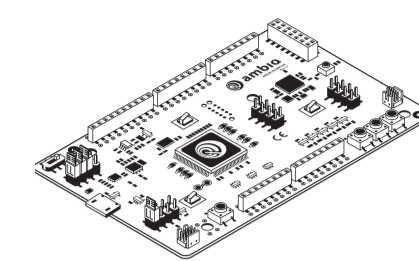
Apollo2



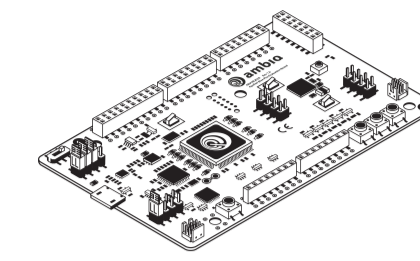
Apollo4



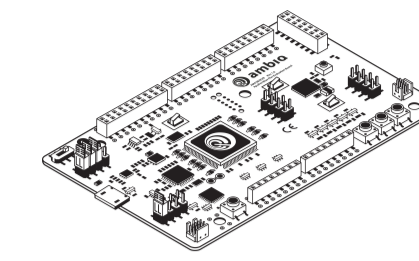
Apollo2 Blue



Apollo3 Blue



Apollo3 Blue Plus



Apollo4 Blue

|                      | Apollo   | Apollo2   | Apollo4   | Apollo2 Blue   | Apollo3 Blue   | Apollo3 Blue Plus  | Apollo4 Blue   |
|----------------------|--|---|---|--|--|--|--|
| MCU Frequency        | 24 MHz   | 48 MHz  | 96 MHz<br>192 MHz TurboSPOT   | 48 MHz   | 48 MHz<br>96 MHz TurboSPOT   | 48 MHz<br>96 MHz TurboSPOT   | 96 MHz<br>192 MHz TurboSPOT  |
| MCU                  | 32-bit Arm Cortex-M4F  | 32-bit Arm Cortex-M4F   | 32-bit Arm Cortex-M4F, DMA  | 32-bit Arm Cortex-M4F<br>Dedicated BLE Core  | 32-bit Arm Cortex-M4F, DMA,<br>Arm Cortex-M0 for BLE   | 32-bit Arm Cortex-M4F, DMA,<br>Arm Cortex-M0 for BLE   | 32-bit Arm Cortex-M4F, DMA,<br>Arm Cortex-M0 for BLE   |
| MCU Power Efficiency | 34 $\mu$ A/MHz   | 10 $\mu$ A/MHz<br>< 3 $\mu$ A Deep Sleep Mode   | < 3 $\mu$ A/MHz   | 10 $\mu$ A/MHz<br>< 3 $\mu$ A Deep Sleep Mode  | < 6 $\mu$ A/MHz<br>< 1 $\mu$ A Deep Sleep Mode   | < 6 $\mu$ A/MHz<br>< 1 $\mu$ A Deep Sleep Mode   | < 3 $\mu$ A/MHz  |
| NVM                  | 512KB Flash  | 1MB Flash   | 2MB MRAM  | 1MB Flash  | 1MB Flash  | 2MB Flash  | 2MB MRAM   |
| SRAM                 | 64KB   | 256KB   | 1.8MB   | 256KB  | 384KB  | 768KB  | 1.8MB  |
| Voltage              | 2.2-3.8 V  | 1.755-3.63 V  | 1.71-2.2 V  | 1.755-3.63 V   | 1.755-3.63 V   | 1.755-3.63 V   | 1.71-2.2 V   |
| ADC                  | 10-bit, 13-channel,<br>up to 800 kSps Sampling Rate ADC  | 14-bit, 15-channel,<br>up to 2.67 MS/s Sampling Rate ADC  | 12-bit, 11-channel,<br>up to 2.8 MS/s Sampling Rate ADC   | 14-bit, 15-channel,<br>up to 2.67 MS/s Sampling Rate ADC   | 14-bit, 15-channel,<br>up to 2.67 MS/s Sampling Rate ADC   | 14-bit, 15-channel,<br>up to 2.67 MS/s Sampling Rate ADC   | 12-bit, 11-channel,<br>up to 2.8 MS/s Sampling Rate ADC  |
| UART                 | 1  | 2   | 4   | 2  | 2  | 2  | 4  |
| I/O                  | I <sup>2</sup> C/SPI master (2x)<br>I <sup>2</sup> C/SPI slave   | I <sup>2</sup> C/SPI master (6x)<br>I <sup>2</sup> C/SPI slave  | I <sup>2</sup> C/SPI master (8x)<br>I <sup>2</sup> C/SPI slave<br>USB FS/HS<br>SDIO v3.0/1x eMMC  | I <sup>2</sup> C/SPI master (4x)<br>I <sup>2</sup> C/SPI slave                                       | I <sup>2</sup> C/SPI master (6x)<br>I <sup>2</sup> C/SPI slave   | I <sup>2</sup> C/SPI master (6x)<br>I <sup>2</sup> C/SPI slave                                       | I <sup>2</sup> C/SPI master (7x)<br>I <sup>2</sup> C/SPI slave<br>USB FS/HS<br>SDIO v3.0/1x eMMC |
| MSPI                 | -  | -   | Dual/Quad/Octal-SPI Master (3x)<br>96 MHz SDR<br>48 MHz DDR   | -  | Dual/Quad/Octal-SPI Master<br>48 MHz SDR<br>ISO7816 Master   | Dual/Quad/Octal-SPI Master (3x) 48 MHz SDR<br>ISO7816 Master   | Dual/Quad/Octal-SPI Master (3x)<br>96 MHz SDR<br>48 MHz DDR                                      |
| I <sup>2</sup> S     | -  | I <sup>2</sup> S slave for PDM<br>Audio Pass-through  | I <sup>2</sup> S master/slave (2x)<br>full-duplex with ASRC   | I <sup>2</sup> S slave for PDM<br>Audio Pass-through   | I <sup>2</sup> S slave for PDM<br>Audio Pass-through   | I <sup>2</sup> S slave for PDM<br>Audio Pass-through   | I <sup>2</sup> S master/slave (2x)<br>full-duplex with ASRC                                      |
| Audio                | -  | Dual Interface PDM for Mono and Stereo<br>Audio Microphones   | 4x Stereo Digital Microphones<br>2x LP Analog Microphone with PGA   | Dual Interface PDM for Mono and Stereo<br>Audio Microphones  | Dual Interface PDM for Mono and Stereo<br>Audio Microphones  | Dual Interface PDM for Mono and Stereo<br>Audio Microphones  | 4x Stereo Digital Microphones<br>2x LP Analog Microphone with PGA                                |
| Display              | -  | -   | SPI 3-wire/4-wire<br>Dual/QuadSPI/MIPI DSI x2<br>4-layer Display Controller   | -  | SPI 3-wire/4-wire  | SPI 3-wire/4-wire<br>Dual/QuadSPI  | SPI 3-wire/4-wire<br>Dual/QuadSPI<br>MIPI DSI x2<br>4-layer Display Controller                   |
| Graphics             | -  | -   | 2D/2.5D GPU   | -  | -  | -  | 2D/2.5D GPU  |
| Security             | -  | -   | SecureSPOT 2.0  | AES 128-bit Encryption   | SecureSPOT   | SecureSPOT   | SecureSPOT 2.0   |
| Connectivity         | -  | -   | -   | BLE 5  | BLE 5  | BLE 5  | BLE 5  |
| RF Sensitivity       | -  | -   | -   | -95 dBm  | -94 dBm  | -94 dBm  | -97 dBm  |
| Rx Current           | -  | -   | -   | 3.5 mA   | 3 mA   | 3 mA   | 3 mA   |
| Tx Current           | -  | -   | -   | 5 mA @ 0 dBm   | 3 mA @ 0 dBm   | 3 mA @ 0 dBm   | 3 mA @ 0 dBm   |
| Tx Output Power      | -  | -   | -20 dBm to +6.8 dBm   | -40 dBm to +5 dBm  | -20 dBm to +4 dBm  | -20 dBm to +4 dBm  | -20 dBm to +6.8 dBm  |
| Packages             | <ul style="list-style-type: none"> <li>4.5 mm x 4.5 mm, 64-pin BGA with 50 GPIO</li> <li>2.49 mm x 2.90 mm, 41-pin WLCSP with 27 GPIO</li> </ul> | <ul style="list-style-type: none"> <li>4.5 mm x 4.5 mm, 64-pin BGA with 50 GPIO</li> <li>2.5 mm x 2.5 mm, 49-pin WLCSP with 34 GPIO</li> <li>2.5 mm x 2.5 mm, 49-pin WLCSP with 300um with backside coating (Thin)</li> </ul> | <ul style="list-style-type: none"> <li>5 mm x 5 mm, 146-pin BGA with 105 GPIO</li> <li>3.9 mm x 3.9 mm, 121-pin WLCSP with 82 GPIO</li> </ul> | <ul style="list-style-type: none"> <li>4 mm x 4 mm x 0.9mm, 64-pin LGA with up to 31 GPIO</li> </ul> | <ul style="list-style-type: none"> <li>4.5 mm x 4.5 mm, 81-pin BGA with 50 GPIO</li> <li>3.25 mm x 3.37 mm, 66-pin WLCSP with 37 GPIO</li> <li>3.25 mm x 3.37 mm, 66-pin WLCSP 300um with backside coating (Thin)</li> </ul> | <ul style="list-style-type: none"> <li>5.3 mm x 5.3 mm x 0.8 mm, 108-pin BGA with 74 GPIO</li> </ul> | <ul style="list-style-type: none"> <li>4.7 mm x 4.7 mm, 131-pin SiP BGA with 81 GPIO</li> </ul>  |
| Ordering Information | <ul style="list-style-type: none"> <li>APOLLO512-KBR (BGA)</li> <li>APOLLO512-KCR (WLCSP)</li> <li>AMAP1EVb (EVb)</li> </ul>                     | <ul style="list-style-type: none"> <li>AMAPH1KK-KBR (BGA)</li> <li>AMAPH1KK-KCR (WLCSP)</li> <li>AMAPH1KK-KCR-TB (Thin)</li> <li>AMAPHEVB (EVb)</li> </ul>  | <ul style="list-style-type: none"> <li>AMAP42KK-KBR (BGA)</li> <li>AMAP42KK-KCR (WLCSP)</li> </ul>  | <ul style="list-style-type: none"> <li>AMA2B1KK-KLR</li> <li>AMA2BEVB (EVb)</li> </ul>               | <ul style="list-style-type: none"> <li>AMA3B1KK-KBR-B0 (BGA)</li> <li>AMA3B1KK-KCR-B0 (WLCSP)</li> <li>AMAP31KK-KCR (WLCSP, non-BLE)</li> <li>AMA3B1KK-KCR-TB (Thin)</li> <li>AMA3BEVB (EVb)</li> </ul>                      | <ul style="list-style-type: none"> <li>AMA3B2KK-KBR</li> <li>AMA3B2EVb (EVb)</li> </ul>              | <ul style="list-style-type: none"> <li>AMA4B2KK-KBR</li> </ul>                                   |