



# Quectel 5G & LTE-Advanced Module Product Overview

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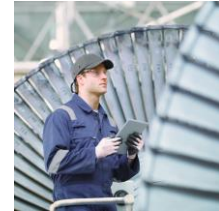
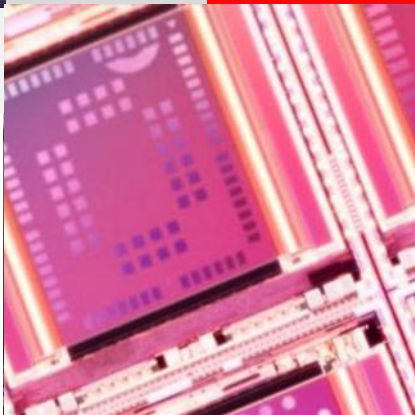
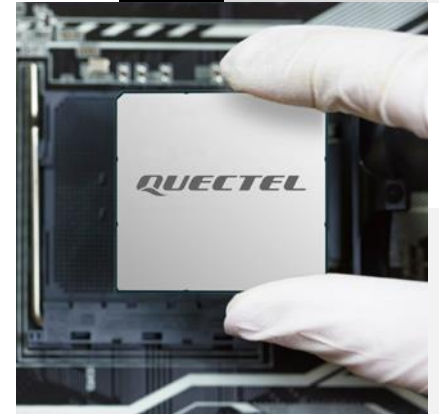




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# 5G & LTE-Advanced Roadmap

5G Product Overview

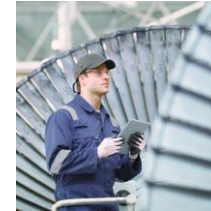
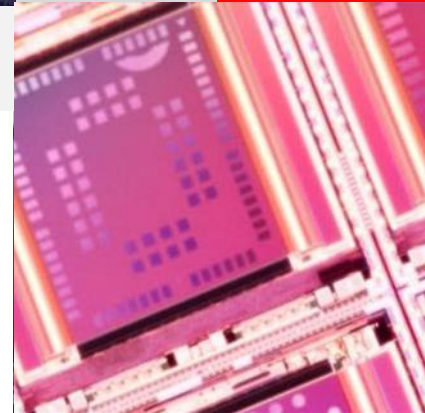
5G QuecOpen<sup>®</sup>

LTE-A Product Overview

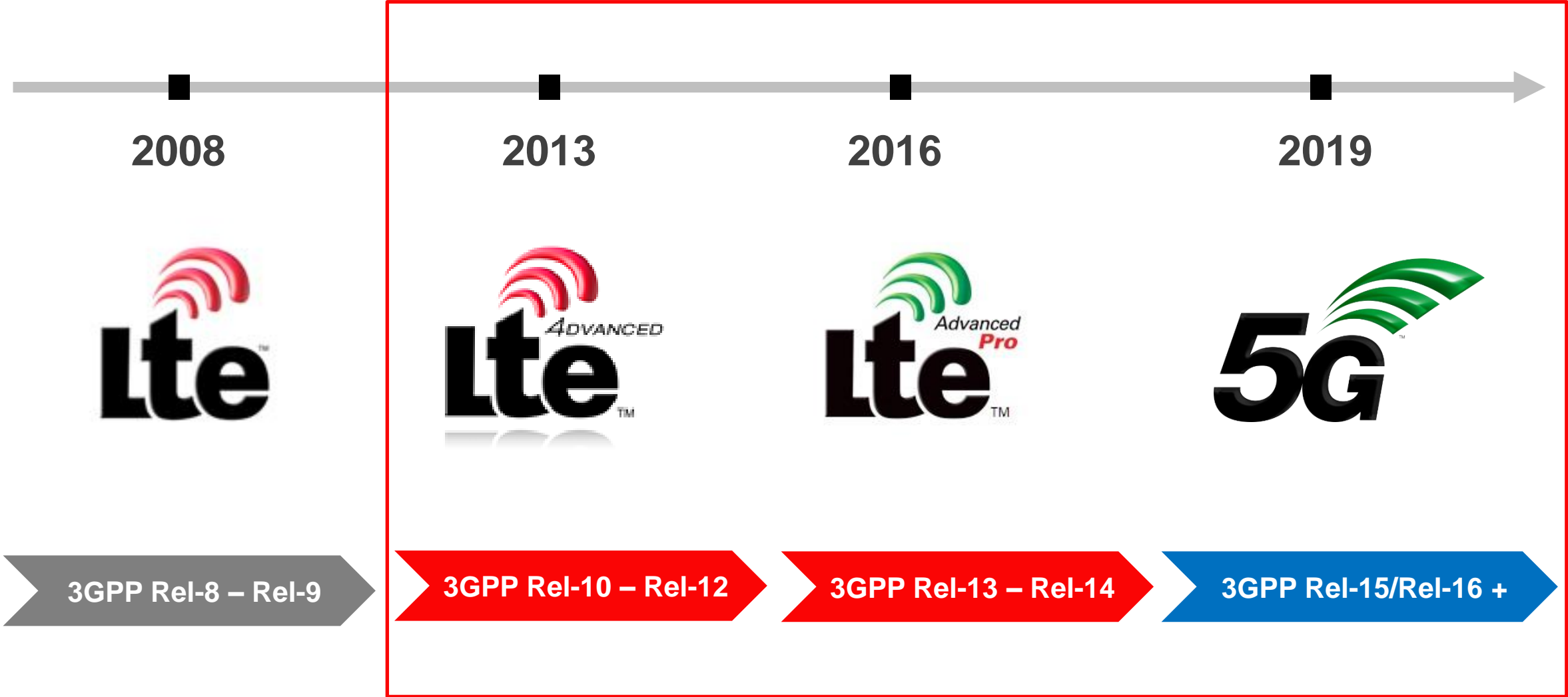
Technical Details

Application Fields

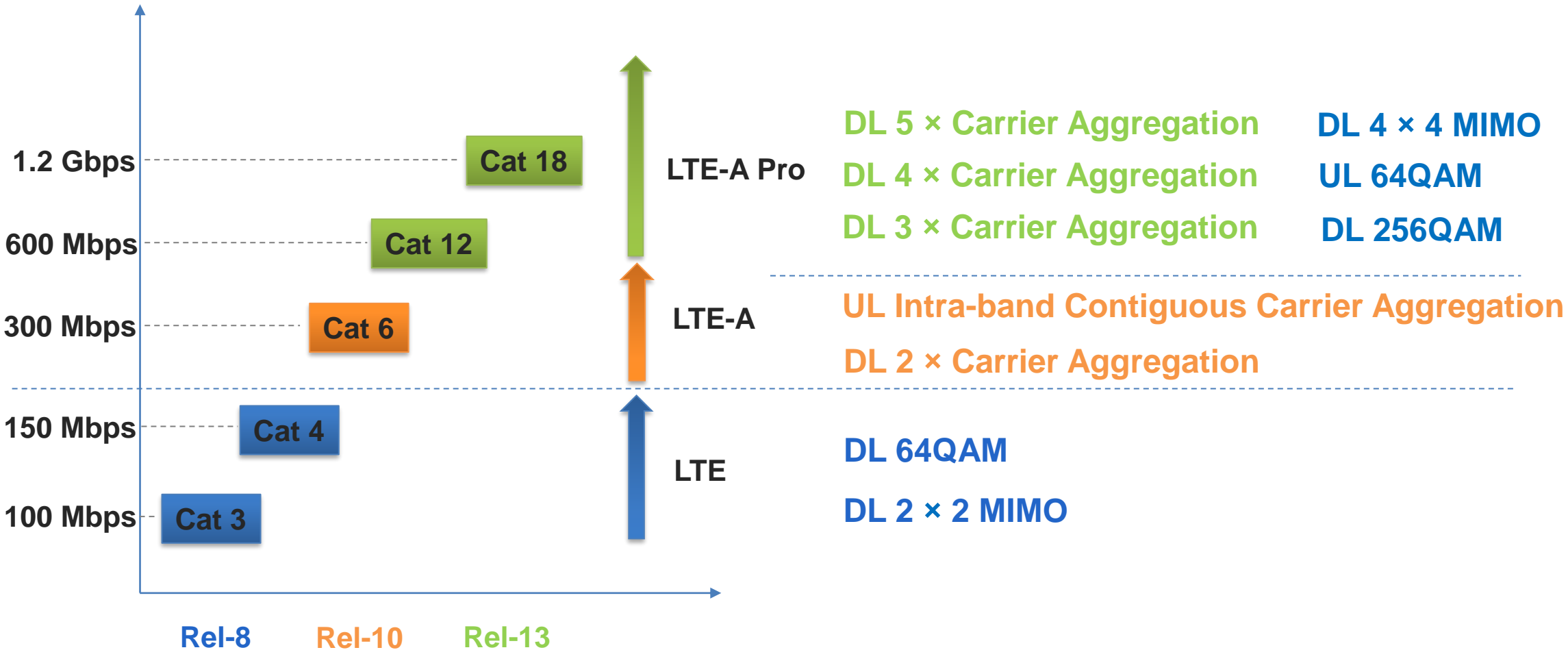
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# Cellular Networks Keep on Evolving



# Key LTE-A/ LTE-A Pro Technology



More Spectrums Aggregated

Multi-Antenna Technology

Higher Order Modulation

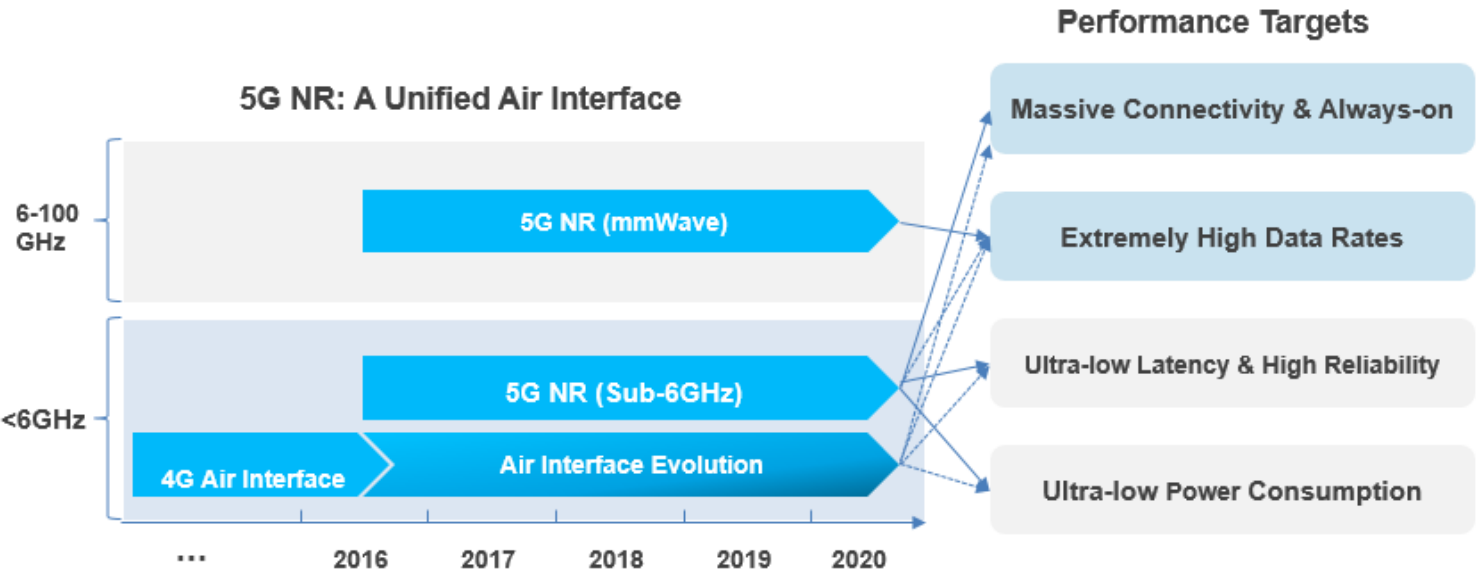
# Key 5G Technology: More Spectrums



**mmWave**  
**100–800 MHz Bandwidth**

**Sub-6 GHz**  
**100–200 MHz Bandwidth**

**Sub-2.6 GHz**  
**20–100 MHz Bandwidth**



# 5G/ LTE-A Module Roadmap

## mmWave

## Sub-6 G

## Cat 12/ 16/ 18

## Cat 6



• Qx/YY Estimated Engineering Sample Time



RG530F Series

• Q4/21



RG500L Series



RG520F Series

RG520N Series

RG50xQ Series

• Q4/21



EG18 Series

EG12 Series

EG120K-EA



EG512R-EA

Compatible Design



EG060K-EA

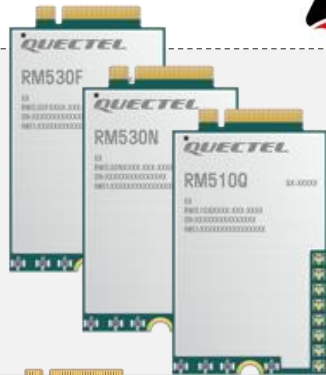
EG06 Series

EG060V-EA

Compatible Design



EP06 Series



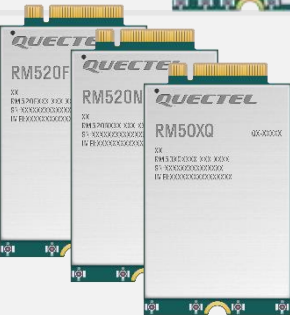
RM530F-GL

• Q4/21

RM530N-GL

• Q4/21

RM510Q-GL

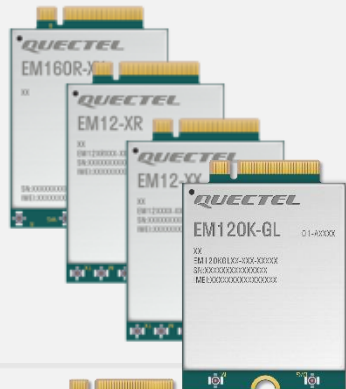


RM520F-GL

• Q4/21

RM520N-GL

RM50xQ Series



EM160R-GL

EM12xR-GL

EM12-G

EM120K-GL

• Q4/21



EM060K-GL

• Q4/21

EM06 Series

Compatible Design



5G & LTE-Advanced Roadmap

**5G Product Overview**

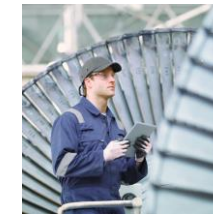
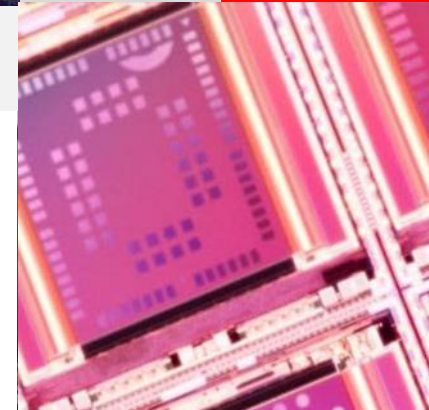
5G QuecOpen<sup>®</sup>

LTE-A Product Overview

Technical Details

Application Fields

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# 5G Module Overview



Sub-6 GHz

Sub-6 GHz + mmWave



## RG50xQ Series

- LGA Form Factor
- Variants:
  - EA
  - EU
  - GT



## RM50xQ Series

- M.2 Form Factor
- Variants:
  - GL
  - AE



## RM510Q-GL

- M.2 Form Factor
- Variant:
  - GL



## RG520N Series

- LGA Form Factor
- Variants:
  - EU Engineering Sample
  - NA Engineering Sample



## RM520N-GL

- M.2 Form Factor
- Variant:
  - GL Engineering Sample



## RM530N-GL

- M.2 Form Factor
- Variant:
  - GL Under Development

• Q4/21



## RG520F Series

- LGA Form Factor
- Variants:
  - EU Under Development
  - NA Planned

• Q4/21

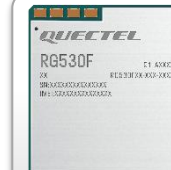
• Q4/21



## RM520F-GL

- M.2 Form Factor
- Variant:
  - GL Planning

• Q4/21



## RG530F Series

- LGA Form Factor
- Variants:
  - EU Planning
  - NA Planned

• Q4/21

• Q4/21



## RM530F-GL

- M.2 Form Factor
- Variant:
  - GL Planning

• Q4/21



## RG500L Series

- LGA Form Factor
- Variants:
  - EU Commercial Sample
  - NA Under Development

• Q4/21

• Qx/YY Estimated Engineering Sample Time

Version: 5.1 | Status: Released

# RG50xQ Series Specifications



**44.0 mm × 41.0 mm × 2.75 mm**  
**5G Sub-6 GHz LGA Module**

## ■ UMTS/LTE/5G Multi-Mode Module

Variant		RG500Q-EA	RG502Q-EA	RG500Q-EU	RG501Q-EU	RG502Q-EU	RG502Q-GT
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz		3GPP Release 15 NSA/SA operation, Sub-6 GHz		3GPP Release 15 SA operation, Sub-6 GHz	
	NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79		n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78		-	
	SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79		n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78		n78	
	Sub-6 CA	-	TDD + TDD DL CA*	-	-	TDD + TDD DL CA*	TDD + TDD DL CA*
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n77/n78/n79		n1/n3/n7/n38/n40/n41/n77/n78		n78	
	UL 2 × 2 MIMO	n41/n77/n78/n79		n41/n77/n78		n78	
LTE	LTE Category	Cat 16	Cat 20	Cat 16	Cat 20	Cat 20	Cat 20
	LTE Bands	B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/ B32/B34/B38/B39/B40/B41/B42/B43		B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42/B43		B42/B43	
	DL 4 × 4 MIMO	B1/B3/B7/B32/B34/B38/B39/B40/B41/B42/B43		B1/B3/B5(optional)/B7/B20(optional)/B28(optional)/B32/B38/B40/B41/B42		B42/B43	
UMTS	WCDMA Bands	B1/B3/B5/B6/B8/B19		B1/B5/B8		-	
Embedded GNSS		Supported		Supported		-	
PCIe 3.0 Interface		Supported		Supported		Supported	
USB 3.1 Interface		Supported		Supported		Supported	
RGMII Interface		Supported		Supported		Supported	
eSIM		Supported		Supported / Built-in eSIM (optional)		Supported / Built-in eSIM (optional)	
Region		EMEA/ APAC		EMEA/ Oceania/ Brazil		Global TDD 3.5 GHz Network	
Certification		Carrier: Telstra <sup>TBD</sup> / China Telecom/ China Mobile/ China Unicom/ KT*/ SKT/ LGU+ Regulatory: CE/ SRRC/ NAL/ CCC/ KC/ JATE/ TELEC/ RCM	Carrier: TBD Regulatory: CE/ RCM	Carrier: TBD Regulatory: TBD	Carrier: TBD Regulatory: GCF/ CE/ RCM	Carrier: TBD Regulatory: CE/ RCM	Carrier: TBD Regulatory: CE/ RCM*

# RG500Q-EA/ RG502Q-EA Certifications



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

## Project Stage

RG500Q-EA 

RG502Q-EA 

## Carrier Certification

RG500Q-EA

China Telecom/ China Mobile/ China Unicom/ SKT/ LGU+ Completed



RG502Q-EA

TBD

## Regulatory Certification

RG500Q-EA

CE/ SRRC/ NAL/ CCC/ KC/ JATE/ TELEC/ RCM Completed

RG502Q-EA

CE/ RCM Completed



# RG500Q-EU/ RG501Q-EU/ RG502Q-EU Timeline



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

## Project Schedule

### RG500Q-EU

### RG501Q-EU

### RG502Q-EU

MP

ES

CS

MP

ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification

### RG500Q-EU/ RG501Q-EU/ RG502Q-EU

TBD

## Regulatory Certification

### RG500Q-EU

TBD

### RG501Q-EU

GCF/ CE/ RCM

Completed

### RG502Q-EU

CE/ RCM

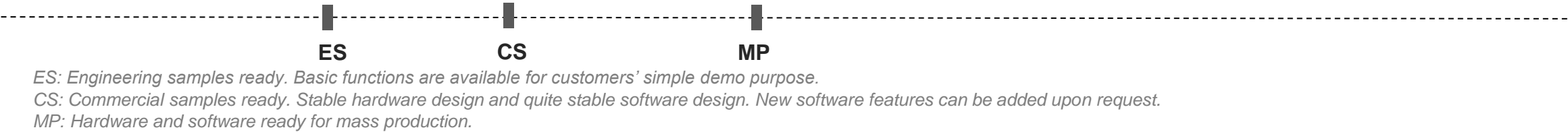
Completed

# RG502Q-GT Timeline



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

## Project Schedule



## Carrier Certification

TBD

## Regulatory Certification



# RG520N Series Specifications (Preliminary)



44.0 mm × 41.0 mm × 2.75 mm  
5G Sub-6 GHz LGA Module

## ■ UMTS/LTE/5G Multi-Mode Module

Variant		RG520N-EU (Draft)	RG520N-NA (Draft)
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz	3GPP Release 16 NSA/SA operation, Sub-6 GHz
	NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/n38/n41/n48/n66/n70/n71/n77/n78
	SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/n38/n41/n48/n66/n70/n71/n77/n78
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD 2CA	FDD + FDD, TDD + TDD, FDD + TDD 2CA
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n77/n78/n75/n76	n2/n7/n25/n30/n38/n41/n48/n66/n70/n77/n78
LTE	LTE Category	Cat 19	Cat 19
	LTE Bands	B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42/B43	B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B29/B30/B38/B41/B42/B43/ B46/B48/B66/B71
	DL 4 × 4 MIMO	B1/B3/B7/B32/B38/B40/B41/B42/B43	B2/B4/B25/B30/B66/B41/B42/B43/B48
UMTS	WCDMA Bands	B1/B5/B8	-
Embedded GNSS		Supported	Supported
PCIe 4.0 Interface		Supported	Supported
USB 3.1 Interface		Supported	Supported
RGMII Interface		Not Supported	Not Supported
Region		EMEA/ Oceania/ Brazil	North America
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> CE*/ RCM*	<b>Carrier:</b> TBD <b>Regulatory:</b> FCC*/ IC*



# RG520N Series Timeline (Preliminary)



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

## Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification (Planning)

### RG520N-EU / RG520N-NA

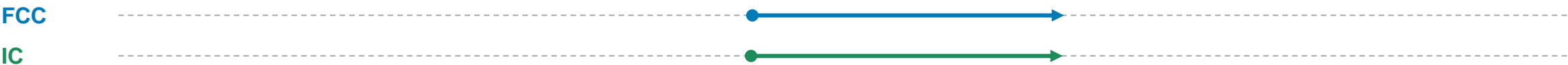
TBD

## Regulatory Certification (Planning)

### RG520N-EU



### RG520N-NA



Notes: 1. This is the preliminary timeline, and it might be influenced by the Qualcomm chipsets timeline.  
2. TBD: To Be Determined.

# RG520F Series Specifications (Preliminary)



**45.0 mm × 48.0 mm × 2.85 mm (approx.)**  
**5G Sub-6 GHz LGA Module**

## ■ UMTS/LTE/5G Multi-Mode Module

Variant		RG520F-EU (Draft)	RG520F-NA (Draft)
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz	3GPP Release 16 NSA/SA operation, Sub-6 GHz
	NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/n38/n41/n48/n66/n70/n71/n77/n78
	SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/n38/n41/n48/n66/n70/n71/n77/n78
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD DL 3CA / UL 2CA	FDD + FDD, TDD + TDD, FDD + TDD DL 3CA / UL 2CA
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n75/n76/n77/n78	n2/n7/n25/n30/n38/n41/n48/n66/n70/n77/n78
LTE	LTE Category	Cat 20	Cat 20
	LTE Bands	B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42/B43	B2/B4/B5/B7/B12(B17)/B13/B14/B25/B26/B29/B30/B38/B41/B42/B43/B46/B48/B66/B71
	DL 4 × 4 MIMO	B1/B3/B7/B32/B38/B40/B41/B42/B43	B2/B4/B25/B30/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B5/B8	-
Embedded GNSS		Supported	Supported
PCIe 4.0 Interface		Supported	Supported
USB 3.1 Interface		Supported	Supported
RGMII Interface		Not Supported	Not Supported
Region		EMEA/ Oceania/ Brazil	North America
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> GCF <sup>TBD</sup> /CE*/ RCM*	<b>Carrier:</b> TBD <b>Regulatory:</b> GCF <sup>TBD</sup> /PTCRB <sup>TBD</sup> /FCC*/ IC*

Notes: 1. “\*”: Under development/ In progress.  
 2. TBD: To Be Determined.

# RG520F Series Timeline (Preliminary)



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

## Project Schedule

### RG520F-EU

### RG520F-NA



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification (Planning)

### RG520F-EU / RG520F-NA

TBD

## Regulatory Certification (Planning)

### RG520F-EU

CE/RCM

GCF

TBD



### RG520F-NA

FCC/IC

GCF/PTCRB

TBD





# RG530F Series Specifications (Preliminary)



**45.0 mm × 48.0 mm × 2.85 mm (approx.)**  
**5G Sub-6 GHz LGA Module**

## ■ UMTS/LTE/5G Multi-Mode Module

Variant		RG530F-EU (Draft)	RG530F-NA (Draft)
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz, mmWave	3GPP Release 16 NSA/SA operation, Sub-6 GHz, mmWave
	Sub-6 NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/n38/n41/n48/n66/n70/n71/n77/n78
	Sub-6 SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n75/n76/n77/n78	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/n38/n41/n48/n66/n70/n71/n77/n78
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD DL 3CA / UL 2CA	FDD + FDD, TDD + TDD, FDD + TDD DL 3CA / UL 2CA
	mmWave Bands	n257/n258/n260/n261	n257/n258/n260/n261
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n75/n76/n77/n78	n2/n7/n25/n30/n38/n41/n48/n66/n70/n77/n78
LTE	LTE Category	Cat 20	Cat 20
	LTE Bands	B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42/B43	B2/B4/B5/B7/B12(B17)/B13/B14/B25/B26/B29/B30/B38/B41/B42/B43/B46/B48/B66/B71
	DL 4 × 4 MIMO	B1/B3/B7/B32/B38/B40/B41/B42/B43	B2/B4/B25/B30/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B5/B8	-
Embedded GNSS		Supported	Supported
PCIe 4.0 Interface		Supported	Supported
USB 3.1 Interface		Supported	Supported
RGMII Interface		Not Supported	Not Supported
Region		EMEA/ Oceania/ Brazil	North America
Certification		Carrier: TBD Regulatory: TBD	Carrier: TBD Regulatory: TBD

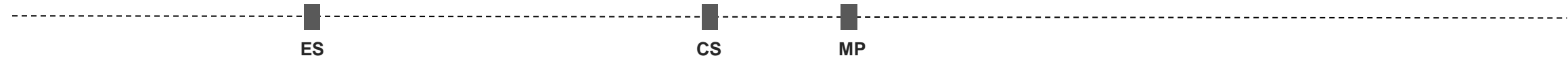
# RG530F Series Timeline (Preliminary)



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

## Project Schedule

### RG530F-EU



### RG530F-NA



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification (Planning)

### RG530F-EU / RG530F-NA

TBD

## Regulatory Certification (Planning)

### RG530F-EU / RG530F-NA

TBD

# RG500L Series Specifications



**44.0 mm × 41.0 mm × 2.75 mm**  
**5G Sub-6 GHz LGA Module**

## ■ UMTS/LTE/5G Multi-Mode Module

Variant		RG500L-EU	RG500L-NA (Preliminary)
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78	n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78
	SA Bands	n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78	n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78
	DL 4 × 4 MIMO	n1/n3/n7/n38/n40/n41/n77/n78	n2/n7/n25/n41/n48/n66/n77/n78
	UL 2 × 2 MIMO	n40*/n41/n77/n78	n41/n48*/n77/n78
LTE	LTE Category	Cat 19	Cat 19
	LTE Bands	B1/B3/B5/B7/B8/B20/B28/B32/B38/B40/B41/B42/B43	B2/B4/B5/B7/B12/B13/B17/B14/B25/B26/B29/B30/B41/B42/B43/B46/B48/B66/B71
	DL 4 × 4 MIMO	B1/B3/B7/B38/B40/B41/B42	B2/B4/B25/B30/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B5/B8	-
Embedded GNSS		Supported	Supported
PCIe 3.0 Interface		Supported	Supported
USB 3.1 Interface		Supported	Supported
SGMII Interface		Supported	Supported
Region		EMEA/ Oceania/ Brazil	North America
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> GCF <sup>TBD</sup> / CE/ RCM	<b>Carrier:</b> TBD <b>Regulatory:</b> GCF <sup>TBD</sup> / FCC <sup>TBD</sup> / IC <sup>TBD</sup> / PTCRB <sup>TBD</sup>

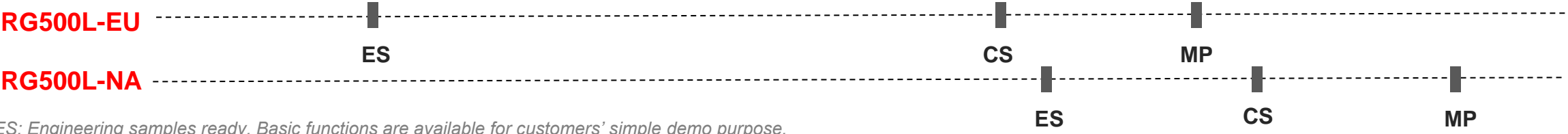


# RG500L Series Timeline



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

## Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification (Planning)

RG500L-EU/ RG500L-NA  
TBD

## Regulatory Certification (Planning)

RG500L-EU  
CE/ RCM                      Completed  
GCF                              TBD

RG500L-NA  
GCF/ FCC/ IC/ PTCRB      TBD

Notes: 1. TBD: To Be Determined.  
2. This is the preliminary timeline, and it might be influenced by the chipsets timeline.

# RM50xQ Series Specifications



## ■ UMTS/LTE/5G Multi-Mode Module

**52.0 mm × 30.0 mm × 2.3 mm**  
**5G Sub-6 GHz M.2 Module**

Variant		RM500Q-AE	RM502Q-AE	RM505Q-AE	RM500Q-GL	RM502Q-GL
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz			3GPP Release 15 NSA/SA operation, Sub-6 GHz	
	NSA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/ n66/n71/n77/n78/n79			n41/n77/n78/n79	n38/n41/n77/n78
	SA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/ n66/n71/n77/n78/n79			n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/ n79	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78
	Sub-6 CA	-	TDD +TDD DL CA*	-	-	TDD +TDD DL CA*
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79			n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78
	UL 2 × 2 MIMO	n41			n41/n77/n78/n79	n41/n77/n78
LTE	LTE Category	DL Cat 16/ UL Cat 18	DL Cat 20/ UL Cat 18	DL Cat 16/ UL Cat 18	DL Cat 16/ UL Cat 18	DL Cat 20/ UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12(B17)/B13/B14/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71			B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/ B46(LAA)/B48/B66/B71	
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/39/B40/B41/B42/B43/B48/B66			B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66	
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B6/B8/B19			B1/B2/B3/B4/B5/B6/B8/B19	
Embedded GNSS		Supported	Supported	Supported (Independent GNSS Antenna Port, Active)	Supported	
PCIe 3.0 Interface		Supported			Supported	
USB 3.1 Interface		Supported			Supported	
eSIM		Supported / Built-in eSIM (optional)			Supported / Built-in eSIM (optional)	
Region		Global (except for China)			Global (except for US)	Global (except for US/ China/ Japan)
Certification		<b>Carrier:</b> Deutsche Telecom/ AT&T/ T-Mobile*/ Verizon*/ Telstra* <b>Regulatory:</b> GCF/ CE/ PTCRB/ FCC/ IC/ NCC*/ JATE/ TELEC/ RCM	<b>Carrier:</b> Deutsche Telecom*/ AT&T/ T-Mobile/ Verizon*/ Telstra <b>Regulatory:</b> GCF/ CE/ PTCRB/ FCC/ IC/ JATE/ TELEC/ RCM	<b>Carrier:</b> Deutsche Telecom/ AT&T/ T-Mobile*/ Verizon*/ Telstra* <b>Regulatory:</b> GCF/ CE/ PTCRB/ FCC/ IC/ JATE/ TELEC/ RCM	<b>Carrier:</b> Deutsche Telecom/ China Telecom/ China Mobile/ China Unicom/ KT/ SKT/ LGU+ <b>Regulatory:</b> GCF/ CE/ SRRC/ NAL/ CCC/ KC/ RCM	<b>Carrier:</b> TBD <b>Regulatory:</b> GCF/ PTCRB / CE/ RCM/ IC/ FCC

# RM500Q-AE Certifications



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

## Project Stage

RM500Q-AE

MP

## Carrier Certification

Deutsche Telecom/ AT&T

Completed

T-Mobile

Start

Complete (Planned)

Verizon

Telstra

## Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ IC/ NCC/ JATE/ TELEC/ RCM

Completed

# RM502Q-AE Certifications



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

## Project Stage

MP  
RM502Q-AE

## Carrier Certification

AT&T/ T-Mobile/ Telstra Completed

Deutsche Telecom Start Complete (Planned)

Verizon

## Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ IC/ JATE/ TELEC/ RCM Completed

# RM505Q-AE Certifications



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

## Project Stage

RM505Q-AE

MP

## Carrier Certification

Deutsche Telecom/ AT&T

Completed

T-Mobile

Start

Complete (Planned)

Verizon

Telstra

## Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ IC/ JATE/ TELEC/ RCM

Completed



# RM500Q-GL Certifications



## Project Stage

RM500Q-GL



## Carrier Certification

Deutsche Telekom/ China Telecom/ China Mobile/ China Unicom/ KT/ SKT/ LGU+ Completed



## Regulatory Certification

GCF/ CE/ RCM/ SRRC/ NAL/ CCC/ KC Completed



# RM502Q-GL Certifications



## Project Stage

RM502Q-GL 

## Carrier Certification

TBD

## Regulatory Certification

GCF/ CE/ IC/ PTCRB/ FCC/ RCM

Completed



Note: TBD: To Be Determined.

# RM520N-GL Specifications (Preliminary)



52.0 mm × 30.0 mm × 2.3 mm  
5G Sub-6 GHz M.2 Module

## ■ UMTS/LTE/5G Multi-Mode Module

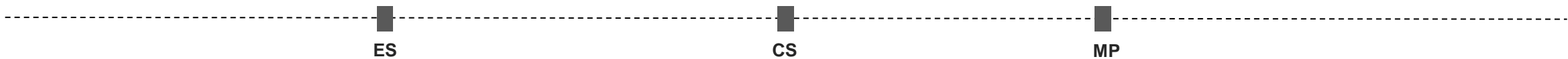
Variant		RM520N-GL (Draft)
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz
	NSA Bands	n1/n2/n3/n5/n7/n8/n12/n13/n14/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n71/n75/n76/n77/n78/n79
	SA Bands	n1/n2/n3/n5/n7/n8/n12/n13/n14/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n71/n75/n76/n77/n78/n79
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD 2CA
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n41/n48/n66/n77/n78/n79
	UL 2 × 2 MIMO	n41
LTE	LTE Category	DL Cat 19/ UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B38/B41/ B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
PCIe 4.0 Interface		Supported
USB 3.1 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> GCF*/ PTCRB*/ CE*/ RCM*/ IC*/ FCC*/ JATE*/ TELEC*

# RM520N-GL Timeline (Preliminary)



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

## Project Schedule

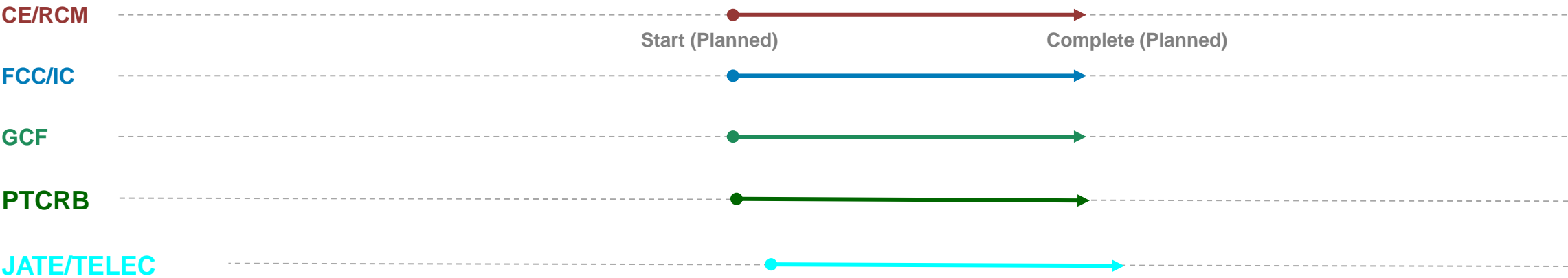


ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification

TBD

## Regulatory Certification (Planning)



# RM510Q-GL Specifications



## ■ UMTS/LTE/5G Multi-Mode Module

52.0 mm × 30.0 mm × 2.3 mm

Variant		RM510Q-GL
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz, mmWave
	Sub-6 NSA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79
	Sub-6 SA Bands	n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79
	mmWave Bands	n257/n258/n260/n261
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79
	UL 2 × 2 MIMO	n41/n257/n258/n260/n261
LTE	LTE Category	DL Cat 20 / UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12(B17)/B13/B14/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
PCIe 3.0 Interface		Supported
USB 3.1 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		<b>Carrier</b> <sup>TBD</sup> : Verizon/ AT&T/ T-Mobile/ Telstra <b>Regulatory</b> : GCF/ CE/ PTCRB/ FCC/ IC/ RCM



# RM510Q-GL Certifications



## Project Stage

RM510Q-GL (AA/HA) 

## Carrier Certification (Planning)

Verizon/ AT&T/ T-Mobile/ Telstra

TBD

## Regulatory Certification (HA)

GCF/ CE/ PTCRB/ FCC/ IC/ RCM Completed



# RM530N-GL Specifications (Preliminary)



## ■ UMTS/LTE/5G Multi-Mode Module

52.0 mm × 30.0 mm × 2.3 mm  
5G Sub-6 GHz + mmWave M.2 Module

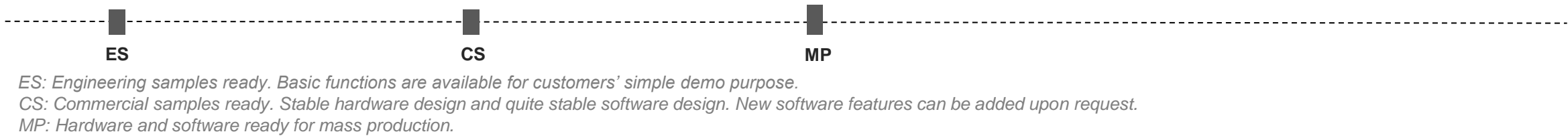
Variant		RM530N-GL (Draft)
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz, mmWave
	Sub-6 NSA Bands	n1/n2/n3/n5/n7/n8/n12/n13/n14/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n71/n75/n76/n77/n78/n79/
	Sub-6 SA Bands	n1/n2/n3/n5/n7/n8/n12/n13/n14/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n71/n75/n76/n77/n78/n79
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD 2CA
	mmWave Bands	n257/n258/n260/n261
	DL 4 × 4 MIMO	n1/n2/n3/n7/n25/n38/n41/n48/n66/n77/n78/n79
	UL 2 × 2 MIMO	n41/n257/n258/n259/n260/n261
LTE	LTE Category	DL Cat 19 / UL Cat 18
	LTE Bands	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B66/B71
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B38/B41/B42/B43/B48/B66
UMTS	WCDMA Bands	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
PCIe 4.0 Interface		Supported
USB 3.1 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		Carrier: TBD Regulatory: GCF*/ PTCRB*/ CE*/ RCM*/ IC*/ FCC*/ JATE*/ TELEC*

# RM530N-GL Timeline (Preliminary)



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

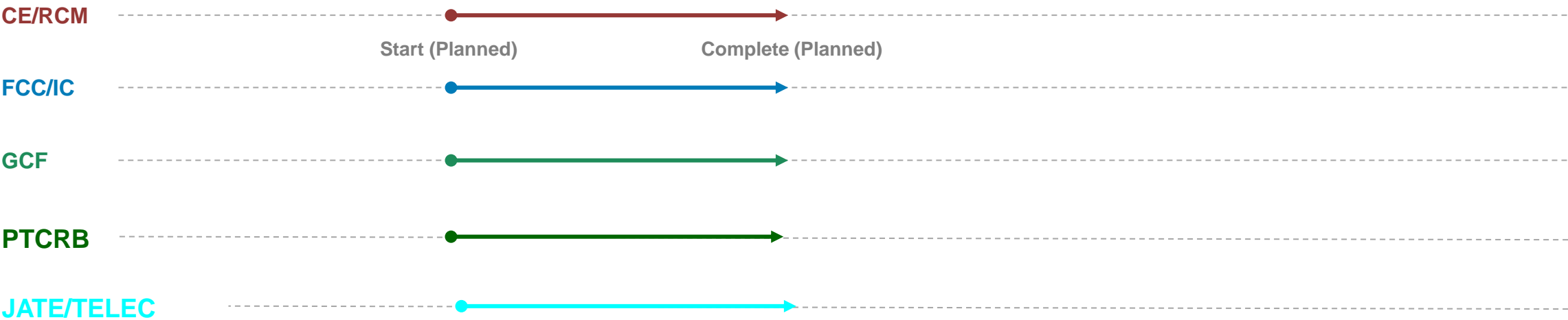
## Project Schedule



## Carrier Certification

TBD

## Regulatory Certification



# 5G Product Key Features & Status



Product	Form Factor	5G NR Bandwidth (Max.)	LTE Category	Cellular Antenna	RGMII / SGMII Interface	Embedded GNSS	Region	Status
RG500Q-EA	LGA	Sub-6 GHz, 100 M	16	6 + 2 (n79)	RGMII	Supported (L1 + L5)	EMEA/ APAC	MP
RG502Q-EA	LGA	Sub-6 GHz, 200M	20	6 + 2 (n79)	RGMII	Supported (L1 + L5)	EMEA/ APAC	MP
RG502Q-EU	LGA	Sub-6 GHz, 200M	20	4 + 2 (optional)	RGMII	Supported (L1 + L5)	EMEA/ Oceania/ Brazil	MP
RG501Q-EU	LGA	Sub-6 GHz, 100M	20	4 + 2 (optional)	RGMII	Supported (L1 + L5)	EMEA/ Oceania/ Brazil	MP
RG500Q-EU	LGA	Sub-6 GHz, 100M	16	4 + 2 (optional)	RGMII	Supported (L1 + L5)	EMEA/ Oceania/ Brazil	CS
RG502Q-GT	LGA	Sub-6 GHz, 200M	20	4	RGMII	-	Global TDD 3.5 GHz Network	CS
RG500L-EU	LGA	Sub-6 GHz, 200M	19	8	SGMII	Supported (L1 + L5)	EMEA/ Oceania/ Brazil	CS
RG520N-EU	LGA	Sub-6 GHz, 120M	19	4 + 2 (optional)	-	Supported (L1 + L5)	EMEA/ Oceania/ Brazil	ES
RG520N-NA	LGA	Sub-6 GHz, 120M	19	4	-	Supported (L1 + L5)	North America	ES
RG520F-EU	LGA	Sub-6 GHz, 200M	20	4 + 2 (optional)	-	Supported (L1 + L5)	EMEA/ Oceania/ Brazil	Developing
RG520F-NA	LGA	Sub-6 GHz, 200M	20	4	-	Supported (L1 + L5)	North America	Developing
RG530F-NA	LGA	Sub-6 GHz (200M) + mmWave (800M)	20	4 Sub-6 GHz + mmWave	-	Supported (L1 + L5)	North America	Developing
RM500Q-GL	M.2	Sub-6 GHz, 100M	16	4	-	Supported (L1)	Global (except for US)	MP
RM500Q-AE	M.2	Sub-6 GHz, 100M	16	4	-	Supported (L1)	Global (except for China)	MP
RM505Q-AE	M.2	Sub-6 GHz, 100M	16	4	-	Supported (L1 + L5)	Global (except for China)	MP
RM502Q-GL	M.2	Sub-6 GHz, 200M	20	4	-	Supported (L1)	Global (except for US/ China/ Japan)	MP
RM502Q-AE	M.2	Sub-6 GHz, 200M	20	4	-	Supported (L1)	Global (except for China)	MP
RM510Q-GL	M.2	Sub-6 GHz (200M) + mmWave (800M)	20	4 Sub-6 GHz + mmWave	-	Supported (L1)	Global	MP
RM520N-GL	M.2	Sub-6 GHz, 120M	19	4	-	Supported (L1)	Global	ES



5G & LTE-Advanced Roadmap

5G Product Overview

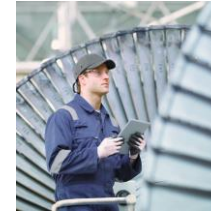
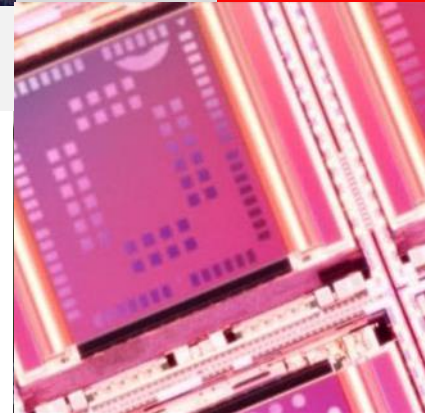
**5G QuecOpen®**

LTE-A Product Overview

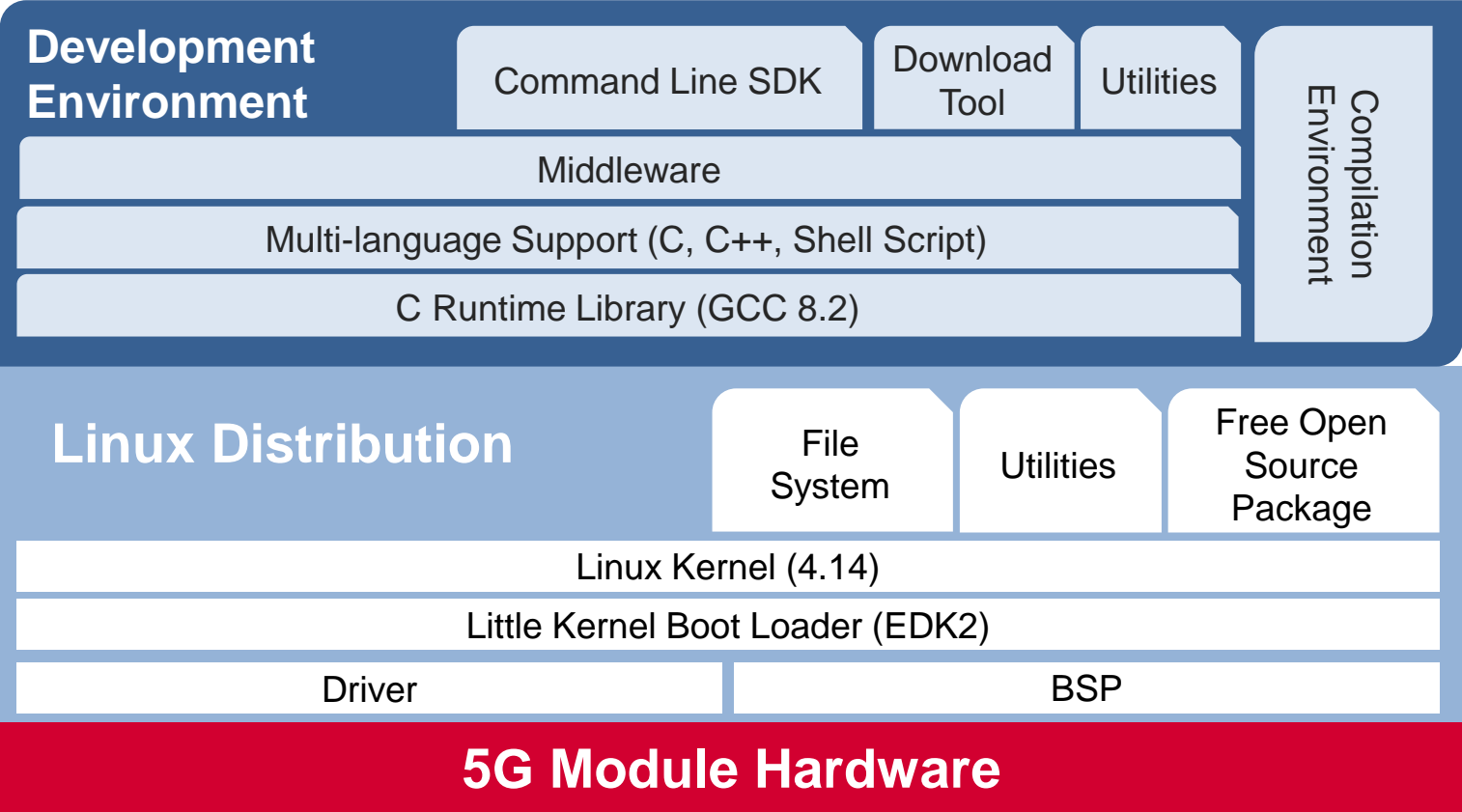
Technical Details

Application Fields

Build a Smarter World





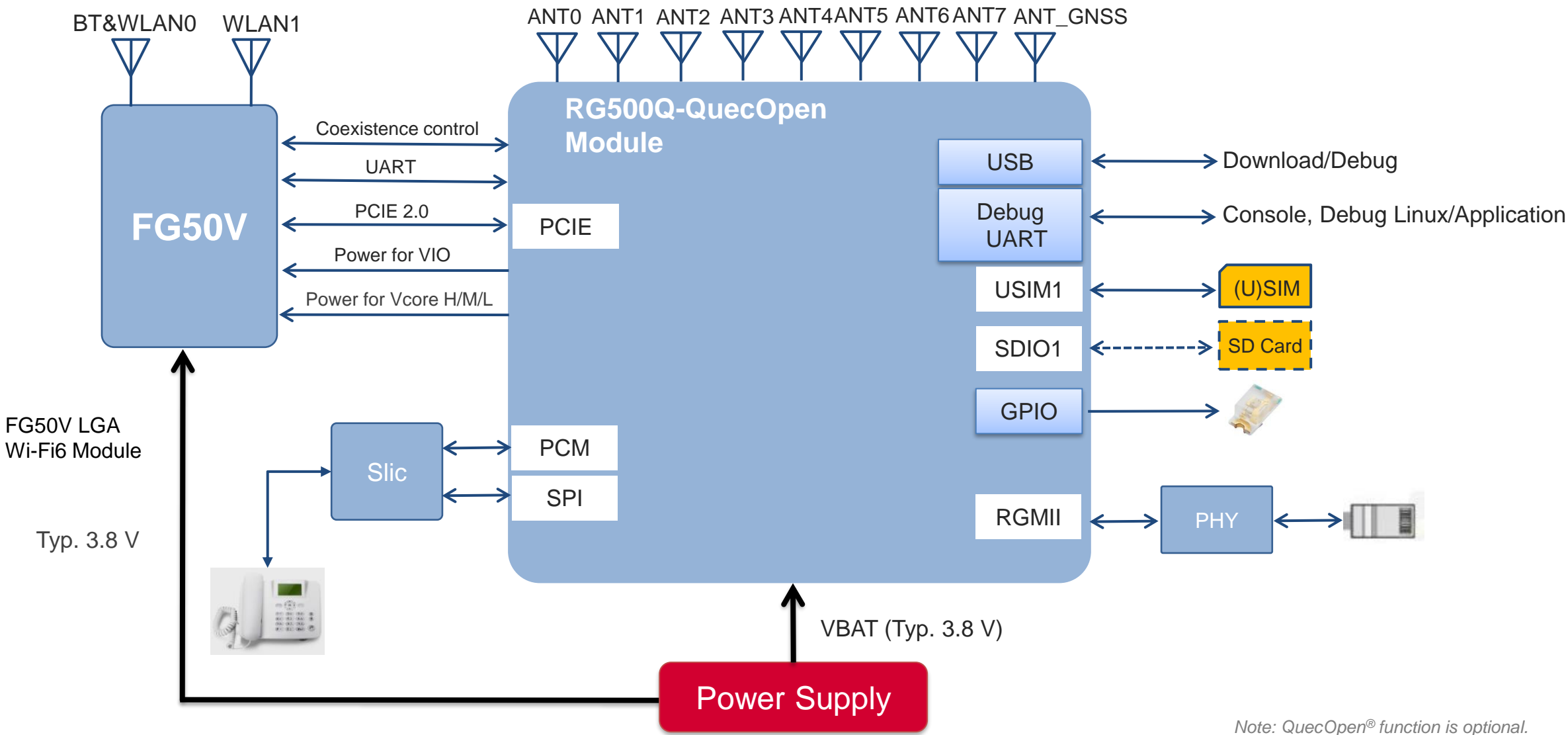


**QuecOpen®** is an open source embedded development platform based on Linux system, which is intended to simplify the design and development process for IoT applications.

Figure: Framework of QuecOpen®

Note: QuecOpen® function is optional.

# QuecOpen<sup>®</sup> - Typical Router Solution



Note: QuecOpen<sup>®</sup> function is optional.



5G & LTE-Advanced Roadmap

5G Product Overview

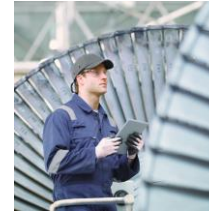
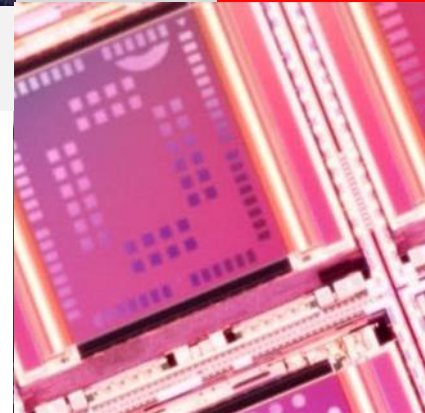
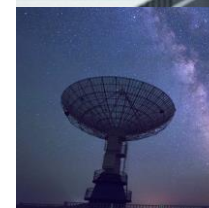
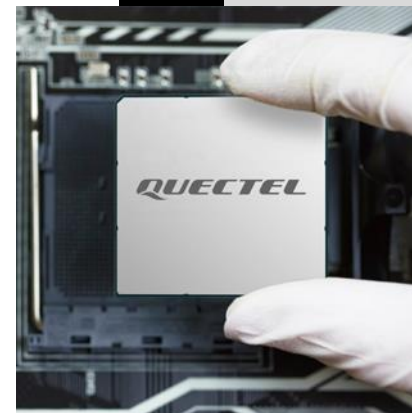
5G QuecOpen®

**LTE-A Product Overview**

Technical Details

Application Fields

Build a Smarter World



# LTE-A Module Overview (Cat 6)



## Cat 6



### EG060K-EA

- LGA Form Factor
- Variant:
  - EA Engineering Sample



### EG065K Series

- LGA Form Factor
- Variant:
  - NA Commercial Sample



### EG06 Series

- LGA Form Factor
- Variants:
  - E
  - EA
  - A
  - AUTL



### EG060V-EA

- LGA Form Factor
- Variants:
  - EA



### EP06 Series

- Mini PCIe Form Factor
- Variants:
  - E
  - A



### EM060K-GL

- M.2 Form Factor
- Variants:
  - GL Under Development

Q4/21



### EM06 Series

- M.2 Form Factor
- Variants:
  - E
  - A
  - J

Qx/YY

Estimated Engineering Sample Time

# EG06 Series Specifications



39.5 mm × 37.0 mm × 2.8 mm  
LTE Cat 6, 300M DL/ 50M UL

## ■ Multi-Mode LTE-A Module

Variant		EG06-E	EG06-EA	EG06-A	EG06-AUTL
Category		6	6	6	6
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28/B32 <sup>①</sup>	B1/B3/B5/B7/B8/B20/B28/B32 <sup>①</sup>	B2/B4/B5/B7/B12/B13/B25/B26/B29 <sup>①</sup> /B30/B66	B3/B7/B28
	LTE-TDD	B38/B40/B41	B38/B40/B41	-	-
	2CA	B1+B1/B5/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 <sup>①</sup> ; B38+B38; B40+B40; B41+B41	B1+B1/B3/B5/B7/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 <sup>①</sup> ; B38+B38; B40+B40; B41+B41	B2+B2/B5/B12/B13/B29 <sup>①</sup> ; B4+B4/B5/B12/B13/B29 <sup>①</sup> ; B7+B5/B7/B12/B26; B25+B5/B12/B25/B26; B30+B5/B12/B29 <sup>①</sup> ; B66+B5/B12/B13/B29 <sup>①</sup> /B66	B3+B3/B7/B28; B7+B7/B28
UMTS	WCDMA	B1/B3/B5/B8	B1/B3/B5/B8	B2/B4/B5	-
Embedded GNSS		Supported	Supported	Supported	Supported
VoLTE (Voice over LTE)		Supported	Supported	Supported	Supported
USB 2.0 Interface		Supported	Supported	Supported	Supported
Region		EMEA/ APAC <sup>②</sup> / Brazil	EMEA/ APAC <sup>②</sup> / Brazil	North America	Australia
Certification		<b>Carrier:</b> Deutsche Telekom/ British Telecom/ Telstra <b>Regulatory:</b> GCF/ CE/ KC/ RCM	<b>Carrier:</b> TBD <b>Regulatory:</b> CE/ RCM	<b>Carrier:</b> Verizon/ AT&T/ U.S. Cellular <b>Regulatory:</b> GCF/ FCC/ PTCRB/ IC	<b>Carrier:</b> Telstra <b>Regulatory:</b> GCF/ RCM

- Notes: 1. TBD: To Be Determined.  
2. <sup>①</sup> LTE-FDD B29 and B32 support receiving only, and are only for secondary component carrier in 2CA.  
3. <sup>②</sup> Excluding Japan and China Mobile.

# EG06 Series Certifications



## Project Stage

EG06-A 	EG06-EA 	EG06-E 	EG06-AUTL 
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## Carrier Certifications

EG06-A Verizon/ AT&T/ U.S. Cellular   	EG06-EA TBD	EG06-E Deutsche Telekom/ British Telecom/ Telstra   	EG06-AUTL Telstra 
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## Regulatory Certifications

EG06-A GCF/ FCC/ PTCRB/ IC    	EG06-EA CE/ RCM  	EG06-E GCF/ CE/ KC/ RCM    	EG06-AUTL GCF/ RCM  
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# EG06xK Series Specifications (Preliminary)



EG060K-EA: 39.5 mm × 37.0 mm × 2.80 mm

EG065K-NA: 28.0 mm × 31.0 mm × 2.40 mm

LTE Cat 6, 300M DL/ 50M UL

## LTE-A Module

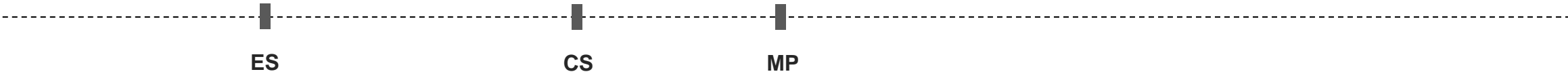
Variant		EG060K-EA	EG065K-NA
Category		6	6
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28/B32	B2/B4/B5/B7/B12/B13/B14/B25/B26/B30/B66
	LTE-TDD	B38/B40/B41/B42(Optional)/B43(Optional)	-
	2CA	B1+B1/B3/B5/B7/B8/B20/B28/B38/B40/B41 B3+B3/B5/B7/B8/B20/B28/B38/B40/B41 B7+B5/B7/B8/B20/B28 B20+B32 B20+B38/B40 B38+B38 B40+B40 B41+B41	B2+B4/5/12/13/14/66 B4+B5/12/13 B5+B5/30/66 B12+B66 B7+B5/B12 B25+B5/12/25/26 B30+B5/12/14 B66+B5/12/13 66A-66A, 66B, 66C
UMTS	WCDMA	B1/B3/B5/B8	B2*/B4*/B5*
Embedded GNSS		Supported	-
VoLTE (Voice over LTE)		Supported	-
USB 2.0/3.0 Interface		Supported	Supported <sup>①</sup>
Region		EMEA/ APAC/ Brazil	North America
Certification		Carrier: TBD Regulatory: CE*/ RCM*	Carrier: AT&T*/ Verizon*/ Telus* Regulatory: GCF*/ FCC*/ IC*/ PTCRB*/ IFETEL *

# EG060K-EA Timeline (Preliminary)



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

## Project Schedule



ES: Engineering samples ready. Basic functions are available for customers’ simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification

TBD

## Regulatory Certification

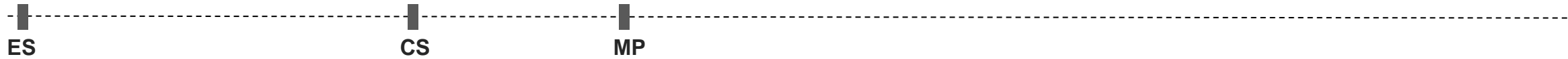
CE/RCM                      TBD

# EG065K-NA Timeline (Preliminary)



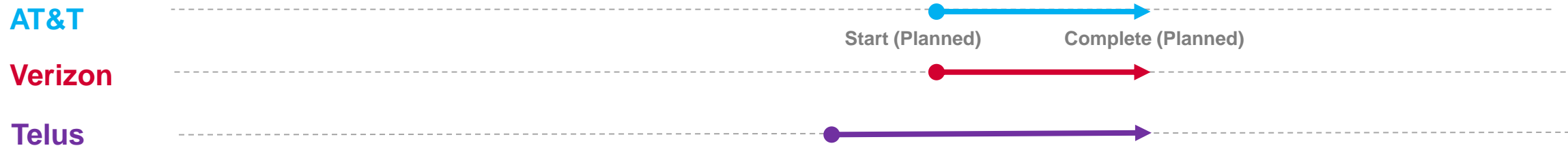
2021							2022							
Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

## Project Schedule

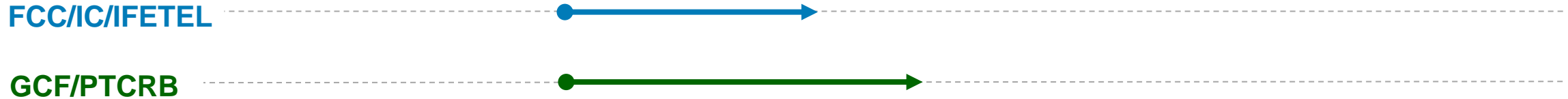


ES: Engineering samples ready. Basic functions are available for customers’ simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification



## Regulatory Certification



# EG060V-EA Specifications



39.5 mm × 37.0 mm × 3.05 mm  
LTE Cat 6, 300M DL/ 50M UL

## LTE-A Module

Variant		EG060V-EA
Category		6
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28
	LTE-TDD	B38/B40/B41
	2CA <sup>②</sup>	B1+B1/B3/B5/B8/B20/B28; B3+B3/B5/B7/B8 <sup>①</sup> /B20/B28; B7+B5/B7/B8/B20/B28; B38+B38; B40+B40; B41+B41
UMTS	WCDMA	B1/B5/B8
Embedded GNSS		-
VoLTE (Voice over LTE)		Supported
USB 2.0 Interface		Supported
Region		EMEA/ APAC <sup>③</sup> / Brazil
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> CE*/ NCC

Notes: 1. “\*”: Under development/ In progress. TBD: To Be Determined.  
2. ① For CA-3A-8A, “B3 (PCC) + B8 (SCC)” is supported, while “B8 (PCC) + B3 (SCC)” is not.  
3. ② 2CA supports continuous intra-band CA, but not non-continuous intra-band CA.  
4. ③ Excluding Japan and China Mobile.

# EG060V-EA Project Stage



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

## Project Stage

EG060V-EA



MP: Hardware and software ready for mass production.

## Carrier Certification

TBD

## Regulatory Certification

NCC Completed



# EP06 Series Specifications



**50.95 mm × 30.0 mm × 3.95 mm**  
**LTE Cat 6, 300M DL/ 50M UL**

## ■ Multi-Mode LTE-A Module

Variant		EP06-E	EP06-A
Category		6	6
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28/B32 <sup>①</sup>	B2/B4/B5/B7/B12/B13/B25/B26/B29 <sup>①</sup> /B30/B66
	LTE-TDD	B38/B40/B41	-
	2CA	B1+B1/B5/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 <sup>①</sup> ; B38+B38; B40+B40; B41+B41	B2+B2/B5/B12/B13/B29 <sup>①</sup> ; B4+B4/B5/B12/B13/B29 <sup>①</sup> ; B7+B5/B7/B12/B26; B25+B5/B12/B25/B26; B30+B5/B12/B29 <sup>①</sup> ; B66+B5/B12/B13/B29 <sup>①</sup> /B66
UMTS	WCDMA	B1/B3/B5/B8	B2/B4/B5
Embedded GNSS		Supported	Supported
USB 2.0 Interface		Supported	Supported
Region		EMEA/ APAC <sup>②</sup> / Brazil	North America
Certification		<b>Carrier:</b> Telstra/ Deutsche Telekom <b>Regulatory:</b> GCF/ CE/ NCC/ RCM/ ICASA	<b>Carrier:</b> Verizon/ AT&T/ Sprint/ Rogers/ Bell <sup>TBD</sup> / Telus <b>Regulatory:</b> GCF/ FCC/ PTCRB/ IC

Notes: 1. TBD: To Be Determined.

2. <sup>①</sup> LTE-FDD B29 and B32 support receiving only, and are only for secondary component carrier in 2CA.

3. <sup>②</sup> Excluding Japan and China Mobile.

# EP06 Series Certifications



## Project Stage

EP06-E 

EP06-A 

## Carrier Certifications

EP06-E

Deutsche Telecom/ Telstra



EP06-A

Verizon/ AT&T/ Sprint/ Rogers/ Telus



## Regulatory Certifications

EP06-E

GCF/ CE/ NCC/ RCM/ ICASA



EP06-A

GCF/ FCC/ PTCRB/ IC





# EM06 Series Specifications



**42.0 mm × 30.0 mm × 2.3 mm**  
**LTE Cat 6, 300M DL/ 50M UL**

## ■ Multi-Mode LTE-A Module

Variant		EM06-E	EM06-A	EM06-J
Category		6	6	6
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28/B32 <sup>①</sup>	B2/B4/B5/B7/B12/B13/B25/B26/B29 <sup>①</sup> / B30/ B66	B1/B3/B8/B18/B19/B26/B28
	LTE-TDD	B38/B40/B41	B41	B41
	2CA	B1+B1/B5/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 <sup>①</sup> ; B38+B38; B40+B40; B41+B41	B2+B2/B5/B12/B13/B29 <sup>①</sup> ; B4+B4/B5/B12/B13/B29 <sup>①</sup> ; B5+B5/B7/B25/B30/B66; B7+B7/B12/B26; B12+B12/B25/B30/B66; B13+B66; B25+B25/B26; B30+B29 <sup>①</sup> ; B66+B29 <sup>①</sup> /B66; B41+B41	B1+B1/B8/B18/B19/B26/B28; B3+B3/B8/B18/B19/B26/B28; B41+B41
UMTS	WCDMA	B1/B3/B5/B8	B2/B4/B5	B1/B3/B6/B8/B19
Embedded GNSS		Supported	Supported	Supported
eSIM		Supported	Supported	Supported
USB 2.0 Interface		Supported	Supported	Supported
Region		EMEA/ APAC <sup>②</sup> / Brazil	North America	Japan
Certification		<b>Carrier:</b> Deutsche Telekom/ KT/ SKT/ Telstra <b>Regulatory:</b> GCF/ CE/ NCC/ RCM/ ICASA/ KC <b>Others:</b> WHQL	<b>Carrier:</b> Verizon/ AT&T/ T-Mobile/ Sprint <b>Regulatory:</b> GCF/ FCC/ PTCRB/ IC <b>Others:</b> WHQL	<b>Carrier:</b> KDDI <b>Regulatory:</b> JATE/ TELEC <b>Others:</b> WHQL

Notes: 1. <sup>①</sup> LTE-FDD B29 and B32 support receiving only, and are only for secondary component carrier in 2CA.  
2. <sup>②</sup> Excluding Japan and China Mobile.

# EM06 Series Certifications



## Project Stage

EM06-A

MP

EM06-E

MP

EM06-J

MP

## Carrier Certifications

EM06-A

Verizon/ AT&T/ T-Mobile/ Sprint

verizon

AT&T

T-Mobile

Sprint

EM06-E

Deutsche Telecom/ KT/ SKT/ Telstra

Deutsche Telekom

kt

SK telecom

EM06-J

KDDI

KDDI

## Regulatory Certifications

EM06-A

GCF/ FCC/ PTCRB/ IC

GCF

FCC

PTCRB

Industry Canada

EM06-E

GCF/ CE/ / KC/ NCC/ RCM/ ICASA

GCF

CE

KC

NCC

RCM

ICASA

EM06-J

JATE/ TELEC

JATE

TELEC

## Others

EM06-A

WHQL

EM06-E

WHQL

EM06-J

WHQL

# EM060K-GL Specifications (Preliminary)



42.0 mm × 30.0 mm × 2.3 mm  
LTE Cat 6, 300M DL/ 50M UL

## ■ Multi-Mode LTE-A Module

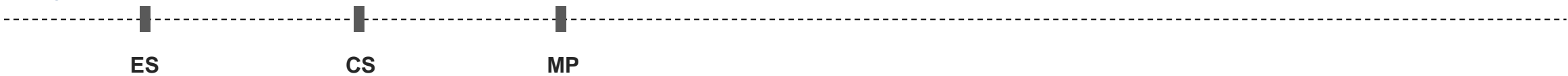
Variant		EM060K-GL (Preliminary)
Category		6
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 <sup>①</sup> /B30/B32 <sup>①</sup> /B66/B71
	LTE-TDD	B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)
	DL 2CA	Intra-band and Inter-band
UMTS	WCDMA	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
USB 2.0 Interface		Supported
PCIe Interface		Optional (RC Mode)
USB 3.0 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> GCF*/PTCRB*/CE*/RCM*/FCC*/IC*/CCC* <b>Others:</b> WHQL

# EM060K-GL Timeline (Preliminary)



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

## Project Schedule



ES: Engineering samples ready. Basic functions are available for customers’ simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification

TBD

## Regulatory Certification



# LTE-A Pro Module Overview (Cat 12/16/18)



## Cat 16/ Cat 18



### EG18 Series

- LGA Form Factor
- Variants:
  - EA
  - NA



### EM160R-GL

- M.2 Form Factor
- Variant:
  - GL

## Cat 12



### EG12 Series

- LGA Form Factor
- Variants:
  - GT
  - EA



### EG512R-EA

- LGA Form Factor
- Variant:
  - EA



### EM12-G

- M.2 Form Factor
- Variant:
  - G



### EM12xR-GL

- M.2 Form Factor
- Variant:
  - EM120R-GL
  - EM121R-GL Engineering Sample



### EG120K-EA

- LGA Form Factor
- Variant:
  - EA Engineering Sample



### EM120K-GL

- M.2 Form Factor
- Variant:
  - GL Under Development

Q4/21

Qx/YY

Estimated Engineering Sample Time

# EM12-G Specifications



**42.0 mm × 30.0 mm × 2.3 mm**  
**LTE Cat 12, 600M DL/ 150M UL**

## ■ Multi-Mode LTE-A Module

Variant		EM12-G
Category		DL/UL: 12/13
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/B14/B17/B18/B19/B20/B21/B25/B26/B28/B29 <sup>①</sup> /B30/B32 <sup>①</sup> /B66
	LTE-TDD	B38/39/B40/B41
	DL 2CA	B1+B3/B5/B18/B19/B20/B21/B26; B2+B2/B4/B5/B12/B13/B17/B29 <sup>①</sup> /B30/B66; B3+B3/B5/B7/B8/B19/B20/B28; B4+B4/B5/B12/B13/B17/B29 <sup>①</sup> /B30; B5+B7/B25/B30/B66; B7+B7/B20/B28; B12+B25/B30; B13+B66; B20+B32 <sup>①</sup> ; B25+B25/B26/B41; B29+B30; B38+B38; B40+B40; B41+B41; B66+B66
	DL 3CA	DL inter-band 3CA: B1+B3+B7; B1+B3+B19; B1+B3+B20; B1+B19+B21; B2+B4+B5; B2+B4+B13; B2+B5+B30; B2+B12+B30; B2+B29+B30; B3+B7+B20; B3+B7+B28; B4+B5+B30; B4+B12+B30; B4+B29+B30; B5+B66+B2; B13+B66+B2  DL 2 contiguous plus inter-band 3CA: B2+B2+B5; B2+B2+B13; B3+B3+B7; B3+B7+B7; B3+B3+B20; B4+B4+B5; B4+B4+B13; B5+B66+B66; B13+B66+B66; B66+B66+B2; B66+B66+B66
	DL 256QAM	Supported
	UL 2CA	B3+B3; B41+B41
	UL 64QAM	Supported
UMTS	WCDMA	B1/B2/B3/B4/B5/B8/B19
Embedded GNSS		Supported
PCIe Interface		Optional (RC Mode)
USB 3.0 Interface		Supported
Region		Global
Certification		<b>Carrier:</b> Vodafone/ TIM/ Deutsche Telekom/ British Telecom/ Telefónica/ Verizon/ AT&T/ T-Mobile/ Sprint/ Rogers/ Telus/ NTT DOCOMO/ SoftBank/ KDDI/ Telstra <b>Regulatory:</b> GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA <b>Others:</b> WHQL

Note: ① LTE-FDD B29 and B32 support receiving only, and are only for secondary component carrier in 2CA.

# EM12-G Certifications



## Project Stage

EM12-G MP

## Carrier Certification

Vodafone/ TIM/ Deutsche Telekom/ British Telecom/ Telefónica/ Verizon/ AT&T/ T-Mobile/ Sprint/ Rogers/ Telus/ NTT DOCOMO/ SoftBank/ KDDI/ Telstra



## Regulatory/Other Certifications

GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA/ WHQL





# EG12 Series Specifications



## ■ Multi-Mode LTE-A Module

39.5 mm × 37.0 mm × 2.8 mm  
LTE Cat 12, 600M DL/ 150M UL

Variant		EG12-GT	EG12-EA
Category		12	12
LTE	LTE-FDD	-	B1/B3/B5/B7/B8/B20/B28
	LTE-TDD	B42/B43/B48	B38/B40/B41
	DL 2CA	B42+B42; B48+B48	Intra-band and Inter-band
	DL 3CA	B42+B42+B42; B48+B48+B48	Intra-band and Inter-band
	DL 256QAM	Supported	Supported
	DL 4 × 4 MIMO	B42/B48	B1/B3/B7
	UL 2CA	B42+B42	Intra-band contiguous
UMTS	WCDMA	-	B1/B3/B5/B8
Embedded GNSS		Supported	Supported
PCIe Interface		Optional (RC Mode)	Optional (RC Mode)
USB 3.0 Interface		Supported	Supported
Region		Global TDD 3.5 GHz Network	EMEA/ APAC <sup>①</sup> / Brazil
Certification		<b>Regulatory:</b> FCC	<b>Regulatory:</b> GCF/ CE/ RCM

Note: ① Excluding Japan and China Mobile.

# EG12 Series Certifications



## Project Stage

EG12-GT

MP

EG12-EA

MP

## Regulatory Certification

EG12-GT

FCC Completed



EG12-EA

GCF/ CE/ RCM Completed



# EG120K-EA Specifications (Preliminary)



## LTE-A Module

39.5 mm × 37.0 mm × 2.80 mm  
LTE Cat 12, 600M DL/ 150M UL

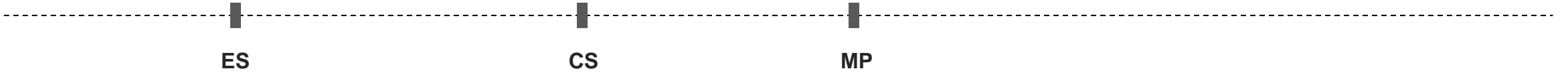
Variant		EG120K-EA (Preliminary)
Category		12
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28/B32
	LTE-TDD	B38/B40/B41/B42(Optional)/B43(Optional)
	CA	DL 3CA; UL 2CA
	DL 4 × 4 MIMO	LTE-FDD: B1/B3/B7 LTE-TDD: B38/B40/B41/B42
UMTS	WCDMA	B1/B3/B5/B8
Embedded GNSS		Supported
VoLTE (Voice over LTE)		Supported
USB 2.0/3.0 Interface		Supported
Region		EMEA/ APAC/ Brazil
Certification		TBD

# EG120K-EA Timeline (Preliminary)



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

## Project Schedule



ES: Engineering samples ready. Basic functions are available for customers’ simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

# EG18 Series Specifications



**39.5 mm × 37.0 mm × 2.8 mm**  
**LTE Cat 18, 1.2G DL/ 150M UL**

## ■ Multi-Mode LTE-A Pro Module

Variant		EG18-EA	EG18-NA
Category		DL/UL: 18/13	DL/UL: 18/13
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28	B2/B4/B5/B7/B12/B13/B14/B25/B26/B29/B30/B66/B71
	LTE-TDD	B38/B40/B41	B41
	DL 2CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 3CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 4CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 5CA	Intra-band and Inter-band within 4 bands	Intra-band and Inter-band within 4 bands
	DL 4 × 4 MIMO	B1/B3/B7	B2/B4/B7/B25/B66
	DL 256QAM	Supported	Supported
	UL 2CA	Intra-band contiguous	Intra-band contiguous
	UL 64QAM	Supported	Supported
UMTS	WCDMA	B1/B3/B5/B8	B2/B4/B5
Embedded GNSS		Supported	Supported
PCIe Interface		Optional (RC Mode)	Optional (RC Mode)
USB 3.0 Interface		Supported	Supported
Region		EMEA/ APAC <sup>①</sup> / Brazil	North America
Certification		<b>Carrier:</b> Telstra <b>Regulatory:</b> GCF/ CE/ RCM	<b>Carrier:</b> Verizon/ AT&T/ T-Mobile/ U.S. Cellular <b>Regulatory:</b> GCF/ FCC/ PTCRB/ IC

# EG18-EA Certifications



## Project Stage



## Carrier Certification

Telstra



## Regulatory Certifications



# EG18-NA Certifications



## Project Stage

EG18-NA 

## Carrier Certification

Verizon/ AT&T/ T-Mobile/ U.S. Cellular Completed



## Regulatory Certification

FCC/ IC/ GCF/ PTCRB Completed



# EG512R-EA Specifications



42.0 mm × 38.0 mm × 2.65 mm  
LTE Cat 12, 600M DL/ 90M UL

## ■ Multi-Mode LTE-A Pro Module

Variant		EG512R-EA
Category		DL/UL: 12 /13
LTE	LTE-FDD	B1/B3/B5/B7/B8/B20/B28/B32
	LTE-TDD	B38/B41/B42/B43
	DL 2CA	Intra-band and Inter-band
	DL 3CA	Intra-band and Inter-band
	DL 4 × 4 MIMO	B1/B3/B7/B32/B38/B41/B42/B43
	DL 256QAM	Supported
	UL 2CA	Intra-band contiguous
	UL 64QAM	Supported
UMTS	WCDMA	B1/B3/B5/B8
Embedded GNSS		Supported
PCIe Interface		Supported
RGMII Interface		Supported
USB 3.0 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		EMEA/ Australia/ Brazil
Certification		<b>Regulatory:</b> GCF/ CE/ RCM <b>Carrier:</b> TBD



# EG512R-EA Timeline



## Project Stage

EG512R-EA 

MP: Hardware and software ready for mass production.

## Regulatory Certification

GCF/ CE/ RCM

Completed



# EM12xR-GL Specifications



## ■ Multi-Mode LTE-A Pro Module

**42.0 mm × 30.0 mm × 2.3 mm**  
**LTE Cat 12, 600 Mbps DL/150 Mbps UL**

Variant		EM120R-GL	EM121R-GL (Preliminary)
Category		DL/UL: 12 /13	DL/UL: 12 /13
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/ B30/B32/B66	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 / B30/B32/B66
	LTE-TDD	B38/B39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)	B38/B39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)
	DL 2CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 3CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 256QAM	Supported	Supported
	UL 2CA	Intra-band	Intra-band
	UL 64QAM	Supported	Supported
UMTS	WCDMA	B1/B2/B3/B4/B5/B6/B8/B19	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported/ L1 (Passive Antenna)	Supported/ L1 + L5 (Active Antenna)
PCIe Interface		Supported	Supported
USB 3.0 Interface		Supported	Supported
eSIM		Supported / Built-in eSIM (optional)	Supported / Built-in eSIM (optional)
Region		Global	Global
Certification		<b>Carrier:</b> Vodafone/ British Telecom/ Verizon/ AT&T/ T-Mobile/ Sprint/ China Mobile/ China Unicom/ NTT DOCOMO/ SoftBank <sup>①</sup> / KDDI/ Rukuten/ Telstra <sup>TBD</sup> / Swisscom <b>Regulatory:</b> GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ SRRC/ NAL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA	<b>Carrier:</b> AT&T*/ Verizon <b>Regulatory:</b> GCF/ CE/ FCC/ PTCRB/ IC/ RCM

Notes: 1. “\*”: Under development/ In progress.

2. TBD: To Be Determined

3. ①: Currently, SoftBank certification is only supported for PC applications.

# EM120R-GL Certification



## Project Schedule

**EM120R-GL** 

*MP: Hardware and software ready for mass production.*

## Carrier Certification

Vodafone/ British Telecom/ AT&T/ T-Mobile/ Sprint/ Verizon/ China Mobile/ China Unicom/  
NTT DOCOMO/ SoftBank<sup>①</sup>/ KDDI/ Rukuten/ Swisscom

Completed



Telstra      TBD

## Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ IC/Anatel/ IFETEL/ SRRC/ NAL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA

Completed



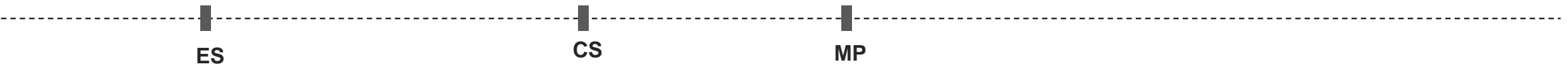
Notes: 1. TBD: To Be Determined  
2. ①: Currently, SoftBank certification is only supported for PC applications.

# EM121R-GL Timeline (Preliminary)



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

## Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification



## Regulatory Certification



# EM120K-GL Specifications (Preliminary)



42.0 mm × 30.0 mm × 2.3 mm  
LTE Cat 12, 600M DL/ 50M UL

## ■ Multi-Mode LTE-A Module

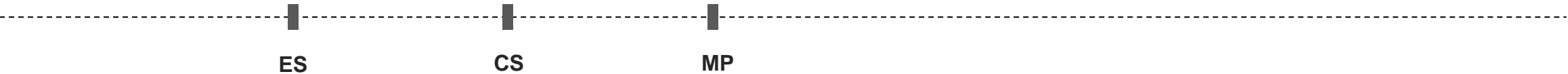
Variant		EM120K-GL (Preliminary)
Category		12
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 <sup>①</sup> /B30/B32 <sup>①</sup> /B66/B71
	LTE-TDD	B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)
	DL 2CA	Intra-band and Inter-band
UMTS	WCDMA	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
USB 2.0 Interface		Supported
PCIe Interface		Optional (RC Mode)
USB 3.0 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		<b>Carrier:</b> TBD <b>Regulatory:</b> GCF*/PTCRB*/CE*/RCM*/FCC*/IC*/CCC* <b>Others:</b> WHQL

# EM120K-GL Timeline (Preliminary)



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

## Project Schedule

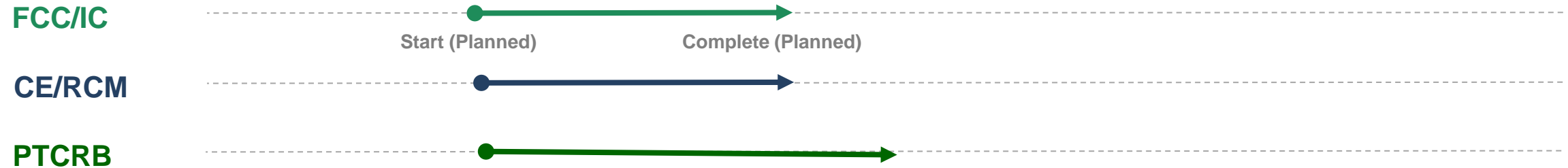


ES: Engineering samples ready. Basic functions are available for customers’ simple demo purpose.  
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.  
MP: Hardware and software ready for mass production.

## Carrier Certification

TBD

## Regulatory Certification



# EM160R-GL Specifications



## ■ Multi-Mode LTE-A Pro Module

42.0 mm × 30.0 mm × 2.3 mm  
LTE Cat 16, 1.0 Gbps DL/150 Mbps UL

Variant		EM160R-GL
Category		DL/UL: 16 /13
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66
	LTE-TDD	B38/B39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)
	DL 2CA	Intra-band and Inter-band
	DL 3CA	Intra-band and Inter-band
	DL 4CA	Intra-band and Inter-band
	DL 5CA	Intra-band and Inter-band within 4 bands
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32/B66/B38/B39/B40/B41
	DL 256QAM	Supported
	UL 2CA	Intra-band
	UL 64QAM	Supported
UMTS	WCDMA	B1/B2/B3/B4/B5/B6/B8/B19
Embedded GNSS		Supported
PCIe Interface		Supported
USB 3.0 Interface		Supported
eSIM		Supported / Built-in eSIM (optional)
Region		Global
Certification		<b>Carrier:</b> Vodafone/ British Telecom/ Verizon/ AT&T/ T-Mobile/ Sprint/ China Mobile/ China Unicom/ NTT DOCOMO/ SoftBank <sup>①</sup> / KDDI/ Rukuten/ Telstra <sup>TBD</sup> / Swisscom <b>Regulatory:</b> GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ SRRC/ NAL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA

Notes: 1. TBD: To Be Determined  
2. ①: Currently, SoftBank certification is only supported for PC applications.

# EM160R-GL Certification



## Project Schedule

**EM160R-GL** 

*MP: Hardware and software ready for mass production.*

## Carrier Certification

Vodafone/ British Telecom/ AT&T/ T-Mobile/ Sprint/ Verizon/ China Mobile/ China Unicom/  
NTT DOCOMO/ SoftBank<sup>①</sup>/ KDDI/ Rukuten/ Swisscom

Completed



AT&T



T-Mobile



Sprint



verizon



中国移动

China Mobile



China unicom

中国联通



SoftBank



KDDI



swisscom

Telstra

TBD

## Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ IC/Anatel/ IFETEL/ SRRC/ NAL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA

Completed



Notes: 1. TBD: To Be Determined  
2. ①: Currently, SoftBank certification is only supported for PC applications.



# LTE-A/LTE-A Pro Product Key Features & Status



Product	Category	WCDMA	USB 2.0/3.0 Interface	PCIe Interface	Embedded GNSS	Region	Status
EG06-E <sup>②</sup>	6	Supported	Supported	-	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP
EG06-A <sup>②</sup>	6	Supported	Supported	-	Supported	North America	MP
EG06-AUTL <sup>②</sup>	6	-	Supported	-	Supported	Australia	MP
EG06-EA <sup>②</sup>	6	Supported	Supported	-	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP
EG060V-EA <sup>②</sup>	6	Supported	Supported	-	-	EMEA/ APAC <sup>①</sup> / Brazil	MP
EG060K-EA	6	Supported	Supported	Optional	Supported	EMEA/ APAC <sup>①</sup> / Brazil	ES
EG065K-NA <sup>②</sup>	6	-	Supported	-	-	North America	CS
EP06-E <sup>②</sup>	6	Supported	Supported	-	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP
EP06-A <sup>②</sup>	6	Supported	Supported	-	Supported	North America	MP
EM06-E <sup>②</sup>	6	Supported	Supported	-	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP
EM06-J <sup>②</sup>	6	Supported	Supported	-	Supported	Japan	MP
EM06-A <sup>②</sup>	6	Supported	Supported	-	Supported	North America	MP
EM060K-GL	6	Supported	Supported	Optional (RC Mode)	Supported	Global	Pre-ES
EM12-G	12	Supported	Supported	Optional (RC Mode)	Supported	Global	MP
EG12-GT	12	-	Supported	Optional (RC Mode)	Supported	Global TDD 3.5 GHz	MP
EG12-EA	12	Supported	Supported	Optional (RC Mode)	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP
EG120K-EA	12	Supported	Supported	Optional	Supported	EMEA/ APAC <sup>①</sup> / Brazil	ES
EG18-EA	18	Supported	Supported	Optional (RC Mode)	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP
EG18-NA	18	Supported	Supported	Optional (RC Mode)	Supported	North America	MP
EM120R-GL	12	Supported	Supported	Supported	Supported/ L1 (Passive)	Global	MP
EM121R-GL	12	Supported	Supported	Supported	Supported/ L1 + L5 (Active)	Global	ES
EM120K-GL	12	Supported	Supported	Optional (RC Mode)	Supported	Global	Developing
EM160R-GL	16	Supported	Supported	Supported	Supported	Global	MP
EG512R-EA	12	Supported	Supported	Supported	Supported	EMEA/ APAC <sup>①</sup> / Brazil	MP

Notes: 1. ① Excluding Japan and China Mobile.

2. ② EG06/EP06/EM06/EG060V-EA modules only support USB 2.0 specification.



5G & LTE-Advanced Roadmap

5G Product Overview

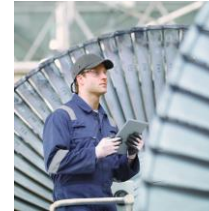
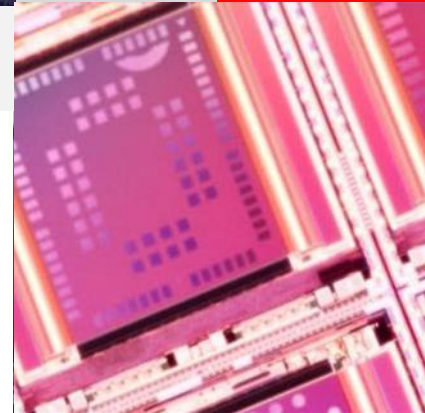
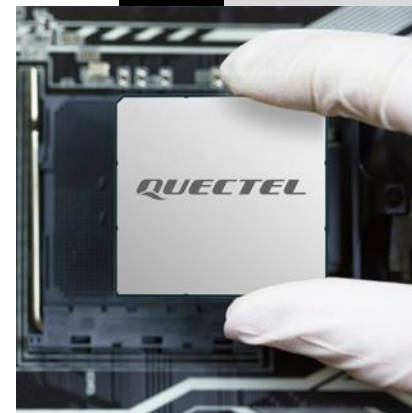
5G QuecOpen<sup>®</sup>

LTE-A Product Overview

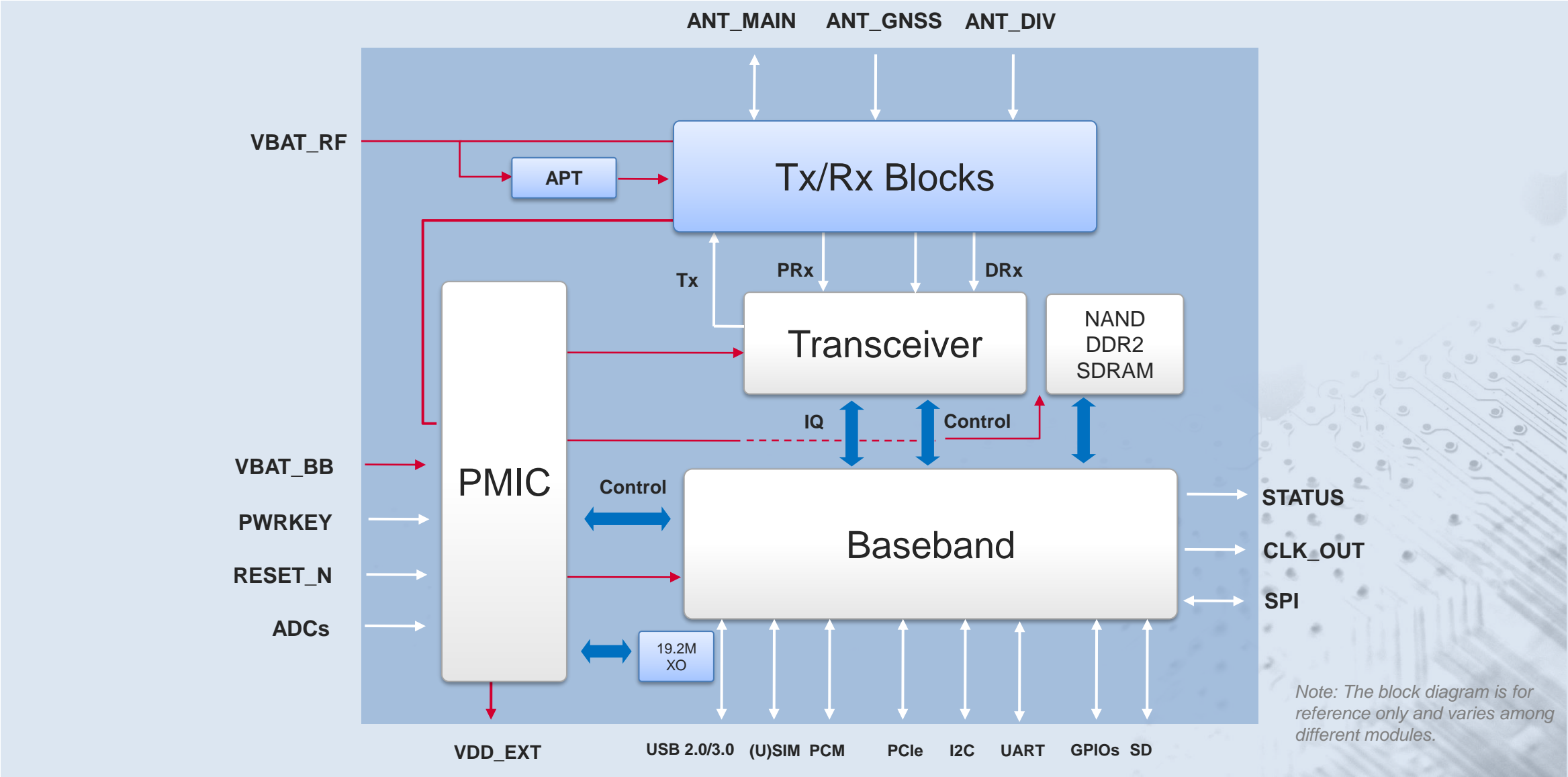
**Technical Details**

Application Fields

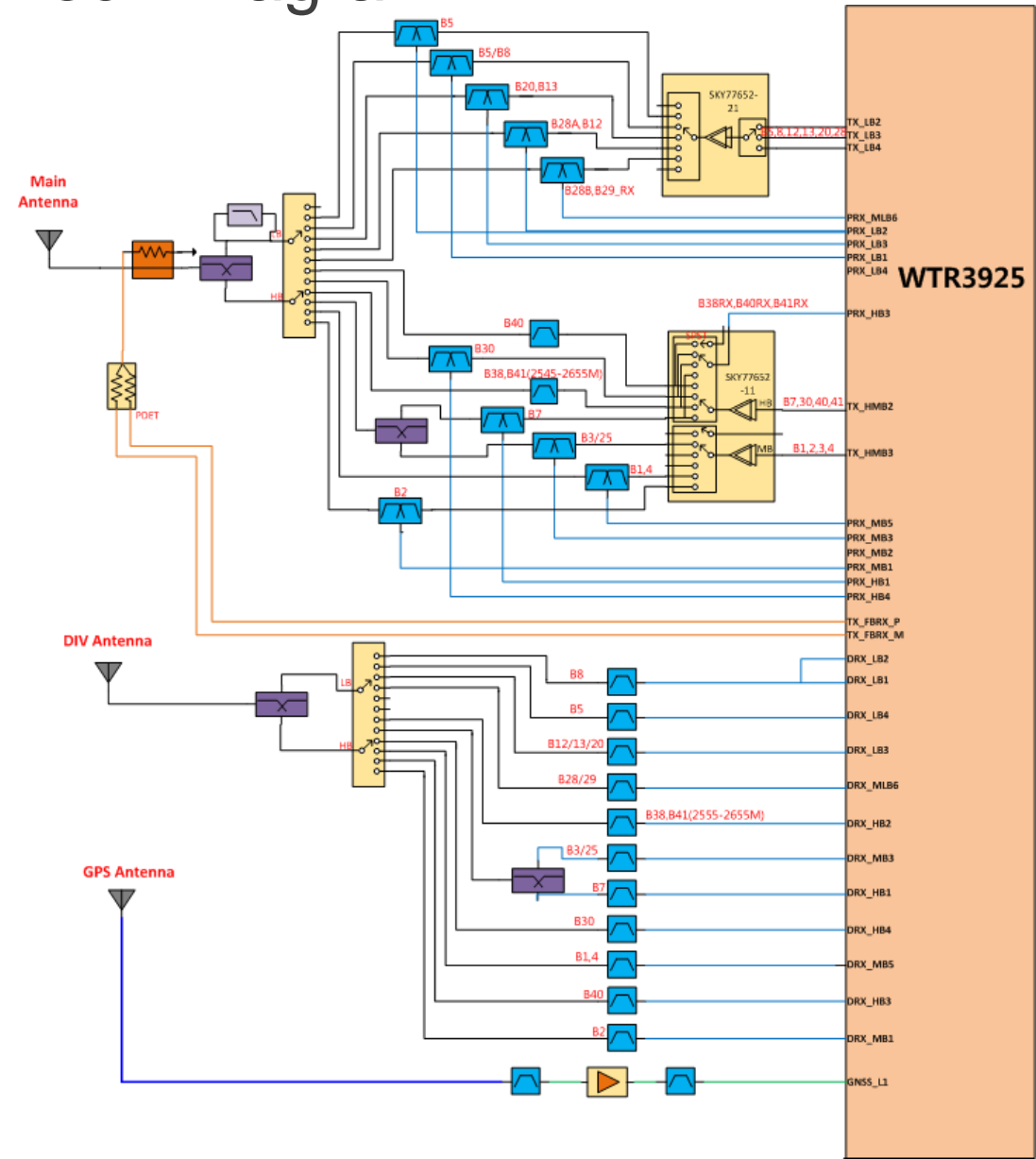
Build a Smarter World



# Hardware BB Block Diagram



# Hardware RF Block Diagram



Note: The block diagram is for reference only and varies among different modules.

# Software Advantages



## USB Serial Drivers

Windows 7/8/8.1/10  
Linux 2.6–5.12  
Android 4.x–11.x

## Quality Guarantee

Reliable network protocols  
Steady flash protection mechanism  
Superior audio algorithms  
High sensitivity



## GNSS & RIL & NDIS & MBIM & GobiNet & QMI\_WWAN Drivers

GNSS/ RIL Driver: Android 4.x–11.x  
NDIS Driver: Windows 7/8/8.1/10  
MBIM Driver: Windows 8/8.1/10,  
Linux 3.18–5.12  
GobiNet Driver: Linux 2.6–5.12  
QMI\_WWAN Driver: Linux 3.4–5.12



## Special Features

Over Temperature &  
Voltage Protection



## Flexible Applications

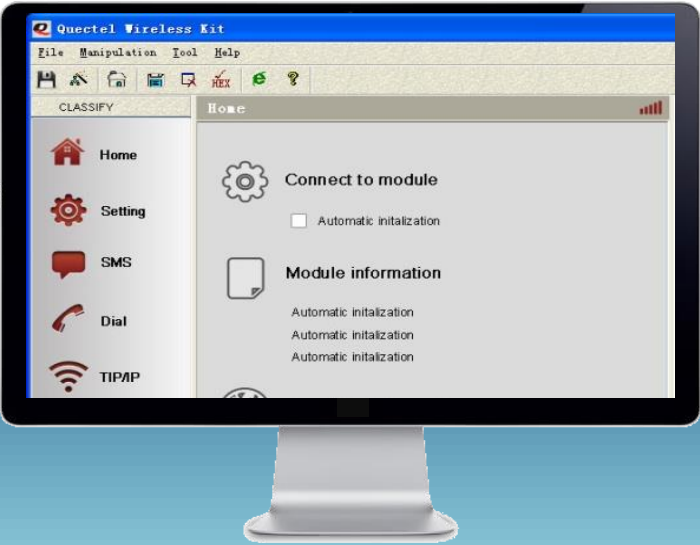
eCall  
(U)SIM card detection  
Voice  
DFOTA

## Abundant Protocols

QMI/ TCP/ UDP/ FTP/ HTTP/  
NTP/ PING



# Support Package



Quectel offers a GUI tool named **QNavigator**. It can help customers quickly test Quectel module's functionality.

## EVB Kits



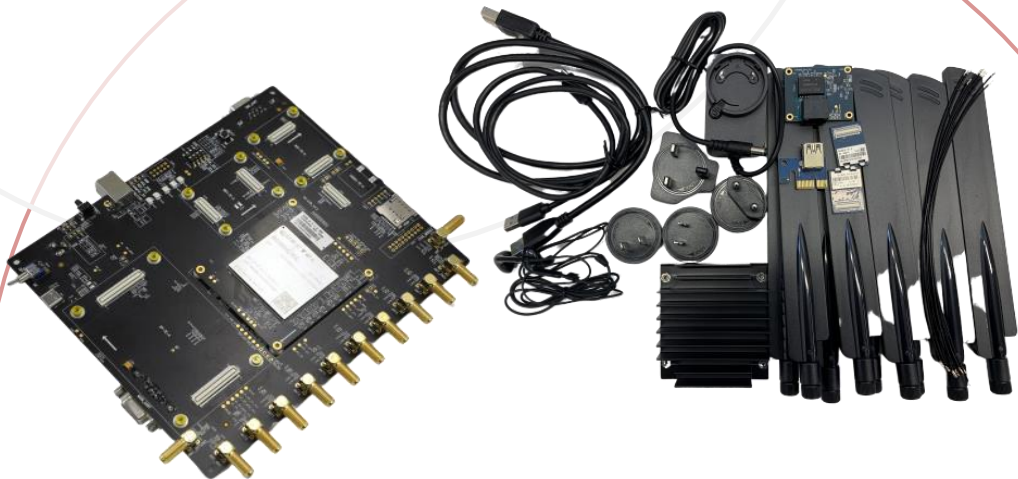
RG5xx EVB kit



RM5xx EVB kit



RM5xx mini EVB kit







5G & LTE-Advanced Roadmap

5G Product Overview

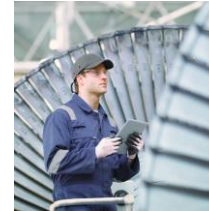
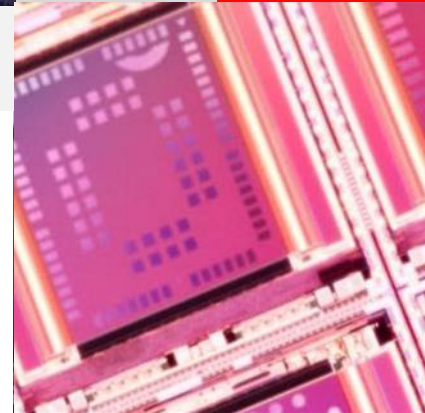
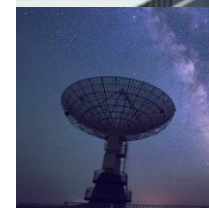
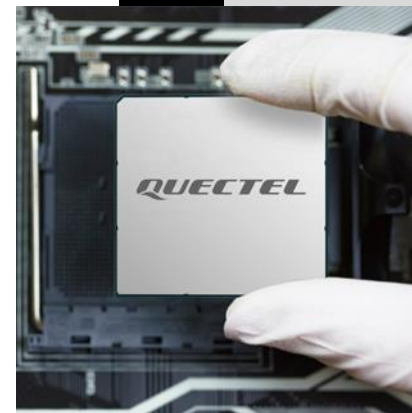
5G QuecOpen<sup>®</sup>

LTE-A Product Overview

Technical Details

**Application Fields**

Build a Smarter World

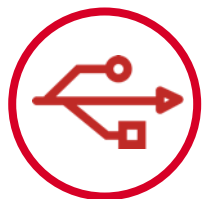


# 5G Module Advantages



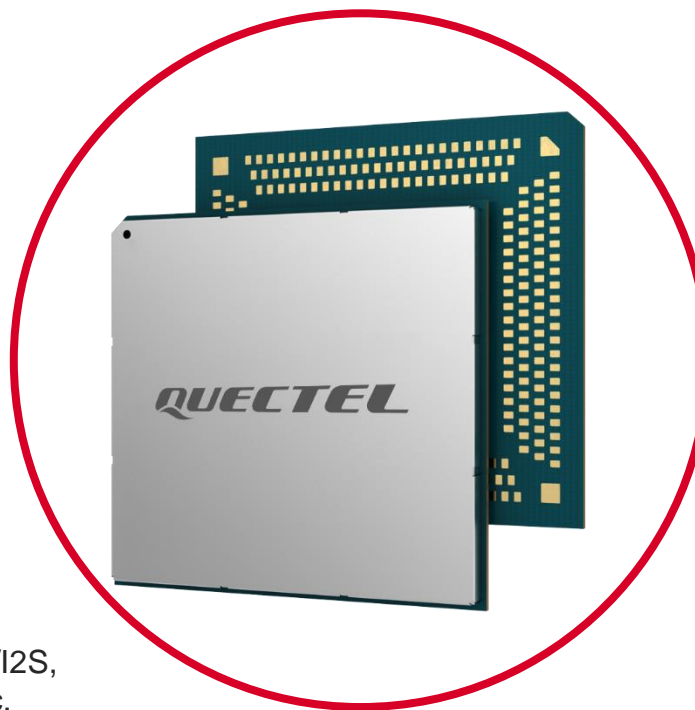
## Powerful algorithm for edge computing and storage

- Cortex-A7 up to 1.5 GHz as primary boot processor
- Qualcomm Hexagon DSP processor up to 1.5 GHz
- Supports 1\*16 bit LPDDR4X memory at 1.8 GHz



## Integrates up to 18 interfaces, suitable for various application scenarios

- Includes USB 3.1, PCIe, RGMII, PCM/I2S, I2C, SPI, GPIO, SDIO, SIM, PWM, etc.
- Supports extended application processors, sensors, memory, Wi-Fi, BT, GNSS, Ethernet











## Robust security capabilities

- Secure boot
- Secure file system
- Secure execution environment



## 5G + X solutions

-  5G + Media & Entertainment (Cameras/TV/STB)
-  5G + Smart Grid
-  5G + Smart Industry
-  5G + Smart Education
-  5G + Smart Cities
-  5G + Smart Finance
-  5G + Smart Medical Services
-  5G + Intelligent Driving



# Target Applications



## Fixed Wireless Wideband Services

- 🚫 Home/Enterprise Gateways
- 🚫 Consumer/Industrial Routers
- 🚫 CPE
- 🚫 DTU
- 🚫 VoIP
- 🚫 Servers
- 🚫 Portable MiFi

## Mobile Wideband Devices

- 🚫 Consumer Laptops
- 🚫 Industrial Laptops
- 🚫 Notebooks/Tablets
- 🚫 High-Definition Live Broadcast
- 🚫 AR/VR
- 🚫 Delivery Drones

## Industrial Automation

- 🚫 Robots
- 🚫 AGV
- 🚫 Industrial Energy
- 🚫 Edge Computers
- 🚫 Vehicle-Mounted Terminals





## 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

# Thank You

Build a Smarter World

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Technical Support: [support@quectel.com](mailto:support@quectel.com)