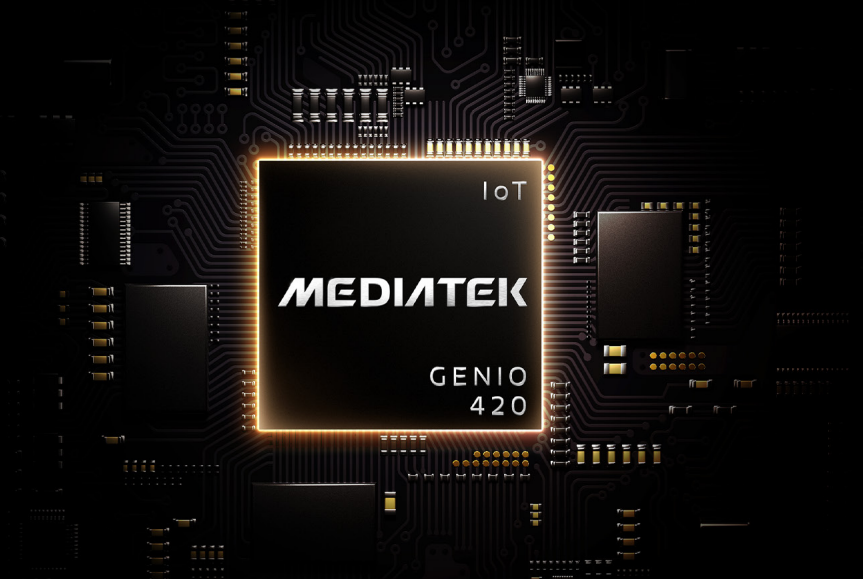


MediaTek Genio 420

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



Key Overview

The MediaTek Genio 420 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 420 integrates an 8th generation MediaTek NPU with 6.1 TOPS of acceleration (7.2 TOPS Total System) 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) under 2B parameters. This enables real-time, low-latency AI inference on the edge, reducing reliance on cloud-based processing.

The Genio 420 further expands the Genio 720/520 family offering pin-to-pin hardware and full software compatibility. Combined with support for the latest LPDDR4X & LPDDR5 memory interfaces, the Genio 420 provides a cost-effective point to the family.

Target Applications

- Home automation
- Smart appliance
- Commercial display
- Interactive flat panel display
- Digital signage
- POS terminal
- Handheld POS

Highlights



NPU with 7.2 TOPS of System AI Acceleration

The integrated NPU with 6.1 TOPS of AI acceleration (7.2 TOPS for the full system) 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

Genio 420 comes equipped with an Arm Mali-G57 MC2 GPU, support for a single ultrawide 5K or dual 2.5K resolution displays and an image signal processor capable of supporting up to 6x FHD30 inputs via virtual channels. It also offers 4K video encoding/decoding to support a wide range of applications.



Industrial Ready and Reference Design

The Genio 420 is pin-compatible with the Genio 720 & Genio 520, providing enhanced design flexibility. It also supports an OSM (Open Standard Module) reference design, with long 10 year product life commitment, making it suitable for a variety of environments and deployments.



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. Support for both LPDDR4X and LPDDR5 memory interfaces allows customers to optimize for overall system BOM cost.



Enhanced Connectivity Options for Next-gen IoT Devices

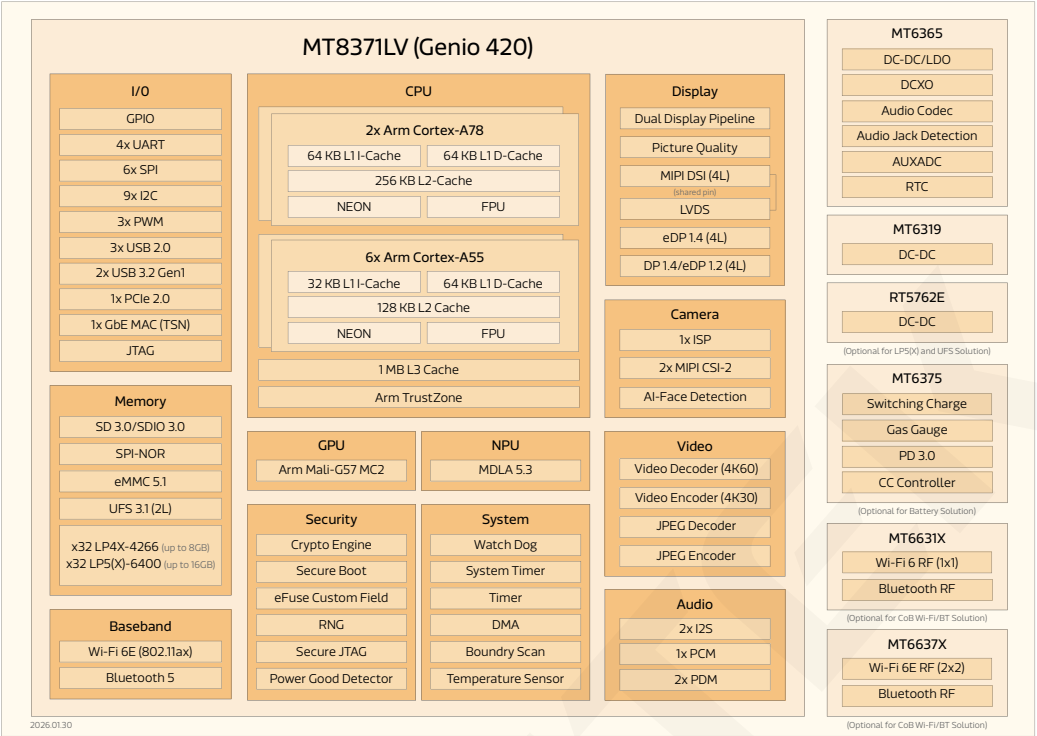
With an integrated baseband design, the Genio 420 supports optional RF solutions from a cost-effective 1x1 Wi-Fi 6/Bluetooth 5.3 configuration to higher performance 2x2 Wi-Fi 6E/Bluetooth 5.3. External module partners can offer expansion options to support Wi-Fi 7, 5G and/or 5G/RedCap connectivity via PCIe or USB3.2 Gen1.



Comprehensive Software Support

Genio 420 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 @ 1.8GHz 6x Arm Cortex-A55 @ 1.6GHz
Memory & Storage	Memory Type & Speed	LPDDR4X up to 4,266Mbps up to 8GB LPDDR5(X) up to 6,400 Mbps up to 16 GB
	Storage Type	UFS 3.1 2-lane eMMC 5.1
AI	NPU	MediaTek 8th generation NPU (6.1 TOPS)
Graphics	GPU	Arm Mali-G57 MC2 Supports OpenGL, Vulkan, OpenCL
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 2x MIPI-CSI Single camera: 16MP@30fps
Package	Type	VFBGA 13.8x11.8mm, ball pitch 0.4mm