Soluciones y Plataformas sobre Core ARM

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Helping Innovation

- **Introducción:**
    - ARM vs x86 - Set de instrucciones
    - Ventajas plataformas ARM vs plataformas x86
    - Desventajas plataformas ARM vs plataformas x86
- **VIA Embedded ARM Solutions:**
    - System on Module basados en cores Qualcomm® y MediaTek
    - System on Module basado en el core Via Embedded Wondermedia A9
    - Plataformas Q7 basadas en cores NXP i.MX6 & i.MX8M
    - SBC Pico ITX basado en el core NXP i.MX6
    - SBC 3,5" basado en el core Via Embedded Wondermedia A9
- **iWave Systems Technologies ARM Solutions:**
    - System on Module basados en cores NXP i.MX6 e i.MX8
    - SBC basados en cores NXP i.MX6 e i.MX8
    - Módulos Soldables basados en cores NXP i.MX8
    - High Performance Computing (HPC) & FPGA basados en Xilinx e Intel
- **Preguntas**

Principal diferencia entre ARM y x86

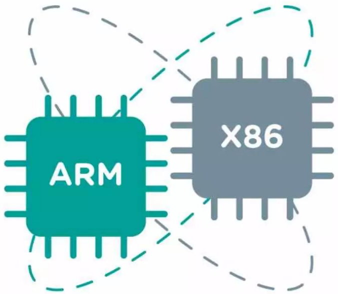
- ARM es RISC (Reduced Instruction Set Computing) → Set de instrucción de datos simple en comparación con x86 < Consumo para decodificar las instrucciones.
- x86 es CISC (Complex Instruction Set Computing) → Set de instrucciones complejo en comparación con RISC > Consumo para decodificar las instrucciones.

¿Cuándo usar uno u otro?

- Depende de la aplicación, su complejidad y el consumo que nos podemos permitir.

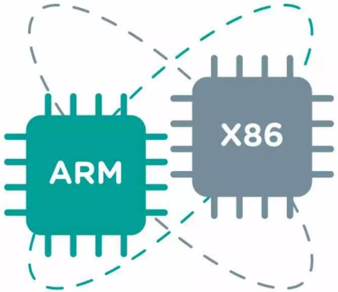
Ventajas ARM sobre x86

- Menor Consumo.
- Flash & RAM normalmente integradas en el SOM / SBC.
- Plataformas más económicas que x86 que permiten customización.
- ¿Sistemas más seguros ante ciberataques? → Linux & Android vs Windows.
- Componentes soldados en placa (mejora ante vibraciones).
- Rangos de Temperatura mayores.



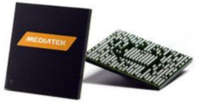
Desventajas ARM sobre x86

- Límite de potencia de procesamiento.
- Límite de recursos de memoria RAM | FLASH | HDD.
- Límite de Sistemas Operativos → No Windows.
- Límite de aplicaciones standard.
- Mayor complejidad para la instalación sistemas operativos, programas, etc. Curva de aprendizaje técnica.
- Requiere conocimientos avanzados de Linux y Android a la hora de compilar programas y módulos.

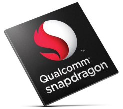


Nuestros Core ARM

VIA Cortex A9 SoC



MediaTek i500 octa-core Processor


Qualcomm snapdragon

APQ8096SG Embedded Processor

i.MX6 Cortex – A9
i.MX 8: 4xCortex – A53 + 2xCortex – A72 + Cortex – M4
i.MX 8M: 4xCortex – A53 + Cortex – M4
i.MX 8XLite: 2xCortex – A35 + Cortex – M4

XILINX ZYNQ

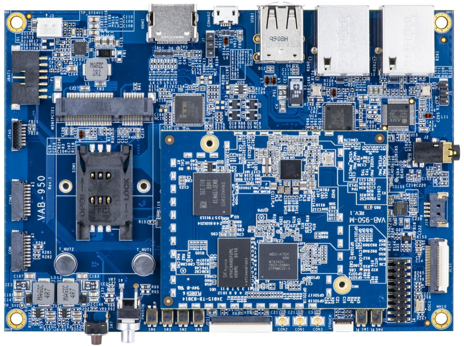
Stratix
FPGA • SoC

4xCortex – A53 + Programmable Logic

SoM vs SBC

- **System on Module (SoM):**
    - Son módulos que integran Procesador, Gráficos, RAM & EMMC.
    - Dependen de tarjeta adicional y diseño (Carrier Board para tener funcionalidad).
    - Time to Market más lento, pero alta customización y ahorro de costes.

- **Single Board Computer (SBC):**
    - Son plataformas que integran todo, Procesador, Graficos, RAM, EMMC & Conexiones (USB, HDMI, MicroSD, LAN, Audio, COM etc…)
    - No requieren de diseño electrónico.
    - Time to Market rápido, pero sin posibilidad de customización.



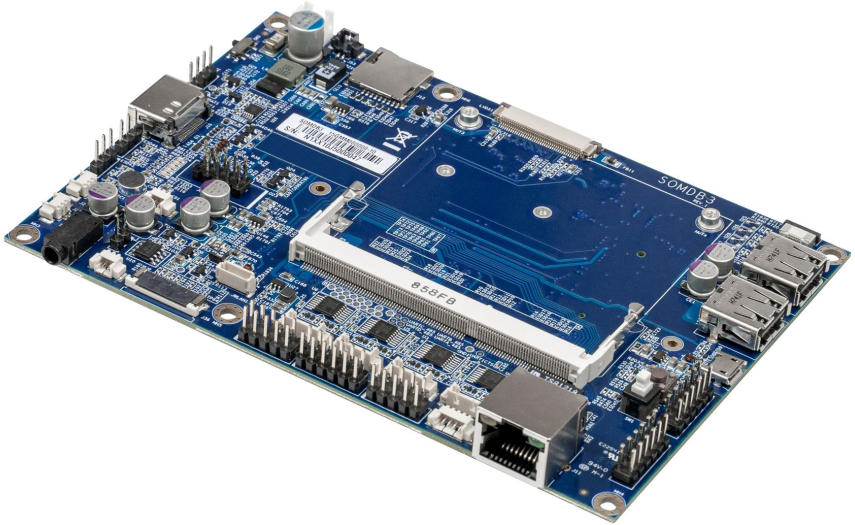
Trabajando con ARM

- **Arquitectura de los Sistemas Operativos Linux ARM & Android:**
    - Boot loader → El arranque inicial. Diseñado por el fabricante de la plataforma.
    - Kernel → Kernel Linux & Android. Adaptado por el fabricante de la plataforma.
    - RFS (Root File System) → Standard pero compilado para arquitecturas ARM.

- **Compilación Cruzada:**
    - Conocido como Cross Compiler.
    - Es un compilador gcc que nos permite crear ejecutables para ARM sobre una máquina x86.
    - ¿Podemos compilar sobre la plataforma directamente? → Sí, a excepción del boot loader y el Kernel.
    - ¿Es recomendable? → No, mejor todo mediante compilación cruzada.
    - ¿Por qué? → Es más rápido.

Ubuntu

Debian



VIA Embedded ARM Solutions

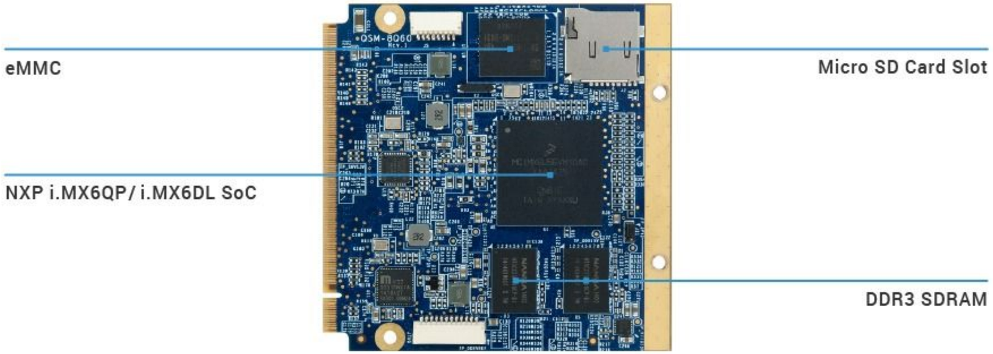
VIA Technologies, Inc., con sede en Taiwán, es un líder mundial en la conexión de empresas con tecnología avanzada de Inteligencia Artificial, IoT y Visión Artificial a través de soluciones inteligentes innovadoras para aplicaciones de transporte, industria, ciudades inteligentes y centros de datos.

VIA proporciona el hardware, el software y los componentes básicos para crear sistemas y dispositivos integrados innovadores.

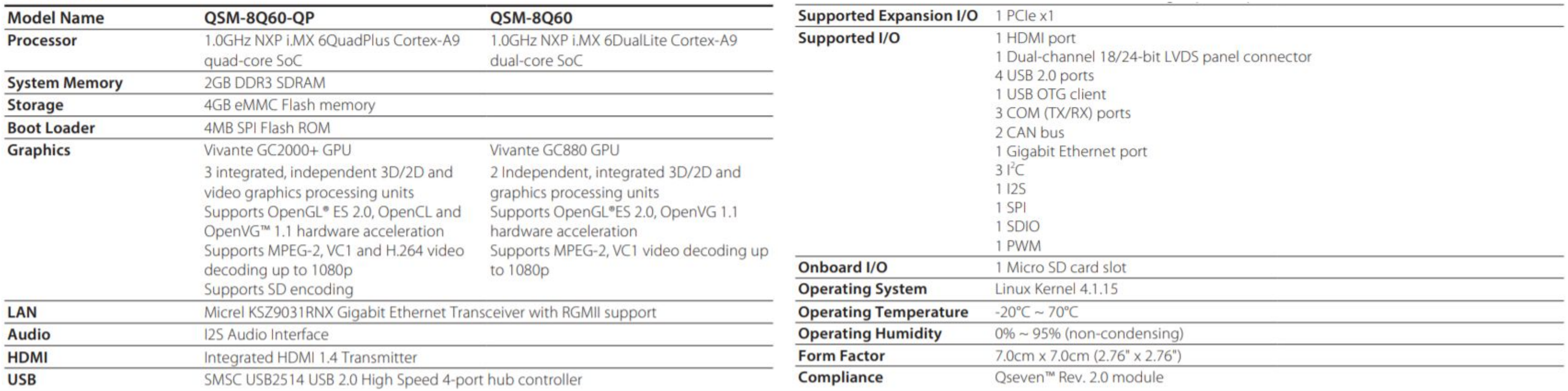
VIA

QSM-8Q60

Qseven™ ARM module with NXP i.MX 6QuadPlus or i.MX 6DualLite Cortex-A9 SoC for industrial automation applications



Specifications



Model Name	QSM-8Q60-QP	QSM-8Q60
Processor	1.0GHz NXP i.MX 6QuadPlus Cortex-A9 quad-core SoC	1.0GHz NXP i.MX 6DualLite Cortex-A9 dual-core SoC
System Memory	2GB DDR3 SDRAM	
Storage	4GB eMMC Flash memory	
Boot Loader	4MB SPI Flash ROM	
Graphics	Vivante GC2000+ GPU 3 integrated, independent 3D/2D and video graphics processing units Supports OpenGL® ES 2.0, OpenCL and OpenVG™ 1.1 hardware acceleration Supports MPEG-2, VC1 and H.264 video decoding up to 1080p Supports SD encoding	Vivante GC880 GPU 2 Independent, integrated 3D/2D and graphics processing units Supports OpenGL®ES 2.0, OpenVG 1.1 hardware acceleration Supports MPEG-2, VC1 video decoding up to 1080p
LAN	Micrel KSZ9031RNX Gigabit Ethernet Transceiver with RGMII support	
Audio	I2S Audio Interface	
HDMI	Integrated HDMI 1.4 Transmitter	
USB	SMSC USB2514 USB 2.0 High Speed 4-port hub controller	

Supported Expansion I/O	1 PCIe x1
Supported I/O	1 HDMI port 1 Dual-channel 18/24-bit LVDS panel connector 4 USB 2.0 ports 1 USB OTG client 3 COM (TX/RX) ports 2 CAN bus 1 Gigabit Ethernet port 3 I^{2}C 1 I2S 1 SPI 1 SDIO 1 PWM
Onboard I/O	1 Micro SD card slot
Operating System	Linux Kernel 4.1.15
Operating Temperature	-20°C ~ 70°C
Operating Humidity	0% ~ 95% (non-condensing)
Form Factor	7.0cm x 7.0cm (2.76" x 2.76")
Compliance	Qseven™ Rev. 2.0 module

VIA

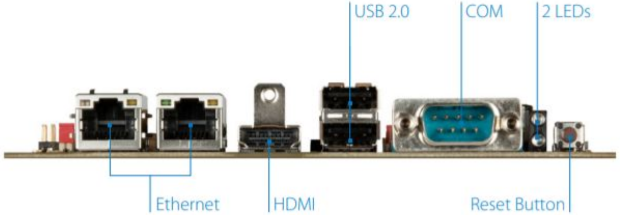
QSM-8Q60

Qseven™ ARM module with NXP i.MX 6QuadPlus or i.MX 6DualLite Cortex-A9 SoC for industrial automation applications

Carrier Board (QSMDB2)

EMIO-2531 miniPCIe Wi-Fi + BT Module
802.11b/g/n standards
Bluetooth 2.1 + EDR specification

Carrier Board Front Panel I/O



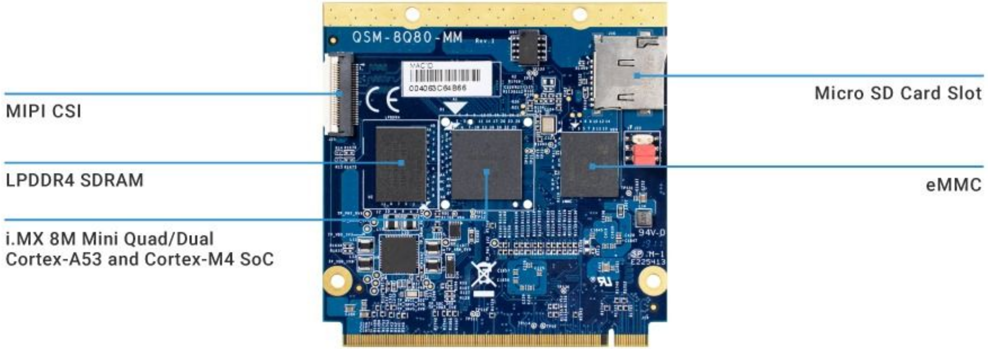
Specifications

Model Name	**QSMDB2**
Audio	NXP SGTL5000 low power stereo codec
Onboard I/O	1 Dual-channel 18/24-bit LVDS panel connector 1 LVDS inverter connector 1 Touch panel connector 4 COM port pin headers (RS-232/422/485) 1 GPIO (16 GPI +16 GPO) pin header 1 CAN bus connector (supports 2 CAN bus) 1 I²C and Serial port pin header (supports 2 RS-232 TX/RX) 1 Audio pin header for Line-in, Line-out, Mic-in 1 SIM card slot 1 miniPCIe slot 1 DC-in connector
Front Panel I/O	1 HDMI port 2 USB 2.0 ports 1 COM port (TX/RX for debug) 1 Gigabit Ethernet port 1 10/100Mbps Ethernet port 2 LEDs for power & Wi-Fi status 1 Reset Button
Power Supply	15~24V DC-in
Operating Temperature	-20°C ~ 70°C
Operating Humidity	0% ~ 95% (non-condensing)
Form Factor	3.5" Form Factor 14.6cm x 10.2cm (5.75" x 4.01")

VIA

QSM-8Q80-MM

Qseven™ ARM module for fleet management and in-vehicle infotainment applications



Specifications

Model Name	**QSM-8Q80-MM**
Processor	1.6GHz NXP i.MX 8M Mini Quad/Dual Cortex-A53 and 400MHz Cortex-M4 SoC
System Memory	2GB LPDDR4 SDRAM
Storage	16GB eMMC 5.1 Flash memory
Graphics	GCNanoUltra + GC320 GPU 2 integrated, independent 3D/2D and video graphics processing units Graphics engine supporting OpenGL® ES 2.0 hardware acceleration Supports H.265/H.264/VP8 video decoding up to 1080p @60fps Supports H.264/VP8 video encoding
LAN	AR8031-AL1A-R Gigabit Ethernet Transceiver with RGMII support
Audio	I2S Audio Interface
PMIC	ROHM BD71847MWV Power Management Integrated Circuit
USB	SMSC USB2514i USB 2.0 High-speed 4-port hub controller
External RTC	Epson RX8010J

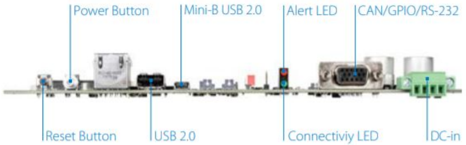
Supported I/O	1 MIPI DSI (4-Lanes) 4 USB 2.0 1 USB 2.0 OTG client 1 Gigabit Ethernet port 3 SDIO 3.0 3 I^{2}C 1 PCIe 2.0 (1-Lane) 1 SPI 2 UART (TX/RX) 2 I2S 1 PWM 1 JTAG 8 GPIO
Onboard I/O	1 Micro SD card slot 1 MIPI CSI connector (4-Lanes) 1 Boot selection jumper
Operating System	Yocto 2.5
Operating Temperature	0°C ~ 60°C
Operating Humidity	0% ~ 95% (relative humidity; non-condensing)
Form Factor	7.0cm x 7.0cm (2.76" x 2.76")
Compliance	Qseven™ Rev. 2.1 module

VIA

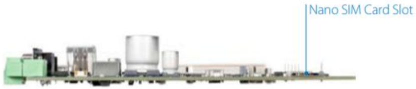
QSM-8Q80-MM

Qseven™ ARM module for fleet management and in-vehicle infotainment applications

Carrier Board Front Panel I/O



Carrier Board Right Panel I/O



Carrier Board (QSMDB3)

EMIO-2574 miniPCIe 4G LTE Mobile Broadband Module

Specifications

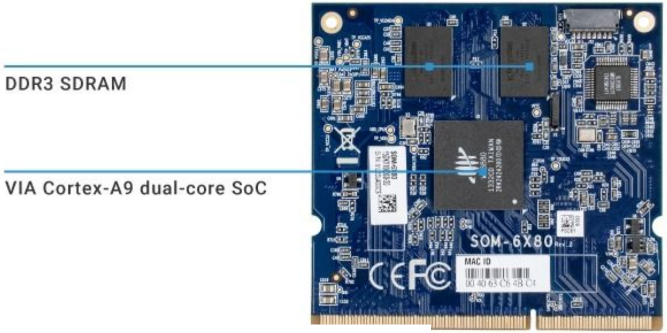
Model Name	**QSMDB3**
MCU	STMicroelectronics STM32F103RCT6 ARM Cortex-M3 with 256KB Flash
Audio	Wolfson WM8960 Stereo Codec Analog Devices SSM2306 Class-D Amplifier
GPS	Locosys ST-1612i-DGO GNSS and Dead Reckoning (DR) Module
Wi-Fi/Bluetooth	AMPAK AP6256 Wi-Fi 802.11ac + Bluetooth V4.2 Module
Sensor	InvenSense ICM-20948 Low Power 9-Axis MEMS MotionTracking Device
Display	Supports BOE COG-PVLSZT026-01 10.1" FHD, 16:9, Landscape, Transmissive, Normally black, ADS type, with mutual Capacitive touch panel
Onboard I/O	1 MXM connector 1 LVDS panel connector (supports dual-channel and touch) 1 Light Sensor connector 1 Mic-in connector 2 Speaker connectors 1 Gigabit Etherner port 1 miniPCIe slot (supports USB host) 2 IPEX connectors for Wi-Fi/BT/GPS

Front Panel I/O	1 Power button with LED 1 Reset button 1 USB 2.0 port 1 Mini-B USB 2.0 port (supports OTG) 2 LEDs for alert and connectivity status 1 CAN/GPIO/RS-232 (D-Sub) port 1 4-pole Phoenix DC jack (for ACC/IGN/BAT(DCIN)/GND)
Right Panel I/O	1 Nano SIM card slot
Power Supply	9V ~36V DC-in
Operating Temperature	-20°C ~ 70°C
Storage Temperature	-30°C ~ 85°C
Form Factor	22cm x 15cm (8.66" x 5.90")
Compliance	CE, FCC Class A

VIA

SOM-6X80

Ultra-compact low-power solution for HMI applications with rapid time-to-market



Specifications

Model Name	SOM-6X80
Processor	1.0GHz VIA Cortex-A9 dual-core SoC
System Memory	2GB DDR3 SDRAM
Storage	8GB eMMC Flash Memory
Boot Loader	512KB SPI Flash ROM
Graphics	Mali-400 SP GPU 2 integrated, independent 3D/2D graphics processing units Graphics engine supporting OpenGL® ES 2.0 hardware acceleration Supports MPEG-2 and H.264 video decoding up to 1080p
LAN	ASIX AX88772CLF USB to LAN
Audio	Wolfsen WM8960 I2S Audio Codec
HDMI	Integrated HDMI 1.4 Transmitter
USB	Genesys GL852GT USB hub 4-port controller
USB to UART	CP2108-B03-GM USB to UART 4-port controller

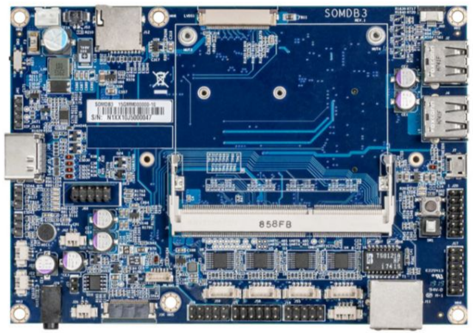
Supported I/O	1 HDMI 1 Single-channel LVDS 3 USB 2.0 ports 6 UART (4 TX/RX, RTS/CTS, 1 RS-485, 1 Debug TX/RX) 9 GPIO 1 10/100Mbps Ethernet port 3 I^2C 1 Micro SD card slot 2 SPI 1 Line-in, Line-out, Mic-in 1 Headphone-out
Onboard I/O	Debug connector
Operating System	Yocto 2.1 (Linux Kernel 4.4.26)
Operating Temperature	0°C ~ 60°C
Operating Humidity	0% ~ 90% (non-condensing)
Form Factor	6.76cm x 6.3cm (2.66" x 2.48")

VIA

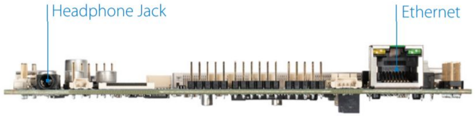
SOM-6X80

Ultra-compact low-power solution for HMI applications with rapid time-to-market

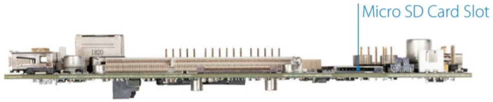
Carrier Board (SOMDB3)



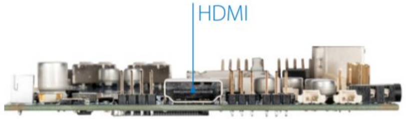
Carrier Board Front Panel I/O



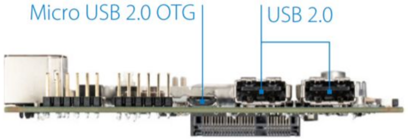
Carrier Board Back Panel I/O



Carrier Board Left Panel I/O



Carrier Board Right Panel I/O



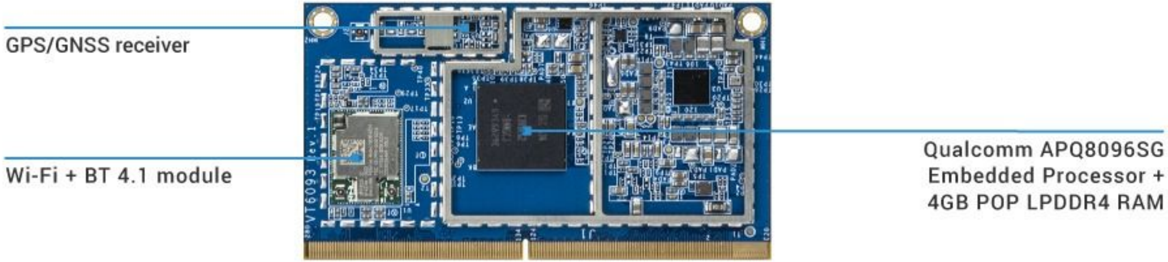
Specifications

Model Name	**SOMDB3**
Onboard I/O	1 LCD panel connector 1 Touch connector 4 COM connectors (RS-232) 1 COM pin header (RS-485) 1 Debug connector 1 Camera connector 1 GPIO pin header (9 GPIO) 1 I²C pin header(3 I²C) 1 SPI pin header 2 Line-in pin headers 3 Line-out connectors (for Mono, Right & Left channel speakers) 1 Mic-in connector 1 Microphone 1 Audio mono out signal pin header 1 USB WLAN connector 1 System wake up button 1 Watchdog timer switch 1 Power button 1 RTC battery connector 1 DC-in connector 1 miniPCIe slot (with USB 2.0 signal only) 1 SIM card slot
Front Panel I/O	1 10/100Mbps Ethernet port 1 Headphone jack
Back Panel I/O	1 Micro SD card slot
Right Panel I/O	2 USB 2.0 ports 1 Micro USB 2.0 OTG port
Left Panel I/O	1 HDMI port
Power Supply	12V~24V DC-in
Operating Temperature	0°C ~ 60°C
Operating Humidity	0% ~ 90% (non-condensing)
Form Factor	3.5" carrier board (14.6cm x 10.2cm) (5.74" x 4.01")

VIA

SOM-9X20

Ultra-compact solution for graphics-intensive edge computing applications



Specifications

Model Name	**SOM-9X20**
Processor	Qualcomm® APQ8096SG Embedded Processor - Two high-performance Kryo cores up to 2.342GHz - Two low power Kryo cores up to 1.593GHz
System Memory	4GB POP LPDDR4 RAM
Storage	64GB UFS 2.1 Flash Memory
Graphics	Qualcomm® Adreno™ 530 GPU 3D graphics accelerator with 64-bit addressing 624MHz Graphics engine supporting OpenGL ES 3.1/GEP, GL4.4, DX11.3/4, OpenCL 2.0, Renderscript-Next Supports H.264, VP8, HEVC 8/10-bit, VP9 video decoding up to: 4K@60fps, 1080p@240fps, 8 x 1080p@30fps
Trusted Platform Module	TPM1.2 : ST33TPM12I2C
Wireless Connectivity	NFA324A-12H32 QCA6174A-1 Wi-Fi 802.11a/b/g/n/ac + BT 4.1 combo LGA module with 2 antenna connectors Qualcomm WGR7640 GPS/GNSS RF receiver with antenna connector
HDMI	Integrated HDMI 2.0 Transmitter

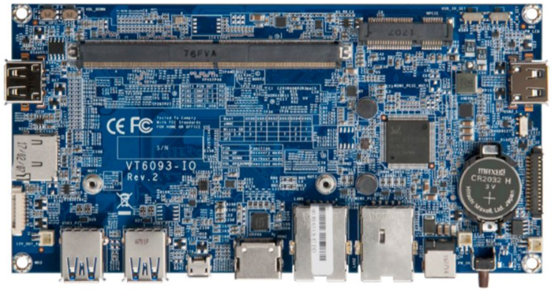
Supported I/O through MXM 3.0 connector	1 HDMI port 2 MIPI DSI 4-Lane connectors 3 MIPI CSI 4-Lane connectors 1 USB 3.0 OTG 1 USB 2.0 host 1 SDIO 2 PCM/MI2S Multi-function pins for UART, I^2C, SPI, GPIO 1 JTAG 2 PCIe 2.0 (1-Lane)
Operating System	Android 8.0, Linux kernel 3.18.44
Operating Temperature	-20°C ~ 70°C
Operating Humidity	0% ~ 95% (non-condensing)
Form Factor	8.2cm x 4.5cm (3.23" x 1.77")

VIA

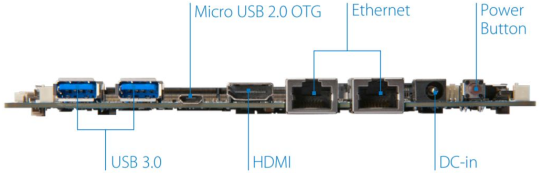
SOM-9X20

Ultra-compact solution for graphics-intensive edge computing applications

Carrier Board (SOMDB2)



Carrier Board Back Panel I/O



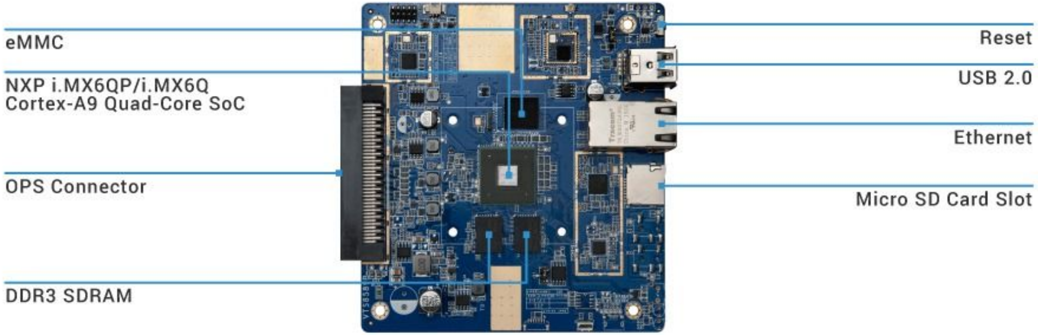
Specifications

Model Name	**SOMDB2**
Audio	Qualcomm WCD9335 Audio Codec
LAN	RealTek RTL8111G Ethernet Controller RealTek RTL8365MB LAN Hub
Onboard I/O	1 MIPI DSI LCD panel connector 1 MIPI CSI Interface for camera module 1 P-Cap Touch connector 2 USB 2.0 ports 1 USB 2.0 OTG switch (for Host mode/Device mode) 1 COM connector (TX/RX only for debugging) 1 GPIO connector (8 GPIO) 2 I^2C connectors (for light & proximity sensor and NFC module) 1 Front panel connector 1 JTAG connector 1 Mic-in connector 2 2W speaker connectors 2 Audio module connectors (for VT6093 audio module) 2 Volume buttons 1 Boot switch 1 RTC battery connector 1 Micro SD card slot 1 miniPCIe slot 1 MXM 3.0 slot
Back Panel I/O	1 HDMI port 2 USB 3.0 ports 1 Micro USB 2.0 OTG port (for debugging) 2 Gigabit Ethernet ports 1 Power button 1 12V DC-in jack
Operating Temperature	-20°C ~ 70°C
Operating Humidity	0% ~ 95% (non-condensing)
Form Factor	17cm x 8.6cm (6.69" x 3.89")
Compliance	RoHS

VIA

VTS-8589

Low power quad-core digital signage starter kit for OPS (Open Pluggable Specification) systems



Specifications

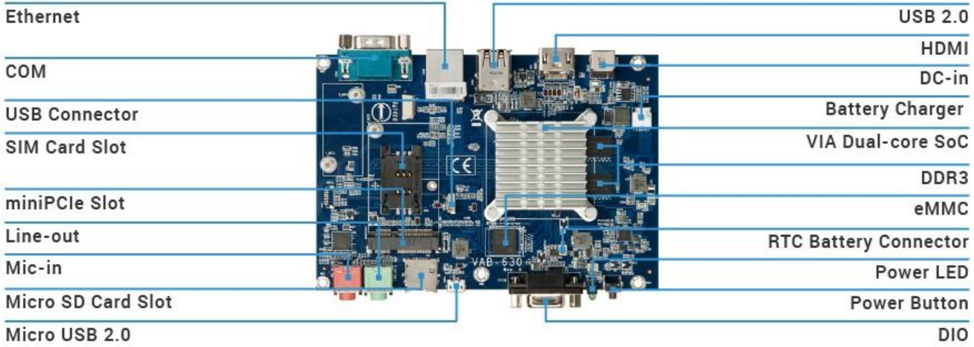
Model Name	**VTS-8589-QP**	**VTS-8589**
Processor	1.0GHz NXP i.MX 6QuadPlus Cortex-A9 quad-core SoC	1.0GHz NXP i.MX 6Quad Cortex-A9 quad-core SoC
System Memory	2GB DDR3 SDRAM	
Storage	8GB eMMC Flash memory	
Boot Loader	4MB SPI Flash ROM	
Graphics	Vivante GC2000+ GPU	Vivante GC2000 GPU
	3 integrated, independent 3D/2D and video graphics processing units Supports OpenGL® ES 3.0, OpenCL and OpenVG™ 1.1 hardware accleration Supports VC1 and H.264 video decoding up to 1080p	
LAN	Micrel KSZ9031RNX Gigabit Ethernet transceiver with RGMII support	
Audio	NXP SGTL5000 low power stereo codec	
HDMI	Integrated HDMI 1.4 Transmitter	
USB	SMSC USB2514 USB 2.0 high speed 4-port hub controller	
Wi-Fi	Realtek RTL 8189ETV SDIO onboard Wi-Fi module	

Onboard I/O	1 Boot Flash select pin header 1 JTAG pin header (for debugging) 1 RTC battery connector	
Front Panel I/O	2 USB 2.0 ports 1 Gigabit Ethernet port 1 Micro SD Card slot 1 Reset button	
Back Panel I/O	1 OPS Connector - includes signals for: 1 HDMI 2 USB 2.0 ports 1 UART (TTL 3V3) GPIO Audio Power (12~19V)	
Power Supply	12~19V DC-in (included in OPS Connector)	
Operating System	Linux Kernel 4.1.15	Linux Kernel 3.10.53
Operating Temperature	0°C ~ 45°C	
Operating Humidity	0% ~ 90% (relative humidity; non-condensing)	
Form Factor	12.1cm x 11.4cm (4.76" x 4.49")	

VIA

VAB-630

Cost effective single board computer with flexible I/O and rich connectivity


Ethernet
COM
USB Connector
SIM Card Slot
miniPCIe Slot
Line-out
Mic-in
Micro SD Card Slot
Micro USB 2.0
USB 2.0
HDMI
DC-in
Battery Charger
VIA Dual-core SoC
DDR3
eMMC
RTC Battery Connector
Power LED
Power Button
DIO

Specifications

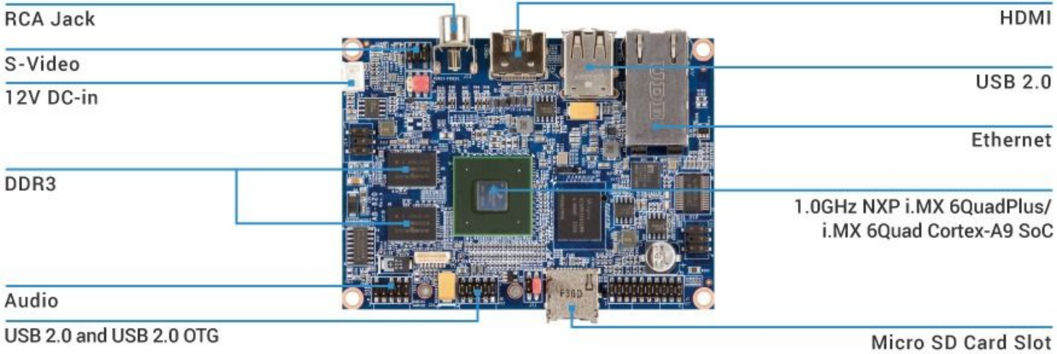
Model Name	VAB-630
Processor	1.0GHz VIA Cortex-A9 dual-core SoC
System Memory	1GB DDR3 SDRAM onboard
Storage	4GB eMMC flash memory
Boot Loader	512KB SPI Flash ROM
Graphics	Mali-400 SP GPU 2 integrated, independent 3D/2D graphics processing units Graphics engine supporting OpenGL® ES 2.0 hardware acceleration Supports MPEG-2 and H.264 video decoding up to 1080p
LAN	ASIC AX88772CLF
Audio	VIA VT1603A I2S Audio Codec
HDMI	Integrated HDMI 1.4 Transmitter
USB	ASIC USB2514B-AEZC USB 2.0 hi speed 4-port hub controller
Expansion I/O	1 miniPCIe slot
Onboard I/O	1 Single-channel LVDS connector 1 miscellaneous pin header for I^2C touch screen interface 1 USB connector 1 UART (console port connector) 1 RTC battery connector 1 Battery charger connector 1 Reset connector 1 SIM card slot (supports 3G module without built-in SIM card slot) 1 miniPCIe slot

Front Panel I/O	1 Micro USB 2.0 OTG port 1 DIO port supporting 10 GPIO with 3.3V power 1 Micro SD card slot 2 Audio jacks : Line-out and Mic-in 1 Power LED 1 Power Button
Back Panel I/O	1 HDMI port 2 USB 2.0 ports 1 COM port for RS-232 (TX/RX) 1 10/100Mbps Ethernet port 1 DC-in jack
Power Supply	12V DC-in (5V DC-in optional)
Operating System	Android 5.0, Linux Kernel 3.4.5
VIA Smart ETK	Watchdog timer, GPIO, UART
Operating Temperature	0°C ~ 60°C
Operating Humidity	0 ~ 90% @ 40°C (non-condensing)
Form Factor	14.6cm x 10.2cm (5.75" x 4.02")
Compliance	CE, FCC

VIA

VAB-820

Ultra-reliable low-power edge computing platform with flexible I/O and wireless connectivity options.



Specifications

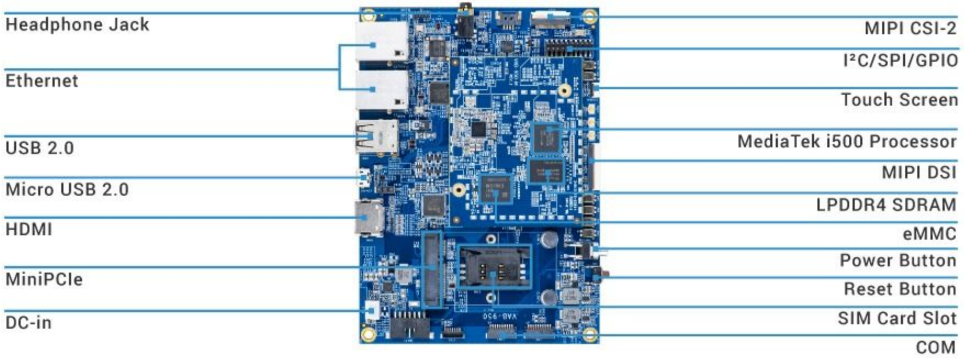
Model Name	VAB-820-QP	VAB-820
Processor	1.0GHz NXP i.MX 6QuadPlus Cortex-A9 quad-core SoC	1.0GHz NXP i.MX 6Quad Cortex-A9 quad-core SoC
System Memory	1GB DDR3 SDRAM onboard	
Storage	4GB eMMC Flash memory	
Boot Loader	4MB SPI Flash ROM	
Graphics	Vivante GC2000+ GPU	Vivante GC2000 GPU
	3 integrated, independent 3D/2D and video graphics processing units Supports OpenGL® ES 3.0, OpenCL and OpenVG™ 1.1 hardware accleration Supports MPEG-2, VC-1 and H.264 video decoding up to 1080p Supports SD encoding	
LAN	Micrel KSZ9031RNX Gigabit Ethernet transceiver with RGMII support	
Audio	NXP SGTL5000 low power stereo codec	
HDMI	Integrated HDMI 1.4 transmitter	
USB	SMSC USB2514 USB 2.0 high speed 4-port hub controller	
Expansion I/O	1 miniPCIe slot	

Onboard I/O	1 Dual-channel 18/24-bit LVDS panel connector 1 S-video input pin header 1 USB 2.0 host port, and 1 USB2.0 OTG port pin header 1 COM port connector with power supply (supports 8-wire DTE mode) 1 COM/CAN port connector with power supply (supports 1 RS-232 (TX/RX) and 2 FlexCAN TX/RX ports) 1 Miscellaneous pin header for 1 I^{2}C pair, 1 Digital I/O (4 GPI + 4 GPO), system reset button and LEDs for power/WPAN/Wi-Fi/WWAN 1 MIPI CSI-2 connector (supports 2 data lanes) 1 SPI master pin header (supports 2 SPI slave devices) 1 Front audio pin header for Line-in, Line-out, Mic-in 1 Boot Flash select pin header (for SPI or Micro SD) 2 Power pin headers (support optional PD power board) 1 RTC battery connector 1 DC-in connector 1 miniPCIe slot (supports multiple connections and buses including JTAG)
Front Panel I/O	1 Micro SD card slot
Back Panel I/O	1 HDMI port 1 Composite RCA jack 2 USB 2.0 ports 1 Gigabit Ethernet port (supports optional IEEE 802.3at type 2)
Power Supply	12V DC-in
Operating System	Android 6.0, Linux kernel 4.1.15
VIA Smart ETK	Watchdog timer, CAN Bus, GPIO, UART
Operating Temperature	-20°C ~ 70°C (3G & Wi-Fi not included)
Operating Humidity	0% ~ 95% (non-condensing)
Form Factor	Pico-ITX (10cm x 7.2cm, 3.9" x 2.8")
Compliance	CE, FCC

VIA

VAB-950

Fanless low-power platform for AIoT applications with octa-core MediaTek i500 processor

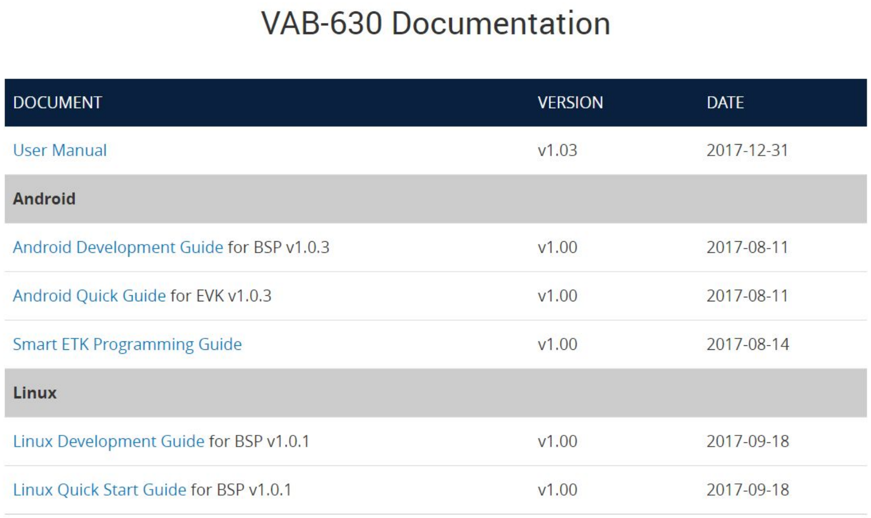


Specifications

Model Name		VAB-950-V2	VAB-950-V4
SOM-9X50 Module	**Processor**	MediaTek i500 octa-core Processor - Four Cortex-A73 @ 2.0GHz - Four Cortex-A53 @ 2.0GHz	
	System Memory	2GB LPDDR4 SDRAM	4GB LPDDR4 SDRAM
	Storage	16GB eMMC Flash memory	
	Graphics	ARM Mali-G72 high-performance GPU 3D graphics accelerator capable of processing 2400M pixel/sec @ 800MHz Graphics engine supporting OpenGL® ES 3.0, OpenCL ES 1.1, and Vulkan 1.0 hardware acceleration Supports H.265 and H.264 video decoding up to 1080p@30fps Supports Cadence Tensilica Vision P6 x2 DSP	
	Supported I/O through IO connector	1 HDMI port 1 MIPI DSI connector 1 MIPI CSI-2 connector 1 Multi-function pins for I^{2}C, SPI, GPIO 1 JTAG	
	Form Factor	7cm x 5.5cm (2.75" x 2.2")	
Wireless Connectivity	MediaTek MT7668 - 2x2 Dual-band Wi-Fi 802.11ac with MU-MIMO - Bluetooth 5.0		

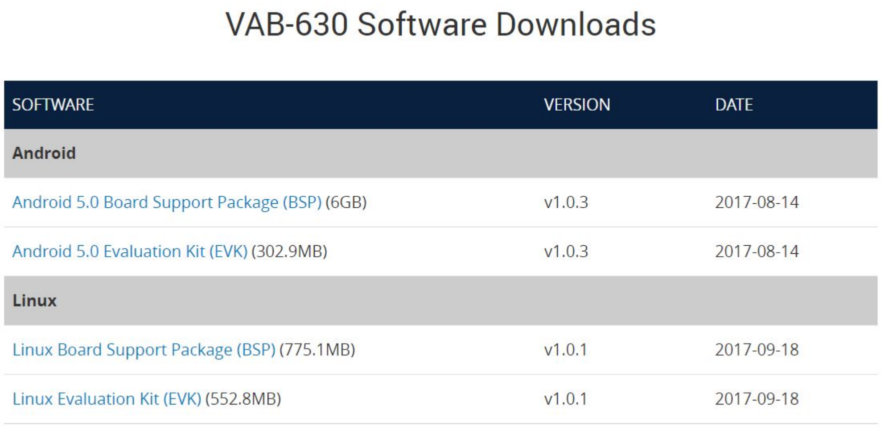
Audio	MediaTek MT6358
HDMI	ITE IT66121FN Digital Parallel Interface to HDMI 1.3a transmitter
USB	TI TS3USB21 High-speed USB 2.0 (480Mbps) 1:2 Multiplexer/Demultiplexer Switch With Single Enable Microchip LAN9514 USB 2.0 to USB hub and 10/100Mbps Ethernet controller
LAN	ASIX AX88772 USB 2.0 to Fast Ethernet controller
Onboard I/O	1 COM port (supports RS-232 TX/RX) 1 Debug port (supports RS-232 TX/RX) 1 JTAG connector 1 MIPI DSI connector 1 MIPI CSI-2 connector 1 Touch screen connector (includes I^{2}C for capacitive touch) 1 SIM card slot 1 MiniPCIe slot (supports USB 2.0 connectivity for optional 4G module) 4 Keypad buttons 1 Mono speaker-out connector 1 Miscellaneous pin header (for 1 I^{2}C pair, 1 SPI and 12 GPIOs) 1 Battery charger connector (supports I^{2}C and Gas gauge) 3 IPEX connectors (for RF antennas for Wi-Fi and Bluetooth) 2 USB host/device jumpers 1 12V DC-in connector
Front Panel I/O	1 Power button with LED 1 Reset button

Documentación y Descargas



VAB-630 Documentation

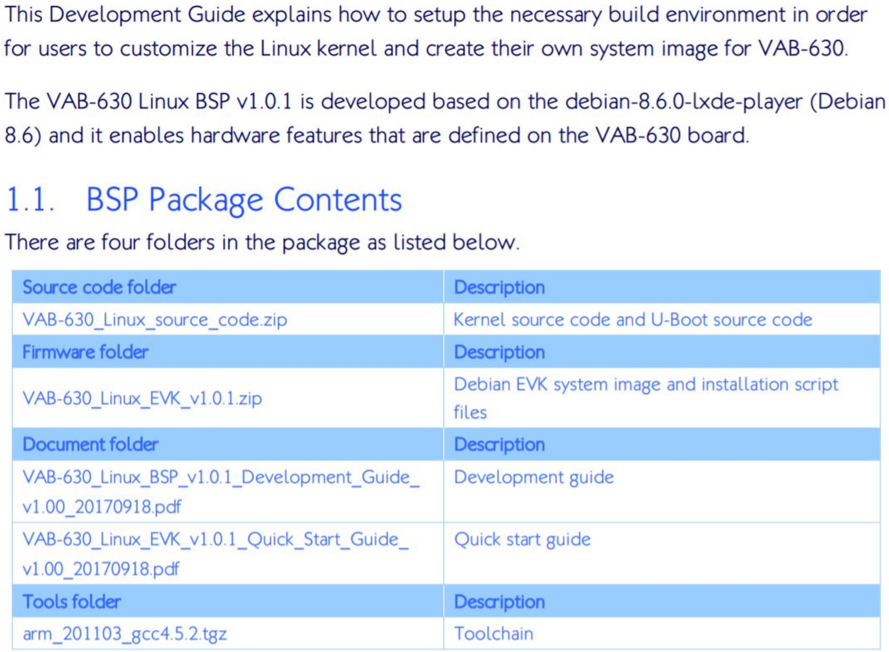
DOCUMENT	VERSION	DATE
User Manual	v1.03	2017-12-31
Android		
Android Development Guide for BSP v1.0.3	v1.00	2017-08-11
Android Quick Guide for EVK v1.0.3	v1.00	2017-08-11
Smart ETK Programming Guide	v1.00	2017-08-14
Linux		
Linux Development Guide for BSP v1.0.1	v1.00	2017-09-18
Linux Quick Start Guide for BSP v1.0.1	v1.00	2017-09-18



VAB-630 Software Downloads

SOFTWARE	VERSION	DATE
Android		
Android 5.0 Board Support Package (BSP) (6GB)	v1.0.3	2017-08-14
Android 5.0 Evaluation Kit (EVK) (302.9MB)	v1.0.3	2017-08-14
Linux		
Linux Board Support Package (BSP) (775.1MB)	v1.0.1	2017-09-18
Linux Evaluation Kit (EVK) (552.8MB)	v1.0.1	2017-09-18

Documentación y Descargas



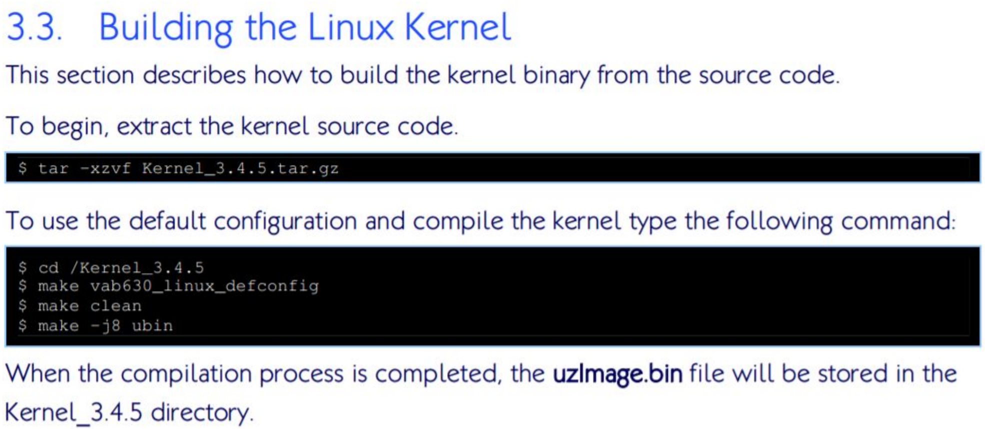
This Development Guide explains how to setup the necessary build environment in order for users to customize the Linux kernel and create their own system image for VAB-630.

The VAB-630 Linux BSP v1.0.1 is developed based on the debian-8.6.0-lxde-player (Debian 8.6) and it enables hardware features that are defined on the VAB-630 board.

1.1. BSP Package Contents

There are four folders in the package as listed below.

Source code folder	Description
VAB-630_Linux_source_code.zip	Kernel source code and U-Boot source code
Firmware folder	**Description**
VAB-630_Linux_EVK_v1.0.1.zip	Debian EVK system image and installation script files
Document folder	**Description**
VAB-630_Linux_BSP_v1.0.1_Development_Guide_v1.00_20170918.pdf	Development guide
VAB-630_Linux_EVK_v1.0.1_Quick_Start_Guide_v1.00_20170918.pdf	Quick start guide
Tools folder	**Description**
arm_201103_gcc4.5.2.tgz	Toolchain



3.3. Building the Linux Kernel

This section describes how to build the kernel binary from the source code.

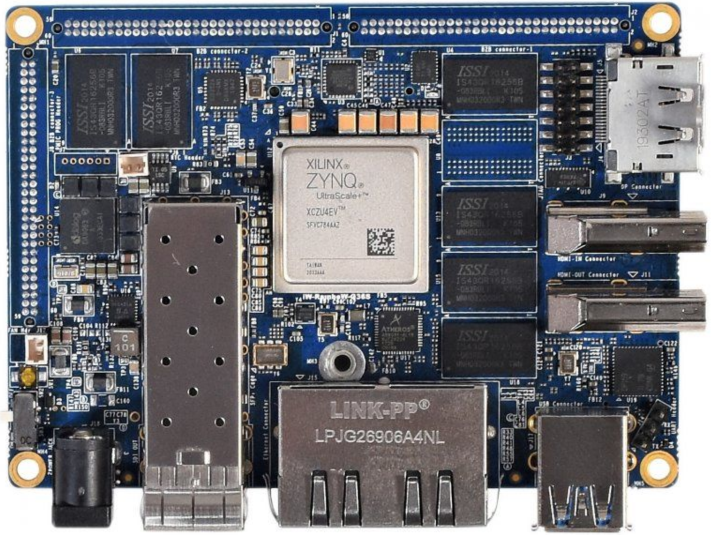
To begin, extract the kernel source code.

```
$ tar -xzvf Kernel_3.4.5.tar.gz
```

To use the default configuration and compile the kernel type the following command:

```
$ cd /Kernel_3.4.5
$ make vab630_linux_defconfig
$ make clean
$ make -j8 ubin
```

When the compilation process is completed, the **uzImage.bin** file will be stored in the Kernel_3.4.5 directory.



iWave Systems Technologies ARM Solutions

iWave
Embedding Intelligence

iWave Systems Technologies es una empresa con certificación ISO 9001: 2015, con sede en Bangalore, India, establecida en el año 1999. La empresa se centra en proporcionar soluciones y servicios integrados para aplicaciones industriales, médicas, automotrices y varias otras aplicaciones informáticas integradas.

iWave Systems ofrece una amplia gama de System On Modules y SBC construidas con una amplia gama de plataformas SoC de CPU y FPGA con diferentes factores de forma, como Qseven, SMARC, SODIMM y HPC, en estrecha colaboración con grandes fabricantes, como NXP, Xilinx, Intel, etc

iW-RainboW-G15M-SODIMM

i.MX 6 SODIMM SOM

iWave
iW-RainboW-G15M-SM

iW-RainboW-G15M-SODIMM HIGHLIGHTS

ARM Cortex A9 @ 1GHz/800MHz Quad/Dual/Dual Lite/Solo core

Modular & Compact SODIMM form factor- 67.6mm X 37mm

HD 1080p encode and decode

2D/3D Hardware Graphics Acceleration

Technical and quick customization support

10+ years, long term support

SPECIFICATIONS

CPU:
i.MX6 Q/D/DL/S @1GHz/800MHz ARM-Cortex-A9
PMIC:
MMPF0100
RAM:
1GB DDR3 for Q/D/DL (Expandable)
512MB DDR3 for Solo (Expandable)
2MB SPI NOR Flash (Expandable)
4GB eMMC Flash (Expandable)
Communication:
10/100/1000 Ethernet PHY
Power Input:
3.3V , 3.5A input through SODIMM edge
Operating Temperature:
-40°C to +85°C Industrial
0°C to +70°C Commercial
Form Factor:
67.6mm X 37mm SODIMM Form Factor
SODIMM Edge Connector Interfaces:
PCIe x 1
UART x 3
10/100/1000Mbps Ethernet
HDMI x 1
SATA x 1 *
USB Host 2.0 x 1
USB OTG 2.0 x 1
SD (4bit) x 1
I2S Audio x 1
LVDS Display x 1
24bpp RGB Display x 1
8bit Camera x 1
I2C X 2
GPIOs
PWM x 4
Debug UART Port
JTAG Port
Operating Systems:
Linux 4.1.15, Android Nougat 7.1.1

iW-RainboW-G34M/G37M

i.MX 8M Mini or i.MX 8M Nano SODIMM SOM

iW-RainboW-G34M/G37M HIGHLIGHTS

Quad Cortex-A53 @ upto 1.8 GHz

Dual/Quad Cortex-M4F @ 400 MHZ

64-bit Armv8-A architecture

H.265, H.264 Video Decode

H.264, VP8 Video Encode

2D and 3D Graphics Processing Unit

Wi-Fi 802.11a/b/g/n/ac + BLE v5.0

Dual 1000/100/10 Mbps Ethernet

SPECIFICATIONS

SOC:
NXP i.MX8M Mini/Nano Q/QL/D/DL/S/SL
Upto 4 X Cortex-A53 & 1 X Cortex-M4F

PMIC:
BD71847MWV

Memory:
1GB LPDDR4 (Expandable)
8GB eMMC Flash (Expandable)
2MB QSPI Flash (Optional)
Micro SD slot

Communication:
Wi-Fi 802.11a/b/g/n/ac + BLE v5.0
Gigabit Ethernet PHY Transceivers x 1
PCIe to Gigabit Ethernet PHY Transceivers x 1 (Optional)

SODIMM Edge Connector Interfaces:
Gigabit Ethernet x 2 Port (One is optional)
PCIe x 1 Port
USB2.0 OTG x 2 Ports
SD (4bit) x 1 Port
SAI/I2S (Audio Interface) x 1 Port
Debug UART
Data UART (with CTS & RTS) x 2 Port (One is optional)
Data UART (without CTS & RTS) x 1 Port
SPI x 3 Ports
I2C x 2 Ports
PWM x 2 Ports
JTAG
MIPI DSI 4 lane x 1 Channel
MIPI CSI 4 lane x 1 Channel
SPDIF x 1 Port
GPIOs

Power Supply:
3.3V, 4A Input from SODIMM Edge Connector

Form Factor:
67.6mm X 37mm

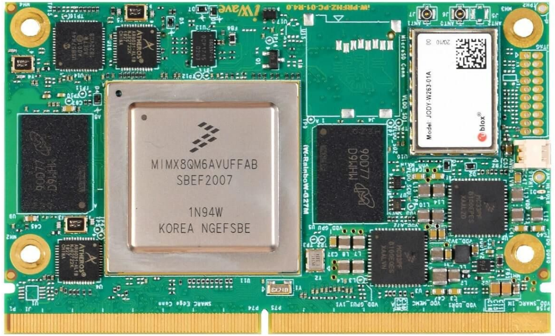
Temperature support:
Industrial,Commercial: -40°C to +85°C

OS Support: Linux 5.10.72, Android 11, Ubuntu 20.04 LTS, 2021.02.8 LTS

REACH & RoHS2 Complaint

iW-RainboW-G27M

i.MX 8 QuadMax/QuadPlus SMARC SOM



iW-RainboW-G27M HIGHLIGHTS

Dual Complex Core System:

- Complex 1: 4 x Cortex-A53 @ 1.2 GHZ
- Complex 2: 2 x Cortex-A72 @ 1.6 GHZ

2 x Cortex-M4F @ 264 MHZ for advanced system control

ARM v8 64-bit instruction capability; Fully 32-bit capable

Integrated Full Chip Hardware Virtualization capabilities

16-Shader 3D (Vec4)

4K H.265 decode & 1080p H.264 encoder/deccapable VPU

Enhanced Vision Capabilities (via GP)

IEEE 802.11 a/b/g/n/ac/ax* Wi-Fi & BT 5.0 Module

Dual 1000/100/10 Mbps Ethernet

LPDDR4 - Up to 8GB

SMARC v2.1.1 compatible

SPECIFICATIONS

SOC: i.MX 8 QM/QP

Dual Complex Core System:

- Complex 1: 4 x Cortex-A53 @ 1.2 GHz
- Complex 2: 2 x Cortex-A72 @ 1.6 GHz

2 x Cortex-M4F @ 264 MHz for advanced system control

ARM v8 64-bit instruction capability; Fully 32-bit capable

Integrated Full Chip Hardware Virtualization capabilities

16-Shader 3D (Vec4)

4K H.265 decode & 1080p h.264 enc/deccapable VPU

Memory:

LPDDR4 - Up to 8GB

eMMC Flash - 16GB(Expandable upto 256GB)

Micro SD slot (Optional)

QSPI Flash - (Optional)

Communication:

Gigabit Ethernet PHY Transceiver x 2

USB 3.0 High Speed 4-Port Hub

IEEE 802.11 a/b/g/n/ac/ax* Wi-Fi & BT 5.0

SMARC Edge Connector Interfaces:

Gigabit Ethernet x 2 Ports

USB 3.0 Host x 2 Ports

PCIe x 2 Ports

SATA x 1 Port

USB 2.0 OTG x 1 Port

USB 2.0 Host x 2 Ports

SD (4bit) x 1 Port

LVDS1/MIPI_DSI x 2 Channels

HDMI/DP Transmitter x 1 Port

SAI/I2S (Audio Interface) x 2 Ports

Debug UART

Data UART (with CTS & RTS) x 1 Port

Data UART (without CTS & RTS) x 1 Port

CAN x 2 Ports

SPI x 2 Ports

I2C x 1 Port

GPIO, Control & Status Signals

Expansion Connector interfaces*:

LVDS0 x 2 Channels

MLB x 1 Channel

HDMI Receiver X 1 Port (Optional)

CAN x 1 port

SPDIF x 1 port

ESAI x 1 port

GPIOs

OS: Linux 5.10.52, Android 11, Ubuntu 20.04 LTS, QNX 7

Temperature support: -40°C to +85°C

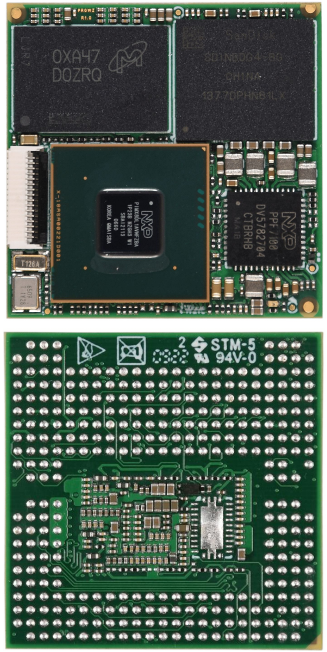
Form Factor:

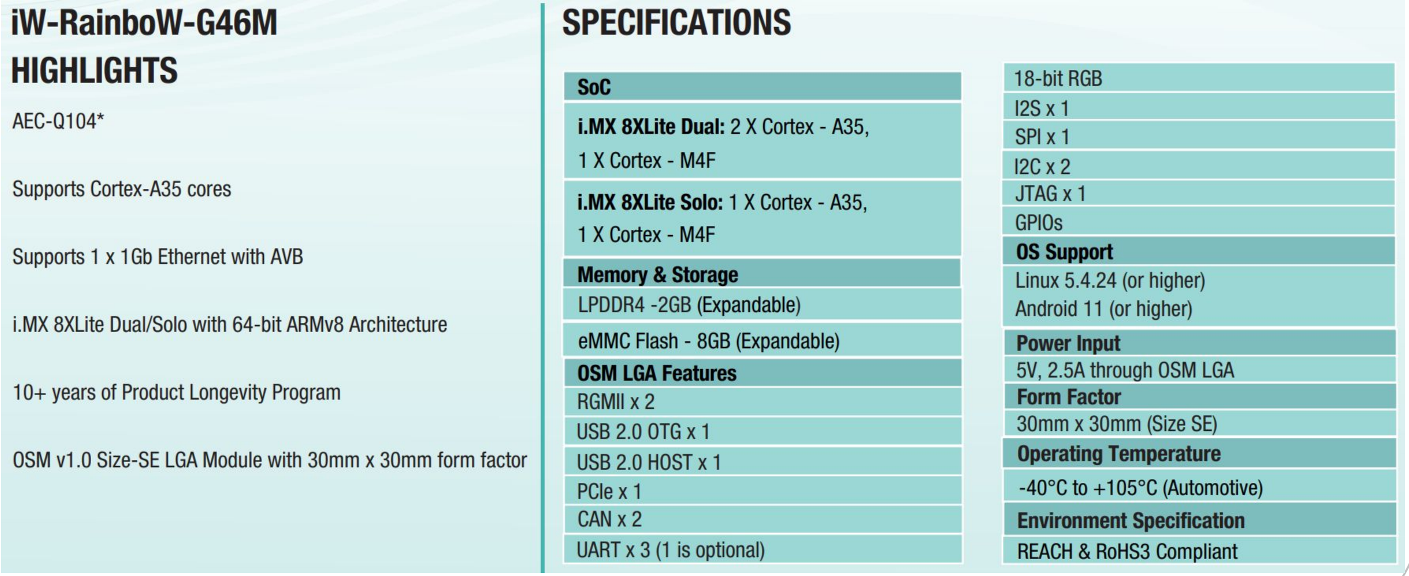
82mm x 50mm, SMARC v2.1.1 compatible

REACH & RoHS3 Compliant

iW-RainboW-G46M

i.MX 8XLite OSM – SE LGA Module





iW-RainboW-G46M HIGHLIGHTS

AEC-Q104*

Supports Cortex-A35 cores

Supports 1 x 1Gb Ethernet with AVB

i.MX 8XLite Dual/Solo with 64-bit ARMv8 Architecture

10+ years of Product Longevity Program

OSM v1.0 Size-SE LGA Module with 30mm x 30mm form factor

SPECIFICATIONS

SoC

i.MX 8XLite Dual: 2 X Cortex - A35, 1 X Cortex - M4F

i.MX 8XLite Solo: 1 X Cortex - A35, 1 X Cortex - M4F

Memory & Storage

LPDDR4 -2GB (Expandable)

eMMC Flash - 8GB (Expandable)

OSM LGA Features

RGMII x 2
USB 2.0 OTG x 1
USB 2.0 HOST x 1
PCIe x 1
CAN x 2
UART x 3 (1 is optional)
18-bit RGB
I2S x 1
SPI x 1
I2C x 2
JTAG x 1
GPIOs

OS Support

Linux 5.4.24 (or higher)
Android 11 (or higher)

Power Input

5V, 2.5A through OSM LGA

Form Factor

30mm x 30mm (Size SE)

Operating Temperature

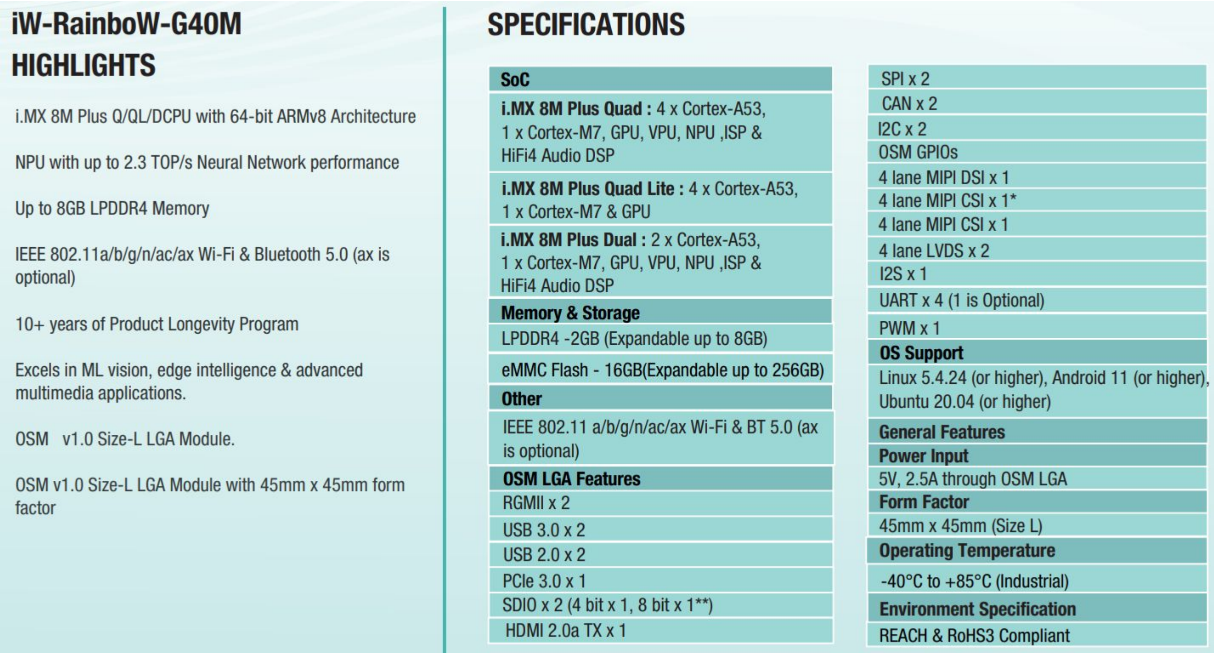
-40°C to +105°C (Automotive)

Environment Specification

REACH & RoHS3 Compliant

iW-RainboW-G40M

i.MX 8M Plus OSM LGA Module



iW-RainboW-G40M HIGHLIGHTS

i.MX 8M Plus Q/QL/DCPU with 64-bit ARMv8 Architecture

NPU with up to 2.3 TOP/s Neural Network performance

Up to 8GB LPDDR4 Memory

IEEE 802.11a/b/g/n/ac/ax Wi-Fi & Bluetooth 5.0 (ax is optional)

10+ years of Product Longevity Program

Excels in ML vision, edge intelligence & advanced multimedia applications.

OSM v1.0 Size-L LGA Module.

OSM v1.0 Size-L LGA Module with 45mm x 45mm form factor

SPECIFICATIONS

SoC

i.MX 8M Plus Quad : 4 x Cortex-A53, 1 x Cortex-M7, GPU, VPU, NPU ,ISP & HiFi4 Audio DSP

i.MX 8M Plus Quad Lite : 4 x Cortex-A53, 1 x Cortex-M7 & GPU

i.MX 8M Plus Dual : 2 x Cortex-A53, 1 x Cortex-M7, GPU, VPU, NPU ,ISP & HiFi4 Audio DSP

Memory & Storage

LPDDR4 -2GB (Expandable up to 8GB)

eMMC Flash - 16GB(Expandable up to 256GB)

Other

IEEE 802.11 a/b/g/n/ac/ax Wi-Fi & BT 5.0 (ax is optional)

OSM LGA Features

RGMII x 2

USB 3.0 x 2

USB 2.0 x 2

PCIe 3.0 x 1

SDIO x 2 (4 bit x 1, 8 bit x 1**)

HDMI 2.0a TX x 1

SPI x 2

CAN x 2

I2C x 2

OSM GPIOs

4 lane MIPI DSI x 1

4 lane MIPI CSI x 1*

4 lane MIPI CSI x 1

4 lane LVDS x 2

I2S x 1

UART x 4 (1 is Optional)

PWM x 1

OS Support

Linux 5.4.24 (or higher), Android 11 (or higher), Ubuntu 20.04 (or higher)

General Features

Power Input

5V, 2.5A through OSM LGA

Form Factor

45mm x 45mm (Size L)

Operating Temperature

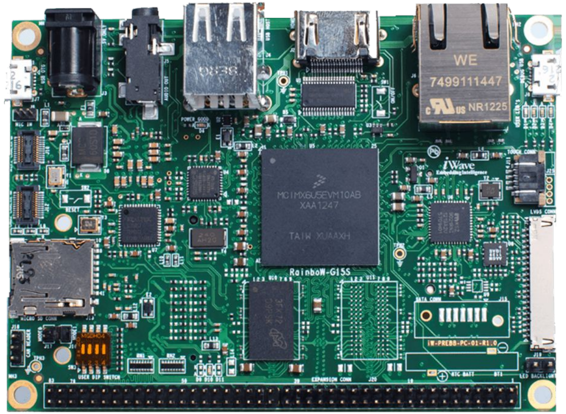
-40°C to +85°C (Industrial)

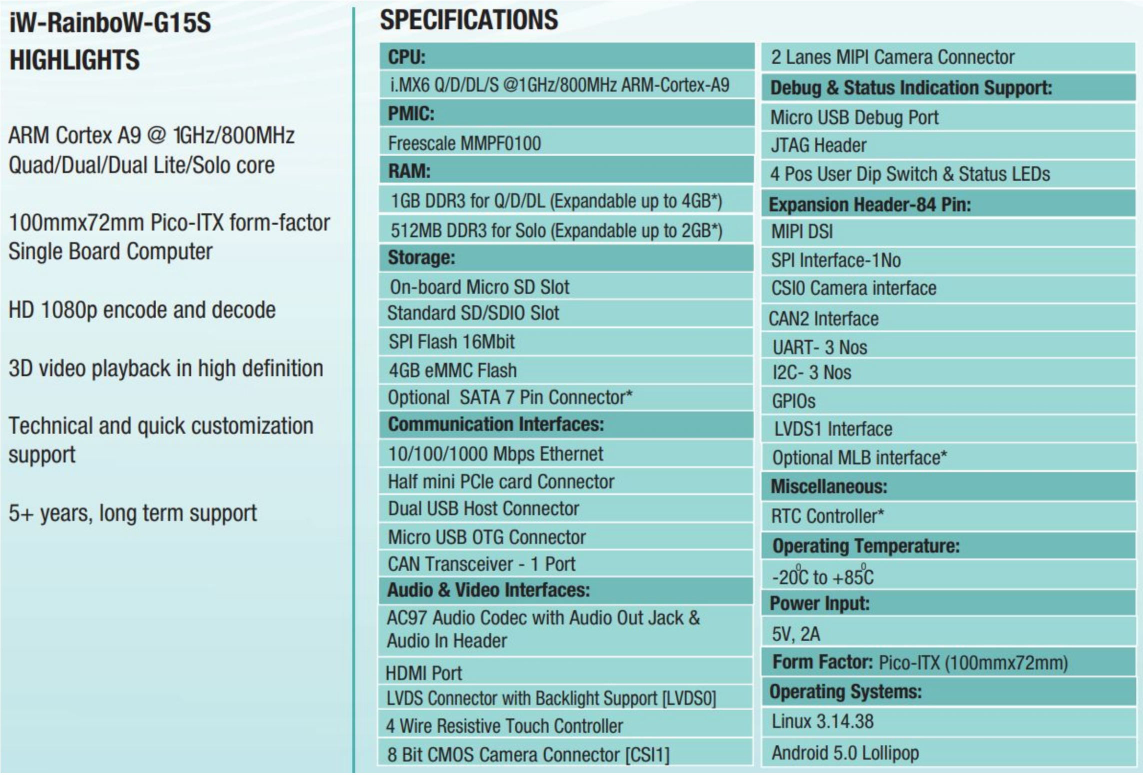
Environment Specification

REACH & RoHS3 Compliant

iW-RainboW-G15S

i.MX 6 Pico ITX SBC





iW-RainboW-G15S HIGHLIGHTS

ARM Cortex A9 @ 1GHz/800MHz Quad/Dual/Dual Lite/Solo core

100mmx72mm Pico-ITX form-factor Single Board Computer

HD 1080p encode and decode

3D video playback in high definition

Technical and quick customization support

5+ years, long term support

SPECIFICATIONS

CPU:
i.MX6 Q/D/DL/S @1GHz/800MHz ARM-Cortex-A9

PMIC:
Freescale MMPF0100

RAM:
1GB DDR3 for Q/D/DL (Expandable up to 4GB*)
512MB DDR3 for Solo (Expandable up to 2GB*)

Storage:
On-board Micro SD Slot
Standard SD/SDIO Slot
SPI Flash 16Mbit
4GB eMMC Flash
Optional SATA 7 Pin Connector*

Communication Interfaces:
10/100/1000 Mbps Ethernet
Half mini PCIe card Connector
Dual USB Host Connector
Micro USB OTG Connector
CAN Transceiver - 1 Port

Audio & Video Interfaces:
AC97 Audio Codec with Audio Out Jack & Audio In Header
HDMI Port
LVDS Connector with Backlight Support [LVDS0]
4 Wire Resistive Touch Controller
8 Bit CMOS Camera Connector [CSI1]
2 Lanes MIPI Camera Connector

Debug & Status Indication Support:
Micro USB Debug Port
JTAG Header
4 Pos User Dip Switch & Status LEDs

Expansion Header-84 Pin:
MIPI DSI
SPI Interface-1No
CSI0 Camera interface
CAN2 Interface
UART- 3 Nos
I2C- 3 Nos
GPIOs
LVDS1 Interface
Optional MLB interface*

Miscellaneous:
RTC Controller*

Operating Temperature:
-20^0C to $+85^0C$

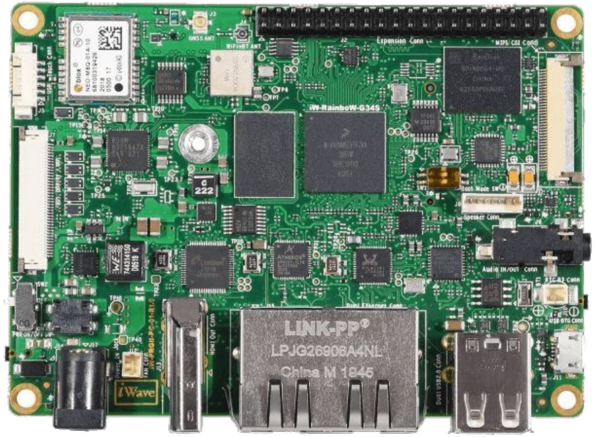
Power Input:
5V, 2A

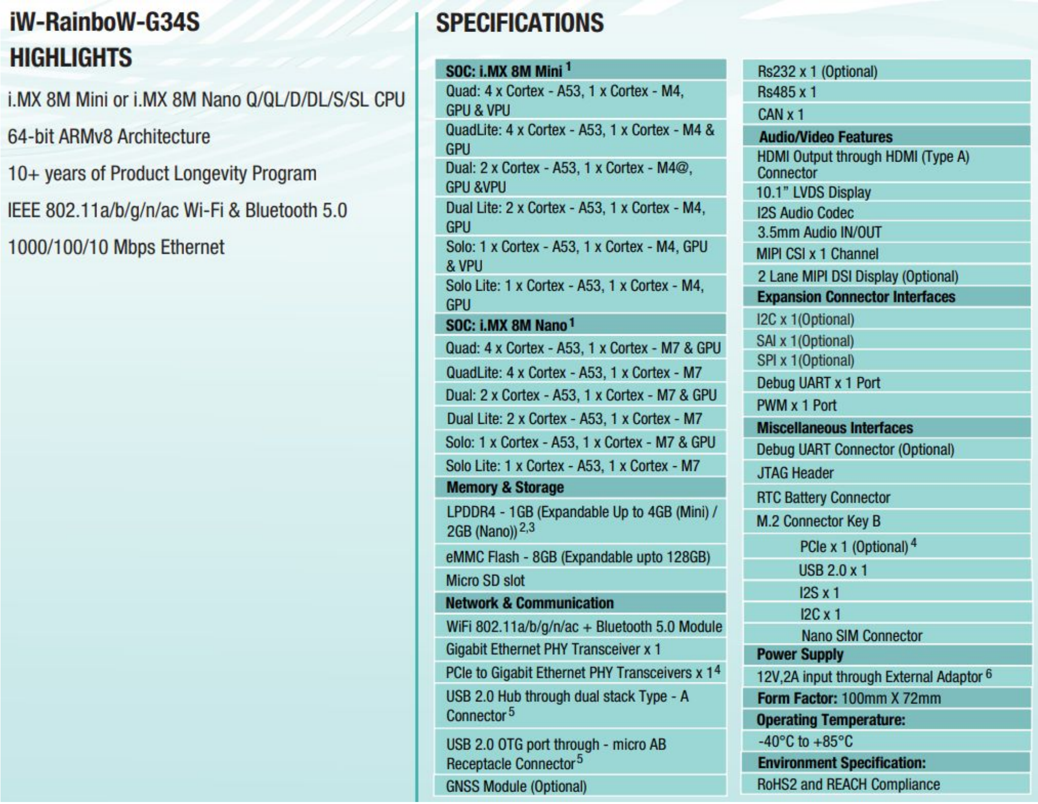
Form Factor: Pico-ITX (100mmx72mm)

Operating Systems:
Linux 3.14.38
Android 5.0 Lollipop

iW-RainboW-G34S/G37S

i.MX 8M Mini or
i.MX 8M Nano Pico ITX SBC





iW-RainboW-G34S HIGHLIGHTS

i.MX 8M Mini or i.MX 8M Nano Q/QL/D/DL/S/SL CPU

64-bit ARMv8 Architecture

10+ years of Product Longevity Program

IEEE 802.11a/b/g/n/ac Wi-Fi & Bluetooth 5.0

1000/100/10 Mbps Ethernet

SPECIFICATIONS

SOC: i.MX 8M Mini [1]
Quad: 4 x Cortex - A53, 1 x Cortex - M4, GPU & VPU
QuadLite: 4 x Cortex - A53, 1 x Cortex - M4 & GPU
Dual: 2 x Cortex - A53, 1 x Cortex - M4@, GPU &VPU
Dual Lite: 2 x Cortex - A53, 1 x Cortex - M4, GPU
Solo: 1 x Cortex - A53, 1 x Cortex - M4, GPU & VPU
Solo Lite: 1 x Cortex - A53, 1 x Cortex - M4, GPU

SOC: i.MX 8M Nano [1]
Quad: 4 x Cortex - A53, 1 x Cortex - M7 & GPU
QuadLite: 4 x Cortex - A53, 1 x Cortex - M7
Dual: 2 x Cortex - A53, 1 x Cortex - M7 & GPU
Dual Lite: 2 x Cortex - A53, 1 x Cortex - M7
Solo: 1 x Cortex - A53, 1 x Cortex - M7 & GPU
Solo Lite: 1 x Cortex - A53, 1 x Cortex - M7

Memory & Storage
LPDDR4 - 1GB (Expandable Up to 4GB (Mini) / 2GB (Nano))[2,3]
eMMC Flash - 8GB (Expandable upto 128GB)
Micro SD slot

Network & Communication
WiFi 802.11a/b/g/n/ac + Bluetooth 5.0 Module
Gigabit Ethernet PHY Transceiver x 1
PCIe to Gigabit Ethernet PHY Transceivers x 1[4]
USB 2.0 Hub through dual stack Type - A Connector[5]
USB 2.0 OTG port through - micro AB Receptacle Connector[5]
GNSS Module (Optional)
Rs232 x 1 (Optional)
Rs485 x 1
CAN x 1

Audio/Video Features
HDMI Output through HDMI (Type A) Connector
10.1" LVDS Display
I2S Audio Codec
3.5mm Audio IN/OUT
MIPI CSI x 1 Channel
2 Lane MIPI DSI Display (Optional)

Expansion Connector Interfaces
I2C x 1(Optional)
SAI x 1(Optional)
SPI x 1(Optional)
Debug UART x 1 Port
PWM x 1 Port

Miscellaneous Interfaces
Debug UART Connector (Optional)
JTAG Header
RTC Battery Connector
M.2 Connector Key B
  PCIe x 1 (Optional)[4]
  USB 2.0 x 1
  I2S x 1
  I2C x 1
  Nano SIM Connector

Power Supply
12V,2A input through External Adaptor[6]

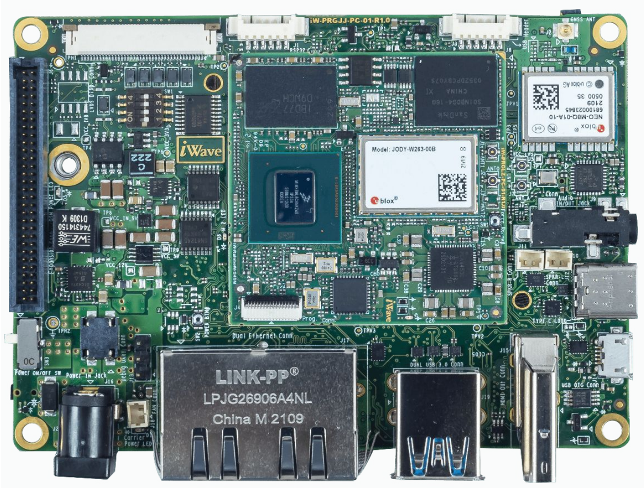
Form Factor: 100mm X 72mm

Operating Temperature:
-40°C to +85°C

Environment Specification:
RoHS2 and REACH Compliance

iW-RainboW-G40S

i.MX 8M Plus Pico ITX SBC



iW-RainboW-G40S HIGHLIGHTS

i.MX 8M Plus Q/QL/D CPU with 64-bit ARMv8 Architecture

NPU with up to 2.3 TOP/s Neural Network performance

Up to 8GB LPDDR4 Memory

Multi-OS Platform Support

10+ years of Product Longevity Program

IEEE 802.11a/b/g/n/ac/ax Wi-Fi (ax is optional) & Bluetooth 5.0

Dual 1000/100/10 Mbps Ethernet

+40°C to +85°C Operation

SPECIFICATIONS

CPU
- **i.MX 8M Plus Quad :** 4 x Cortex-A53, 1 x Cortex-M7, GPU, VPU
- **i.MX 8M Plus Quad Lite :** 4 x Cortex-A53, 1 x Cortex-M7 & GPU
- **I .MX 8M Plus Dual :** 2 x Cortex-A53, 1 x Cortex-M7, GPU, VPU

Memory & Storage
- LPDDR4 -2GB (Expandable up to 8GB)
- eMMC Flash - 16GB (Expandable up to 256GB)
- Micro SD Slot

Network & Communication
- Gigabit Ethernet x2 (Dual RJ45 Mag-jack Connector)
- USB 3.0 x2 (Dual-stack Type-A Connector)
- USB 2.0 OTG (micro AB Receptacle Connector)
- IEEE 802.11 a/b/g/n/ac/ax Wi-Fi & BT 5.0 (ax is optional)
- GNSS receiver Module -GPS/GLONASS/Galileo/BeiDou
- RS232 Header x 1
- USB Header x 1
- CAN Header x 1

Audio/Video Features
- HDMI Output through HDMI (Type A)
- LVDS Display Connector x 1
- 3.5mm Audio IN/OUT Jack
- Speaker Out Header
- 5.5inch MIPI DSI Display
- 2 Lane MIPI DSI Display (Optional)
- MIPI CSI Camera Connector

Miscellaneous Interfaces
- Debug UART Connector
- RTC Battery Connector
- JTAG Header
- M.2 Connector Key B
  - PCIe 3.0 x 1
  - USB 2.0 x 1
  - Nano SIM Connecter

Expansion Connector Features
- 4 lane MIPI DSI x 1
- UART x 1
- 8 bit SD (optional)
- 4 lane LVDS x 1 Channel
- SPI x 1 Port
- PWM x 1
- CAN x1 Port

OS Support
- Linux 5.4.70

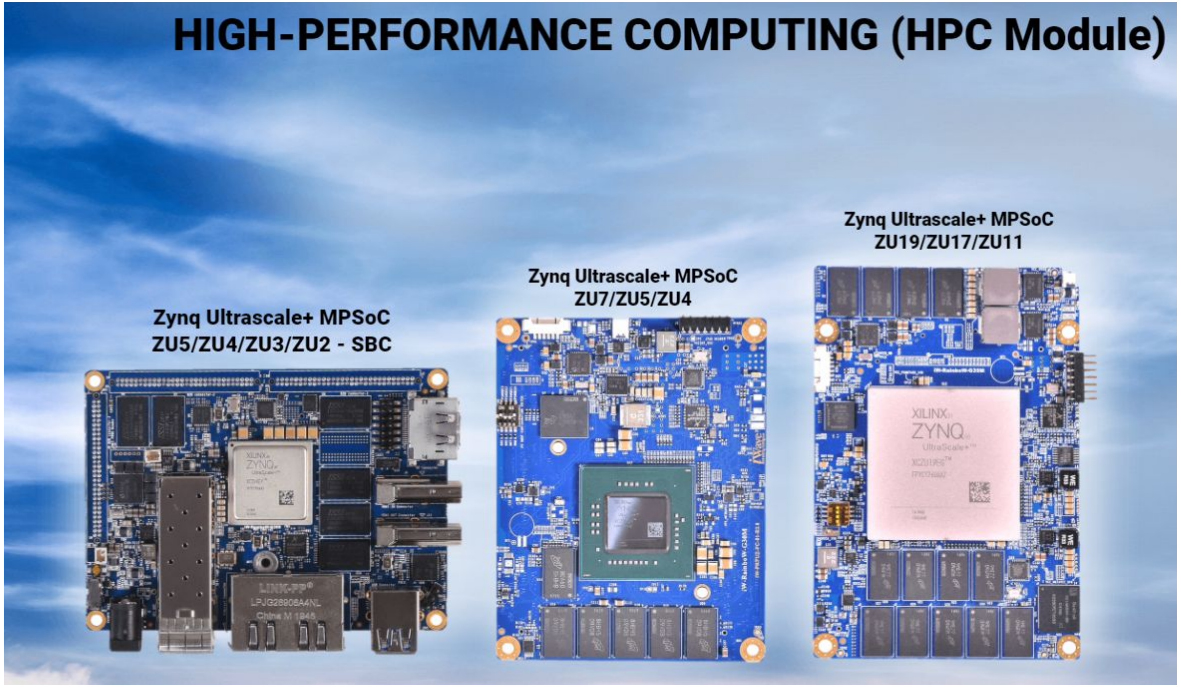
General Features

Power Input:
7V to 24V

Form Factor:
100mm x 72mm

Operating Temperature:
-40°C to +85°C

Environment Specification:
REACH & RoHS3 Compliant

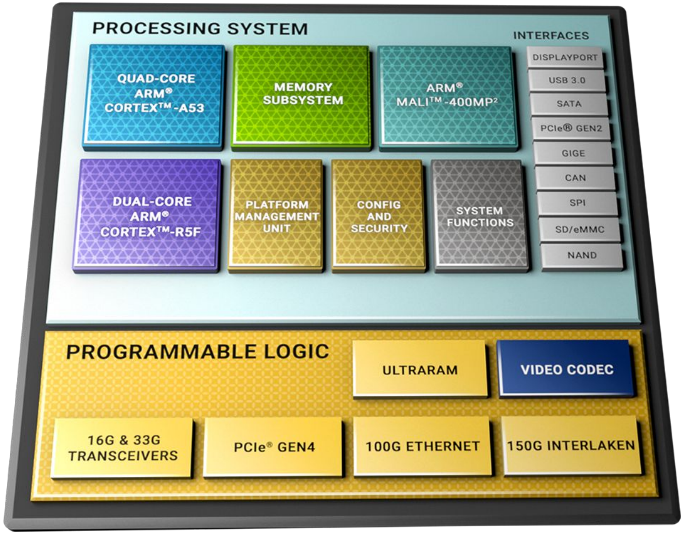


HIGH-PERFORMANCE COMPUTING (HPC Module)

Zynq Ultrascale+ MPSoC
ZU5/ZU4/ZU3/ZU2 - SBC

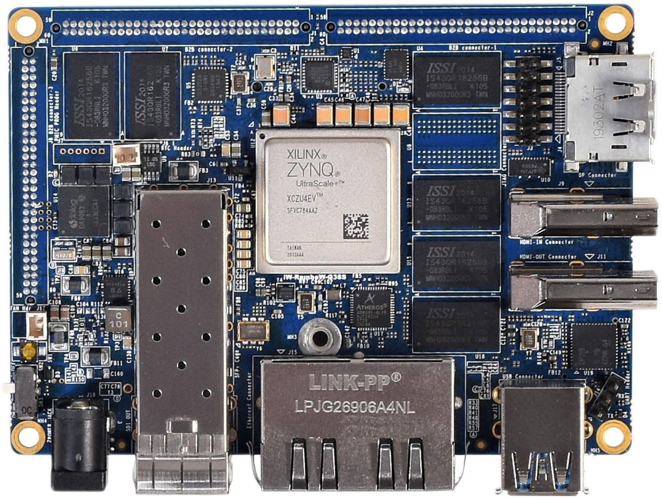
Zynq Ultrascale+ MPSoC
ZU7/ZU5/ZU4

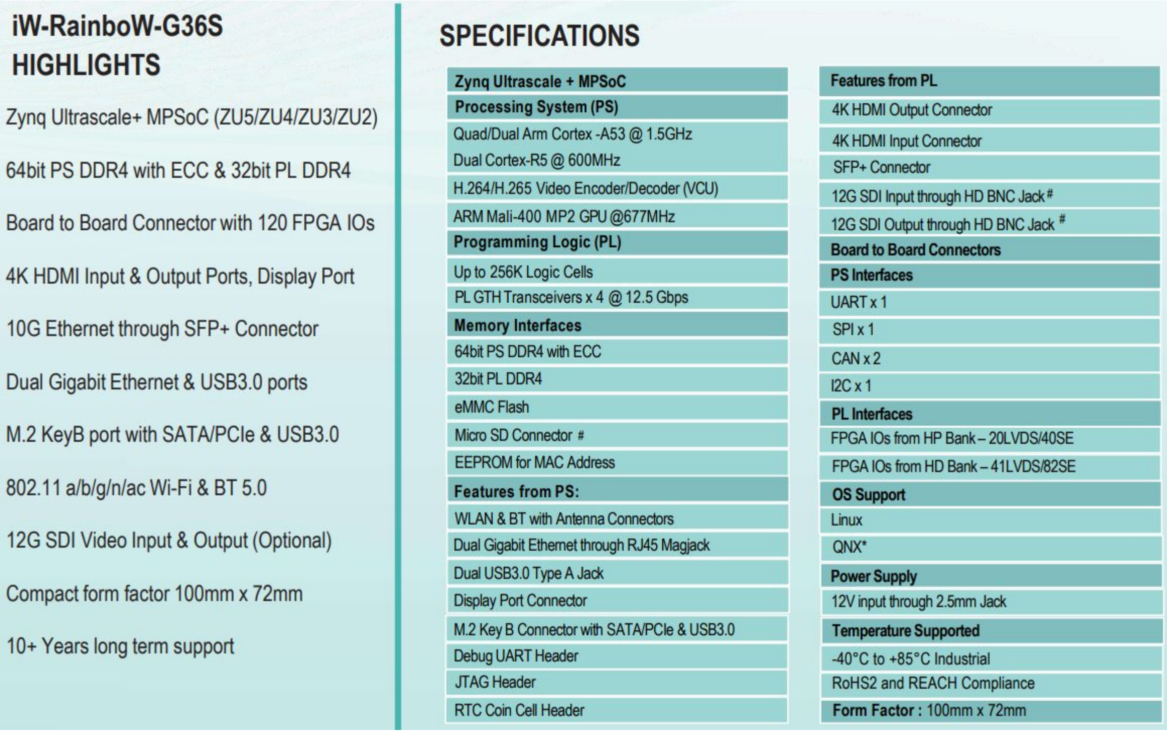
Zynq Ultrascale+ MPSoC
ZU19/ZU17/ZU11


PROCESSING SYSTEM
INTERFACES
QUAD-CORE ARM® CORTEX™-A53
MEMORY SUBSYSTEM
ARM® MALI™-400MP2
DISPLAYPORT
USB 3.0
SATA
PCIe® GEN2
GIGE
CAN
SPI
SD/eMMC
NAND
DUAL-CORE ARM® CORTEX™-R5F
PLATFORM MANAGEMENT UNIT
CONFIG AND SECURITY
SYSTEM FUNCTIONS
PROGRAMMABLE LOGIC
ULTRARAM
VIDEO CODEC
16G & 33G TRANSCEIVERS
PCIe® GEN4
100G ETHERNET
150G INTERLAKEN

iW-RainboW-G36S

ZU5/ZU4/ZU3/ZU2 Zynq Ultrascale+ SBC





iW-RainboW-G36S
HIGHLIGHTS

- Zynq Ultrascale+ MPSoC (ZU5/ZU4/ZU3/ZU2)
- 64bit PS DDR4 with ECC & 32bit PL DDR4
- Board to Board Connector with 120 FPGA IOs
- 4K HDMI Input & Output Ports, Display Port
- 10G Ethernet through SFP+ Connector
- Dual Gigabit Ethernet & USB3.0 ports
- M.2 KeyB port with SATA/PCIe & USB3.0
- 802.11 a/b/g/n/ac Wi-Fi & BT 5.0
- 12G SDI Video Input & Output (Optional)
- Compact form factor 100mm x 72mm
- 10+ Years long term support

SPECIFICATIONS

Zynq Ultrascale + MPSoC

Processing System (PS)
- Quad/Dual Arm Cortex -A53 @ 1.5GHz
- Dual Cortex-R5 @ 600MHz
- H.264/H.265 Video Encoder/Decoder (VCU)
- ARM Mali-400 MP2 GPU @677MHz

Programming Logic (PL)
- Up to 256K Logic Cells
- PL GTH Transceivers x 4 @ 12.5 Gbps

Memory Interfaces
- 64bit PS DDR4 with ECC
- 32bit PL DDR4
- eMMC Flash
- Micro SD Connector #
- EEPROM for MAC Address

Features from PS:
- WLAN & BT with Antenna Connectors
- Dual Gigabit Ethernet through RJ45 Magjack
- Dual USB3.0 Type A Jack
- Display Port Connector
- M.2 Key B Connector with SATA/PCIe & USB3.0
- Debug UART Header
- JTAG Header
- RTC Coin Cell Header

Features from PL
- 4K HDMI Output Connector
- 4K HDMI Input Connector
- SFP+ Connector
- 12G SDI Input through HD BNC Jack #
- 12G SDI Output through HD BNC Jack #

Board to Board Connectors

PS Interfaces
- UART x 1
- SPI x 1
- CAN x 2
- I2C x 1

PL Interfaces
- FPGA IOs from HP Bank – 20LVDS/40SE
- FPGA IOs from HD Bank – 41LVDS/82SE

OS Support
- Linux
- QNX*

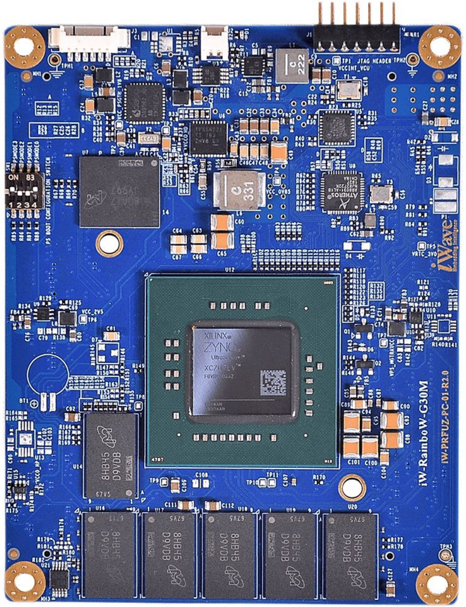
Power Supply
- 12V input through 2.5mm Jack

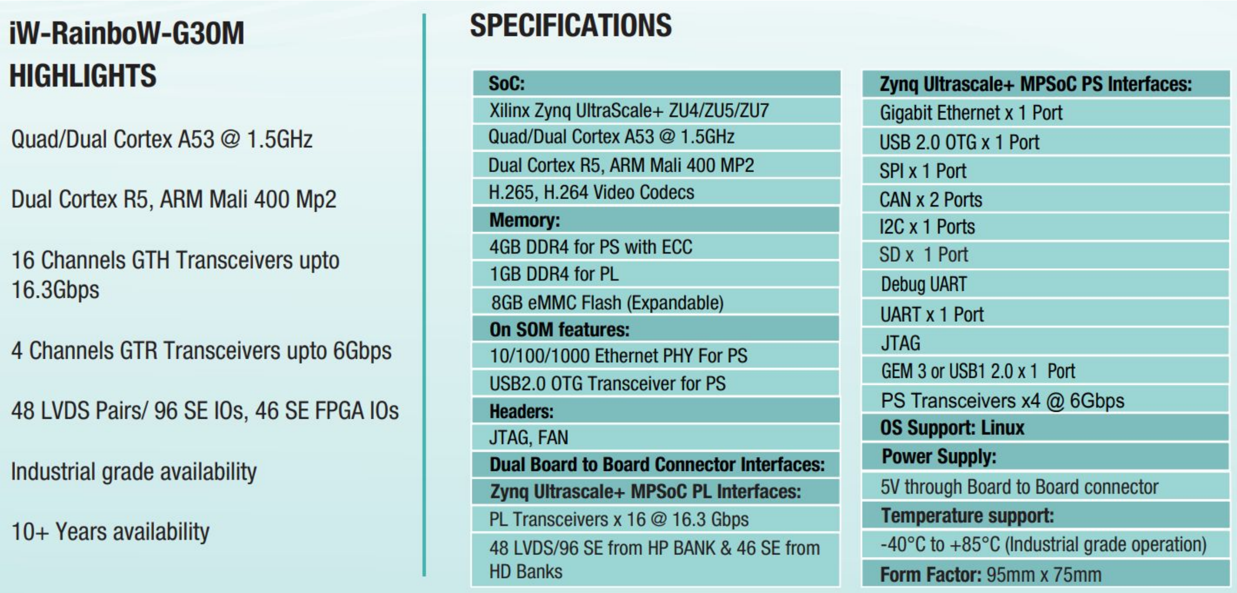
Temperature Supported
- -40°C to +85°C Industrial
- RoHS2 and REACH Compliance

Form Factor : 100mm x 72mm

iW-RainboW-G30M

ZU7/ZU5/ZU4- Zynq UltraScale+ SOM





iW-RainboW-G30M HIGHLIGHTS

Quad/Dual Cortex A53 @ 1.5GHz

Dual Cortex R5, ARM Mali 400 Mp2

16 Channels GTH Transceivers upto 16.3Gbps

4 Channels GTR Transceivers upto 6Gbps

48 LVDS Pairs/ 96 SE IOs, 46 SE FPGA IOs

Industrial grade availability

10+ Years availability

SPECIFICATIONS

SoC:
Xilinx Zynq UltraScale+ ZU4/ZU5/ZU7
Quad/Dual Cortex A53 @ 1.5GHz
Dual Cortex R5, ARM Mali 400 MP2
H.265, H.264 Video Codecs

Memory:
4GB DDR4 for PS with ECC
1GB DDR4 for PL
8GB eMMC Flash (Expandable)

On SOM features:
10/100/1000 Ethernet PHY For PS
USB2.0 OTG Transceiver for PS

Headers:
JTAG, FAN

Dual Board to Board Connector Interfaces:

Zynq Ultrascale+ MPSoC PL Interfaces:
PL Transceivers x 16 @ 16.3 Gbps
48 LVDS/96 SE from HP BANK & 46 SE from HD Banks

Zynq Ultrascale+ MPSoC PS Interfaces:
Gigabit Ethernet x 1 Port
USB 2.0 OTG x 1 Port
SPI x 1 Port
CAN x 2 Ports
I2C x 1 Ports
SD x 1 Port
Debug UART
UART x 1 Port
JTAG
GEM 3 or USB1 2.0 x 1 Port
PS Transceivers x4 @ 6Gbps

OS Support: Linux

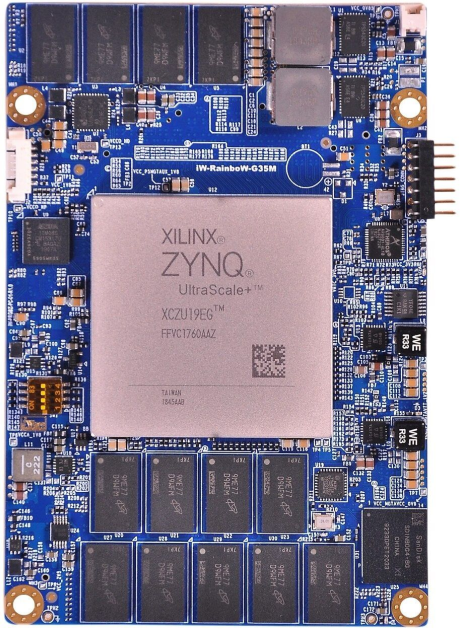
Power Supply:
5V through Board to Board connector

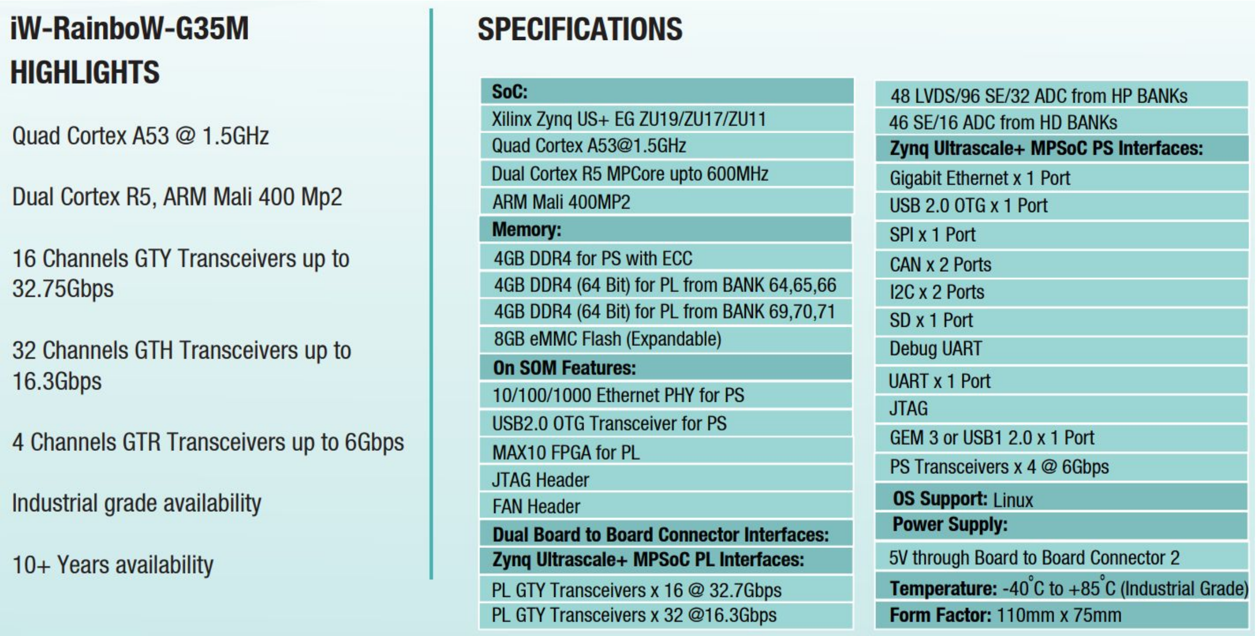
Temperature support:
-40°C to +85°C (Industrial grade operation)

Form Factor: 95mm x 75mm

iW-RainboW-G35M

ZU19/ZU17/ZU11- Zynq UltraScale+ SOM





iW-RainboW-G35M HIGHLIGHTS

- Quad Cortex A53 @ 1.5GHz
- Dual Cortex R5, ARM Mali 400 Mp2
- 16 Channels GTY Transceivers up to 32.75Gbps
- 32 Channels GTH Transceivers up to 16.3Gbps
- 4 Channels GTR Transceivers up to 6Gbps
- Industrial grade availability
- 10+ Years availability

SPECIFICATIONS

SoC:
Xilinx Zynq US+ EG ZU19/ZU17/ZU11
Quad Cortex A53@1.5GHz
Dual Cortex R5 MPCore upto 600MHz
ARM Mali 400MP2

Memory:
4GB DDR4 for PS with ECC
4GB DDR4 (64 Bit) for PL from BANK 64,65,66
4GB DDR4 (64 Bit) for PL from BANK 69,70,71
8GB eMMC Flash (Expandable)

On SOM Features:
10/100/1000 Ethernet PHY for PS
USB2.0 OTG Transceiver for PS
MAX10 FPGA for PL
JTAG Header
FAN Header

Dual Board to Board Connector Interfaces:

Zynq Ultrascale+ MPSoC PL Interfaces:
PL GTY Transceivers x 16 @ 32.7Gbps
PL GTY Transceivers x 32 @16.3Gbps
48 LVDS/96 SE/32 ADC from HP BANKs
46 SE/16 ADC from HD BANKs

Zynq Ultrascale+ MPSoC PS Interfaces:
Gigabit Ethernet x 1 Port
USB 2.0 OTG x 1 Port
SPI x 1 Port
CAN x 2 Ports
I2C x 2 Ports
SD x 1 Port
Debug UART
UART x 1 Port
JTAG
GEM 3 or USB1 2.0 x 1 Port
PS Transceivers x 4 @ 6Gbps

OS Support: Linux

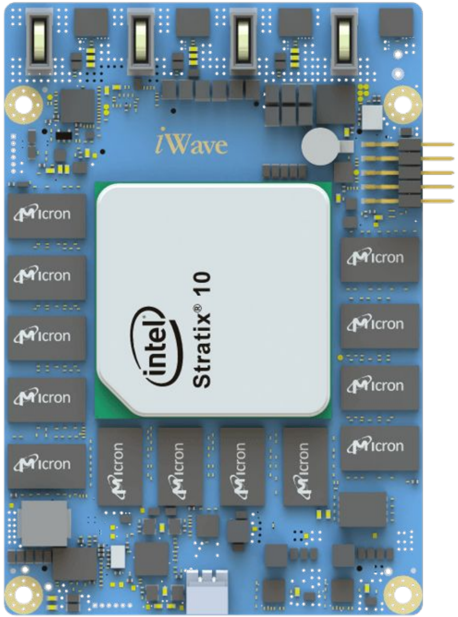
Power Supply:
5V through Board to Board Connector 2

Temperature: -40°C to +85°C (Industrial Grade)

Form Factor: 110mm x 75mm

iW-RainboW-G45M

Stratix 10 SoC FPGA SOM



iW-RainboW-G45M HIGHLIGHTS

Quad-Core 64bit ARM Cortex -A53 with MPU up to 1500MHz

32GB eMMC Flash (Upgradable)

1Gb QSPI Flash (Upgradable)

8GB DDR4 for HPS with ECC (64bit + 8bit) (Upgradable)

2 x 8GB DDR4 for FPGA (64bit + 64bit) (Upgradable)

On SOM Gigabit Ethernet PHY

Industrial Grade availability

SPECIFICATIONS

On Board Features

Supported CPU Devices

Stratix10 SX SoC:

SX850, SX1100, SX1650, SX2100, SX2500, SX2800

Quad Core 64bit ARM Cortex -A53 with MPU

Up to 2753K Logic Elements & 9,33,120 ALMs

Stratix10 GX FPGA:

GX850, GX1100, GX1650, GX2100, GX2500, GX2800

Up to 2753K Logic Elements & 9,33,120 ALMs

Stratix 10 SX SoC FPGA HPS Interfaces

32GB eMMC Flash (Upgradable)

1GB QSPI Flash (Upgradable)

8GB DDR4 for HPS with ECC (64bit + 8bit) (Upgradable)

2 x 8GB DDR4 for FPGA (64bit + 64bit) (Upgradable)

On SOM Features

Gigabit Ethernet PHY for HPS

USB2.0 OTG Transceiver for HPS

JTAG/ Active Serial Header, Fan Header

Stratix 10 SX HPS Features

Gigabit Ethernet x 1 Port

USB2.0 OTG x 1 Port

SPI/UART x 1 Port

I2C x 1 Port

SDMMC x 1 Port

Debug UART

Stratix 10 GX/SX SDM Features

QSPI Flash x 1 Port

PMBus X 1 Port

JTAG x 1 Port

Control Signals

OS Support

Linux

Power Input

5V

Operating Temperature

-40°C to +85°C (Industrial Grade)

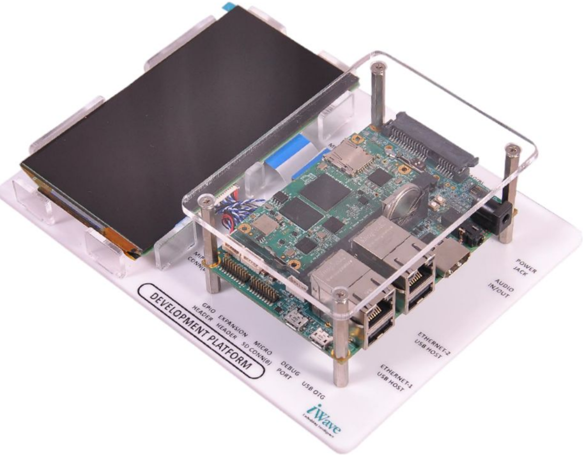
Form factor

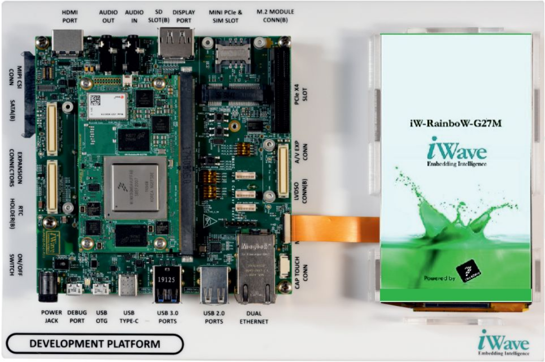
110mm x 75mm

Environment Specification

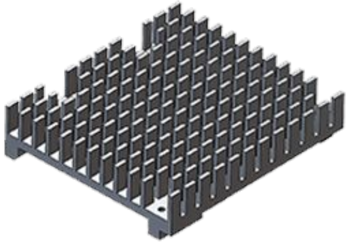
RoHS3 & REACH Compliant

Kits de desarrollo y accesorios


DEVELOPMENT PLATFORM
POWER JACK
AUDIO IN/OUT
ETHERNET-2 USB HOST
ETHERNET-1 USB HOST
USB OTG
DEBUG PORT
MICRO SD CONN(B)
EXPANSION HEADER
GPIO HEADER
iWave


HDMI PORT
AUDIO OUT
AUDIO IN
SD SLOT(B)
DISPLAY PORT
MINI PCIe & SIM SLOT
M.2 MODULE CONN(B)
MIPI CSI CONN
SATA(B)
EXPANSION CONNECTORS
RTC HOLDER(B)
ON/OFF SWITCH
PCIe X4 SLOT
A/V EXP CONN
LVDS0 CONN(B)
CAP TOUCH CONN
POWER JACK
DEBUG PORT
USB OTG
USB TYPE-C
USB 3.0 PORTS
USB 2.0 PORTS
DUAL ETHERNET
DEVELOPMENT PLATFORM
iW-RainboW-G27M
iWave
Embedding Intelligence
iWave
Embedding Intelligence

RainboW-G15D
i.MX6 Qseven Development Kit
Powered By
iWave
Embedding Intelligence
iWave



Muchas gracias