



	Apollo330 Plus	Apollo330 B Plus	Apollo330 M Plus	Apollo 510
SoC Frequency	96 MHz 192 / 250 MHz turboSPOT®	96 MHz 192 / 250 MHz turboSPOT	96 MHz 192 / 250 MHz turboSPOT	96 MHz 250 MHz turboSPOT
SoC	32-bit Arm® Cortex®-M55 with Helium™ technology, DMA	32-bit Arm Cortex-M55 with Helium technology, DMA Arm Cortex-M4F network coprocessor	32-bit Arm Cortex-M55 with Helium technology, DMA Arm Cortex-M4F network coprocessor	32-bit Arm Cortex-M55 with Helium, DMA
CoreMark® Efficiency (CM/mJ)	Contact Ambiq	Contact Ambiq	Contact Ambiq	120
NVM	2MB	2MB	2MB	4MB
SRAM	2MB	2MB	2MB	3.75MB
Voltage	1.71-3.63V	1.71-3.63V	1.71-3.63V	1.71-2.2V
ADC	12-bit, 11 channels, up to 1.7 MS/s Sampling Rate ADC	12-bit, 11 channels, up to 1.7 MS/s Sampling Rate ADC	12-bit, 11 channels, up to 1.7 MS/s Sampling Rate ADC	12-bit, 11-channel, up to 2.8 MS/s Sampling Rate ADC
UART	2	2	2	4
I/O	I²C/SPI masters (6x) 1x full-duplex I²C/SPI Slave USB 2.0 FS/HS SDIO (v3.0) / eMMC (2x)	I²C/SPI masters (6x) 1x full-duplex I²C/SPI Slave USB 2.0 FS/HS SDIO (v3.0) / eMMC (2x)	I²C/SPI masters (6x) 1x full-duplex I²C/SPI Slave USB 2.0 FS/HS SDIO (v3.0) / eMMC (2x)	I²C/SPI Master (8x) 1x full-duplex/1x half-duplex I²C/SPI Slave USB 2.0 FS/HS SDIO v3.0/eMMC (2x) Support for multiple I/O voltages ranging 1.14 to 3.63V
MSPI Master	1/2/4-bit wide (2x) up to 96 MT/s (SDR/DDR) 1/2/4/8/16-bit wide (1x) up to 250 MT/s (SDR/DDR)	1/2/4-bit wide (2x) up to 96 MT/s (SDR/DDR) 1/2/4/8/16-bit wide (1x) up to 250 MT/s (SDR/DDR)	1/2/4-bit wide (2x) up to 96 MT/s (SDR/DDR) 1/2/4/8/16-bit wide (1x) up to 250 MT/s (SDR/DDR)	1/2/4/8-bit wide (2x) up to 96 MT/s (SDR/DDR) 1/2/4/8/16-bit wide (2x) up to 250 MT/s (SDR/DDR)
I²S	I²S Master/Slave full-duplex (1x)	I²S Master/Slave full-duplex (1x)	I²S Master/Slave full-duplex (1x)	I²S Master/Slave (2x) full-duplex, with ASRC (1x)
Audio	PDM stereo DMIC interface (1x) PLL for Precision Audio	PDM stereo DMIC interface (1x) PLL for Precision Audio	PDM stereo DMIC interface (1x) PLL for Precision Audio	PDM stereo DMIC interface (1x) Low Power Audio ADC (1x) PLL for Precision Audio
Display	--	--	--	SPI 3-wire/4-wire Dual/QuadSPI MIPI DSI at 1.5 Gbps (2 lanes) 4-layer Display Controller Memory in Pixel (MiP) Interface
Graphics	--	--	--	2D/2.5D GPU with anti-aliasing, dithering, and HW vector graphics acceleration
Security	secureSPOT® 3.0 Arm TrustZone® Security	secureSPOT 3.0 Arm TrustZone Security	secureSPOT 3.0 Arm TrustZone Security	secureSPOT 3.0 Arm TrustZone Security
Connectivity	--	Bluetooth® Low Energy 5.4	Bluetooth Low Energy 5.4 802.15.4, Thread, and Matter	--
RF Sensitivity	--	-95/-98/-104dBm (2Mbps/1Mbps/125kbps)	-95/-98/-104dBm (2Mbps/1Mbps/125kbps)	--
Tx Output Power	--	Up to +14dBm	Up to +14dBm	--
Packages	5.3 x 5.3 x 0.8 mm, BGA w/ 120 GPIO 4.0 x 4.0 x 0.5 mm, CSP w/ 68 GPIO	5.3 x 5.3 x 0.8 mm, BGA w/ 120 GPIO 4.0 x 4.0 x 0.5 mm, CSP w/ 68 GPIO	5.3 x 5.3 x 0.8 mm, BGA w/ 120 GPIO 4.0 x 4.0 x 0.5 mm, CSP w/ 68 GPIO	6.6 x 6.6 x 0.8 mm, BGA w/ 183 GPIO 4.9 x 4.7 x 0.5 mm, CSP w/ 144 GPIO
Ordering Information	AP330NPA-IBR (BGA) AP330NPA-CCR (CSP) AP330MPEVB (EVB)	AP330BPA-CCR (CSP) AP330BPA-ICR (CSP) AP330MPEVB (EVB)	AP330MPA-IBR (BGA) AP330MPA-CCR (CSP) AP330MPEVB (EVB)	AP510NFA-CBR (BGA) AP510NFA-CCR (CSP) AP510EVB (EVB)

	Apollo2	Apollo3 & Apollo3 Blue	Apollo3 Blue Plus	Apollo4 Lite & Apollo4 Blue Lite	Apollo4 Plus & Apollo4 Blue Plus
SoC Frequency	48 MHz	48 MHz 96 MHz turboSPOT	48 MHz 96 MHz turboSPOT	96 MHz 192 MHz turboSPOT	96 MHz 192 MHz turboSPOT
SoC	32-bit Arm Cortex-M4F	32-bit Arm Cortex-M4F, DMA Arm Cortex-M0 network coprocessor (Blue)	32-bit Arm Cortex-M4F, DMA Arm Cortex-M0 network coprocessor (Blue)	32-bit Arm Cortex-M4F, DMA Arm Cortex-M0 network coprocessor (Blue)	32-bit Arm Cortex-M4F, DMA Arm Cortex-M0 network coprocessor (Blue)
CoreMark Efficiency (CM/mJ)	88	83	83	72	94
NVM	1MB Flash	1MB	2MB	2MB	2MB
SRAM	256KB	384KB	768KB	1.4MB	2.75MB
Voltage	1.755-3.63 V	1.755-3.63 V	1.755-3.63 V	1.71-2.2 V	1.71-2.2 V
ADC	14-bit, 15-channel, up to 2.67 MS/s Sampling Rate ADC	14-bit, 15-channel, up to 2.67 MS/s Sampling Rate ADC	14-bit, 15-channel, up to 2.67 MS/s Sampling Rate ADC	12-bit, 11-channel, up to 2.8 MS/s Sampling Rate ADC	12-bit, 11-channel, up to 2.8 MS/s Sampling Rate ADC
UART	2	2	2	4	4
I/O	I ² C/SPI Master (6x) I ² C/SPI Slave	I ² C/SPI Master (6x) I ² C/SPI Slave	I ² C/SPI Master (6x) I ² C/SPI Slave	I ² C/SPI Master (8x) (Blue 7x) I ² C/SPI Slave SDIO v3.0/eMMC (1x)	I ² C/SPI Master (8x) (Blue 7x) I ² C/SPI Slave USB FS SDIO v3.0/eMMC (1x)
MSPI Master	--	1/2/4/8-bit wide up to 48 MT/s (SDR) ISO7816 Master	1/2/4/8-bit wide (3x) up to 48 MT/s (SDR) ISO7816 Master	1/2/4/8-bit wide (2x) 1/2/4/8/16-bit wide up to 96 MT/s (SDR/DDR)	1/2/4/8-bit wide (2x) 1/2/4/8/16-bit wide (KXR pkg only) up to 96 MT/s (SDR/DDR)
I²S	I ² S Slave for PDM Audio Pass-through	I ² S Slave for PDM Audio Pass-through	I ² S Slave for PDM Audio Pass-through	I ² S Master/Slave full-duplex	I ² S Master/Slave (2x) full-duplex with ASRC (2x)
Audio	PDM stereo DMIC interface (1x)	PDM stereo DMIC interface (1x)	PDM stereo DMIC interface (1x)	PDM stereo DMIC interface (1x)	PDM stereo DMIC interface (4x) Low Power Stereo Audio ADC (1x)
Display	--	SPI 3-wire/4-wire	SPI 3-wire/4-wire Dual/QuadSPI	SPI 3-wire/4-wire Dual/QuadSPI	SPI 3-wire/4-wire Dual/QuadSPI MIPI DSI at 500 Mbps (2 lanes) (Blue 1 lane) 4-layer Display Controller
Graphics	--	--	--	2D/2.5D GPU with anti-aliasing and dithering	2D/2.5D GPU with anti-aliasing, dithering, and vector graphics assist
Security	--	secureSPOT	secureSPOT w/ Secure Boot	secureSPOT 2.0 Secure Boot, Root of Trust	secureSPOT 2.0 Secure Boot, Root of Trust
Connectivity	--	Bluetooth Low Energy 5 (Blue)	Bluetooth Low Energy 5	Bluetooth Low Energy 5.4 (Blue)	Bluetooth Low Energy 5.4 (Blue)
RF Sensitivity	--	-93 dBm (Blue)	-93 dBm	-95 dBm (Blue)	-95 dBm (Blue)
Tx Output Power	--	Up to +3 dBm (Blue)	Up to +3 dBm	Up to +6 dBm (Blue)	Up to +6 dBm (Blue)
Packages	4.5 x 4.5 x 0.8 mm, 64-pin BGA w/ 50 GPIO 2.6 x 2.6 x 0.5 mm, CSP 49-pin w/ 34 GPIO 2.6 x 2.6 x 0.3 mm, CSP-49 w/ 34 GPIO (Thin)	5 x 5 x 0.8 mm, BGA-81 w/ 50 GPIO 3.3 x 3.4 x 0.5 mm, CSP-66 w/ 37 GPIO 3.3 x 3.4 x 0.3 mm, CSP-66 w/ 37 GPIO (Thin) 8 x 8 x 0.8 mm, QFN-64 w/ 38 GPIO (Blue)	5.3 x 4.3 x 0.8 mm, BGA-108 w/ 74 GPIO	5 x 5 x 0.8 mm, BGA-146 w/ 84 GPIO 4.7 x 4.7 x 0.9 mm, BGA-131 w/ 75 GPIO (Blue)	5 x 5 x 0.8 mm, BGA-146 w/ 105 GPIO 4.7 x 4.7 x 0.9 mm, BGA-131 w/ 81 GPIO (Blue)
Ordering Information	AMAPH1KK-KBR (BGA) AMAPH1KK-KCR (CSP) AMAPH1KK-KCR-TB (Thin CSP) AMAPHEVB (EVB)	AMAP31KK-KBR (BGA) AMAP31KK-KCR (CSP) AMA3B1KK-KBR-B0 (BGA) (Blue) AMA3B1KK-KCR-B0 (CSP) (Blue) AMA3B1KK-KCR-TB (Thin CSP) (Blue) AMA3B1KK-KQR-B0 (QFN) (Blue) AMA3BEVB (EVB)	AMA3B2KK-KBR (BGA) AMA3B2EVB (EVB)	AMAP42KL-KBR (BGA) AMAP4LEVb (EVB) AMA4B2KL-KXR (BGA) (Blue) AMA4BLEVB (EVB) (Blue)	AMAP42KP-KBR (BGA) AMAP4PEVB (EVB) AMAP4PDISP (Display Kit) AMA4B2KP-KXR (BGA) (Blue) AMA4B2KP-KBR (BGA) (Blue) AMAP4BPXEVB (EVB) (Blue)