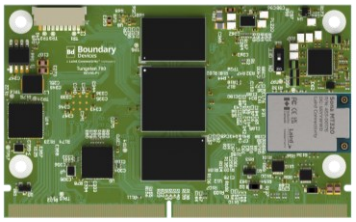
Powerful, Standardized, and Connected Processing: Cutting Edge MediaTek IoT Processing with Wi-Fi 6 & Bluetooth 5.3

Our customers asked for cutting edge, high performance, robust SOM that simplifies their BOM, has reliable connectivity, uses a standard form factor, and is globally certified. One with multiple software options, next generation performance, advanced multimedia, and dedicated AI capabilities.

Our new Tungsten510 is powered by **MediaTek's Genio 510** processor and our Sona™ MT320 Wi-Fi 6 / Bluetooth 5.3 radio based on **MediaTek's Filogic 320 (MT7921)**, high performance LPDDR4 RAM, and eMMC storage. In combination with our universal SMARC carrier board, they are a single board computer (SBC) that can speed your product to market. Alternately, work with us to create a custom carrier that fits your mechanical, environmental, temperature, and interface requirements.

- **Powerful Arm DynamIQ big.LITTLE Multiprocessing: 2x 2.0 GHz Cortex-A78** and **4x 2.0 GHz Cortex-A55** balances power efficiency via the *little* A55 cores with the peak computing performance provided0 by the *big* A78 cores.
- **High Performance Graphics and Display** powered by an **Arm Mali-G57 MC2 GPU** and dual display outputs supporting 4K60 plus FHD60 resolution, allowing for smartphone and tablet class UIs and 3D performance.
- **4K Video Encoder and Decoder** with **encoding support for 4K30** in HEVC/H.264 and **decoding of up to 4K60** in HEVC/H.264/AV1/VP9.
- **Tensilica HiFi 5 Audio DSP:** efficient processing of audio codecs / voice data.
- **Dedicated MediaTek AI Accelerator:** High-performance edge machine learning via an integrated neural processing unit, delivering up to 2.8 TOPS.
- **Advanced Vision Pipeline:** multiple MIPI-CSI, onboard **image signal processor** (up to **32MP @ 30 fps)** for functions like electronic image stabilization and HDR fusion, and a Tensilica **VP6 vision processing unit** capable of face detection, object identification, scene analysis, optical character recognition, and more.
- **Diversity of Interfaces:** Multiple display, network, data, audio, camera, more.
- Optional **Wi-Fi 6** (802.11ax) and **Bluetooth 5.3** Classic & Low Energy (LE)



MEDIATEK

- **SMARC 2.1.1 Form Factor: 82mm x 50mm** SMARC edge connector form including **onboard ethernet PHYs and a USB hub controller**. One design supports multiple processor, memory, and wireless configurations.
- **Hardware Upgrade Roadmap:** A design that can easily be upgraded to the latest processors / wireless as our future SMARC SOMs are released.
- **Advanced Common Carrier/Dev Board:** Display, camera, audio, ethernet, USB, PCI-Express, CAN, I2C, SPI, UART,& more. Use in development, as an SBC in a product, or as reference for your carrier design.
- **Operating Temp**: Commercial (0° to +70 °C) / Industrial (-40° to +85 °C)
- Multiple high performance memory options:
  - 4GB LPDDR4 / 16GB eMMC
  - 8GB LPDDR4 / 16GB eMMC
- Extensive range of **pre-certified antennas** for Sona MT320
- **US based manufacturing with Global Options:** Assembled in USA for local customer base and US market needs. Global manufacturing capability as part of Ezurio footprint, growing into EMEA & APAC regions
- **Diverse Software / BSP Options:** Yocto Linux, Android, or Ubuntu.
- **Power Efficient:** Genio 700 is built using class leading 6nm equivalent process combined with MediaTek PMIC, power optimized LPDDR4 & eMMC memory, core shut off, clock/voltage scaling, low power interfaces, power optimized Wi-Fi and BT enable highly optimized power consumption.
- **Long term HW availability and SW support:** Ezurio's products are specifically designed to meet the needs of the industrial and markets, which typically require 10 year or more product lifecycles.

Key Features

Powerful, efficient general purpose embedded computing
2.0 GHz dual-core Cortex-A78 and quad-core 2.0 GHz Cortex-A55 allows for balancing power efficiency with the availability of peak computing performance.

AI, graphics, video, vision, and audio – Up to 2 displays
2.8 TOPS AI/Machine Learning Unit, dual 4K60 and FHD60 displays, smartphone class Arm Mali-G57 MC2 GPU, multi codec 4K30 encode and 4K60 decode video, 2 MIPI-CSI camera interfaces, dedicated Image Signal Processing up to 32MP, HiFi 5 audio DSP.

Reliable connectivity: Wi-Fi 6 and BT 5.3
Excellent Wi-Fi and BT Classic / LE connectivity in difficult environments, plus enterprise Wi-Fi support via WPA3-Enterprise for more secure and robust connections.

Robust software and speed to market
Choose from Yocto Linux, Android, and Ubuntu.

Global Radio Approvals
Carries several modular FCC, IC, CE, and Bluetooth SIG approvals.

Personal support from Design to Manufacture
Our industry-renowned support and field application engineering team is passionate about helping you speed your design to market.

Application Areas

- **Smart Camera**
- **Industrial Tablets and Handhelds**
- **Industrial IoT, Vision Systems**
- **Smart Fitness Equipment**
- **Autonomous / Automated Robots and Vehicles**
- **Smart Signage and Retail POS**

Interested in our Tungsten510 Series?
Visit www.ezurio.com/tungsten510-smarc

Specifications

Category	Feature	Specification
Processors	Microprocessor	2x Cortex-A78 @ up to 2.0 GHz and 4x Cortex-A55 @ up to 2.0 GHz
	Vision	Tensilica VP6 Vision Processing Unit
	Audio	Tensilica® HiFi 5 DSP
	Graphics	Arm Mali-G57 MC2 GPU up to 950 MHz
	Machine Learning	AI Accelerator with up to 2.8 TOP/s
Memory	RAM	4GB and 8GB. (For custom sizes, please contact Sales)
	Storage	16GB. (For custom sizes, please contact Sales)
Machine Learning	AI Processing Accelerator	• Fix 8 × Fix 8: 2.8 TOPS • Fix 16 × Fix 8: 1.4 TOPS • Fix 16 × Fix 16: 0.7 TOPS • FP 16/BF 16: 0.7 TOPS
Graphics and Video	Graphics Processing Unit	• OpenGL ES 1.1, 2.0, and 3.2 • Vulkan 1.0 and 1.1 • 2D acceleration • OpenCL 1.0, 1.1, 1.2, 2.0, 2.1, 2.2
	Video Processing Unit	**Video Decode** • 4K60 HEVC/H.265 Main, Main 10 (up to level 5.1) • 4K60 AV1 Main profile (up to level 5.1) • 4K60 VP9 Profile 0 / 2 • 4K60 H.264 Baseline, Main, High, High 10 profile • 1080p60 H.263 Baseline profile • 1080p60 VP8 • 1080p60 MPEG-2 Main profile • 1080p60 MPEG-4 Simple, Advanced Simple Profile • HEIF Main, Main 10 profile up to 16383 × 16383 **Video Encode** • 4K30 H.264 encoder • 4K30 HEVC/H.265 encoder
	Display Interfaces	• 2x 4-lane MIPI DSI, throughput up to 1.2 Gbps per data lane • 1x Embedded DisplayPort, up to 2560x1600@60Hz • 1x HDMI 2.0a Tx, up to 4K60 • 1x DisplayPort, up to 4K60
Vision	Camera	2x 4-lane MIPI CSI
	Image Signal Processor	• Single camera: 32MP @ 30fps • Dual camera: 16MP + 16MP @ 30fps • Video High Dynamic Range (HDR) with stagger HDR sensor: up to 12 MP at 30 fps
Audio	Audio Interfaces	• 2x I2S
Peripherals	Input/Output	• 1x PCIe Gen2 1-Lane Dual Mode with PHY • 2x USB 3.0/2.0 Host • 2x USB 2.0 Host • 1x USB 2.0 OTG • 2x Gbit Ethernet • 3x UART • 5x I2C • 3x SPI • 1x SDIO 3.0/eMMC 5.1 • 14x GPIO
Wireless Specification	Wi-Fi	Wi-Fi 6 (802.11ax)
	Frequency	Dual-Band 2.4GHz & 5GHz
	Bluetooth	Bluetooth 5.3
	Transmit Power	+ 18 dBm (maximum)
	Antenna Options	MHF4 connector for external antenna
	Raw Data Rates (Air)	Wi-Fi 6 1020.8 Mbit/s – MCS11, 2 spatial streams, 80MHz, 1024-QAM, SGI
	Regulatory Approvals	FCC/IC/CE
Key Wi-Fi Features	Wi-Fi 6 (802.11ax)	• IEEE 802.11 a/b/g/n/ac/ax • 20, 40 & 80MHz bandwidth support • OFDMA
Key Bluetooth Features	Bluetooth Version	• Classic Bluetooth – BR / EDR • Central / Peripheral Modes • LE Secure Connections
Supply Voltage		5 V
Physical	Dimensions	SMARC 2.1.1 Standard - 82mm x 50mm
Environmental	Temp Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
Miscellaneous	Lead Free	Lead-free and RoHS-compliant
	Carrier Board	Carrier board, accessories, and evaluation software
Qualifications	Bluetooth® SIG	Bluetooth SIG Qualified Listing

Ordering Information

Part	Description
T510_SMARC_SOM_4r16e	Tungsten510 SMARC SOM: Genio 510 / 4GB / 16GB eMMC / 0 to +70°C / Without Wireless
T510_SMARC_SOM_8r16e	Tungsten510 SMARC SOM: Genio 510 / 8GB / 16GB eMMC / 0 to +70°C / Without Wireless
T510_SMARC_SOM_4r16e_MT320_2M	Tungsten510 SMARC SOM: Genio 510 / 4GB / 16GB eMMC / MT320 / 0 to +70°C
T510_SMARC_SOM_8r16e_MT320_2M	Tungsten510 SMARC SOM: Genio 510 / 8GB / 16GB eMMC / MT320 / 0 to +70°C
T510_SMARC_SOM_4r16e_i	Tungsten510 SMARC SOM: Genio 510 / 4GB / 16GB eMMC / -40 to +85°C / Without Wireless
T510_SMARC_SOM_8r16e_i	Tungsten510 SMARC SOM: Genio 510 / 8GB / 16GB eMMC / -40 to +85°C / Without Wireless
T510_SMARC_SOM_4r16e_MT320_2M_i	Tungsten510 SMARC SOM: Genio 510 / 4GB / 16GB eMMC / MT320 / -40 to +85°C
T510_SMARC_SOM_8r16e_MT320_2M_i	Tungsten510 SMARC SOM: Genio 510 / 8GB / 16GB eMMC / MT320 -40 to +85°C
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Ezurio:

T510_SMARC_SOM_8R16E T510_SMARC_SOM_4R16E T510_SMARC_SOM_4r16e_MT320_2M_i T510_SMARC_SOM_8r16e_MT320_2M T510_SMARC_SOM_8r16e_i T510_SMARC_SOM_4r16e_MT320_2M T510_SMARC_SOM_4r16e_i T510_SMARC_SOM_8r16e_MT320_2M_i