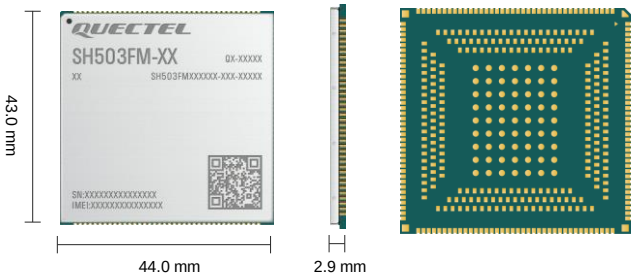
Quectel SH503FM Series

Smart Module
with Wi-Fi & Bluetooth



The SH503FM series is Quectel's new generation of mid-to-high-end smart modules. Based on the Genio G420 (MT8371LV) platform, which integrates an octa-core Cortex-A78 + A55 processor, built-in ARM Mali-G57 MC2 GPU, and runs Android 15*/Yocto Linux (Kernel 6.6)*/Ubuntu* operating systems, it supports Wi-Fi 6E 2 × 2 and Bluetooth 5.4. The NPU delivers up to 6.1 TOPS of computing power, offering robust performance and rich multimedia capabilities, fully meeting customer demands for high-speed data rates, multimedia functionality, and long product lifecycles in industrial and consumer applications. The SH503FM series includes two variants: SH503FM-WF* (Wi-Fi 6_1 × 1/6E_2 × 2) and SH503FM-AP*.

The SH503FM series integrates a rich set of interfaces (such as LCM, camera, touch screen, microphone, 4 × UART, 5 × USB 3.0/2.0, 8 × I2C, 5 × SPI, RGMII, PCIe, etc.). The module also supports video output interfaces for dual-screen display with independent content (MIPI(LVDS)/eDP/DP), significantly expanding their applications in fields such as M2M, industrial smart tablet devices, smart intercom recorder devices, edge computing equipment, vending machines, logistics cabinets, edge computing BOX, smart cash registers, aftermarket in-vehicle entertainment devices, digital signage, audio-video recorders, companion smart displays, smart home systems, and more.

Key Features

- Based on the Genio G420 (MT8371LV) platform, it features a high-performance Cortex-A78 + A55 processor.
- ARM Mali-G57 MC2 GPU
- NPU up to 6.1 TOPS
- Features built-in LPDDR5X memory, supporting up to 16 GB DRAM
- Supports dual-screen independent display via MIPI(LVDS)/EDP/DP interfaces.
- supports up to 16 MP @ 30 fps camera
- Recording and playback 4K @ 60 fps
- USB 3.0 & 2.0
- Wi-Fi 6E, 802.11 a/b/g/n/ac/ax
- RGMII, 10M/100M/1000M bps

cortex-A78 + A55 Processor (octa-core)

MTK ARM Mali-G57 MC2 GPU

Android*/ Ubuntu*/ Yocto Linux (Kernel 6.6) *

Powerful Multimedia Functions

IEEE 802.11 a/ b/ g/ n/ ac/ ax

Bluetooth 5.4 (BR/ EDR + BLE)

Version: 1.0 | Status: Released

Quectel SH503FM Series

Module	SH503FM-WF*	SH503FM-AP*
Region/ Operator	Global	Global
CPU	Genio G420 (MT8371LV) 2 × A78 @ 1.8 GHz, 6 × A55 @ 1.6 GHz	Genio G420 (MT8371LV) 2 × A78 @ 1.8 GHz, 6 × A55 @ 1.6 GHz
NPU	6.1 TOPS	6.1 TOPS
Memory	4 GB LPDDR5X + 64 GB UFS (default) 8 GB LPDDR5X + 128 GB UFS (optional) 12 GB LPDDR5X + 256 GB UFS (optional)	4 GB LPDDR5X + 64 GB UFS (default) 8 GB LPDDR5X + 128 GB UFS (optional) 12 GB LPDDR5X + 256 GB UFS (optional)
OS	Android 15*/Yocto Linux* (Kernel 6.6)/ Ubuntu*	Android 15*/Yocto Linux* (Kernel 6.6)/ Ubuntu*
Dimensions (mm)	43 × 44 × 2.9	43 × 44 × 2.9
Package	LCC + LGA	LCC + LGA
Weight (g)	11.76	TBD
Temperature Range		
Operating Temperature	-35 °C to +75 °C	-35 °C to +75 °C
Frequency Bands		
LTE-FDD	-	-
LTE-TDD	-	-
WCDMA	-	-
GSM	-	-
WLAN	Wi-Fi 6E 2.4 & 5 & 6 Ghz, 802.11 a/b/g/n/ac/ax Wi-Fi 2 × 2 Wi-Fi 6 2.4 & 5 Ghz, 802.11 a/b/g/n/ac/ax Wi-Fi 1 × 1	-
Bluetooth	Bluetooth 5.4 Bluetooth 5.4	-
GNSS	-	-
Certifications		
Carrier	TBD	TBD
Regulatory/ Conformance	**Europe:** CE* **America:** FCC* **Australia/New Zealand:** RCM* **Canada:** IC*	**Europe:** CE* **America:** FCC* **Australia/New Zealand:** RCM* **Canada:** IC*
Others	RoHS/ REACH	-
Enhanced Features		
3GPP E-UTRA	-	-
Bandwidth	-	-
Rx-diversity	-	-
DL MIMO 2 × 2	-	-
(U)SIM Card Detection	-	-
DSDS	-	-
Firmware Upgrade via USB	●	●
Firmware Upgrade via OTA	●	●

Notes:
1. ●: Supported
2. *: Under development/ in progress/ planning
3. ①：TBD

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Quectel Global Center: No. 8 Waipojing Road, Sijing Town, Songjiang District, Shanghai 201601, China
Tel: +86 21 51086236 Email: info@quectel.com

Module	General Features
Interfaces	
LCM	4-lane MIPI DSI, 4-lane eDP, 4-lane DP (multiplexed from USB 3.0), 4-lane LVDS(multiplexed from DSI) Single-screen display: resolution and frame rate up to 5120 × 2160 @ 60 fps or 3840 × 2160 @ 60 fps, 2560 × 1600 @ 120 fps Dual monitors: resolution and frame rate up to 2560 × 1600 @ 60 fps
Camera	Two 4-lane MIPI CSI, up to 2.5 Gbps/ lane Supports 2 cameras, single ISP, up to 16 MP
Touch Panel	Capacitive touch panel, controlled by I2C
Audio	3 analog input: MIC0, MIC1 (earpiece), MIC2 3 analog output: Line-out, earpiece, headphone
Video	Decode: 4K @ 60 fps; H.265/H.264/VP9 Encode: 4K @ 30 fps; H.265/H.264
USB	× 5 USB 0 complies with USB 3.2 Gen 1 specifications and supports USB OTG USB 1 complies with the USB 2.0 specification and only supports HOST USB 2 complies with the USB 2.0 specification and only supports HOST USB 3 complies with the USB 3.2 Gen 1 specification and only supports HOST USB 4 complies with the USB 2.0 specification and only supports HOST
UART	× 4 Debug UART: 2-wire UART, dedicated for debugging UART1: 2-wire UART UART2: 4-wire UART, supports RTS and CTS hardware flow control UART3: 4-wire UART, supports RTS and CTS hardware flow control
PCIe	× 1, Gen 2, 1-lane
SD Card	× 1, SD 3.0, supports 4-bit SDIO
SDIO	× 1, SDIO 3.0, supports 4-bit SDIO
ADC	× 4, general-purpose ADC interface
PCM	× 1
RGMII	× 1, 10M/100M/1000M bps
DMIC	× 2
I2C①	× 8 (Multiplexed)
I2S①	× 2 (Multiplexed)
SPI①	× 5 (Multiplexed)
PWRKEY	0~5 V, pull it down to power on
GPIO①	× 104
Antenna	Wi-Fi & Bluetooth antennas
Electrical Features	
Supply Voltage Range	3.55–4.4 V, typ. 3.8 V
Power Consumption (Typ.)	TBD

Notes:
1. ①: SPI, I2C, I2S and GPIO outputs are multiplexed. Let us know your requirements if you need to customize them. We will assist you in corresponding software adaptation.
2. *: Under development/ in progress/ planning

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Quectel Global Center: No. 8 Waipojing Road, Sijing Town, Songjiang District, Shanghai 201601, China
Tel: +86 21 51086236 Email: info@quectel.com