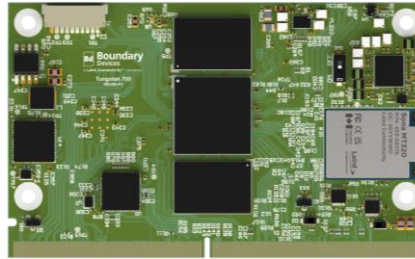


## POWERFUL, STANDARDIZED, AND CONNECTED PROCESSING: CUTTING EDGE MEDIATEK IoT PROCESSING WITH WI-FI 6 & BLUETOOTH 5.3

Featuring **Genio 700**  
and **Sona MT320 (MediaTek Filogic 320)**

**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™ 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: Dual-core 2.2 GHz 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 MT320
- **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
<b>Processors</b>	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
<b>Memory</b>	RAM	4GB and 8GB. <i>(For custom sizes, please contact Sales)</i>
	Storage	16GB. <i>(For custom sizes, please contact Sales)</i>
<b>Machine Learning</b>	AI Processing Accelerator	<ul style="list-style-type: none"> <li>▪ Fix 8 × Fix 8: 3.7 TOPS</li> <li>▪ Fix 16 × Fix 8: 1.9 TOPS</li> <li>▪ Fix 16 × Fix 16: 0.9 TOPS</li> <li>▪ FP 16/BF 16: 0.9 TOPS</li> </ul>
	<b>Graphics and Video</b>	Graphics Processing Unit
Video Processing Unit		<p><b>Video Decode</b></p> <ul style="list-style-type: none"> <li>▪ 4K75 HEVC/H.265 Main, Main 10 (up to level 5.1)</li> <li>▪ 4K75 AV1 Main profile (up to level 5.1)</li> <li>▪ 4K75 VP9 Profile 0 / 2</li> <li>▪ 4K75 H.264 Baseline, Main, High, High 10 profile</li> <li>▪ 1080p60 H.263 Baseline profile</li> <li>▪ 1080p60 VP8</li> <li>▪ 1080p60 MPEG-2 Main profile</li> <li>▪ 1080p60 MPEG-4 Simple, Advanced Simple Profile</li> <li>▪ HEIF Main, Main 10 profile up to 16383 × 16383</li> </ul> <p><b>Video Encode</b></p> <ul style="list-style-type: none"> <li>▪ 4K30 H.264 encoder</li> <li>▪ 4K30 HEVC/H.265 encoder</li> </ul>
	Display Interfaces	<ul style="list-style-type: none"> <li>▪ 2x 4-lane MIPI DSI, throughput up to 1.2 Gbps per data lane</li> <li>▪ 1x Embedded DisplayPort, up to 1920x1410@60Hz</li> <li>▪ 1x HDMI 2.0a Tx, up to 4K60</li> <li>▪ 1x DisplayPort, up to 4K60</li> </ul>
<b>Vision</b>	Camera	<ul style="list-style-type: none"> <li>▪ 2x 4-lane MIPI CSI</li> </ul>
	Image Signal Processor	<ul style="list-style-type: none"> <li>▪ Single camera: 32MP @ 30fps</li> <li>▪ Dual camera: 16MP + 16MP @ 30fps</li> <li>▪ Video High Dynamic Range (HDR) with stagger HDR sensor: up to 16 MP at 30 fps</li> </ul>
<b>Audio</b>	Audio Interfaces	<ul style="list-style-type: none"> <li>▪ 2x I2S</li> </ul>
<b>Peripherals</b>	Input/Output	<ul style="list-style-type: none"> <li>▪ 1x PCIe Gen2 1-Lane Dual Mode with PHY</li> <li>▪ 2x USB 3.0/2.0 Host</li> <li>▪ 2x USB 2.0 Host</li> <li>▪ 1x USB 2.0 OTG</li> <li>▪ 2x Gbit Ethernet</li> </ul>
		<ul style="list-style-type: none"> <li>▪ 3x UART</li> <li>▪ 5x I2C</li> <li>▪ 3x SPI</li> <li>▪ 1x SDIO 3.0/eMMC 5.1</li> <li>▪ 14x GPIO</li> </ul>
<b>Wireless Specification</b>	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
<b>Key Wi-Fi Features</b>	Raw Data Rates (Air)	Wi-Fi 6 1020.8 Mbit/s – MCS11, 2 spatial streams, 80MHz, 1024-QAM, SGI
	Wi-Fi 5 (802.11ac)	<ul style="list-style-type: none"> <li>▪ IEEE 802.11 a/b/g/n/ac/ax</li> <li>▪ 20, 40 &amp; 80MHz bandwidth support</li> <li>▪ OFDMA</li> </ul>
<b>Key Bluetooth Features</b>	Bluetooth V	<ul style="list-style-type: none"> <li>▪ Classic Bluetooth – BR / EDR</li> <li>▪ Central / Peripheral Modes</li> <li>▪ LE Secure Connections</li> </ul>
<b>Supply Voltage</b>		5 V
<b>Physical</b>	Dimensions	SMARC 2.1.1 Standard - 82mm x 50mm
<b>Environmental</b>	Temp Range	0°C to +70°C (Commercial) and -40° to +85 °C (Industrial)
<b>Miscellaneous</b>	Lead Free	Lead-free and RoHS-compliant
	Carrier Board	Carrier board, accessories, and evaluation software
<b>Qualifications</b>	Bluetooth® SIG	Bluetooth SIG Qualified Listing
<b>Regulatory</b>	Approvals	FCC/IC/CE/MIC/RCM

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

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

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