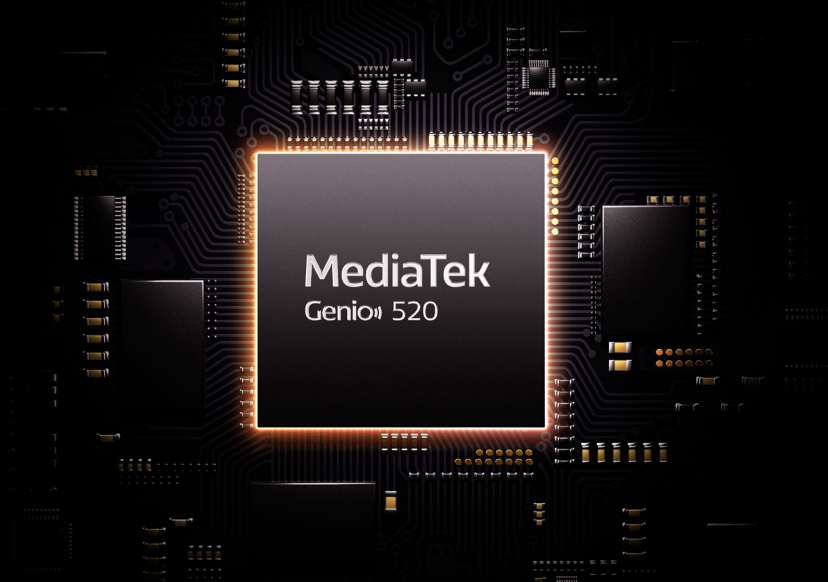


# MediaTek Genio 520

Empowering Mainstream IoT Applications  
with Powerful Neural Processing Unit for  
Advanced Edge GenAI



## Key Overview

The MediaTek Genio 520 is engineered for embedded applications that require reliable, low-power implementation of edge AI and GenAI applications. Built on an advanced 6nm process technology, the Genio 520 integrates an 8th generation MediaTek NPU, that delivers up to 10 TOPS of acceleration for handling complex AI tasks like object detection, image classification, and speech recognition as well as on-device support for GenAI applications and leading LLMs (Large Language Models). This enables real-time, low-latency AI inference on the edge, reducing reliance on cloud-based processing.

### Target Applications

- Home automation
- Smart appliance
- Commercial display
- Interactive flat panel display
- Digital signage
- POS terminal
- Handheld POS
- Industrial gateway
- Industrial handheld device
- Industrial HMI
- Industrial edge AI device

## Highlights



### NPU with 10 TOPS of System AI Acceleration

The integrated NPU with 10 TOPS of system AI acceleration allows for low-power, reliable acceleration of AI and GenAI uses cases without the need for cloud computing – reducing latency and system costs, while increasing data privacy at the edge.



### Advanced Multimedia for Dual Displays and 4K Resolution

Equipped with an Arm Mali-G57 MC2 GPU and single image signal processor, supports up to single ultrawide 5K or dual 2.5K resolution displays and multi-camera configurations up to 6x FHD30 via virtual channels. It offers advanced multimedia capabilities, including 4K video encoding/decoding, and supports a wide range of display and camera applications.



### Industrial Ready and Reference Design

The Genio 520 is pin-compatible with the Genio 720, providing enhanced design flexibility. It also supports industrial temperature ranges and OSM (Open Standard Module) reference design, with long 10 year product life commitment, making it suitable for a variety of environments and industrial deployment.



### High-Performance, Power-Efficient Computing Platform

Built on TSMC's 6nm process, the platform features 2x Arm Cortex-A78 and 6x Arm Cortex-A55 cores which delivers enhanced performance for compute-intensive edge applications while maintaining power efficiency for sustained operation.



### Enhanced Connectivity Options for Next-gen IoT Devices

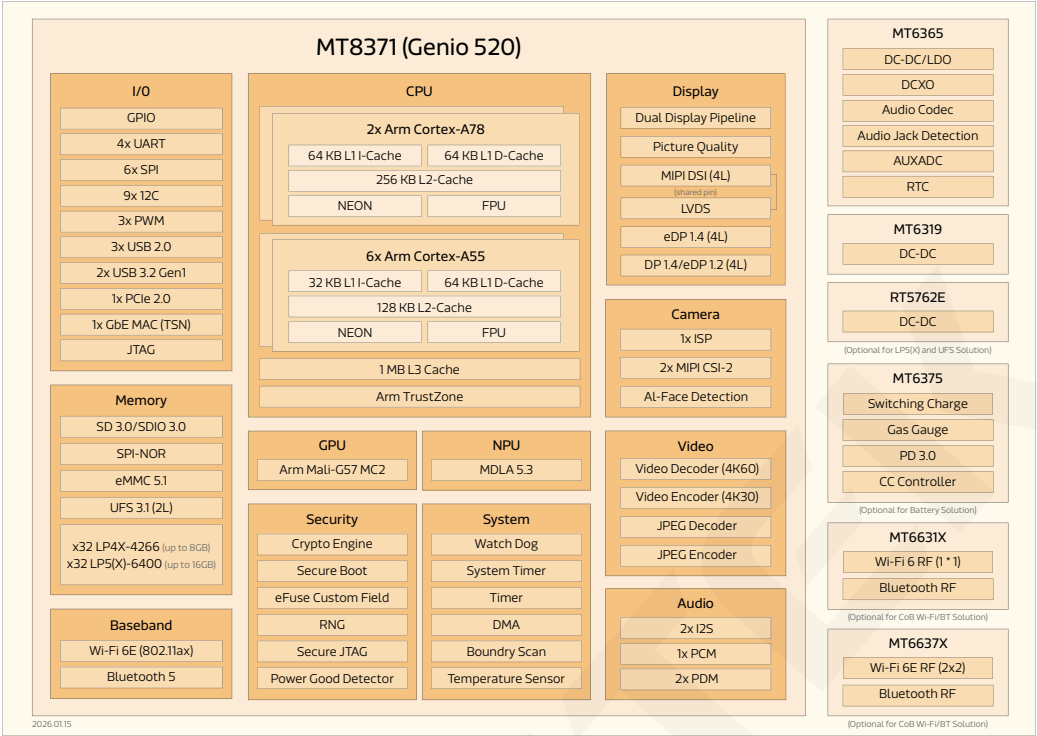
With an integrated baseband design, the Genio 520 supports optional RF solutions from a cost-effective 1x1 Wi-Fi 6/Bluetooth 5.3 configuration to higher performance 2x2 Wi-Fi 6E/Bluetooth 5.3. External module partners can offer expansion options to support Wi-Fi 7, 5G and/or 5G/RedCap connectivity via PCIe or USB3.2 Gen1.



### Comprehensive Software Support

Genio 520 supports Android, Yocto Linux and Ubuntu operating systems. Android is a rapid time-to-market, reliable, and feature-rich OS that delivers optimal performance and power efficiency. Yocto Linux is a standard, open-source, and easily customizable OS that enables developers to create custom Linux-based systems for embedded products. Ubuntu is a trusted and reliable OS with long-term support that provides a unified, stable experience.

# Block Diagram



# Specifications

Processors	CPU	2x Arm Cortex-A78 2.0~2.2GHz <ul style="list-style-type: none"><li>Up to 2.2GHz at commercial grade: -20°C to 95°C (Tj)</li><li>Up to 2.0GHz at industrial grade: -40°C to 105°C (Tj)</li></ul> 6x Arm Cortex-A55 1.8~2.0GHz <ul style="list-style-type: none"><li>Up to 2.0GHz at commercial grade: -20°C to 95°C (Tj)</li><li>Up to 1.8GHz at industrial grade: -40°C to 105°C (Tj)</li></ul>
Memory & Storage	Memory Type & Speed	LPDDR4X up to 4,266Mbps up to 8GB LPDDR5(X) up to 6,400Mbps up to 16GB
	Storage Type	UFS 3.1 2-lane eMMC 5.1
AI	NPU	MediaTek 8 <sup>th</sup> -generation NPU
Graphics	GPU	Arm Mali-G57 MC2 Supports OpenGL, OpenCL, Vulkan
Display & Video	Display Support	2.5K60+2.5K60, 4K60, UW5K60 Supports dual active display
	Video Encode	H.264/H.265 (4K30)
	Video Decode	H.264/H.265/VP9 (4K60) MPEG4/VP8 (FHD60)
	JPEG Encode	400MP/s
	JPEG Decode	250MP/s
Peripheral Interfaces (IO)	Host/Host Device	3x USB 2.0 (Host) 1x USB 3.2 Gen1 (Host) 1x USB 3.2 Gen1 (Host/Device, shared with DP)
	Interfaces	1x GbE MAC (TSN) 1x PCIe 2.0 (IL, RC, WoWLAN) 4x UART 9x I2C 6x SPI Master 3x PWM
	Audio	Audio-In: 2x I2S (2ch, M+M/S), 1x PCM (2ch), 2x DMIC (2ch) Audio-Out: 2x I2S (2ch, M), 1x PCM (2ch)
Wireless Connectivity	Wi-Fi/Bluetooth	Integrated Wi-Fi 6 1x1/6E 2x2 Bluetooth 5.3
Camera	ISP	1x ISP Single camera: 16MP@30fps
Package	Type	VFBGA 13.8x11.8mm, ball pitch 0.4mm