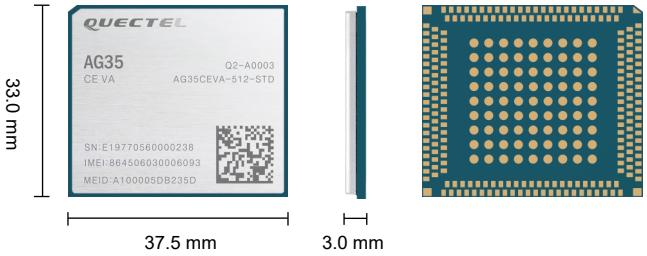
Quectel AG35 Series

IATF 16949 Compliant Automotive Grade LTE Cat 4 Module



AG35 is a series of automotive grade LTE category 4 modules developed by Quectel. Designed and manufactured according to IATF 16949:2016 quality management system, it is targeted at the IoV (Internet of Vehicles) applications. Adopting the 3GPP Rel. 10 LTE technology, it features maximally 150 Mbps downlink and 50 Mbps uplink data rates. It provides abundant interfaces for customers to develop applications, and its excellent performance in ESD and EMI protection ensures great robustness in harsh environments.

AG35 contains five variants (AG35-CE, AG35-E, AG35-NA, AG35-LA, AG35-J) to meet the market requirements of China, Europe, North America, Latin America and Japan. It is backward compatible with existing EDGE and GSM/GPRS networks, enabling it to be connected even in remote areas devoid of 3G or 4G coverage.

AG35 supports multiple-input multiple-output (MIMO) technology. The use of multiple antennas at the receiver end at the same time and on the same frequency band greatly minimizes errors and optimizes the data speed. The module also combines high-speed wireless connectivity with embedded highly sensitive multi-constellation GNSS (GPS, GLONASS, BeiDou, Galileo, QZSS) receiver for positioning.

A rich set of Internet protocols, industry-standard interfaces and abundant functions (USB drivers for Windows 7/8/8.1/10, Windows CE, Linux and Android, eCall, etc.) extend the applicability of AG35 to a wide range of M2M applications in industrial, consumer and automotive markets. It is especially suitable for auto-related applications, such as fleet management, vehicle tracking, in-vehicle navigation system, vehicle remote monitoring, vehicle remote control, security monitoring and alarming, remote vehicle diagnostics, vehicle wireless routing, in-car entertainment, and more.

Key Benefits

- Designed for automotive applications requiring IATF 16949:2016
- Automotive quality processes such as APQP, PPAP, etc.
- Multi-constellation GNSS receiver available for applications requiring fast and accurate position fixes in any environment
- Support Dead Reckoning through external IMUs and RTK algorithm to achieve high-precision positioning (optional)
- Up to 8 APNs and security features such SELinux, TrustZone and Secure Boot are supported to ensure more secure and reliable data communication
- Support EU eCall and Russia ERA-GLONASS emergency call systems
- Wide operation temperature range (-40 °C to +85 °C) and support eCall under +95 °C
- MIMO technology meets demands for data rate and link reliability in modem wireless communication systems

LTE Cat 4
Max 150 Mbps (DL)
Max 50 Mbps (UL)

eCall

LGA Package


Dead Reckoning


High Security


Multi-constellation GNSS


USB Driver

Quectel Enhanced AT Commands


Embedded Abundant Protocols

Rev.: V1.6 | Status: Released

Quectel AG35 Series

LTE Cat 4	AG35-CE	AG35-E	AG35-NA	AG35-LA	AG35-J
Region/Operator	China	EMEA/ Korea/ Australia/ India/ Southeast Asia	North America (America/ Canada/ Mexico)	Latin America (Brazil/ Argentina)	Japan
Dimensions (mm)	33.0 × 37.5 × 3.0	33.0 × 37.5 × 3.0	33.0 × 37.5 × 3.0	33.0 × 37.5 × 3.0	33.0 × 37.5 × 3.0
Temperature Range					
Operation Temperature	-35 °C to +75 °C	-35 °C to +75 °C	-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	-40 °C to +85 °C	-40 °C to +85 °C
Frequency Bands					
LTE FDD	B1/B3/B5/B8	B1/B3/B5/B7/B8/B20/B28	B2/B4/B5/B7/B12(B17)/B13	B1/B2/B3/B4/B5/B7/B8/B28	B1/B3/B5/B8/B9/B19/B21/B28
LTE TDD	B34/B38/B39/B40/B41	B38/B40	/	/	B41
WCDMA	B1/B8	B1/B5/B8	B2/B4/B5	B1/B2/B3/B4/B5/B8	B1/B3/B5/B6/B8/B19
TD-SCDMA	B34/B39	/	/	/	/
EVDO/CDMA	BC0 *(Optional)*	/	/	/	/
GSM/EDGE	900/1800 MHz	900/1800 MHz	850/1900 MHz	850/900/1800/1900 MHz	
Certifications					
Regulatory	**China:** SRRC/ NAL/ CCC	**Global:** GCF **Europe:** CE **North America:** FCC **South Korea:** KC **Australia & New Zealand:** RCM	**Global:** GCF **North America:** FCC/ PTCRB **Canada:** IC	**Europe:** CE **North America:** FCC **Brazil:** Anatel **Australia & New Zealand:** RCM	**Japan:** JATE/ TELEC
Carrier	/	**South Korea:** KT*/ STK*/ LGU+*	**North America:** AT&T/ Verizon*/ T-Mobile* **Canada:** Rogers	/	**Japan:** NTT DOCOMO*
Others	RoHS	RoHS	RoHS	RoHS	RoHS
Data Rate (Max.)					
LTE FDD (Mbps)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)	150 (DL)/ 50 (UL)
LTE TDD (Mbps)	130 (DL)/ 30 (UL)	130 (DL)/ 30 (UL)	/	/	130 (DL)/ 30 (UL)
DC-HSPA+ (Mbps)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)	42 (DL)/ 5.76 (UL)
WCDMA (Kbps)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)	384 (DL)/ 384 (UL)
TD-SCDMA (Mbps)	4.2 (DL)/ 2.2 (UL)	/	/	/	/
EVDO (Mbps)	3.1 (DL)/ 1.8 (UL)	/	/	/	/
1×Advanced (Kbps)	307.2 (DL/UL)	/	/	/	/
EDGE (Kbps)	296 (DL)/ 236.8 (UL)	296 (DL)/ 236.8 (UL)	296 (DL)/ 236.8 (UL)	296 (DL)/ 236.8 (UL)	/
GPRS (Kbps)	107 (DL)/ 85.6 (UL)	107 (DL)/ 85.6 (UL)	107 (DL)/ 85.6 (UL)	107 (DL)/ 85.6 (UL)	/
Interfaces					
(U)SIM Interface	× 1 (1.8 V/3.0 V)	× 1 (1.8 V/3.0 V)	× 1 (1.8 V/3.0 V)	× 1 (1.8 V/3.0 V)	× 1 (1.8 V/3.0 V)
PCM	× 1	× 1	× 1	× 1	× 1
USB 2.0	× 1	× 1	× 1	× 1	× 1
Antenna	× 3 (Main/Rx-diversity/GNSS)	× 3 (Main/Rx-diversity/GNSS)	× 3 (Main/Rx-diversity/GNSS)	× 3 (Main/Rx-diversity/GNSS)	× 3 (Main/Rx-diversity/GNSS)
UART	× 3	× 3	× 3	× 3	× 3
SDIO	× 2 (for Wi-Fi and eMMC)	× 2 (for Wi-Fi and eMMC)	× 2 (for Wi-Fi and eMMC)	× 2 (for Wi-Fi and eMMC)	× 2 (for Wi-Fi and eMMC)
SPI	× 1 (for QuecOpen® Version Only)	× 1 (for QuecOpen® Version Only)	× 1 (for QuecOpen® Version Only)	× 1 (for QuecOpen® Version Only)	× 1 (for QuecOpen® Version Only)
I2C	× 2 (one for PCM)	× 2 (one for PCM)	× 2 (one for PCM)	× 2 (one for PCM)	× 2 (one for PCM)
SGMII	× 1 (Optional)	× 1 (Optional)	× 1 (Optional)	× 1 (Optional)	× 1 (Optional)
ADC	× 3 (15 bits)	× 3 (15 bits)	× 3 (15 bits)	× 3 (15 bits)	× 3 (15 bits)
GPIO	> 15 (for QuecOpen® Version Only)	> 15 (for QuecOpen® Version Only)	> 15 (for QuecOpen® Version Only)	> 15 (for QuecOpen® Version Only)	> 15 (for QuecOpen® Version Only)
Voice					
Speech Codec Modes	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB	HR/FR/EFR/AMR/AMR-WB
Echo Arithmetic	Echo Cancellation Noise Reduction	Echo Cancellation Noise Reduction	Echo Cancellation Noise Reduction	Echo Cancellation Noise Reduction	Echo Cancellation Noise Reduction
VoLTE	Digital Audio and VoLTE (Optional)	Digital Audio and VoLTE (Optional)	Digital Audio and VoLTE (Optional)	Digital Audio and VoLTE (Optional)	Digital Audio and VoLTE (Optional)
SMS					
Point-to-point MO/MT	●	●	●	●	●
SMS Cell Broadcast	●	●	●	●	●
Text and PDU Mode	●	●	●	●	●

Notes:
1. * means under development/ongoing/planning
2. ● means supported

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Quectel AG35 Series

LTE Cat 4	AG35-CE	AG35-E	AG35-NA	AG35-LA	AG35-J
GNSS					
Embedded GNSS	GPS/GLONASS/BeiDou/Galileo/ QZSS	GPS/GLONASS/Beidou/Galileo/ QZSS	GPS/GLONASS/Beidou/Galileo/ QZSS	GPS/GLONASS/Beidou/Galileo/ QZSS	GPS/GLONASS/Beidou/Galileo/ QZSS
TTFF	**Autonomous @ Open Sky:** Cold Start: 35 s Warm Start: 26 s Hot Start: 2.5 s **XTRA Enabled @ Open Sky:** Cold Start: 18 s Warm Start: 2.2 s Hot Start: 1.8 s	**Autonomous @ Open Sky:** Cold Start: 35 s Warm Start: 26 s Hot Start: 2.5 s **XTRA Enabled @ Open Sky:** Cold Start: 18 s Warm Start: 2.2 s Hot Start: 1.8 s	**Autonomous @ Open Sky:** Cold Start: 35 s Warm Start: 26 s Hot Start: 2.5 s **XTRA Enabled @ Open Sky:** Cold Start: 18 s Warm Start: 2.2 s Hot Start: 1.8 s	**Autonomous @ Open Sky:** Cold Start: 35 s Warm Start: 26 s Hot Start: 2.5 s **XTRA Enabled @ Open Sky:** Cold Start: 18 s Warm Start: 2.2 s Hot Start: 1.8 s	**Autonomous @ Open Sky:** Cold Start: 35 s Warm Start: 26 s Hot Start: 2.5 s **XTRA Enabled @ Open Sky:** Cold Start: 18 s Warm Start: 2.2 s Hot Start: 1.8 s
Sensitivity	Acquisition: -146 dBm Reacquisition: -158 dBm Tracking: -162 dBm	Acquisition: -146 dBm Reacquisition: -158 dBm Tracking: -162 dBm	Acquisition: -146 dBm Reacquisition: -158 dBm Tracking: -162 dBm	Acquisition: -146 dBm Reacquisition: -158 dBm Tracking: -162 dBm	Acquisition: -146 dBm Reacquisition: -158 dBm Tracking: -162 dBm
Enhanced Features					
eCall	●	●	●	●	●
ERA-GLONASS	●	●	●	●	●
QuecOpen® (Open Linux)	●	●	●	●	●
Dead Reckoning (QDR)	Optional	Optional	Optional	Optional	Optional
PPE (RTK)	Optional	/	/	/	/
Wi-Fi/BT Interface	●	●	●	●	●
Multi-APN	●	●	●	●	●
Temperature Management	●	●	●	●	●
DFOTA	●	●	●	●	●
TrustZone	●	●	●	●	●
Secure Boot	●	●	●	●	●
Code/User Data Backup	●	●	●	●	●
ESD/EMI Protection	Realized through Internal Specific Circuits and Components	Realized through Internal Specific Circuits and Components	Realized through Internal Specific Circuits and Components	Realized through Internal Specific Circuits and Components	Realized through Internal Specific Circuits and Components
Electrical Characteristics					
Consumption:	20 µA @ Power off 1.9 mA @ LTE Sleep, PF=128 1.6 mA @ LTE Sleep, PF=256 22 mA @ Idle, typ.	20 µA @ Power off 1.9 mA @ LTE Sleep, PF=128 1.6 mA @ LTE Sleep, PF=256 22 mA @ Idle, typ.	20 µA @ Power off 1.9 mA @ LTE Sleep, PF=128 1.6 mA @ LTE Sleep, PF=256 22 mA @ Idle, typ.	20 µA @ Power off 1.9 mA @ LTE Sleep, PF=128 1.6 mA @ LTE Sleep, PF=256 22 mA @ Idle, typ.	20 µA @ Power off 1.9 mA @ LTE Sleep, PF=128 1.6 mA @ LTE Sleep, PF=256 22 mA @ Idle, typ.
Software Features					
USB Serial Driver	Windows 7/8/8.1/10 Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10 Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10 Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10 Linux 2.6–5.4, Android 4.x–9.x	Windows 7/8/8.1/10 Linux 2.6–5.4, Android 4.x–9.x
GNSS Driver	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x
RIL Driver	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x	Android 4.x–9.x
RNDIS Driver	Windows 7/8/8.1/10 Linux 2.6–5.4	Windows 7/8/8.1/10 Linux 2.6–5.4	Windows 7/8/8.1/10 Linux 2.6–5.4	Windows 7/8/8.1/10 Linux 2.6–5.4	Windows 7/8/8.1/10 Linux 2.6–5.4
ECM Driver	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
GobiNet Driver	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4	Linux 2.6–5.4
QMI_WWAN Driver	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4	Linux 3.4–5.4
Protocols	TCP/UDP/PPP/PING/FTP(S)/ HTTP(S)/SMTP/SSL/TLS/ MMS/NTP/FILE/QMI	TCP/UDP/PPP/PING/FTP(S)/ HTTP(S)/SMTP/SSL/TLS/ MMS/NTP/FILE/QMI	TCP/UDP/PPP/PING/FTP(S)/ HTTP(S)/SMTP/SSL/TLS/ MMS/NTP/FILE/QMI	TCP/UDP/PPP/PING/FTP(S)/ HTTP(S)/SMTP/SSL/TLS/ MMS/NTP/FILE/QMI	TCP/UDP/PPP/PING/FTP(S)/ HTTP(S)/SMTP/SSL/TLS/ MMS/NTP/FILE/QMI
General Features					
3GPP E-UTRA Release	Release 10	Release 10	Release 10	Release 10	Release 10
Bandwidth	1.4/3/5/10/15/20 MHz	1.4/3/5/10/15/20 MHz	1.4/3/5/10/15/20 MHz	1.4/3/5/10/15/20 MHz	1.4/3/5/10/15/20 MHz
Weight	Approx. 8.1 g	Approx. 8.1 g	Approx. 8.1 g	Approx. 8.1 g	Approx. 8.1 g
Supply Voltage	3.3–4.3 V, 3.8 V Typ.	3.3–4.3 V, 3.8 V Typ.	3.3–4.3 V, 3.8 V Typ.	3.3–4.3 V, 3.8 V Typ.	3.3–4.3 V, 3.8 V Typ.
Package	LGA	LGA	LGA	LGA	LGA
AT Commands	3GPP TS 27.007 3GPP TS 27.005 Quectel enhanced AT commands	3GPP TS 27.007 3GPP TS 27.005 Quectel enhanced AT commands	3GPP TS 27.007 3GPP TS 27.005 Quectel enhanced AT commands	3GPP TS 27.007 3GPP TS 27.005 Quectel enhanced AT commands	3GPP TS 27.007 3GPP TS 27.005 Quectel enhanced AT commands

Notes:

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