# QUECTEL

Quectel GNSS Module

Product Overview

Build a Smarter World

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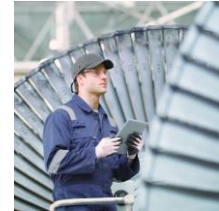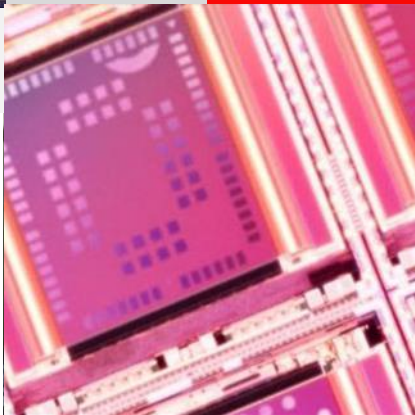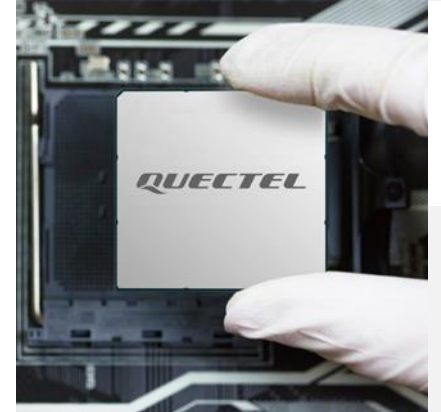**Build a Smarter World**
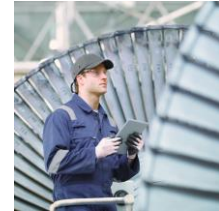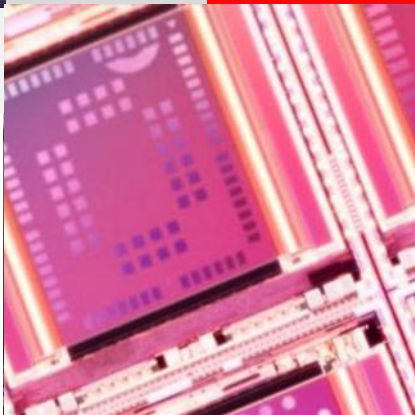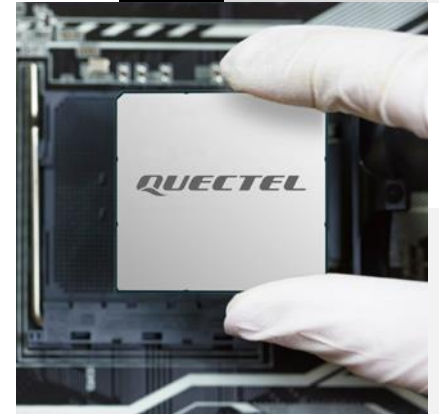
GNSS Module Roadmap

Product Overview
Development Timeline
Technologies
Application

Build a Smarter World

GNSS Modules Roadmap

GPS Only

L70 Series
- L70 (MT3339)
- L70-R (MT3337)
- L70-RL (MT3337)

Single-band GNSS

L76 Series
- L76 (MT3333)
- L76-L (MT3333)
- L76-LB (AG3331)
- LC76F (GK9501)

L26 Series
- L26 (MT3333)
- L26-LB (AG3331)

L26-P
- TESEO III
- GNSS/ IMU raw data output

LG77L
- LG77L (A/B) (AG3331)
- LG77L (C) (MT3333)

L26-DR
- TESEO III
- ADR
- UDR
- Automotive grade (optional)

L26-T
- TESEO III
- Timing Applications

LC98S
- TESEO III
- Timing Applications
- Maximized reliability

Multi-band GNSS

LC79D
- BCM47755
- GPS/GAL: L1/L5 GLO/BDS: L1 IRNSS: L5
- DR (optional)

LC79H
- AG3335
- GPS/GAL/BDS/ QZSS: L1/L5 GLO: L1

LC29D
- BCM47755
- GPS/GAL: L1/L5 GLO/BDS: L1 IRNSS: L5 BDS: L5 (optional)
- DR (optional)
- RTK (optional)

LC29H
- LC29H: AG3335
- GPS/GAL/BDS: L1/L5 GLO: L1

LG69T
- TESEO V
- Automotive
- GPS/Galileo/BeiDou: L1/L5
- GLONASS (optional)
- DR (optional)/RTK (optional)
- Raw data output (optional)
- ASIL B (optional)

Integrated Antenna

L80 Series
- L80 (MT3339)
- L80-R (MT3337)
- GPS only

L86
- MT3333
- GPS/ GLO/ GAL

LC86L
- LC86L (A) (AG3331)
- LC86L (C) (MT3333)

L89 R2.0
- AG3335
- IRNSS GNSS module
- AIS140 Compliant

L96
- MT3333
- Embedded Chip Antenna

LG69T GNSS Module Overview

Dual-Band Automotive Grade GNSS Module (TESEO V)

LG69T is a series automotive grade, dual-band, high precision GNSS modules based on the fifth generation platform of ST.

The module includes variants listed below:

- LG69T (AA) [1] features raw data output and integrates DR.
- LG69T (AD) features L1+L5 dual bands PVT.
- LG69T (AQ) integrates RTK and DR, and therefore outputs high precision results (industrial sensor).
- LG69T (AB) is ASIL B compliant and supports raw data output.
- LG69T (AS) features L1+L5 dual bands base station.
- LG69T (AM) integrates RTK function.

22.0 mm

17.0 mm   3.15 mm

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LG69T

LG69TXXXX
SN:XXXXXXXXXXXXXXX

QX-XXXXX
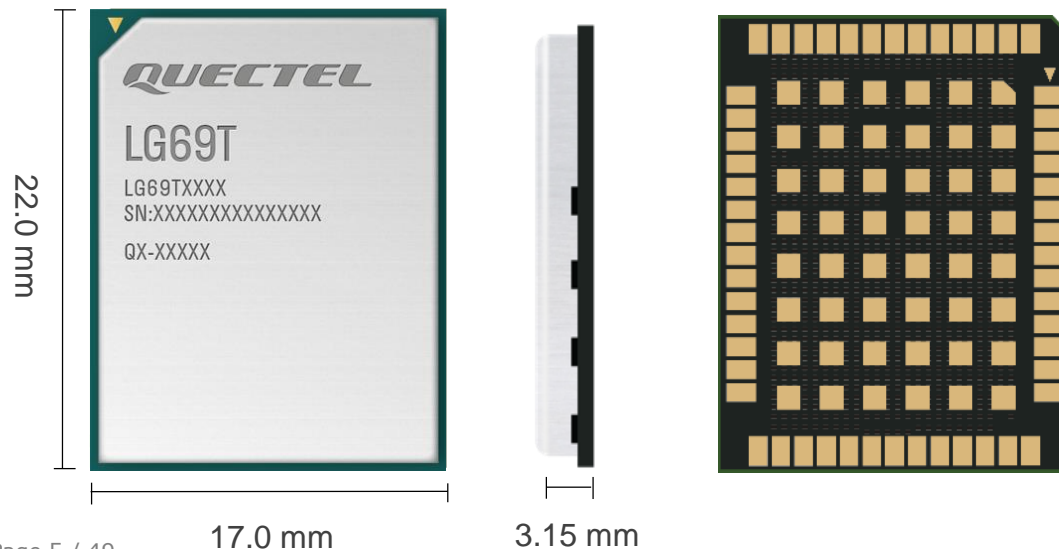
[1] LG69T (AA) can also supports DR function based on a separate firmware version.
LG69T series are distinguished from each other with different OCs (ordering codes).

LG69T GNSS Module

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Dual-Band Automotive Grade GNSS Module

Automotive Grade
LG69T (AA)
Raw Data+DR

LG69T AA

GNSS Engine
Teseo V

IMU

DR
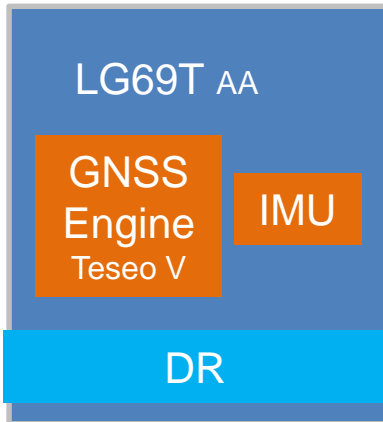
- ST Teseo V
- L1+L5 Dual-Band GNSS
- GNSS Raw Data Output
- Sensor Raw Data Output
- DR Integrated (Optional)

Automotive Grade
LG69T (AD)
L1+L5 Dual-band

LG69T AD

GNSS Engine
Teseo V

- ST Teseo V
- L1+L5 Dual-Band GNSS
- GNSS Raw Data Output

Automotive Grade
LG69T (AQ)
RTK+DR Integrated

LG69T AQ

GNSS Engine
Teseo V

IMU

MCU
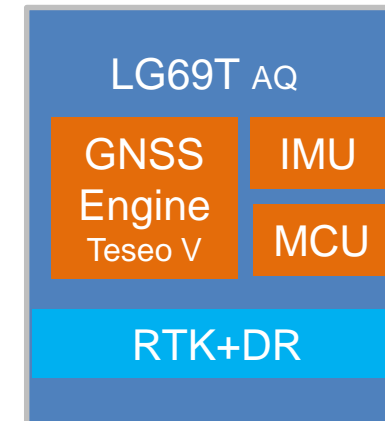
RTK+DR

- ST Teseo V
- L1+L5 Dual-Band GNSS
- High Performance MCU Embedded
- RTK+DR Integrated for High Precision Positioning (cm level)
- Sensor Raw Data Output (Optional)

LG69T series are distinguished from each other with different OCs (ordering codes).

LG69T GNSS Module

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Dual-Band Automotive Grade GNSS Module

Automotive Grade
LG69T (AM)
RTK+DR Integrated

LG69T AM
GNSS Engine Teseo V | MCU
RTK
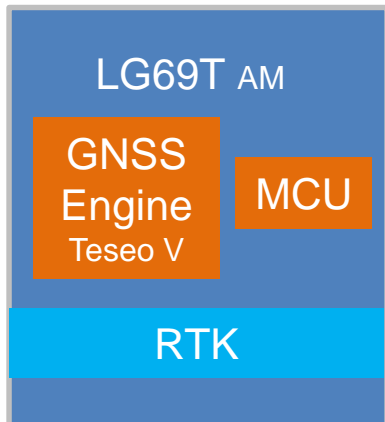
- ST Teseo V
- L1+L5 Dual-Band GNSS
- High Performance MCU Embedded
- RTK Integrated for High Precision Positioning (cm level)

Automotive Grade
LG69T (AS)
Base station

LG69T AS
GNSS Engine Teseo V | MCU
Base station
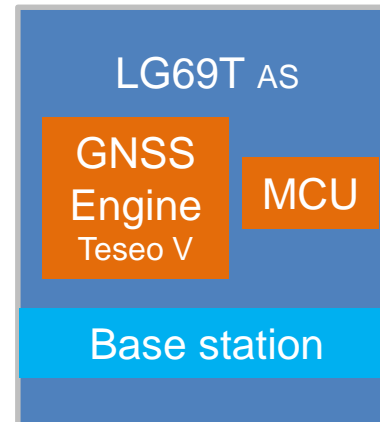
- ST Teseo V
- L1+L5 Dual-Band
- MCU Embedded
- Base station

Automotive Grade
LG69T (AB)
ASIL B Compliant

LG69T AB
GNSS Engine Teseo APP

- ST Teseo App
- L1+L2 Dual-Band GNSS
- GNSS Raw Output
- ASIL B Compliant
- L1+L5 Dual-Band (Optional)

LG69T series are distinguished from each other with different OCs (ordering codes).

Version: 3.7 | Status: Released

LG69T Key Features

Product		LG69T (AQ)	LG69T(AS)*	LG69T (AA)*
Constellation		GPS/Galileo/BeiDou	GPS/Galileo/BeiDou	GPS/GLONASS/Galileo/BeiDou/QZSS/IRNSS
Dimensions (mm)		22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15
Channels		4 Fast Acquisition 80 Tracking	4 Fast Acquisition 80 Tracking	4 Fast Acquisition 80 Tracking
Accuracy		Autonomous: < 1.0 m CEP RTK [1] : Horizontal Accuracy: < 0.2 m + ppm CEP	-	Autonomous: < 1.0 m CEP [2]
TTFF (With AGNSS)	Cold Start	TBD	-	TBD
TTFF (Without AGNSS)	Cold Start	< 35 s	-	< 35 s [2]
	Warm Start	< 30 s	-	< 30 s [2]
	Hot Start	< 3 s	-	< 3 s [2]
Sensitivity	Acquisition	-145 dBm	-	-145 dBm [2]
	Reacquisition	-153 dBm	-	-153 dBm [2]
	Tracking	-160 dBm	-	-160 dBm [2]
Interfaces	UART	× 2	× 2	× 2
	CAN	× 1	-	-
Update Rate		1 Hz (Default), Max. 10 Hz	1 Hz (Default)	1 Hz (Default), Max. 10 Hz
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	360 mA [2]	TBD	260 mA [2]
	Tracking	366 mA [2]	TBD	260 mA [2]
Power Saving Mode Consumption		TBD	TBD	TBD
Key Features	DR	●	-	●
	RTK	●	-	-
	AGNSS	-	-	●
	SBAS	-	-	●
	PPS	●	●	●
	Anti-Jamming	-	-	-
	Jamming Detection	-	-	-
	Antenna Short Circuit Protection	-	-	-
	Antenna Open Circuit Detection	-	-	-
	Geo-fence	-	-	-
	Odometer	-	-	-
	GNSS Raw Data	-	-	●
	Sensor Raw Data	●	-	●

[1] Measured by using active high-precision antennas in an open-sky environment and within 1 km from the base station
[2] Preliminary data   * Under development/planning   - Unsupported   ● Supported   TBD: To Be Determined

Version: 3.7 | Status: Released

LG69T Key Features

Product		LG69T (AD)*	LG69T (AB)*	LG69T(AM)*
Constellation		GPS/BeiDou/Galileo/QZSS/IRNSS	GPS/GLONASS/Galileo/BeiDou/QZSS	GPS/Galileo/BeiDou
Dimensions (mm)		22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15
Channels		4 Fast Acquisition 80 Tracking	4 Fast Acquisition 80 Tracking	4 Fast Acquisition 80 Tracking
Accuracy		Autonomous: < 1.0 m CEP	Autonomous: < 1.0 m CEP [2]	RTK [1] : Horizontal Accuracy: < 0.05 m + ppm CEP
TTFF (With AGNSS)	Cold Start	TBD	TBD	TBD
TTFF (Without AGNSS)	Cold Start	< 35 s [2]	< 35 s [2]	< 35 s [2]
	Warm Start	< 30 s [2]	< 30 s [2]	< 30 s [2]
	Hot Start	< 3 s [2]	< 3 s [2]	< 3 s [2]
Sensitivity	Acquisition	-145 dBm [2]	-146 dBm [2]	-146 dBm [2]
	Reacquisition	-153 dBm [2]	-152 dBm [2]	-152 dBm [2]
	Tracking	-160 dBm [2]	-152 dBm [2]	-152 dBm [2]
Interfaces	UART	× 1	× 2	× 2
	CAN	-	-	-
Update Rate		1 Hz (Default), Max. 10 Hz	1 Hz (Default), Max. 10 Hz	1 Hz (Default)
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +105 °C	-40 °C to +105 °C
	Storage	-40 °C to +90 °C	-40 °C to +105 °C	-40 °C to +105 °C
Power Supply		3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	221 mA [2]	TBD	TBD
	Tracking	218 mA [2]	TBD	TBD
Power Saving Mode Consumption		48 µA [2]	TBD	TBD
Key Features	DR	-	-	-
	RTK	-	-	-
	AGNSS	●	-	-
	SBAS	●	-	-
	PPS	●	●	●
	Anti-Jamming	-	-	-
	Jamming Detection	-	-	-
	Antenna Short Circuit Protection	-	-	-
	Antenna Open Circuit Detection	-	-	-
	Geo-fence	-	-	-
	Odometer	-	-	-
	GNSS Raw Data	●	●	-
	Sensor Raw Data	-	●	-

[1] *Measured by using active high-precision antennas in an open-sky environment and within 1 km from the base station*
[2] *Preliminary data*   * Under development/planning   - Unsupported   ● Supported   TBD: To Be Determined

Version: 3.7 | Status: Released

LG69T Timeline

	2021											2022				
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May

LG69T (AA)

ES1 **ES2** **CS** **MP**

Dual band
- L1, L5 RAW

Dual band
- L1, L5 RAW
- L1, L5 PVT
- DR (alpha)

Dual band + DR
- L1, L5 RAW + PVT
- DR (Beta)

Dual band + DR
- L1, L5 RAW + PVT
- DR (production)

LG69T (AD)

ES1 **CS** **MP**

Dual band
- L1, L5 RAW
- L1, L5 PVT

Dual band
- L1, L5 RAW
- L1, L5 PVT

The timeline may be adjusted according to the actual development status.

Version: 3.7 | Status: Released

LG69T Timeline

	2021												2022				
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May

LG69T (AB)

ES

Dual band

- L1, L5 RAW

LG69T (AQ)

ES   **CS**   **MP**

Dual band RTK + DR

- L1, L5
- RTK + DR

Dual band RTK + DR

- L1, L5
- RTK+DR

Dual band RTK + DR

- L1, L5
- RTK+DR

The timeline may be adjusted according to the actual development status.

LG69T Timeline

	2021												2022				
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May

LG69T (AS)

ES

CS

ES

Dual band
- L1, L5
- Base station

Dual band
- L1, L5
- Base station

Dual band
- L1, L5
- Base station

LG69T (AM)

ES

Dual band RTK + DR
- L1, L5
- RTK + DR

The timeline may be adjusted according to the actual development status.
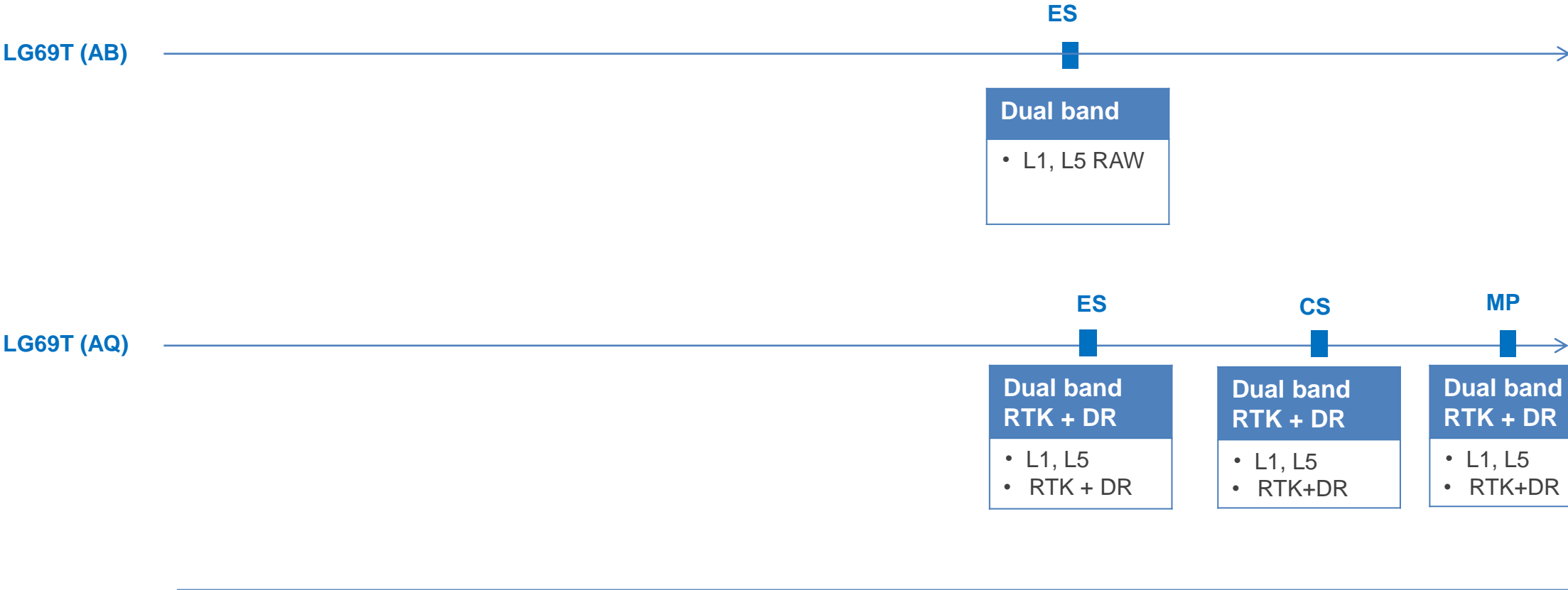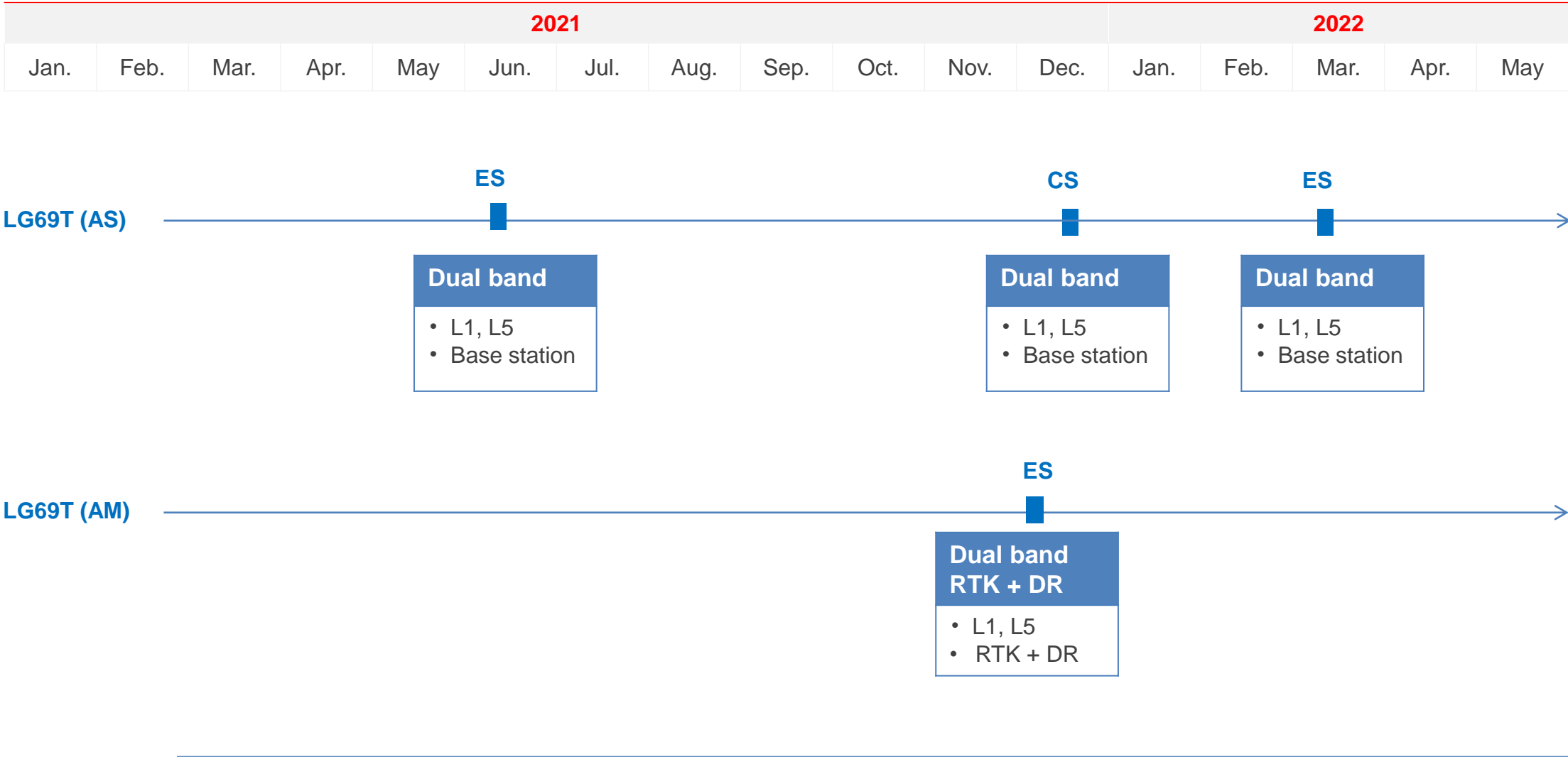
LG69T (AA) Application Architecture

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LG69T (AA)

Measurement Data

1PPS

Car Speed

Direction

RTK & DR Algorithm

MCU

High Precision Positioning

Correction Server

LTE

Correction Data
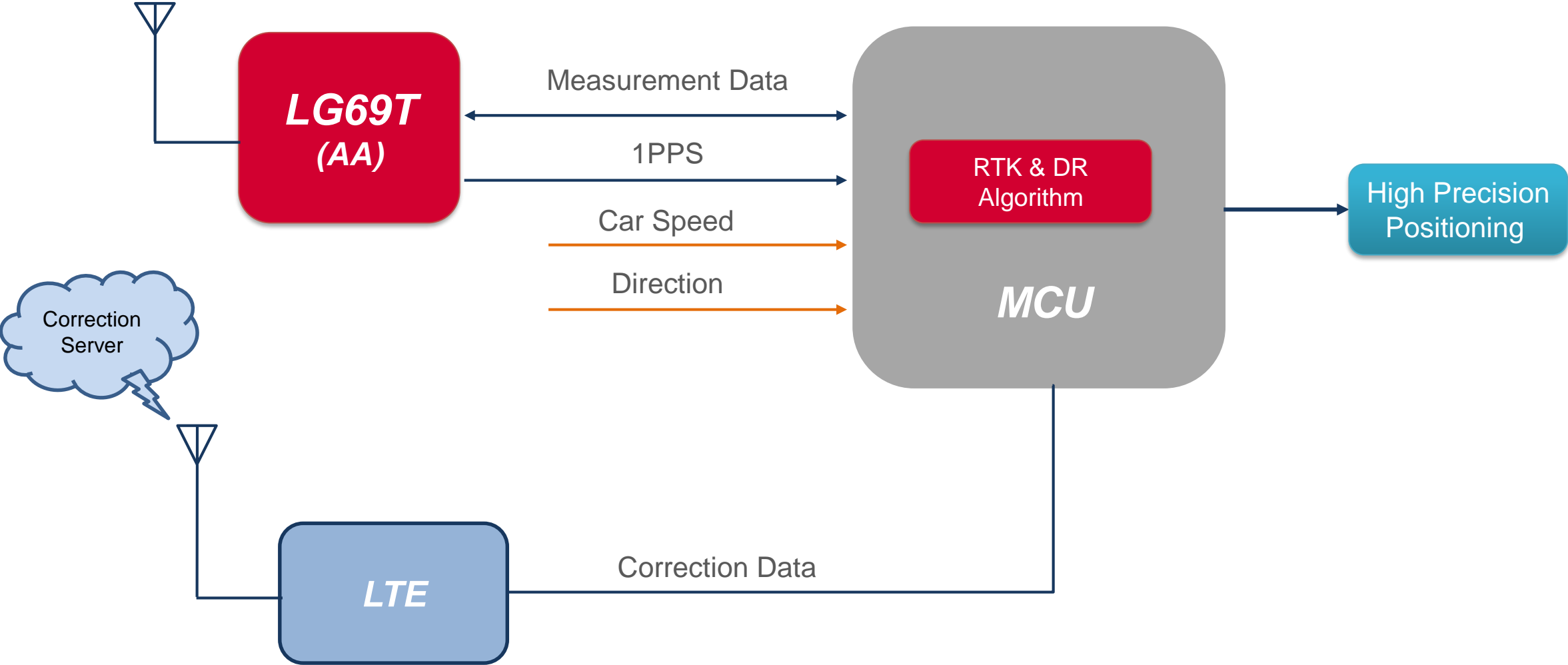
LG69T (AQ) Application Architecture

Correction
Server

RTK & DR
Algorithm

LG69T
(AQ)

MCU

High Precision Positioning

Direction

Car Speed

1PPS

Correction data

LTE
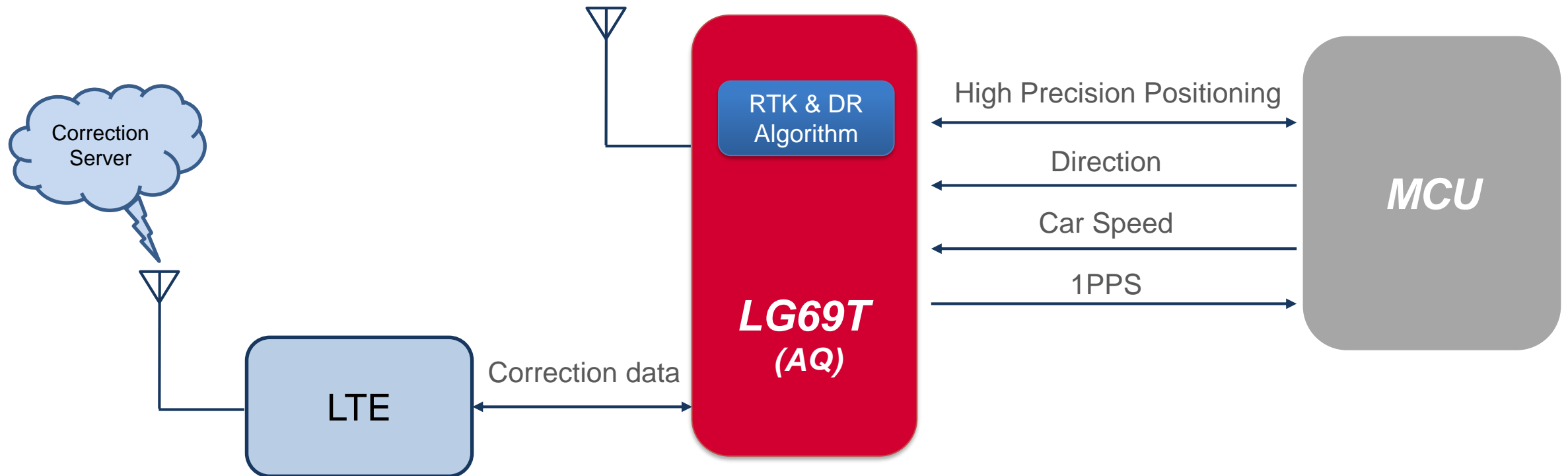
LC79D GNSS Module Overview

Dual-Band High Precision GNSS Module (BCM47755)

LC79D is a series of dual-band, high precision GNSS modules integrating DR function.

The module includes variant listed below:

- LC79D (C) works in 2-wheel ADR and 4-wheel ADR/UDR modes, and supports sensor raw data output, which is Betta architecture not for new customers' design.

LC79D series are distinguished from each other with different OCs (ordering codes).

LC79D Key Features

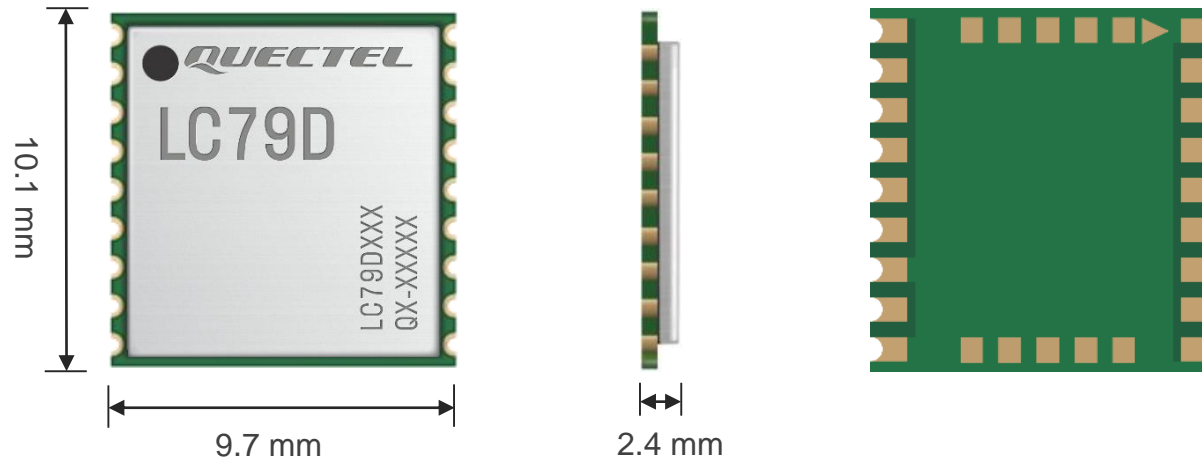| Product		LC79D (C)
Constellation		GPS/GLONASS/Galileo/BeiDou/IRNSS/QZSS
Dimensions (mm)		10.1 × 9.7 × 2.4
Channels		32 Channels
Accuracy		Autonomous: < 1.2 m CEP
TTFF (With AGNSS)	Cold Start	< 5 s
TTFF (Without AGNSS)	Cold Start	< 34 s
	Warm Start	< 30 s
	Hot Start	< 2 s
Sensitivity	Acquisition	-147 dBm
	Reacquisition	-158 dBm
	Tracking	-163 dBm
Interfaces	UART	× 1
	I2C	× 1 (Master)
Update Rate		1 Hz (Default)
Temperature Range	Operating	-40 °C to +85 °C
	Storage	-40 °C to +90 °C
Power Supply		1.7–1.9 V, typ. 1.8 V
Power Consumption (@ 1.8 V)	Acquisition	47 mA
	Tracking	43 mA
Power Saving Mode Consumption		200 µA @ Sleep Mode 88 µA @ Standby Mode
Key Features	DR	●
	RTK	-
	AGNSS	●
	SBAS	●
	PPS	●
	Anti-Jamming	-
	Jamming Detection	-
	Antenna Short Circuit Protection	-
	Antenna Open Circuit Detection	-
	Geo-fence	●
	Odometer	●
	GNSS Raw Data	-
	Sensor Raw Data	●

- *Unsupported*   ● *Supported*

LC79D Timeline

						2021						
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

LC79D (C) — ES · CS · MP

Existing customers only

BCOM Version Betta

- Dual band PVT
- 2 wheels ADR
- 4 wheels xDR
- Hyfix protocol

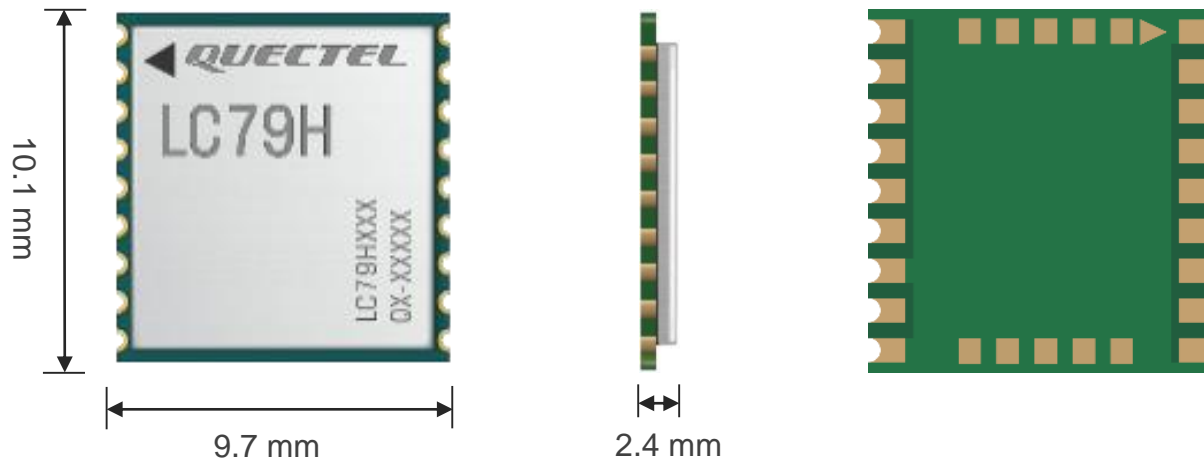*The timeline may be adjusted according to the actual development status.*

LC79H GNSS Module Overview

Dual-Band High Precision GNSS Module (AG3335)

LC79H is a series of dual-band, high precision GNSS modules.

The module includes the variants listed below:

- LC79H (A) works in standard dual-band mode.
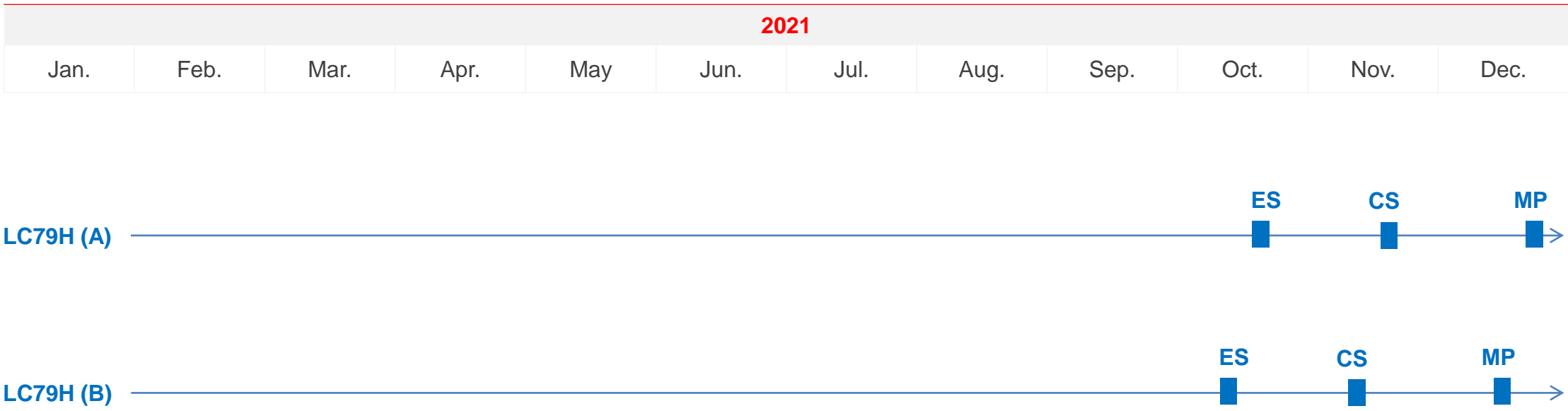- LC79H (B) works in standard single-band mode.

LC79H Key Features

Product		LC79H (A)*	LC79H (B)*
Constellation		GPS/GLONASS/Galileo/BeiDou/QZSS	GPS/GLONASS/Galileo/BeiDou/QZSS
Dimensions (mm)		10.1 × 9.7 × 2.4	10.1 × 9.7 × 2.4
Channels		135 Channels	135 Channels
Accuracy		Autonomous: 1.0 m CEP	Autonomous: 2.0 m CEP
TTFF (With AGNSS)	Cold Start	< 15 s	< 15 s
TTFF (Without AGNSS)	Cold Start	< 28 s	< 28 s
	Warm Start	< 20 s	< 20 s
	Hot Start	< 1 s	< 1 s
Sensitivity	Acquisition	-145 dBm	-145 dBm
	Reacquisition	-157 dBm	-157 dBm
	Tracking	-165 dBm	-165 dBm
Interfaces	UART	× 1	× 1
	I2C*	× 1	× 1
Update Rate		1 Hz (Default)	1 Hz (Default)
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		1.7–1.9 V, typ. 1.8 V	1.7–1.9 V, typ. 1.8 V
Power Consumption (@ 1.8 V)	Acquisition	TBD	TBD
	Tracking	TBD	TBD
Power Saving Mode Consumption		TBD	TBD
Key Features	DR	-	-
	RTK	-	-
	AGNSS	●	●
	SBAS	●	●
	PPS	●	●
	Anti-Jamming	●	●
	Jamming Detection	●	●
	Antenna Short Circuit Protection	●	●
	Antenna Open Circuit Detection	●	●
	Geo-fence	-	-
	Odometer	-	-
	GNSS Raw Data	-	-
	Sensor Raw Data	-	-

*Under development/planning   TBD: To Be Determined
- Unsupported   ● Supported   Version: 3.7 | Status: Released

LC79H Timeline

	2021										
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

LC79H (A) ———————————————————————— ES ———— CS ———— MP →

LC79H (B) ———————————————————————— ES ———— CS ———— MP →

The timeline may be adjusted according to the actual development status.

LC29D GNSS Module Overview

Dual-Band GNSS Module with DR/RTK Functions (BCM47755)

LC29D is a series dual-band, high precision GNSS modules integrating DR and RTK functions.

The module includes variants listed below:

- LC29D (B) features dual-band, RTK and DR functions, and supports sensor raw data output. Additionally it supports B2a band.
- LC29D (C) features dual-band and DR function, and supports sensor raw data output.
- LC29D (D) features dual-band and RTK functions, and supports sensor raw data output. Additionally it supports B2a band.

16.0 mm

12.2 mm

2.4 mm
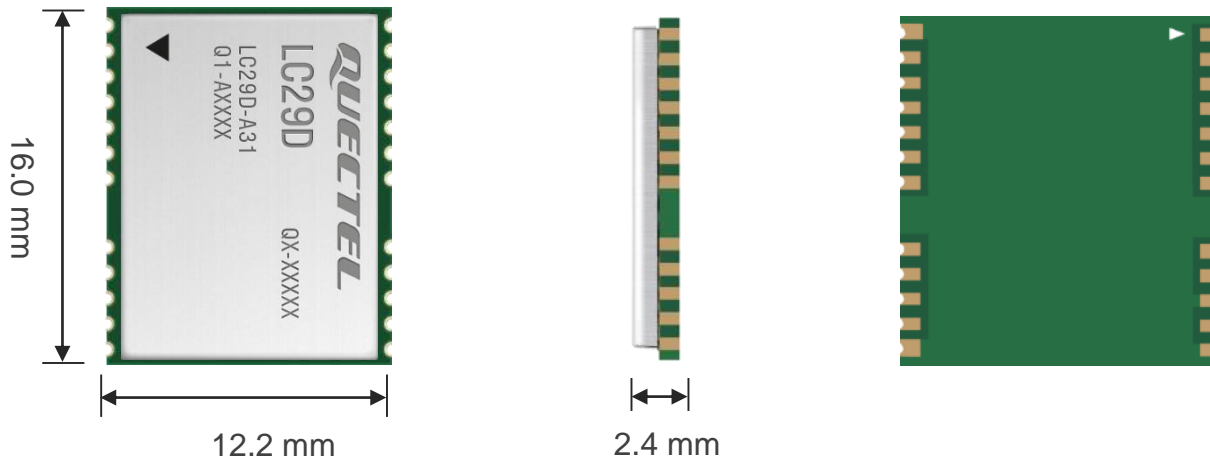
LC29D series are distinguished from each other with different OCs (ordering codes).

LC29D Key Features

Product		LC29D (B)*	LC29D (C)	LC29D (D)*
Constellation		GPS/GLONASS/Galileo/BeiDou/IRNSS/QZSS	GPS/GLONASS/Galileo/BeiDou/IRNSS/QZSS	GPS/GLONASS/Galileo/BeiDou/IRNSS/QZSS
Dimensions (mm)		12.2 × 16.0 × 2.4	12.2 × 16.0 × 2.4	12.2 × 16.0 × 2.4
Channels		48 Channels	32 Channels	48 Channels
Accuracy		Autonomous: < 1.0 m CEP [1] RTK：< 0.5 m [1]	Autonomous: < 1.2 m CEP	Autonomous: < 1.0 m CEP [1] RTK：< 0.5 m [1]
TTFF (With AGNSS)	Cold Start	< 5 s [1]	< 5 s	< 5 s [1]
TTFF (Without AGNSS)	Cold Start	< 34 s [1]	< 34 s	< 34 s [1]
	Warm Start	< 30 s [1]	< 30 s	< 30 s [1]
	Hot Start	< 2 s [1]	< 2 s	< 2 s [1]
Sensitivity	Acquisition	-148 dBm [1]	-148 dBm	-148 dBm [1]
	Reacquisition	-157 dBm [1]	-157 dBm	-157 dBm [1]
	Tracking	-162 dBm [1]	-163 dBm	-162 dBm [1]
Interfaces	UART	× 1	× 1	× 1
	SPI	× 1	× 1	× 1
Update Rate		1 Hz (Default), Max. 10 Hz	1 Hz (Default), Max. 10 Hz	1 Hz (Default), Max. 10 Hz
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		2.7–3.6 V, typ. 3.3 V	2.7–3.6 V, typ. 3.3 V	2.7–3.6 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	50 mA [1]	53 mA	50 mA [1]
	Tracking	37 mA [1]	39 mA	37 mA [1]
Power Saving Mode Consumption		1.3 mA [1] @ Sleep Mode	1.2 mA @ Sleep Mode	1.3 mA [1] @ Sleep Mode
Key Features	DR	●	●	-
	RTK	●	-	●
	AGNSS	●	●	●
	SBAS	●	●	●
	PPS	●	●	●
	Anti-Jamming	-	-	-
	Jamming Detection	-	-	-
	Antenna Short Circuit Protection	-	-	-
	Antenna Open Circuit Detection	-	-	-
	Geo-fence	-	-	-
	Odometer	-	-	-
	GNSS Raw Data	-	-	-
	Sensor Raw Data	●	●	●

[1] Preliminary data   * Under development/planning   - Unsupported   ● Supported

Version: 3.7 | Status: Released

LC29D Timeline

	2021											2022		
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.

LC29D (C)

ES

2 wheels ADR
- Dual band PVT
- 2 wheels ADR

MP1

2 wheels ADR
- Dual band PVT
- 2 wheels ADR

MP 2

2 wheels ADR
- Dual band PVT
- 2 wheels ADR

The timeline may be adjusted according to the actual development status.

Version: 3.7 | Status: Released

LC29D Timeline

	2021								2022					
Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.

LC29D (B)

ES

CS

MP

4 wheels DR + RTK
- Dual band PVT
- 4 wheels ADR
- RTK + DR

4 wheels DR + RTK
- Dual band PVT
- 4 wheels ADR
- RTK + DR

4 wheels DR + RTK
- Dual band PVT
- 4 wheels ADR
- RTK + DR

LC29D (D)

ES

CS

MP

RTK
- Dual band PVT
- RTK
- GPS/ GAL / Beidou

RTK
- Dual band PVT
- RTK
- GPS/ GAL / Beidou

RTK
- Dual band PVT
- RTK
- GPS/ GAL / Beidou

The timeline may be adjusted according to the actual development status.
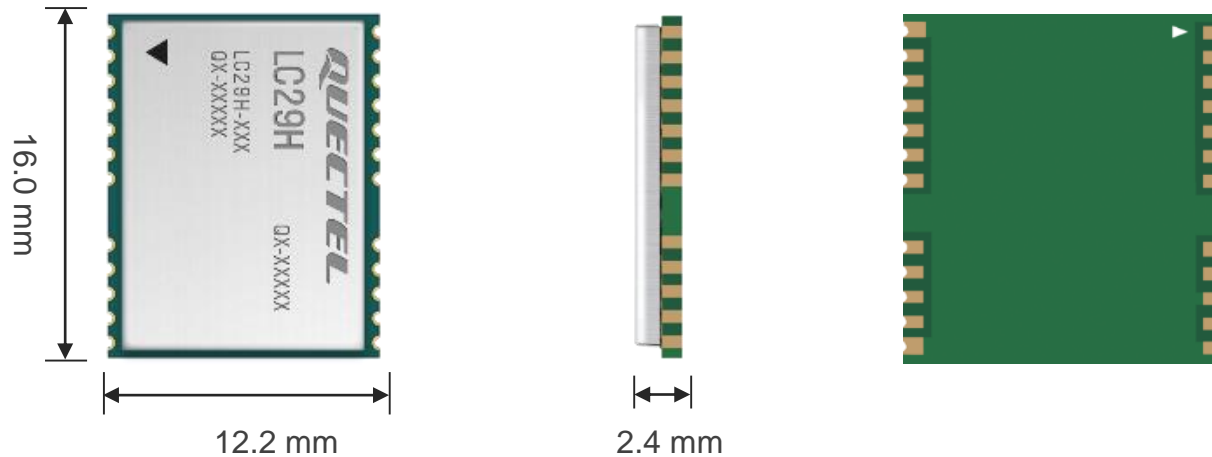
LC29H GNSS Module Overview

Dual-Band High Precision GNSS Module (AG3335)

LC29H is a series of dual-band, high precision GNSS modules.

The module includes the variant listed below:

- LC29H (A) works in standard dual-band mode.

16.0 mm

12.2 mm

2.4 mm

LC29H Key Features

Product		LC29H (A)
Constellation		GPS/GLONASS/Galileo/BeiDou/QZSS
Dimensions (mm)		12.2 × 16.0 × 2.4
Channels		135 Channels
Accuracy		Autonomous: < 1.0 m CEP
TTFF (With AGNSS)	Cold Start	< 15 s
TTFF (Without AGNSS)	Cold Start	< 28 s
	Warm Start	< 20 s
	Hot Start	< 1 s
Sensitivity	Acquisition	-147 dBm
	Reacquisition	-162 dBm
	Tracking	-165 dBm
Interfaces	UART	× 1
	I2C*	× 1
Update Rate		1 Hz (Default)
Temperature Range	Operating	-40 °C to +85 °C
	Storage	-40 °C to +90 °C
Power Supply		3.1–3.6 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	TBD
	Tracking	TBD
Power Saving Mode Consumption		TBD
Key Features	DR	-
	RTK	-
	AGNSS	●
	SBAS	●
	PPS	●
	Anti-Jamming	●
	Jamming Detection	●
	Antenna Short Circuit Protection	●
	Antenna Open Circuit Detection	●
	Geo-fence	-
	Odometer	-
	GNSS Raw Data	-
	Sensor Raw Data	-

*Under development/planning   -   Unsupported   ●   Supported   TBD: To Be Determined

Version: 3.7 | Status: Released

LC29H Timeline

						2021						
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

LC29H (A) ————————————————————————— ES ■ CS ■ MP ■ ▶

The timeline may be adjusted according to the actual development status.

Version: 3.7 | Status: Released

LC76F Key Features

Product (Chipset)		LC76F (AA) (GK9501)
Constellation		GPS/GLONASS/BeiDou/QZSS
Dimensions (mm)		10.1 × 9.7 × 2.5
Channels		26 Channels
Accuracy		Autonomous: < 2 m CEP
TTFF (With AGNSS)	Cold Start	< 6 s
TTFF (Without AGNSS)	Cold Start	< 30 s
	Warm Start	< 2 s
	Hot Start	< 2 s
Sensitivity	Acquisition	-148 dBm
	Reacquisition	-162 dBm
	Tracking	-165 dBm
Interfaces	UART	× 1
	I2C	× 1
Update Rate		1 Hz (Default), up to 10 Hz
Temperature Range	Operating	-40 °C to +85 °C
	Storage	-40 °C to +90 °C
Power Supply		2.8–4.3 V, Typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	29 mA (GPS + GLONASS)
	Tracking	29 mA (GPS + GLONASS)
Power Saving Mode Consumption		30 µA @ Backup Mode
Key Features	DR	-
	RTK	-
	AGNSS	●
	SBAS	●
	PPS	●
	Anti-Jamming	-
	Jamming Detection	-
	Antenna Short Circuit Protection	-
	Antenna Open Circuit Detection	-
	Geo-fence	-
	Odometer	-
	GNSS Raw Data	-
	Sensor Raw Data	-

- Unsupported   ● Supported

LC76F Timeline

					2021						
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

LC76F (AA)

ES   CS   MP

The timeline may be adjusted according to the actual development status.

L70 Series Key Features

Product (Chipset)		L70-R (MT3337)	L70-RL (MT3337)	L70 (MT3339)
Constellation		GPS/QZSS	GPS/QZSS	GPS/QZSS
Dimensions (mm)		10.1 × 9.7 × 2.5	10.1 × 9.7 × 2.5	10.1 × 9.7 × 2.5
Channels		66 Acquisition 22 Tracking	66 Acquisition 22 Tracking	66 Acquisition 22 Tracking
Accuracy		Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP
TTFF (With AGNSS)	Cold Start	< 15 s (with EASY™)	< 15 s (with EASY™)	< 15 s (with EASY™)
TTFF (Without AGNSS)	Cold Start	< 35 s	< 35 s	< 35 s
	Warm Start	< 30 s	< 30 s	< 30 s
	Hot Start	< 1 s	< 1 s	< 1 s
Sensitivity	Acquisition	-148 dBm	-149 dBm	-148 dBm
	Reacquisition	-160 dBm	-161 dBm	-160 dBm
	Tracking	-165 dBm	-167 dBm	--165 dBm
Interface	UART	× 1	× 1	× 1
Update Rate		1 Hz (Default), Max. 5 Hz	1 Hz (Default), Max. 5 Hz	1 Hz (Default), Max. 5 Hz
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		2.8–4.3V, typ. 3.3 V	2.8–4.3V, typ. 3.3 V	2.8–4.3 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	16 mA	21 mA	18 mA
	Tracking	13 mA	18 mA	12 mA
Power Saving Mode Consumption		8 µA @ Backup Mode	8 µA @ Backup Mode	7 µA @ Backup Mode
Key Features	DR	-	-	-
	RTK	-	-	-
	AGNSS	●	●	●
	SBAS	●	●	●
	PPS	●	●	●
	Anti-Jamming	●	●	●
	Jamming Detection	-	-	●
	Antenna Short Circuit Protection	-	-	-
	Antenna Open Circuit Detection	-	-	-
	Geo-fence	-	-	●
	Odometer	-	-	●
	GNSS Raw Data	-	-	-
	Sensor Raw Data	-	-	-

- Unsupported   ● Supported

Product (Chipset)		L76 (MT3333)	L76-L (MT3333)	L76-LB (AG3331)
Constellation		GPS/GLONASS/Galileo/QZSS	GPS/GLONASS/Galileo/QZSS	GPS/GLONASS/ Galileo/BeiDou/QZSS
Dimensions (mm)		10.1 × 9.7 × 2.5	10.1 × 9.7 × 2.5	10.1 × 9.7 × 2.5
Channels		99 Acquisition 33 Tracking	99 Acquisition 33 Tracking	99 Acquisition 33 Tracking 210 PRN
Accuracy		Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP
TTFF (With AGNSS)	Cold Start	< 15 s (with EASY™)	< 15 s (with EASY™)	< 15 s (with EASY™)
TTFF (Without AGNSS)	Cold Start	< 15 s	< 35 s	< 35 s
	Warm Start	< 5 s	< 30 s	< 30 s
	Hot Start	< 1 s	< 1 s	< 1 s
Sensitivity	Acquisition	-148 dBm	-149 dBm	-148 dBm
	Reacquisition	-160 dBm	-161 dBm	-163 dBm
	Tracking	-165 dBm	-167 dBm	-165 dBm
Interfaces	UART	× 1	× 1	× 1
	I2C	-	× 1	× 1
Update Rate		1 Hz (Default), Max. 10 Hz	1Hz (Default), Max. 10Hz	1 Hz (Default), Max. 10 Hz
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		2.8–4.3 V, typ. 3.3 V	2.8–4.3 V, typ. 3.3 V	2.8–4.3 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	25 mA (GPS + GLONASS)	29 mA (GPS + GLONASS)	31.6 mA (GPS + BDS)
	Tracking	18 mA (GPS + GLONASS)	22 mA (GPS + GLONASS)	30.3 mA (GPS + BDS)
Power Saving Mode Consumption		7 µA @ Backup Mode	7 µA @ Backup Mode	7 µA @ Backup Mode
Key Features	DR	-	-	-
	RTK	-	-	-
	AGNSS	●	●	●
	SBAS	●	●	●
	PPS	●	●	●
	Anti-Jamming	●	●	●
	Jamming Detection	-	●	●
	Antenna Short Circuit Protection	-	-	●
	Antenna Open Circuit Detection	-	-	●
	Geo-fence	●	●	●
	Odometer	●	●	●
	GNSS Raw Data	-	-	-
	Sensor Raw Data	-	-	-

- Unsupported   ● Supported

LG77L Key Features

Product (Chipset)		LG77L (A) (AG3331)	LG77L (B) (AG3331)	LG77L (C) (MT3331)
Constellation		GPS/GLONASS/BeiDou/QZSS	GPS/GLONASS/BeiDou/QZSS	GPS/GLONASS/ Galileo/BeiDou/QZSS
Dimensions (mm)		7.0 × 7.0 × 2.0	7.0 × 7.0 × 2.0	7.0 × 7.0 × 2.0
Channels		99 Acquisition 33 Tracking	99 Acquisition 33 Tracking	99 Acquisition 33 Tracking
Accuracy		Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP
TTFF (With AGNSS)	Cold Start	< 14 s (with EASY™)	< 14 s (with EASY™)	< 17 s (with EASY™)
TTFF (Without AGNSS)	Cold Start	< 26 s	< 26 s	< 25 s
	Warm Start	< 24 s	< 24 s	< 23 s
	Hot Start	< 2 s	< 2 s	< 2 s
Sensitivity	Acquisition	-147 dBm	-147 dBm	-146 dBm
	Reacquisition	-156 dBm	-156 dBm	-156 dBm
	Tracking	-158 dBm	-158 dBm	-163 dBm
Interfaces	UART	× 1	× 1	× 1
	I2C	× 1	× 1	× 1
Update Rate		1 Hz (Default), Max. 10 Hz	1Hz (Default), Max. 10Hz	1 Hz (Default), Max. 10 Hz
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		2.8–4.3 V, typ. 3.3 V	2.8–4.3 V, typ. 3.3 V	2.8–4.3 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	25 mA (GPS + GLONASS)	26 mA (GPS + GLONASS)	24 mA (GPS + GLONASS)
	Tracking	24 mA (GPS + GLONASS)	25 mA (GPS + GLONASS)	23 mA (GPS + GLONASS)
Power Saving Mode Consumption		6 µA @ Backup Mode	6 µA @ Backup Mode	6 µA @ Backup Mode
Key Features	DR	-	-	-
	RTK	-	-	-
	AGNSS	●	●	●
	SBAS	●	●	●
	PPS	●	●	●
	Anti-Jamming	●	●	●
	Jamming Detection	●	●	●
	Antenna Short Circuit Protection	●	●	●
	Antenna Open Circuit Detection	●	●	●
	Geo-fence	●	●	●
	Odometer	●	●	●
	GNSS Raw Data	-	-	-
	Sensor Raw Data	-	-	-

- Unsupported   ● Supported

L26 Series Key Features

Product (Chipset)		L26 (MT3333)	L26-LB (AG3331)	L26-T (TESEO III)	L26-P (TESEO III)
Constellation		GPS/GLONASS/Galileo/QZSS	GPS/GLONASS/Galileo/BeiDou/QZSS	GPS/GLONASS/ BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS
Dimensions (mm)		12.2 × 16.0 × 2.4	12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.3
Channels		99 Acquisition 33 Tracking	99 Acquisition 33 Tracking 210 PRN	2 Fast Acquisition 48 Tracking	2 Fast Acquisition 48 Tracking
Accuracy		Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP	Autonomous: < 1.5 m CEP	Autonomous: < 1.5 m CEP
TTFF (With AGNSS)	Cold Start	< 15 s (with EASY™)	< 15 s (with EASY™)	< 13 s	< 13 s
TTFF (Without AGNSS)	Cold Start	< 35 s	< 35 s	< 32 s	< 32 s
	Warm Start	< 30 s	< 30 s	< 25 s	< 25 s
	Hot Start	< 1 s	< 1 s	< 2 s	< 2 s
Sensitivity	Acquisition	-148 dBm	-148 dBm	-147 dBm	-147 dBm
	Reacquisition	-160 dBm	-160 dBm	-154 dBm	-154 dBm
	Tracking	-167 dBm	-165 dBm	-162 dBm	-162 dBm
Interfaces	UART	× 1	× 1	× 1	× 1
	I2C	-	× 1	-	-
Update Rate		1 Hz (Default), Max. 10 Hz	1 Hz (Default), Max. 10 Hz	1 Hz (Default)	1 Hz (Default)
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-45 °C to +125 °C	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		2.8–4.3 V, typ. 3.3 V	2.8–4.3 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	29 mA (GPS + GLONASS) 26 mA (GPS)	30.3 mA (GPS + GLONASS)	71 mA	73 mA
	Tracking	21 mA (GPS + GLONASS) 18 mA (GPS)	28.0 mA (GPS + GLONASS)	67 mA	62 mA
Power Saving Mode Consumption		7 µA @ Backup Mode	7 µA @ Backup Mode	9 µA @ Backup Mode	17 µA @ Backup Mode
Key Features	DR	-	-	-	-
	RTK	-	-	-	-
	AGNSS	●	●	●	●
	SBAS	●	●	●	●
	PPS	●	●	●	●
	Anti-Jamming	●	●	-	-
	Jamming Detection	●	●	-	-
	Antenna Short Circuit Protection	●	●	●	●
	Antenna Open Circuit Detection	●	●	●	●
	Geo-fence	●	●	●	●
	Odometer	●	●	●	●
	GNSS Raw Data	-	-	●	●
	Sensor Raw Data	-	-	-	●

- Unsupported   ● Supported   Version: 3.7 | Status: Released

L26-x Series Key Features

QUECTEL

Product (Chipset)		L26-ADR (TESEO III)	L26-UDR (TESEO III)	L26-ADRC (TESEO III)
Constellation		GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS
Dimensions (mm)		12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.3
Channels		2 Fast Acquisition 48 Tracking	2 Fast Acquisition 48 Tracking	2 Fast Acquisition 48 Tracking
Accuracy		Autonomous: < 1.5 m CEP	Autonomous: < 1.5 m CEP	Autonomous: < 1.5 m CEP
TTFF (With AGNSS)	Cold Start	< 13 s	< 13 s	< 13 s
TTFF (Without AGNSS)	Cold Start	< 32 s	< 32 s	< 32 s
	Warm Start	< 25 s	< 25 s	< 25 s
	Hot Start	< 2 s	< 2 s	< 2 s
Sensitivity	Acquisition	-145 dBm	-145 dBm	-145 dBm
	Reacquisition	-152 dBm	-152 dBm	-152 dBm
	Tracking	-162 dBm	-162 dBm	-162 dBm
Interfaces	UART	× 1	× 1	× 1
	I2C	× 1	× 1	× 1
Update Rate		1 Hz (Default)	1 Hz (Default)	1 Hz (Default)
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V	3.0–3.6 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	79 mA	84 mA	79 mA
	Tracking	74 mA	81mA	74 mA
Power Saving Mode Consumption		17 µA @ Standby Mode	13 µA @ Standby Mode	13 µA @ Standby Mode
Key Features	DR	●	●	●
	RTK	-	-	-
	AGNSS	●	●	●
	SBAS	●	●	●
	PPS	●	●	●
	Anti-Jamming	-	-	-
	Jamming Detection	-	-	-
	Antenna Short Circuit Protection	●	●	●
	Antenna Open Circuit Detection	●	●	●
	Geo-fence	●	●	●
	Odometer	●	●	●
	GNSS Raw Data	-	-	-
	Sensor Raw Data	●	●	●

- Unsupported   *● Supported*

Version: 3.7 | Status: Released

LC86L Key Features

Product (Chipset)		LC86L (A) (AG3331)	LC86L (C) (MT3333)
Constellation		GPS/GLONASS/BeiDou/QZSS	GPS/GLONASS/BeiDou/QZSS
Dimensions (mm)		16.0 × 16.0 × 6.95	16.0 × 16.0 × 6.95
Channels		99 Acquisition 33 Tracking	99 Acquisition 33 Tracking
Accuracy		Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP
TTFF (With AGNSS)	Cold Start	< 15 s (with EASY™)	< 15 s (with EASY™)
TTFF (Without AGNSS)	Cold Start	< 35 s	< 35 s
	Warm Start	< 30 s	< 30 s
	Hot Start	< 2 s	< 2 s
Sensitivity	Acquisition	-148 dBm	-148 dBm
	Reacquisition	-161 dBm	-162 dBm
	Tracking	-166 dBm	-166 dBm
Interfaces	UART	× 1	× 1
	I2C	-	-
Update Rate		1 Hz (Default), Max. 10 Hz	1Hz (Default), Max. 10Hz
Temperature Range	Operating	-40 °C to +85 °C	-40 °C to +85 °C
	Storage	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		typ. 2.8 V	2.8–4.3 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	32 mA (GPS + GLONASS)	32 mA (GPS + GLONASS)
	Tracking	31 mA (GPS + GLONASS)	30 mA (GPS + GLONASS)
Power Saving Mode Consumption		6 µA @ Backup Mode	7 µA @ Backup Mode
Key Features	DR	-	-
	RTK	-	-
	AGNSS	●	●
	SBAS	●	●
	PPS	●	●
	Anti-Jamming	●	●
	Jamming Detection	●	●
	Antenna Short Circuit Protection	●	●
	Antenna Open Circuit Detection	●	●
	Geo-fence	●	●
	Odometer	●	●
	GNSS Raw Data	-	-
	Sensor Raw Data	-	-

- Unsupported   ● Supported

Version: 3.7 | Status: Released

L8x Series/L96 Key Features

Product (Chipset)		L80-R (MT3337)	L80 (MT3339)	L86 (MT3333)	L89 R2.0 (AG3335)	L96 (MT3333)
Constellation		GPS/QZSS	GPS/QZSS	GPS/GLONASS/Galileo/QZSS	GPS/Galileo/IRNSS/ QZSS	GPS/GLONASS/Galileo/QZSS
Dimensions (mm)		16.0 × 16.0 × 6.45	16.0 × 16.0 × 6.45	18.4 × 18.4 × 6.45	26.4 × 18.4 × 6.8	14.0 × 9.6 × 2.0
Channels		66 Acquisition 22 Tracking	66 Acquisition 22 Tracking	99 Acquisition 33 Tracking	135 Channels	99 Acquisition 33 Tracking 210 PRN
Accuracy		Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP	Autonomous: < 2.5 m CEP	Autonomous: < 1.8 m CEP	Autonomous: <2.5m CEP
TTFF (With AGNSS)	Cold Start	< 15 s (with EASY™)	< 15 s (with EASY™)	< 15 s (with EASY™)	< 15 s (with AGPS)	< 15 s (with EASY™)
TTFF (Without AGNSS)	Cold Start	< 35 s	< 35 s	< 35 s	< 30 s	<35s
	Warm Start	< 30 s	< 30 s	< 30 s	< 25 s	<30s
	Hot Start	< 1 s	< 1 s	< 1 s	< 1 s	<1s
Sensitivity	Acquisition	-148 dBm	-148 dBm	-149 dBm	-144 dBm	-148dBm
	Reacquisition	-160 dBm	-160 dBm	-161 dBm	-152 dBm	-160dBm
	Tracking	-165 dBm	-165 dBm	-167 dBm	-161 dBm	-165dBm
Interfaces	UART	× 1	× 1	× 1	× 1	× 1
	I2C	-	-	-	× 1	× 1
Update Rate		1 Hz (Default), Max. 5Hz	1 Hz (Default), Max. 10 Hz	1 Hz (Default), Max. 10 Hz	1 Hz (Default)	1 Hz (Default), Max. 10Hz
Temperature Range	Operating	-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
	Storage	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Power Supply		3.0–4.3 V, typ. 3.3 V	3.0–4.3 V, typ. 3.3 V	3.0–4.3 V, typ. 3.3 V	3.1–4.3 V, typ. 3.3 V	3.0–4.3 V, typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	25 mA	25 mA	30 mA	25 mA	25 mA
	Tracking	20 mA	20 mA	26 mA	25 mA	20 mA
Power Saving Mode Consumption		7 µA @ Backup Mode	7 µA @ Backup Mode	7 µA @ Backup Mode	82 µA @ Backup Mode	7µA @ Backup Mode
Key Features	DR	-	-	-	-	-
	RTK	-	-	-	-	-
	AGNSS	●	●	●	●	●
	SBAS	●	●	●	●	●
	PPS	●	●	●	●	●
	Anti-Jamming	●	●	●	●	●
	Jamming Detection	-	●	●	●	●
	Antenna Short Circuit Protection	-	●	●	●	-
	Antenna Open Circuit Detection	-	●	●	●	-
	Geo-fence	-	●	●	-	●
	Odometer	-	●	●	-	●
	GNSS Raw Data	-	-	-	-	-
	Sensor Raw Data	-	-	-	-	-

- Unsupported   ● *Supported*

LC98S Key Features

Product (Chipset)		LC98S (TESEO III)
Constellation		GPS/GLONASS/BeiDou/QZSS
Dimensions (mm)		22.4 × 17.0 × 2.6
Channels		48 Acquisition 2 Tracking
Accuracy		Autonomous: < 1.5 m CEP
Timing Accuracy (@Room temperature, all satellites at -130 dBm)		1PPS < 6.8 ns @ 1σ
TTFF (With AGNSS)	Warm Start	< 2 s (with EASY™)
TTFF (Without AGNSS)	Cold Start	< 29 s
	Warm Start	< 28 s
	Hot Start	< 2 s
Sensitivity(@Demonstrated with a good external LNA.)	Acquisition	-146 dBm
	Reacquisition	-155 dBm
	Tracking	-161 dBm
Interfaces	UART	× 1
	I2C	-
Update Rate		1 Hz (Default), Max. 10 Hz
Temperature Range	Operating	-40 °C to +85 °C
	Storage	-40 °C to +90 °C
Power Supply		typ. 3.3 V
Power Consumption (@ 3.3 V)	Acquisition	75 mA (GPS + BeiDou)
	Tracking	75 mA (GPS + BeiDou)
Key Features	DR	-
	RTK	-
	AGNSS	●
	SBAS	●
	PPS	●
	Anti-Jamming	-
	Jamming Detection	-
	Antenna Short Circuit Protection	-
	Antenna Open Circuit Detection	-
	Geo-fence	-
	Odometer	-
	GNSS Raw Data	-
	Sensor Raw Data	-

- Unsupported   *● Supported*

Version: 3.7 | Status: Released

GNSS Module Roadmap
Product Overview
Technologies
Application

Build a Smarter World

Global Navigation System Change

Multi-band and more viewable satellites will significantly enhance the positioning performance.

GPS/QZSS

L1C/A/ L1C/ L2/ L5

BeiDou

B1I/ B3I/ B1C/ B2a/ B2b

GLONASS

L1OF/ L2OF

Galileo

E1/ E5a/ E5b/ E6

NavIC

7 Satellites
L5

Till 2020

AGNSS Function

The offline AGNSS technology provides predicted Extended Prediction Orbit to speed up TTFF.

Key Benefits

- Free service to customers.
- Complete application user guides, and automatic data downloading and uploading to GNSS engine.
- Short downloading time due to small data.

AGNSS Server

Internet

GNSS

AGNSS (2)

TTFF Comparison

Test Condition		TTFF without AGNSS	TTFF with AGNSS
Under real network conditions (-130 dBm conductive power level)	Cold Start	< 35 s	< 15 s
	Warm Start	< 30 s	< 5 s

Positioning Technology Trends

GPS	GNSS	Multi-band & GNSS+DR	RTK	
2–5 m	2–5 m	1–2 m	< 1 m	cm
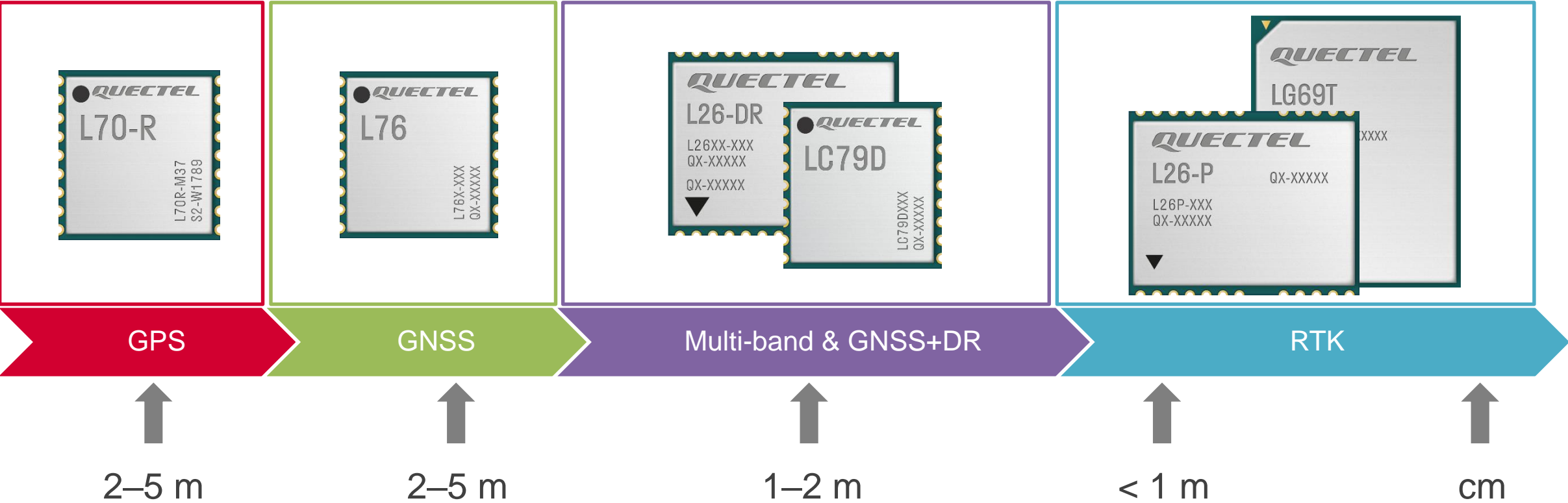
Full Coverage Positioning: Dead Reckoning

- **Dead Reckoning (DR)** technology fuses GNSS and INS sensor together to provide a continuous high accuracy position. Using this technology, the GNSS receiver provides accurate position & time to the navigation system as long as the reception signals are good, once the reception signals are poor the INS sensor will continue to provide the information till the reception signals are improved. Based on this technology, device can get full coverage positioning or navigation even in parking garages, tunnels, and urban canyons.

QUECTEL
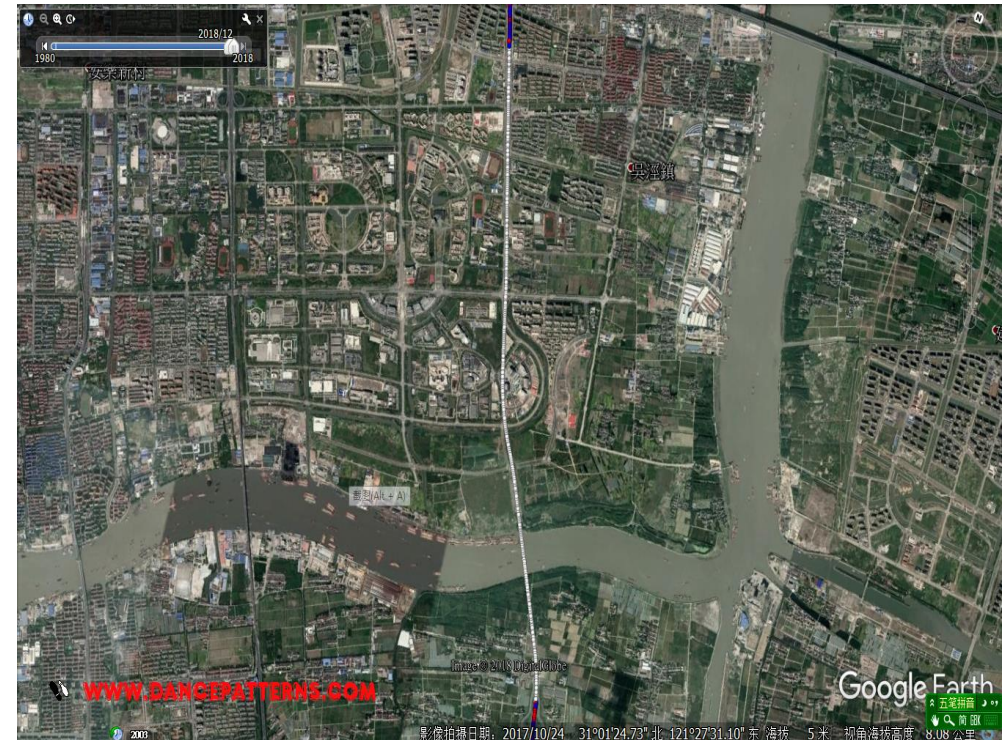
Real-Time Kinematic (RTK)
Positioning Process:

- Satellites broadcast the signal

- The base station calculates the common errors based on carrier phase, and then transfer them to the cloud server

- The device or receiver calculates a precise position with the carrier phase it received and the correction data from correction server

GNSS Satellites

GNSS carrier wave

Internet

Correction data

Correction service

Base Station

Device
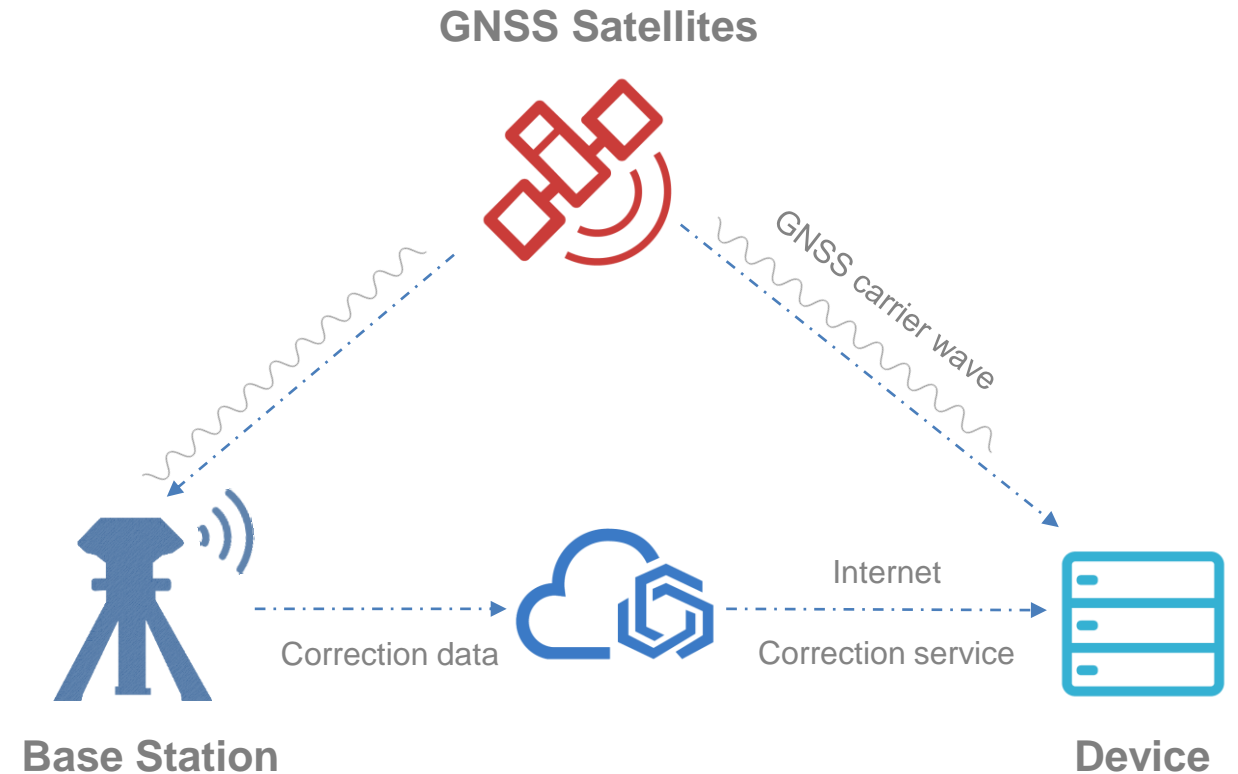
RTK Application Architecture: Single-band Module

QUECTEL

ANT_GNSS

L26-P

UART

1PPS

STA8089FG+
LSM6DSR

GNSS Raw Data +
Sensor Raw Data

4G module

RTK & DR
Algorithm

LTE Connection

Correction
Server

High Precision
Positioning
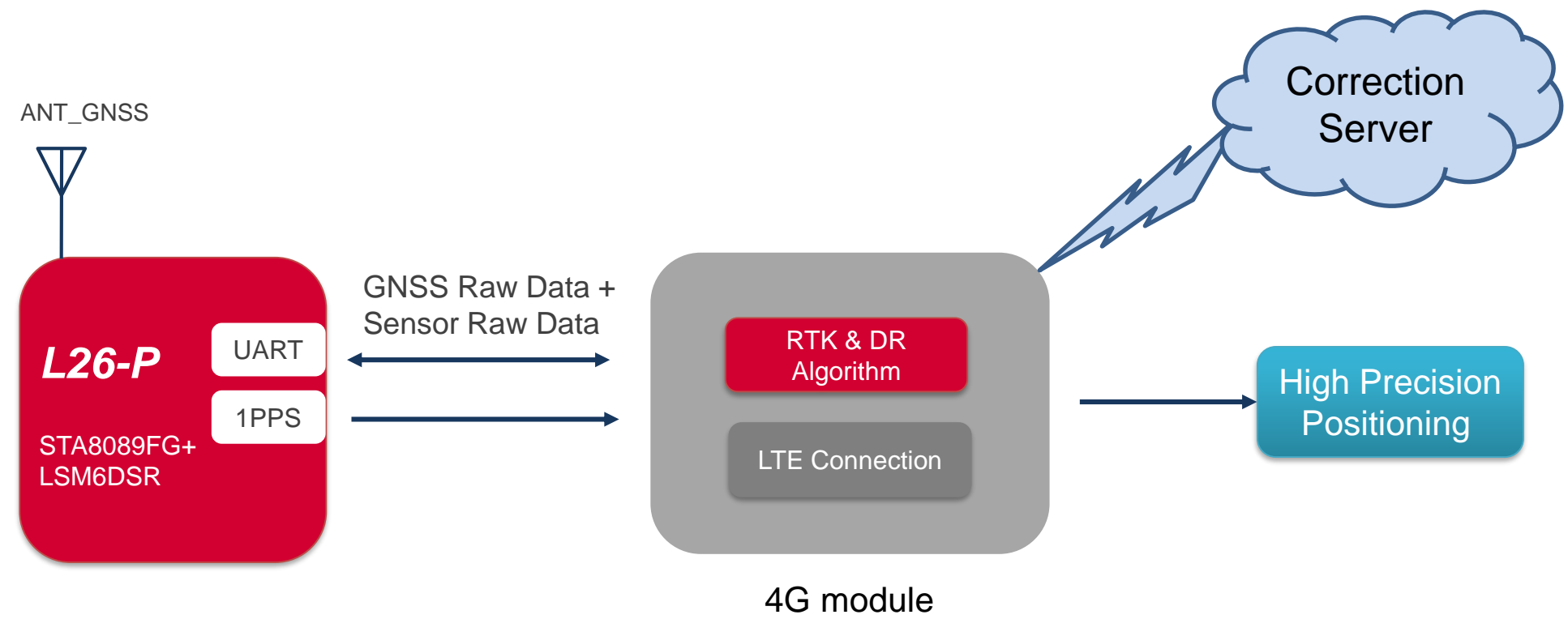
L26-P is raw data output version only.

Dual-band Benefits

The modulation of L5/E5a GNSS signals combined with L1/E1 C/A signals, enables multiband receivers to achieve improved accuracy and better multipath rejection, as well as better interference immunity than only with L1/B1/E1 alone.

These refinements are key for navigation in dense urban canyon environments.

Signal Attribute	L1	L5	E5	Benefits
Chipping Rate (10x higher)	☐	■	■	Multipath Rejection
Increased Signal Power (up to 3 dB)	☐	■	■	Better Weak Signal Tracking
Pilot Signal	☐	■	■	6 dB Better Weak Signal Tracking
Ionospheric Estimation (using dual frequency)	☐	■	■	Sub-meter Accuracy in Open Sky
Error Correction Code on Nav Messages	☐	■	■	More Reliable Autonomous Cold Start
More Frequent Nav Messages	☐	☐	■	Faster Autonomous Cold Start
50 MHz Signal Bandwidth (using E5B)	☐	☐	■	Further Improvement in Multipath Rejection
Secondary Codes	☐	■	■	Reduced Signal Cross Correlation

☐ *means the GNSS band does - the corresponding signal attribute.*
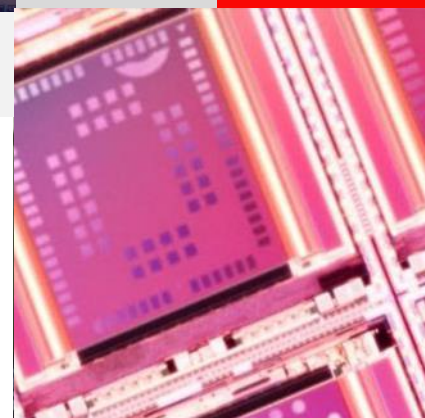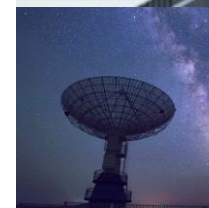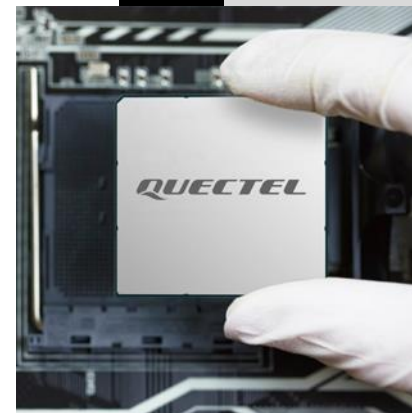■ *means the GNSS band supports the corresponding signal attribute.*

GNSS Module Roadmap
Product Overview
Technologies
Application

Build a Smarter World
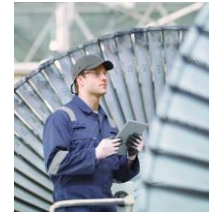
Target Applications
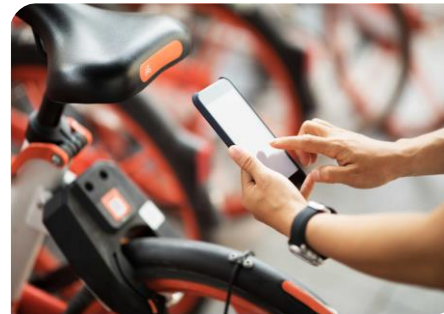
Personal & Pet Tracker

Wearable Devices (e.g. smartwatch)

Vehicle Tracker

ADAS & Self-driving

Shared Mobility

Smart Agriculture

QUECTEL

The number one cellular module vendor in the world and a leading GNSS module supplier

- Unbeatable choice from the broadest module portfolio in the world
- The highest quality products for the best possible prices
- Superb support with the largest R&D team in the industry
- Continuous innovation – first to market with 5G, LPWA, CV2X, snapdragon
- A passionate, dedicated team of "Quectelers" ensure our customers always come first

ThankYou

Build a Smarter World