V.7/23

Boundary Devices
a Laird Connectivity™ company

Tungsten700

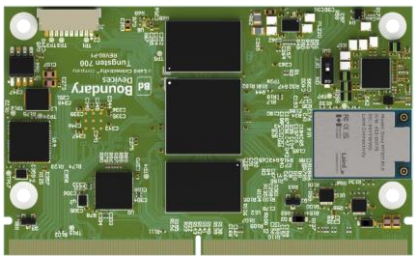
Genio 700 + Wi-Fi 6 + Bluetooth 5.3
SMARC 2.1.1 Form Factor

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

Featuring **Genio 700** and Sona MT921 **(Mediatek MT7921)**

2.2 GHz dual-core Cortex-A78 and **hexa-core 2.0 GHz Cortex-A55**

Optional dual-band Wi-Fi 6 (**802.11ax**) and **Bluetooth 5.3**



MEDIATEK

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 Tungsten700 is powered by **Mediatek's Genio 700** processor and our Sona™ MT921 Wi-Fi 6 / Bluetooth 5.3 radio based on **Mediatek's 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: 2.2 GHz dual-core Cortex-A78** and **hexa-core 2.0 GHz Cortex-A55** balances power efficiency via the *little* A55 cores with the peak computing performance provided by the *big* A78 cores.
- **High Performance Graphics and Display** powered by an **Arm Mali-G57 MC3 GPU** and dual display outputs supporting 4K30 plus 4K60 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 4K75** in HEVC/H.264/AV1/VP9.
- **Tensilica HiFi 5 Audio DSP** for efficient processing of audio codecs and voice data.
- **Dedicated Mediatek AI Accelerator:** High-performance edge machine learning via an integrated neural processing unit, delivering up to 3.7 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 and camera interfaces.
- Optional **Wi-Fi 6** (802.11ax) and **Bluetooth 5.3** Classic & Low Energy (LE)
- **SMARC 2.1.1 Standard Form Factor: 82mm x 50mm** SMARC edge connector form factor including **onboard ethernet PHYs and a USB hub controller**. One design supports multiple processor, memory, and wireless configurations.
- **Hardware Upgrade Roadmap:** Build a design that can easily be upgraded to the latest processors and wireless as our future SMARC SOMs are released.
- **Advanced Common Carrier/Development Board:** Display, camera, audio, Ethernet, USB, PCI-Express, CAN, I2C, SPI, UART, and more. Use in development, as an SBC equivalent in a product, or as reference designs for your carrier board design.
- **Operating Temp**: Commercial (0° to +70 °C) or 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 MT921
- **US based manufacturing with Global Options:** Manufacture in USA for local customer base and US market needs. Global manufacturing capability as part of Laird Connectivity footprint, growing reach to EMEA & APAC regions
- **Diverse Software and Board Support Options:** Choose from Yocto Linux, Android, or Ubuntu.
- **Power Efficient:** Genio 700 is built using class leading 6nm equivalent production process and combined with a Mediatek PMIC, power optimized LPDDR4 and eMMC memory, core shut off, clock/voltage scaling, low power interfaces, power optimized Wi-Fi and Bluetooth enable highly optimized power consumption.
- **Long term hardware availability and software support:** Laird Connectivity's products are specifically designed to meet the needs of the industrial and markets, which typically require 10 year or more product lifecycles.

FEATURES AT A GLANCE

POWERFUL, EFFICIENT GENERAL PURPOSE EMBEDDED COMPUTING
2.2 GHz dual-core Cortex-A78 and hexa-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
3.7 TOPS AI/Machine Learning Processing Unit, dual 4K60 and 4K30 displays, smartphone class Arm Mali-G57 MC3 GPU, multi codec 4K30 encode and 4K75 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, UKCA, RCM, MIC, KC 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 and Automated Robots and Vehicles
- Smart Signage and Retail POS

KEY SPECIFICATIONS

CATEGORY	FEATURE	SPECIFICATION
Processors	Microprocessor	2x Cortex-A78 @ up to 2.2 GHz and 6x Cortex-A55 @ up to 2.0 GHz
	Vision	Tensilica VP6 Vision Processing Unit
	Audio	Tensilica® HiFi 4 DSP
	Graphics	Arm Mali-G57 MC3 GPU up to 950 MHz
	Machine Learning	AI Accelerator with up to 3.7 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: 3.7 TOPS ▪ Fix 16 × Fix 8: 1.9 TOPS ▪ Fix 16 × Fix 16: 0.9 TOPS ▪ FP 16/BF 16: 0.9 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** ▪ 4K75 HEVC/H.265 Main, Main 10 (up to level 5.1) ▪ 4K75 AV1 Main profile (up to level 5.1) ▪ 4K75 VP9 Profile 0 / 2 ▪ 4K75 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 1920x1410@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 16 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
Key Wi-Fi Features	Wi-Fi 5 (802.11ac)	▪ IEEE 802.11 a/b/g/n/ac/ax ▪ 20, 40 & 80MHz bandwidth support ▪ OFDMA
Key Bluetooth Features	Bluetooth V	▪ Classic Bluetooth – BR / EDR ▪ Central / Peripheral Modes ▪ LE Secure Connections
Supply Voltage		5 V
Physical	Dimensions	SMARC 2.1 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
Regulatory	Approvals	FCC/IC/CE/MIC/RCM

For full specifications on the Nitrogen8M Plus SMARC, please see the appropriate datasheet.

Part #	Description
T700_SMARC_SOM_4r16e	Tungsten700 SMARC SOM: Genio 700 / 4GB / 16GB eMMC / 0 to +70°C / Without Wireless
T700_SMARC_SOM_8r16e	Tungsten700 SMARC SOM: Genio 700 / 8GB / 16GB eMMC / 0 to +70°C / Without Wireless
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

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