

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

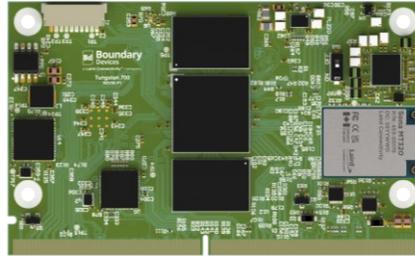


ASSEMBLED IN THE USA

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**



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:** Assembled 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. <i>(For custom sizes, please contact Sales)</i>	
	Storage	16GB. <i>(For custom sizes, please contact Sales)</i>	
Machine Learning	AI Processing Accelerator	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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		<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> Video Decode <ul style="list-style-type: none"> ▪ 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 </td> <td style="width: 50%; vertical-align: top;"> Video Encode <ul style="list-style-type: none"> ▪ 4K30 H.264 encoder ▪ 4K30 HEVC/H.265 encoder </td> </tr> </table>	Video Decode <ul style="list-style-type: none"> ▪ 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
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Vision	Display Interfaces	<ul style="list-style-type: none"> ▪ 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 	
	Camera	<ul style="list-style-type: none"> ▪ 2x 4-lane MIPI CSI 	
Audio	Image Signal Processor	<ul style="list-style-type: none"> ▪ 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 Interfaces	<ul style="list-style-type: none"> ▪ 2x I2S 	
Peripherals	Input/Output	<ul style="list-style-type: none"> ▪ 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	
Key Wi-Fi Features	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"> ▪ IEEE 802.11 a/b/g/n/ac/ax ▪ 20, 40 & 80MHz bandwidth support ▪ OFDMA 	
Key Bluetooth Features	Bluetooth Version	<ul style="list-style-type: none"> ▪ 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	
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
T700_SMARC_SOM_4r16e_MT320_2M	Tungsten700 SMARC SOM: Genio 700 / 4GB / 16GB eMMC / MT320 / 0 to +70°C
T700_SMARC_SOM_8r16e_MT320_2M	Tungsten700 SMARC SOM: Genio 700 / 8GB / 16GB eMMC / MT320 / 0 to +70°C
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

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