

Quectel AG215S Series

IATF 16949 Compliant Automotive Grade C-V2X Application Processor Module

Quectel AG215S is a series of automotive grade C-V2X application processor modules designed and manufactured according to IATF 16949:2016 standards. Designed for use in extremely harsh environments and providing superior ESD/EMI protection performance, AG215S series EAP module can be widely used in C-V2X communication solutions to meet the requirements of enhanced driving safety, autonomous driving, intelligent transportation system (ITS) and advanced driver-assistance system (ADAS) applications. It can also fulfill the critical security function in V2X based on the powerful ARM cores and dedicated hardware crypto engine.

Based on 3GPP Release 14/15 compliant LTE-V2X direct communication, Quectel’s automotive grade C-V2X module AG15 and cellular modules AG52xR/AG55xQ/AG57xQ support vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I) and vehicle-to-pedestrian (V2P) communications in PC5 mode on the unified 5.9 GHz ITS band and concurrently work in Uu mode. AG215S series can be used in combination with these automotive grade modules (AG15/AG52xR/AG55xQ/AG57xQ) to be implemented as a C-V2X application processor to host ITS stack and applications. It provides automotive industry application solutions with more functions and a further extended communication range. Additionally, it ensures enhanced traffic safety and efficiency in C-V2X applications.

Quectel Automotive Modules will make traffic smoother and more efficient by paving the way for automated driving and achieving the goal of fully connected traffic.



Key Features

- ✓ IATF 16949 qualified and compliant with automotive quality processes such as APQP and PPAP
- ✓ Powerful Application Processor to host ITS stack and applications
- ✓ Optimized communication performance with Quectel AG52xR, AG55xQ and AG57xQ family modules
- ✓ Embedded hardware engine fulfills powerful ECDSA verification capability
- ✓ Support C-V2X related algorithms
- ✓ Additional, various types of optional HSM/SE integrated
- ✓ ITS stack integrated (optional)
- ✓ Extended temperature range (-40 °C to +85 °C) meets demanding requirements for automotive devices
- ✓ Excellent EMC protection ensures great robustness even in harsh environments
- ✓ Compact SMT form factor ideal for integration in slim and size-constrained automotive solutions



C-V2X Direct
Communications



Enhanced
Driving Safety



LGA Package



Autonomous
Driving



RGMII Interface
(1 Gbps)



USB 3.0
Interface



HSM Integrated
(Optional)

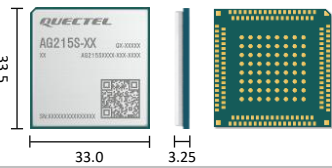
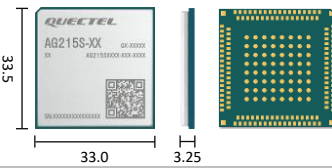
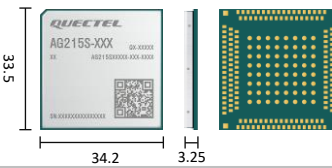


Powerful ECDSA
Verification



C-V2X Algorithms
Supported

Quectel AG215S Series

C-V2X EAP Module	AG215S-CN	AG215S-GL	AG215S-GLR
Region/Operator	Global	Global	Global
Dimensions (mm)			
Temperature Range			
Operating Temperature	-35 °C to +75 °C	-35 °C to +75 °C	-35 °C to +75 °C
Extended Temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
HSM Integrated			
HSM Integrated	High performance HSM: TTM2000	Cost-efficient HSM: XDSM3275 Cost-efficient HSM: SLS37 No internal HSM	Cost-efficient HSM: XDSM3275
Interfaces			
SDIO	× 1	× 1	× 2
USB	× 2 - USB host interface: USB 3.0 and 2.0 compliant - USB debug interface: USB 2.0 compliant	× 2 - USB host interface: USB 3.0 and 2.0 compliant - USB debug interface: USB 2.0 compliant	× 2 - USB host interface: USB 3.0 and 2.0 compliant - USB debug interface: USB 2.0 compliant
PCIe Gen 2	× 1	× 1	× 1
RGMII	× 1 (1 Gbps)	× 1 (1 Gbps)	× 1 (1 Gbps)
UART	× 2 (Main UART, Debug UART)	× 2 (Main UART, Debug UART)	× 2 (Main UART, Debug UART)
SPI	× 2	× 2	× 3 ^①
I2C	× 2	× 2	× 2
1PPS	× 1 (Input)	× 1 (Input)	× 1 (Input)
ADC	× 2	× 2	× 2
Enhanced Features			
High Security	Secure Boot SELinux	Secure Boot SELinux	Secure Boot SELinux
Total Memory	4 Gb + 4 Gb MCP	4 Gb + 4 Gb MCP	4 Gb/8 Gb/16 Gb RAM only
CPU MIPS	6.4/12.8K DMIPS (Optional)	6.4/12.8K DMIPS (Optional)	6.4/12.8K DMIPS (Optional)
Aerolink	Optional	Optional	Optional
Powerful ECDSA Capability	Curve Supported: - NIST p-384, NIST p-256 - Brainpool p-384, Brainpool p-256 - SM2 256 bit	Curve Supported: - NIST p-384, NIST p-256 - Brainpool p-384, Brainpool p-256 - SM2 256 bit - Encryption algorithm varies with the integrated HSM specification	Curve Supported: - NIST p-384, NIST p-256 - Brainpool p-384, Brainpool p-256 - SM2 256 bit
Scalable ECDSA Capability	- Up to 2500 TPS through Embedded Hardware Engine and CPU (Based on NIST p-256 and SM2) - Hardware Crypto Engine Embedded - Support Secret Key Generation and Storage, and Digital Signature and Verification - Additional 2000 TPS ECSDA Capability Supported (Based on NIST p-256 and SMT)	- Up to 2500 TPS through Embedded Hardware Engine and CPU (Based on NIST p-256 and SM2) - Hardware Crypto Engine Embedded - Support Secret Key Generation and Storage, and Digital Signature and Verification - Additional 2000 TPS ECSDA Capability Supported (Based on NIST p-256 and SMT)	- Up to 2500 TPS through Embedded Hardware Engine and CPU (Based on NIST p-256 and SM2) - Hardware Crypto Engine Embedded - Support Secret Key Generation and Storage, and Digital Signature and Verification - Additional 2000 TPS ECSDA Capability Supported (Based on NIST p-256 and SMT)
ESD/EMI Protection	Realized through Internal Specific Circuits and Components	Realized through Internal Specific Circuits and Components	Realized through internal specific circuits and components
Software Features			
Linux Kernel	4.9.11/4.9.88/4.14	4.9.11/4.9.88/4.14	4.9.11/4.9.88/4.14
Protocol	QMI (Qualcomm MSM Interface)	QMI (Qualcomm MSM Interface)	QMI (Qualcomm MSM Interface)
Electrical Characteristics			
Supply Voltage	VBAT: 3.5–4.3 V, typ. 3.8 V VCC_1V8_IN: 1.7–1.9 V, typ. 1.8 V	VBAT: 3.5–4.3 V, typ. 3.8 V VCC_1V8_IN: 1.7–1.9 V, typ. 1.8 V	VBAT: 3.5–4.3 V, typ. 3.8 V VCC_1V8_IN: 1.7–1.9 V, typ. 1.8 V
Power Consumption	Varies with customer's applications	Varies with customer's applications	Varies with customer's applications

NOTE:
①: Two SPI interfaces are used for external applications, with the third one for the integrated HSM, which is available for connecting an external HSM if the integrated HSM is not needed.