

Quectel LTE-Advanced & 5G Module

Product Overview

February, 2020

LTE-Advanced & 5G Roadmap

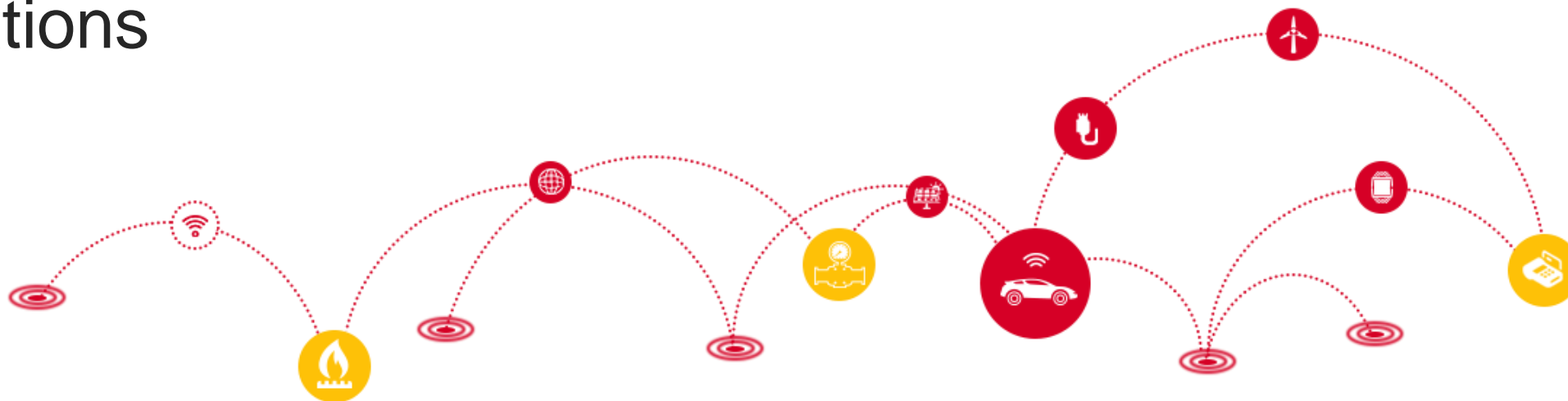
LTE-A Product Overview

5G Product Overview

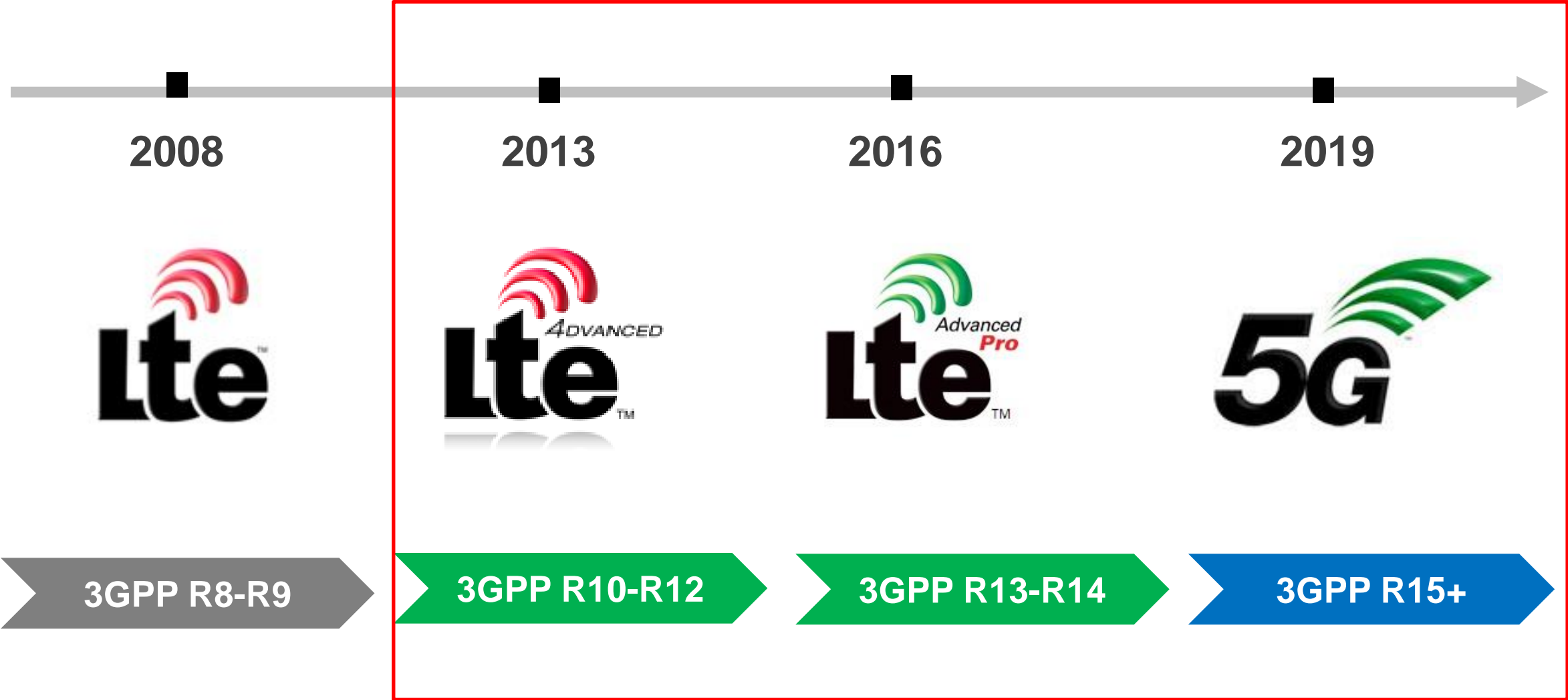
5G QuecOpen[®]

Technical Details

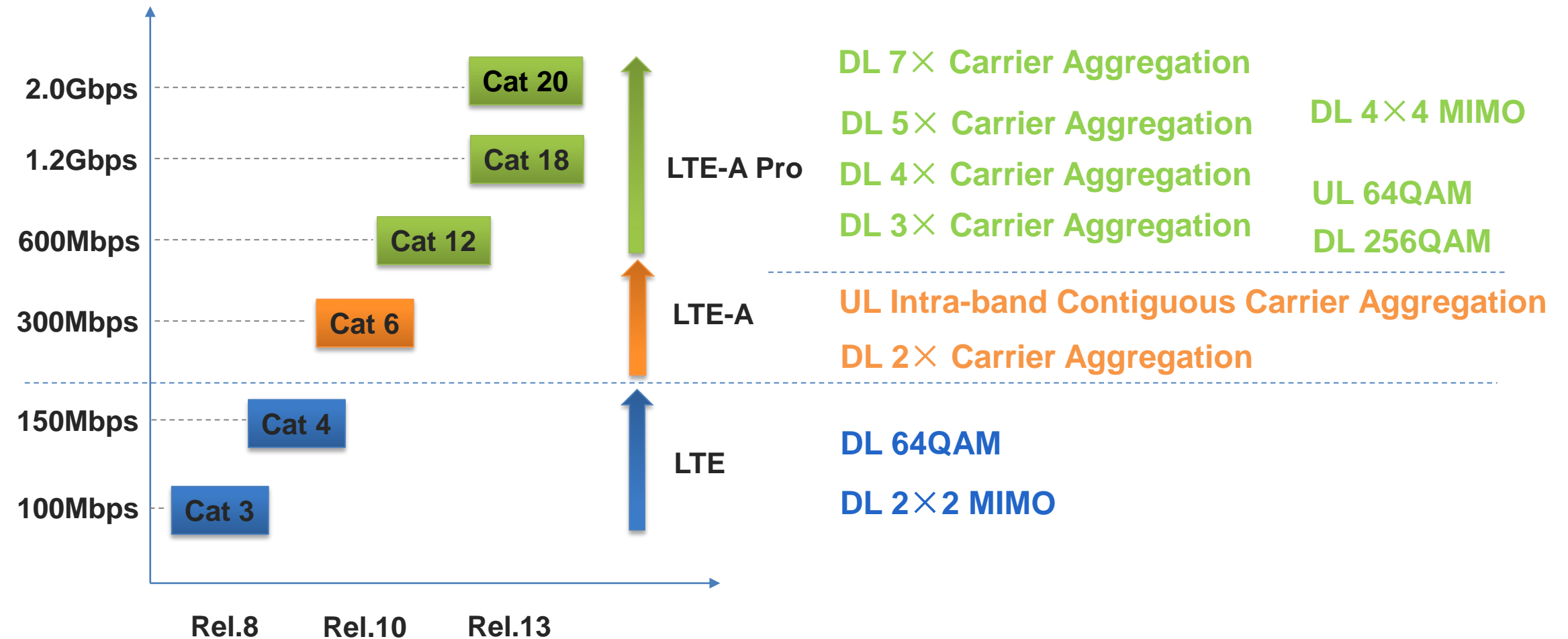
Applications



Cellular Networks Keep on Evolving



LTE-A/ LTE-A Pro Key Technology



Aggregate More Spectrums

Multi-Antenna Technology

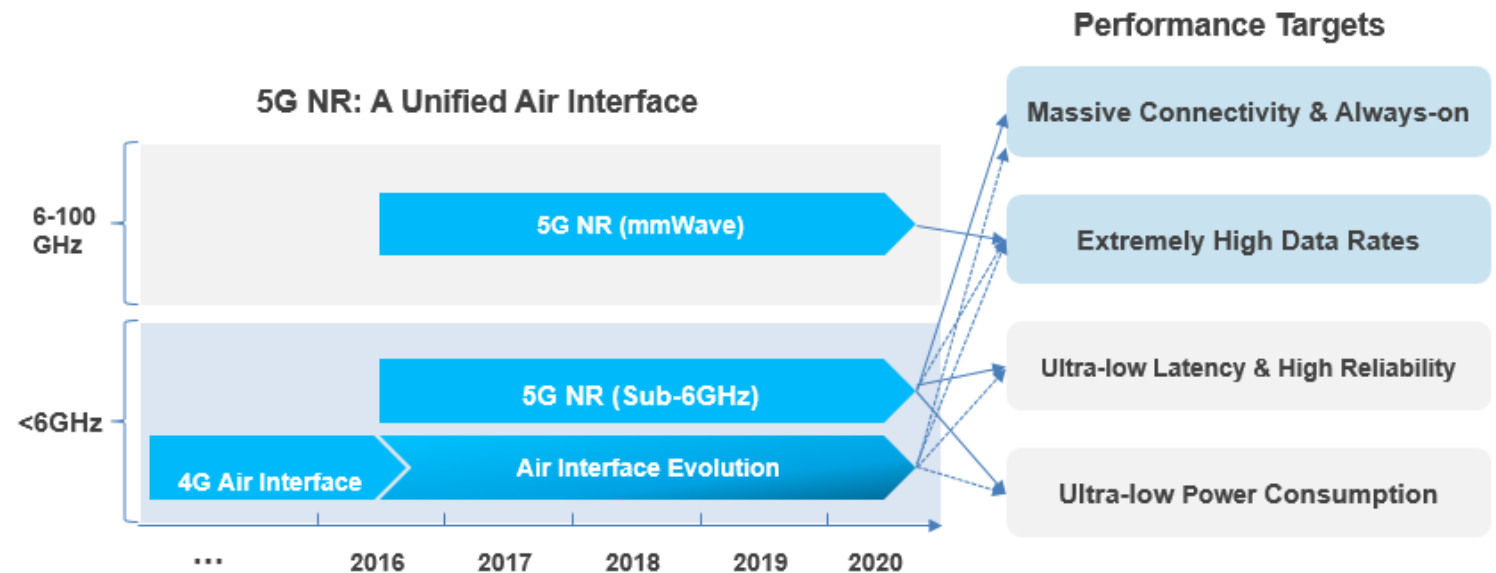
Higher Order Modulation

5G Key Technology: Much More Spectrum

mmWave
100-800MHz Bandwidth

Sub-6GHz
100-200MHz Bandwidth

Sub 2.6GHz
20-100MHz Bandwidth




LTE-A/ LTE-A Pro/ 5G Roadmap

5G mmWave



RG510Q **Q2'20**

- LGA Form Factor
- 5G NR mmWave
- LTE/ 5G Dual-Mode



RM510Q


- M.2 Form Factor
- 5G NR mmWave
- LTE/ 5G Dual-Mode

5G Sub-6



RG500Q


- LGA Form Factor
- 5G NR Sub-6GHz
- LTE/ 5G Dual-Mode



RM500Q


- M.2 Form Factor
- 5G NR Sub-6GHz
- LTE/ 5G Dual-Mode

Cat 18/ Cat 20



EG18

- LGA Form Factor
- 5CA, 4×4 MIMO
- Cat 18



EM20


- M.2 Form Factor
- 7CA
- Cat 20

Cat 12



EG12

- LGA Form Factor
- 3CA
- Cat 12



EM12


- M.2 Form Factor
- 3CA
- Cat 12

Cat 6




EG06

- LGA Form Factor
- LTE with CA
- Cat 6



EP06

- Mini PCIe Form Factor
- LTE with CA
- Cat 6



EM06

- M.2 Form Factor
- LTE with CA
- Cat 6

QxYY

Estimated Engineering
Sample Date

LTE-Advanced & 5G Roadmap

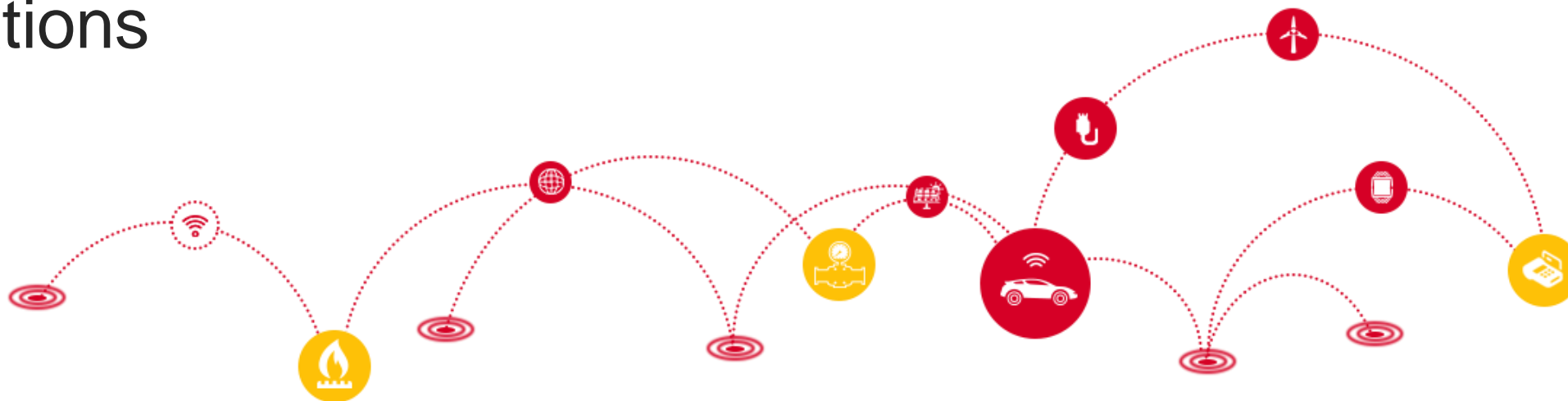
LTE-A Product Overview

5G Product Overview

5G QuecOpen[®]

Technical Details

Applications



LTE-A Modules Overview (Cat 6)

Cat 6



EG06

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



EP06

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



EM06

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

EG06 Specifications



■ Multi-Mode LTE-A Module

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

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

“Y” means supported.

“*” means under development.

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

② means excluding Japan and CMCC.

EG06-A Timeline



Project Stage

EG06-A MP

Carrier Certifications

Verizon/ AT&T/ U.S. Cellular



Regulatory Certifications

GCF/ FCC/ PTCRB/ IC



EG06-E Timeline

2018

Project Stage

EG06-E

MP

Carrier Certifications

Deutsche Telekom/ British Telecom/ Telstra



Regulatory Certifications

GCF/ CE/ KC/ RCM



EG06-AUTL Timeline



Project Stage

EG06-AUTL 

Carrier Certification

Telstra



Regulatory Certifications

GCF/ RCM



EP06 Specifications



30.0mm x 51.0mm x 4.3mm
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 ^①	B2/B4/B5/B7/B12/B13/B25/B26/B29 ^① /B30/B66
	LTE-TDD	B38/B40/B41	\
	2×CA	B1+B1/B5/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 ^① ; B38+B38; B40+B40; B41+B41	B2+B2/B5/B12/B13/B29 ^① ; B4+B4/B5/B12/B13/B29 ^① ; B7+B5/B7/B12/B26; B25+B5/B12/B25/B26; B30+B5/B12/B29 ^① ; B66+B5/B12/B13/B29 ^① /B66
UMTS	WCDMA	B1/B3/B5/B8	B2/B4/B5
Embedded GNSS		Y	Y
USB 2.0 Interface		Y	Y
Region		EMEA/ APAC ^② / Brazil	North America/ Mexico
Certification		Carrier: Telstra/ Deutsche Telekom Regulatory: GCF/ CE/ NCC/ RCM/ ICASA	Carrier: Verizon/ AT&T/ Sprint/ Rogers/ Telus/ Bell ^③ Regulatory: GCF/ FCC/ PTCRB/ IC

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

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③ means TBD.

EP06-A Timeline

2019

Project Stage

EP06-A 

Carrier Certifications

Verizon/ AT&T/ Sprint/ Rogers/ Telus



Regulatory Certifications

GCF/ FCC/ PTCRB/ IC



EP06-E Timeline



Project Stage

EP06-E MP

Carrier Certifications

Deutsche Telecom/ Telstra



Regulatory Certifications



EM06 Specifications

Multi-Mode LTE-A Module



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

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

“Y” means supported.

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

② means excluding Japan and CMCC.

EM06-A Timeline

2019

Project Schedule

EM06-A 

Carrier Certifications

Verizon/ AT&T/ Sprint



Regulatory Certifications

GCF/ FCC/ PTCRB/ IC



Others

WHQL

EM06-E Timeline

2019

Project Stage

EM06-E 

Carrier Certifications

Deutsche Telekom/ Telstra



Regulatory Certifications

GCF/ CE/ NCC/ RCM/ ICASA



Others

WHQL

EM06-J Timeline



Project Stage

EM06-J 

Carrier Certification

KDDI



Regulatory Certifications

JATE/ TELEC



Others

WHQL

LTE-A Pro Modules Overview (Cat 12/18/20)

Cat 18/ Cat 20



EG18

- LGA Form Factor
- Variants:
 - EA
 - NA Commercial Sample



EM18

- M.2
- Variant:
 - G Engineering Sample



EM20

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

Cat 12



EG12

- LGA Form Factor
- Variants:
 - GT
 - EA
 - NA Commercial Sample



EM12

- M.2 Form Factor
- Variant:
 - G

EM12 Specifications

Multi-Mode LTE-A Module



QUECTEL
Build a Smarter World

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

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 ^① /B30/B32 ^① /B66
	LTE-TDD	B38/39/B40/B41
	DL 2×CA	B1+B3/B5/B18/B19/B20/B21/B26; B2+B2/B4/B5/B12/B13/B17/B29 ^① /B30/B66; B3+B3/B5/B7/B8/B19/B20/B28; B4+B4/B5/B12/B13/B17/B29 ^① /B30; B5+B7/B25/B30/B66; B7+B7/B20/B28; B12+B25/B30; B13+B66; B20+B32 ^① ; B25+B25/B26/B41; B29+B30; B38+B38; B40+B40; B41+B41; B66+B66
	DL 3×CA	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	Y
	UL 2×CA	B3+B3; B41+B41
	UL 64QAM	Y
UMTS	WCDMA	B1/B2/B3/B4/B5/B8/B19
Embedded GNSS		Y
PCIe Interface		Optional
USB 3.0 Interface		Y
Region		Global
Certification		Carrier: Verizon/ AT&T/ Telstra/ Telefónica* Regulatory: GCF/ CE/ FCC/ PTCRB/ IC/ NCC/ JATE/ TELEC/ RCM/ ICASA Others: WHQL

“Y” means supported.

“*” means under development.

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

EM12-G Timeline



2019								2020							
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

Project Stage

EM12-G MP

Carrier Certification Schedule

Verizon/ AT&T/ Telus/ Telstra Completed



Regulatory Certifications

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

Others

WHQL Completed

EG12 Specifications



37.0mm x 39.5mm x 2.8mm
LTE Cat 12, 600M DL/ 100M UL

Multi-Mode LTE-A Module

Variant		EG12-GT	EG12-EA	EG12-NA
Category		12	12	12
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	B42/B43/B48	B38/B40/B41	B41
	DL 2×CA	B42+B42; B48+B48	Intra-band and Inter-band	Intra-band and Inter-band
	DL 3×CA	B42+B42+B42; B48+B48+B48	Intra-band and Inter-band	Intra-band and Inter-band
	DL 256QAM	Y	Y	Y
	DL 4×4 MIMO	B42/B48	B1/B3/B7	B2/B4/B7/B25/B66
	UL 2×CA	B42+B42	Intra-band contiguous	Intra-band contiguous
UMTS	WCDMA	\	B1/B3/B5/B8	B2/B4/B5
Embedded GNSS		Y	Y	Y
PCIe Interface		Y	Y	Y
USB 3.0 Interface		Y	Y	Y
Region		Global TDD 3.5G Operators	EMEA/ APAC ^① / Brazil	North America
Certification		Regulatory: FCC	Regulatory: CE/ RCM	Carrier: Verizon ^② / AT&T ^② Regulatory: FCC*/ GCF ^② / PTCRB ^②

“Y” means supported. “*” means under development.

① means excluding Japan and CMCC.

② means TBD.

EG12-GT Timeline



2019								2020							
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

Project Stage

EG12-GT 

Regulatory Certification

FCC



EG12-EA Timeline

2019				2020					
Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.

Project Stage

EG12-EA

MP

Regulatory Certifications

CE/ RCM

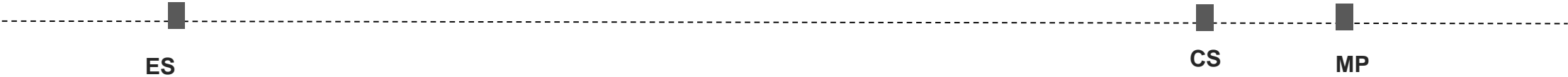


EG12-NA Timeline (Preliminary)



2019					2020						
Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.

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. For certification status, please refer to the "certification schedule".

Regulatory Certification Schedule



EG18 Specifications

■ Multi-Mode LTE-A Pro Module



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

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 2 × CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 3 × CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 4 × CA	Intra-band and Inter-band	Intra-band and Inter-band
	DL 5 × CA	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	Y	Y
	UL 2 × CA	Intra-band contiguous	Intra-band contiguous
	UL 64QAM	Y	Y
UMTS	WCDMA	B1/B3/B5/B8	B2/B4/B5
Embedded GNSS		Y	Y
PCIe Interface		Y	Y
USB 3.0 Interface		Y	Y
Region		EMEA/ APAC ^① / Brazil	North America
Certification		Carrier: Telstra Regulatory: CE/ RCM/ GCF*	Carrier: Verizon*/ AT&T*/ T-Mobile* Regulatory: GCF*/ FCC*/ PTCRB*/ IC*

“Y” means supported.

① means excluding Japan and CMCC.

“*” means under development.

EG18-EA Timeline



2019			2020								
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.

Project Stage

EG18-EA 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. For certification status, please refer to the "certification schedule".

Carrier Certification Schedule

Telstra **Completed**

Regulatory Certification Schedule

CE/ RCM **Completed**

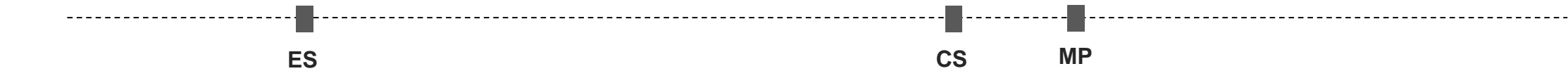
GCF

EG18-NA Timeline (Preliminary)



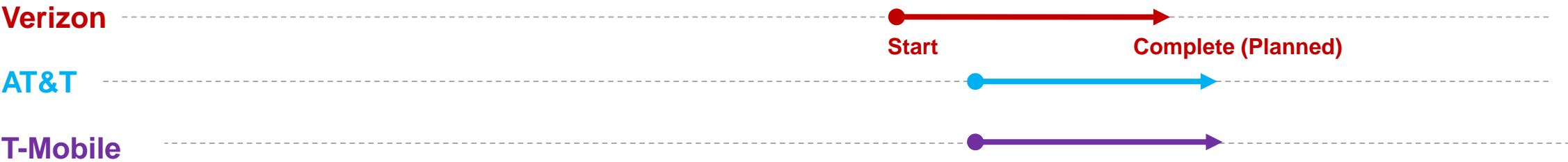
2019						2020							
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

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. For certification status, please refer to the "certification schedule".

Carrier Certification Schedule



Regulatory Certification Schedule



EM18 Specifications (Preliminary)



30.0mm x 42.0mm x 2.3mm
LTE Cat 18, 1.2 Gbps DL/150Mbps UL

■ Multi-Mode LTE-A Pro Module

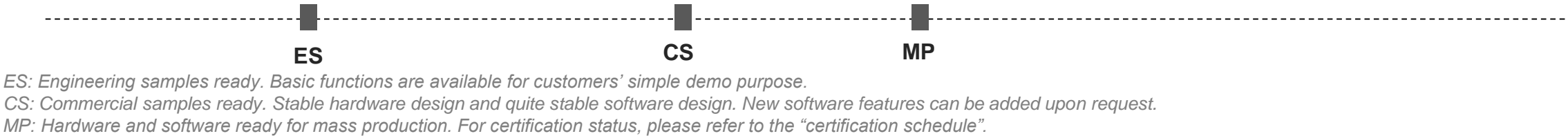
Variant		EM18-G
Category		DL/UL: 18 /13
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66
	LTE-TDD	B38/39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)
	DL CA	5xCA @ 4 x 4 MIMO with 3 inter-band
	DL 256QAM	Y
	UL 2×CA	2 intra-band
	UL 64QAM	Y
UMTS	WCDMA	B1/B2/B3/B5/B8
Embedded GNSS		Y
PCIe Interface		Y
USB 3.0 Interface		Y
Dual (U)SIM Card		Y
Region		Global
Certification		Carrier: Vodafone*/ Verizon*/ AT&T*/ NTT DOCOMO*/ SoftBank*/ KDDI*/ Telstra*/ Orange ^① Regulatory: GCF*/ CE*/ FCC*/ PTCRB*/ IC*/ JATE*/ TELEC*/ RCM*

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 “*” means under development.
 ① means TBD.

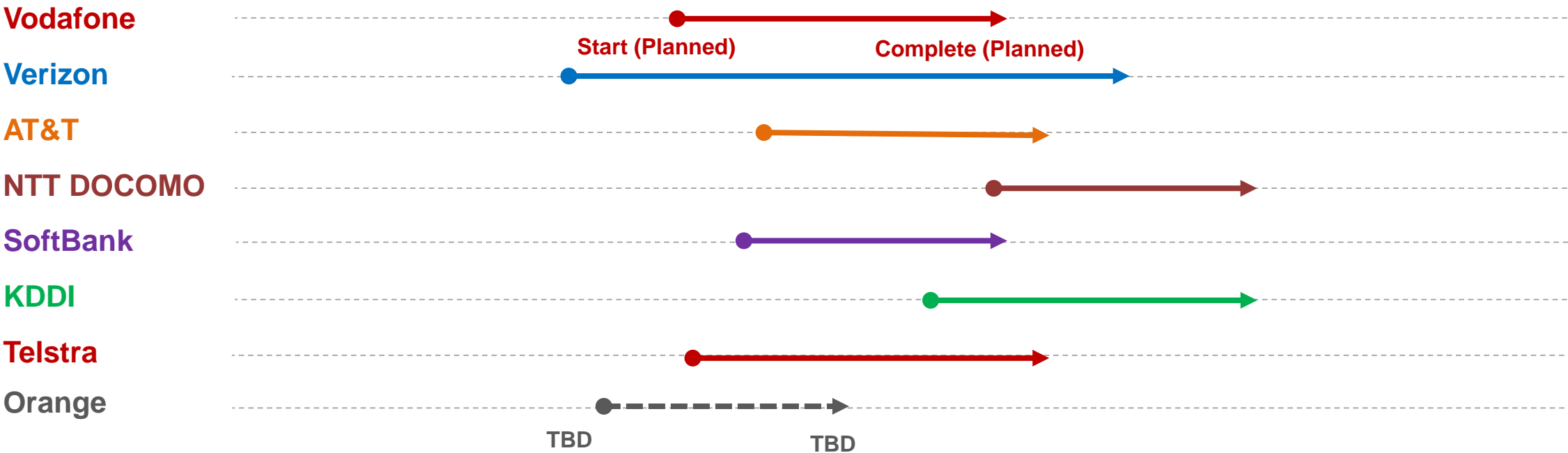
EM18-G Timeline (Preliminary) (1)



Project Schedule



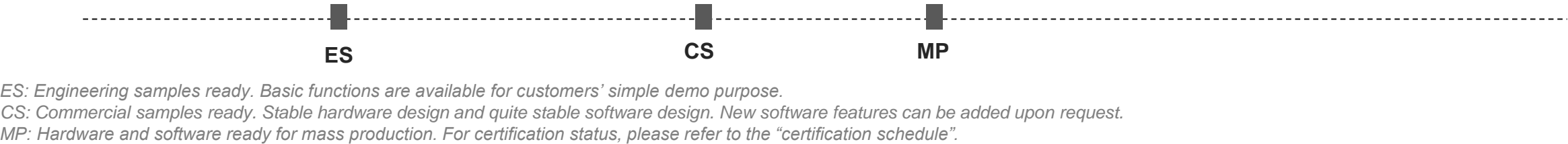
Carrier Certification Schedule



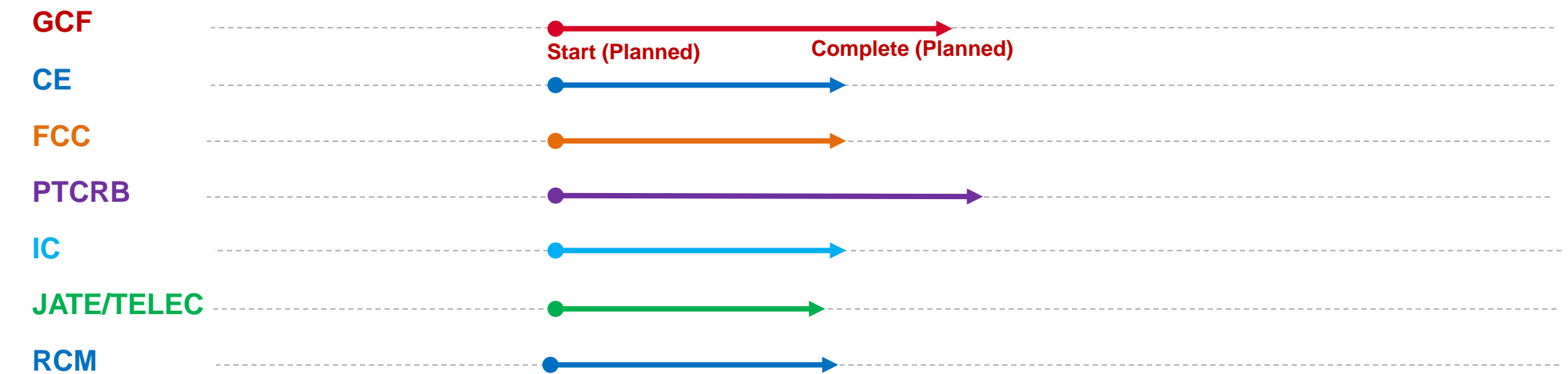
EM18-G Timeline (Preliminary) (2)



Project Schedule



Regulatory Certification Schedule



EM20 Specifications (Preliminary)

■ Multi-Mode LTE-A Pro Module



30.0mm x 42.0mm x 2.3mm
LTE Cat 20, 2.0Gbps DL/150Mbps UL

Variant		EM20-G
Category		DL/UL: 20 /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	B38/39/B40/B41/B42/B43/B46(LAA)/B48(CBRS)
	DL CA	7xCA @ 2 x 2 MIMO with 5 inter-band 5xCA @ 4 x 4 MIMO with 3 inter-band
	DL 256QAM	Y
	UL 2×CA	2 intra-band
	UL 64QAM	Y
UMTS	WCDMA	B1/B2/B3/B5/B8
Embedded GNSS		Y
PCIe Interface		Y
USB 3.0 Interface		Y
Dual (U)SIM Card		Y
Region		Global

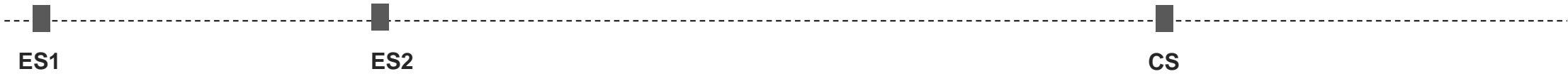
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① means TBD.

EM20-G Timeline (Preliminary)



2019						2020							
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.

Project Schedule



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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. For certification status, please refer to the "certification schedule".

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 ^②	6	Y	Y	Optional	Y	EMEA/ APAC ^① / Brazil	MP
EG06-A ^②	6	Y	Y	Optional	Y	North America/ Mexico	MP
EG06-AUTL ^②	6	\	Y	Optional	Y	Australia	MP
EP06-E ^②	6	Y	Y	Optional	Y	EMEA/ APAC ^① / Brazil	MP
EP06-A ^②	6	Y	Y	Optional	Y	North America/ Mexico	MP
EM06-E ^②	6	Y	Y	Optional	Y	EMEA/ APAC ^① / Brazil	MP
EM06-J ^②	6	Y	Y	Optional	Y	Japan	MP
EM06-A ^②	6	Y	Y	Optional	Y	North America/ Mexico	MP
EM12-G	12	Y	Y	Optional	Y	Global	MP
EG12-GT	12	\	Y	Y	Y	Global TDD 3.5GHz	MP
EG12-EA	12	Y	Y	Y	Y	EMEA/ APAC ^① / Brazil	MP
EG18-EA	18	Y	Y	Y	Y	EMEA/ APAC ^① / Brazil	MP
EG18-NA	18	Y	Y	Y	Y	North America/ Mexico	ES
EM18-G	18	Y	Y	Y	Y	Global	ES
EM20-G	20	Y	Y	Y	Y	Global	ES

“Y” means supported.

① means excluding Japan and CMCC.

② means EG06/EP06/EM06 modules only support USB 2.0 specification.

LTE-Advanced & 5G Roadmap

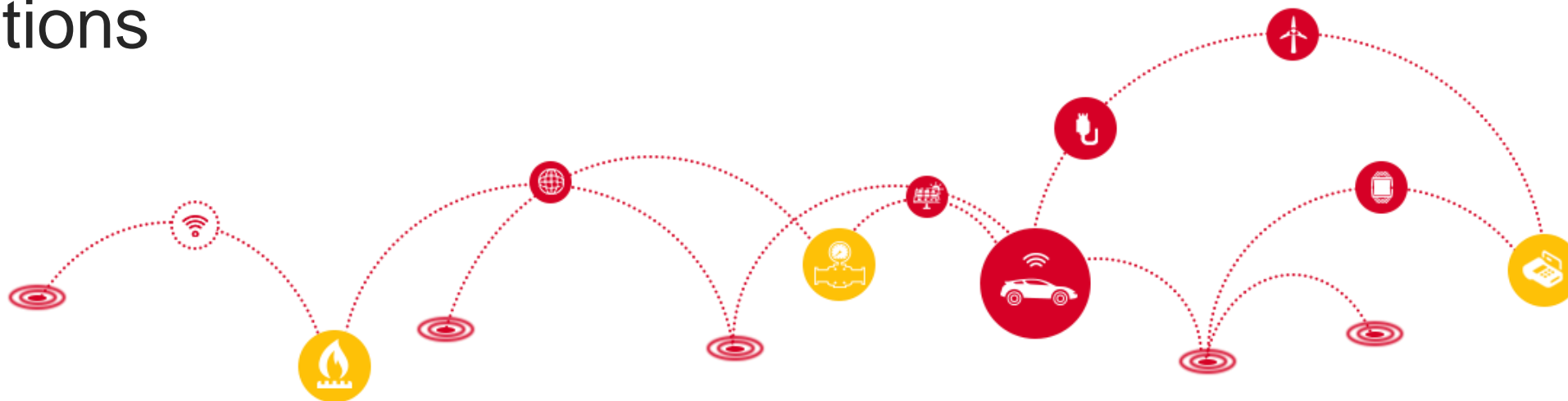
LTE-A Product Overview

5G Product Overview

5G QuecOpen[®]

Technical Details

Applications



5G Modules Overview

Sub-6GHz

Sub-6GHz + mmWave



RG500Q

- LGA Form Factor
- Variants:
 - EA Engineering Sample
 - NA Developing



RM500Q

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



RG510Q

- LGA Form Factor
- Variants:
 - NA Planning
 - EA Planning



RM510Q

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

RG500Q Specifications (Preliminary)



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

LTE/5G Dual-Mode Module

Variant		RG500Q-EA	RG500Q-NA
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6GHz	3GPP Release 15 NSA/SA operation, Sub-6GHz
	Sub-6GHz Bands	n41/n77/n78/n79/n1 ^① /n3 ^① /n5 ^① /n7 ^① /n8 ^① /n20 ^① /n28 ^① /n38 ^① /n40 ^①	n2/n5/n7/n12/n25/n41/n48/n66/n71/n77/n78
	DL 4×4 MIMO	n41/n77/n78/n79	n2/n41/n66
LTE	LTE Category	Cat 16	Cat 16
	LTE Bands	B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32/B34/B38/B39/B40/B41/B42	B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B29/B30/B41/B46/B48/B66/B71
	DL 4×4 MIMO	B1/B3/B7/B38/B40/B41/B42	B2/B4/B25/B30/B41/B66
Embedded GNSS		Y	Y
PCIe 3.0 Interface		Y	Y
USB 3.1 Interface		Y	Y
RGMII Interface		Y	Y
Region		APAC/ EMEA	North America
Certification		Carrier: TBD Regulatory*: CE*/ SRRC*/ NAL*/ CCC*/ KC*/ JATE*/ TELEC*/ RCM*	Carrier: TBD Regulatory: FCC/ IC (TBD)

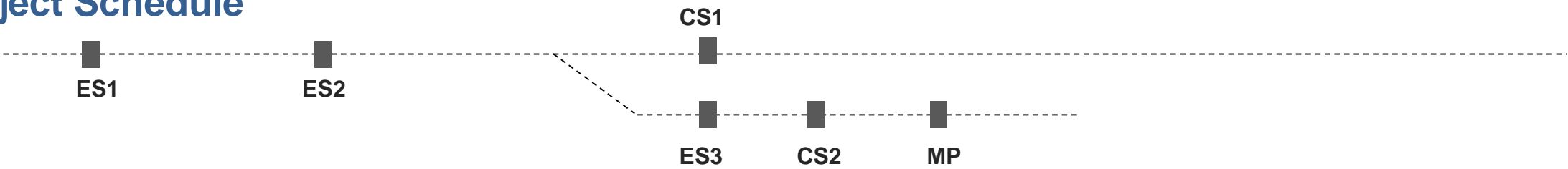
NOTE: ① planned to be supported in CS2 stage.
“*” means under development.

RG500Q-EA Timeline (Preliminary)



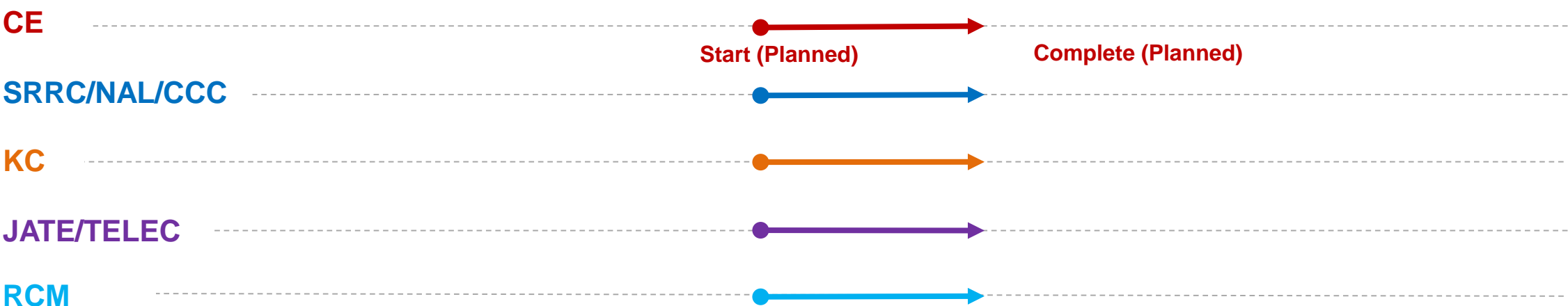
2019					2020									
Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.

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. For certification status, please refer to the "certification schedule".

Regulatory Certification Schedule



NOTE: This is the preliminary timeline, and it might be influenced by the Qualcomm chipsets timeline.

RG500Q-NA Timeline (Preliminary)



2019					2020									
Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.

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. For certification status, please refer to the "certification schedule".

NOTE: This is the preliminary timeline, and it might be influenced by the Qualcomm chipsets timeline.

RM500Q Specifications (Preliminary)



52.0mm x 30.0mm x 2.3mm (Approx.)
5G Sub-6GHz M.2 Module

LTE/5G Dual-Mode Module

Variant		RM500Q-GL
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6GHz
	Sub-6GHz Bands	n1/n2/n3/n5/n7/n8/n12/n20/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79
	DL 4×4 MIMO	n1/n2/n3/n7/n38/n40/n41/n48/n66/n77/n78/n79
LTE	LTE Category	Cat 16
	LTE Bands	B1/B2/B3/B4(B66)/B5(B18/B19/B26)/B7/B8/B9/B12(B17)/B13/B14/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B46(LAA)/B48/B71
	DL 4×4 MIMO	B1/B2/B3/B4/B7/B25/B30/B38/B39/B40/B41/B42/B48/B66
Embedded GNSS		Y
PCIe 3.0 Interface		Y
USB 3.1 Interface		Y
External eSIM		Y
Region		Global
Certification		Carrier: TBD Regulatory*: GCF*/ CE*/ FCC*/ PTCRB*/ IC*/ SRRC*/ NAL*/ CCC*/ RCM*

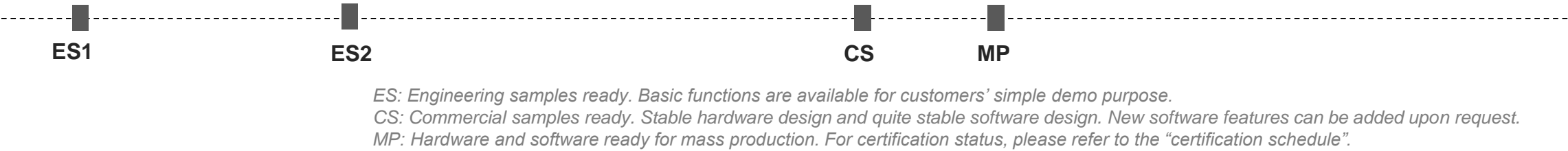
NOTE: “*” means under development.

RM500Q-GL Timeline (Preliminary)

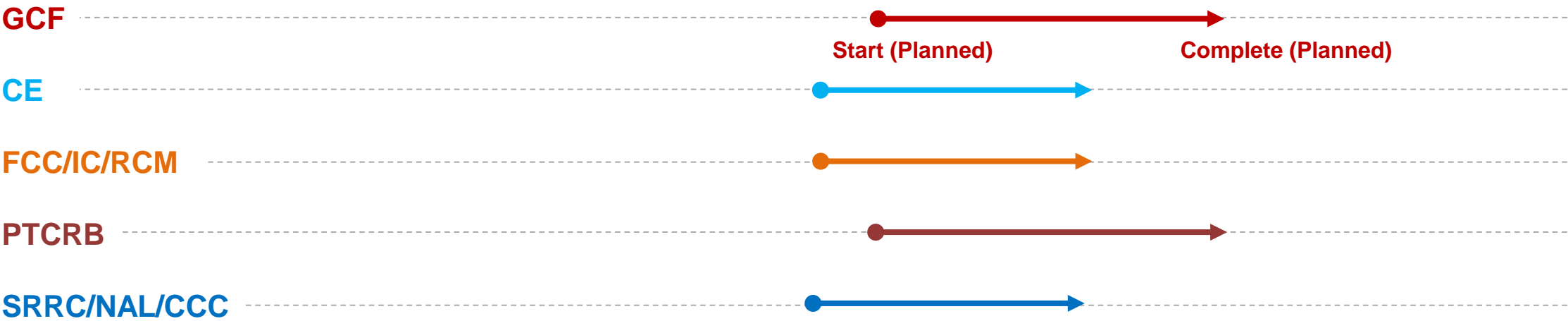


2019			2020								
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.

Project Schedule

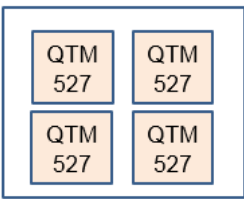
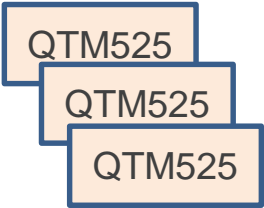


Regulatory Certification Schedule



NOTE: This is the preliminary timeline, and it might be influenced by the Qualcomm chipsets timeline.

RM510Q Specifications (Preliminary)



52.0mm x 30.0mm x 2.3mm (Approx.)

5G Sub-6GHz +mmWave Module

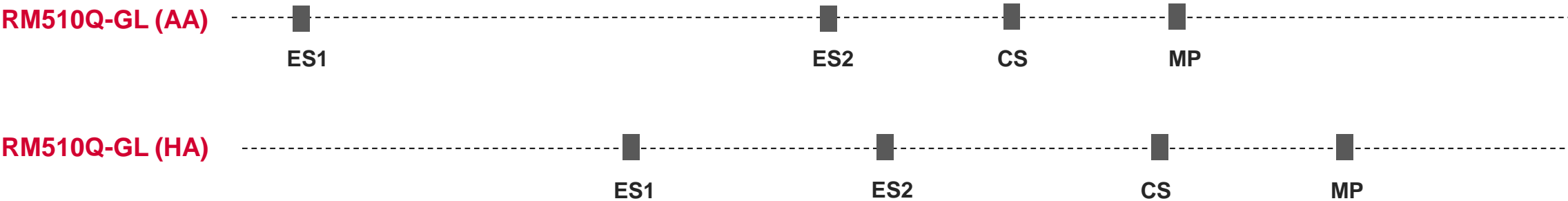
Variant		RM510Q-GL
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6GHz, mmWave
	Sub-6GHz Bands	n1/n2/n3/n5/n7/n8/n12/n20/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79
	mmWave Bands	n257/n258/n260/n261
	DL 4×4 MIMO	n1/n2/n3/n7/n38/n40/n41/n48/n66/n77/n78/n79
LTE	LTE Category	Cat 20
	LTE Bands	B1/B2/B3/B4(B66)/B5(B18/B19/B26)/B7/B8/B9/B12(B17)/B13/B14/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B46(LAA)/B48/B71
	DL 4×4 MIMO	B1/B2/B3/B4/B7/B25/B30/B38/B39/B40/B41/B42/B48/B66
Embedded GNSS		Y
PCIe 3.0 Interface		Y
USB 2.0 Interface		Y
External eSIM		Y
Region		Global
Certification		Carrier: TBD Regulatory: FCC/IC/GCF/PTCRB (TBD)

RM510Q Timeline (Preliminary)



2019		2020						
Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.

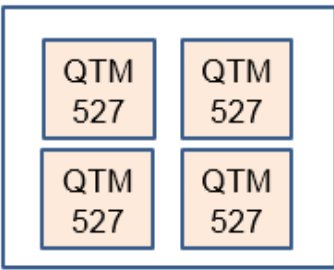
Project Schedule



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. For certification status, please refer to the "certification schedule".

NOTE: This is the preliminary timeline, and it might be influenced by the Qualcomm chipsets timeline.

RG510Q Specifications (Preliminary)



5G Sub-6GHz+mmWave Module

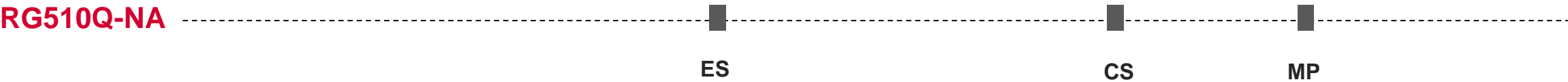
Variant		RG510Q-NA
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6GHz
	mmWave Bands	n260/n261
	Sub-6GHz Bands	n41/n71
	DL 4×4 MIMO	n41
LTE	LTE Category	Cat 20
	LTE Bands	B2/B4/B5/B7/B12/B13/B14/B25/B26/B29/B30/B41/B66/B71
	DL 4×4 MIMO	B2/B4/B25/B30/B41/B66
Embedded GNSS		Y
PCIe 3.0 Interface		Y
USB 3.1 Interface		Y
RGMII		Y
Region		North America
Certification		Carrier:
		TBD
		Regulatory:
		GCF/ FCC/IC/ PTCRB (TBD)

RG510Q Timeline (Preliminary)



2020											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Schedule



NOTE: This is the preliminary timeline, and it might be influenced by the Qualcomm chipsets timeline.

LTE-Advanced & 5G Roadmap

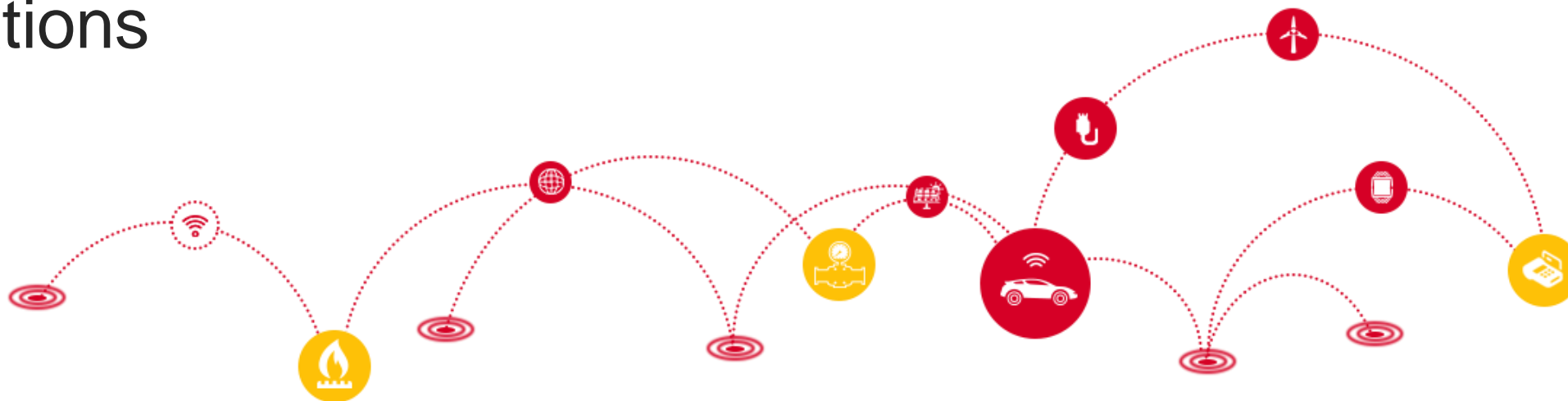
LTE-A Product Overview

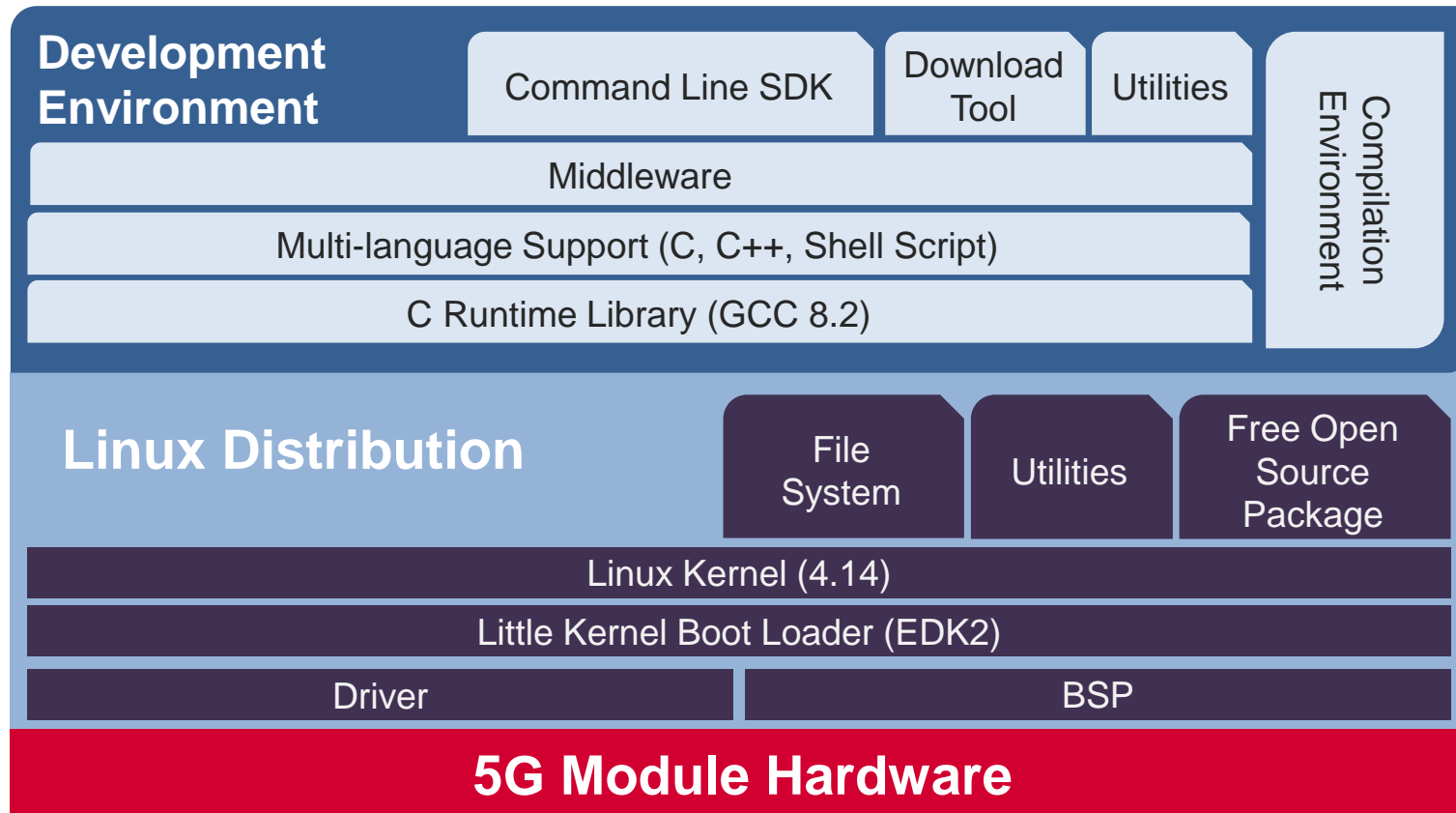
5G Product Overview

5G QuecOpen[®]

Technical Details

Applications



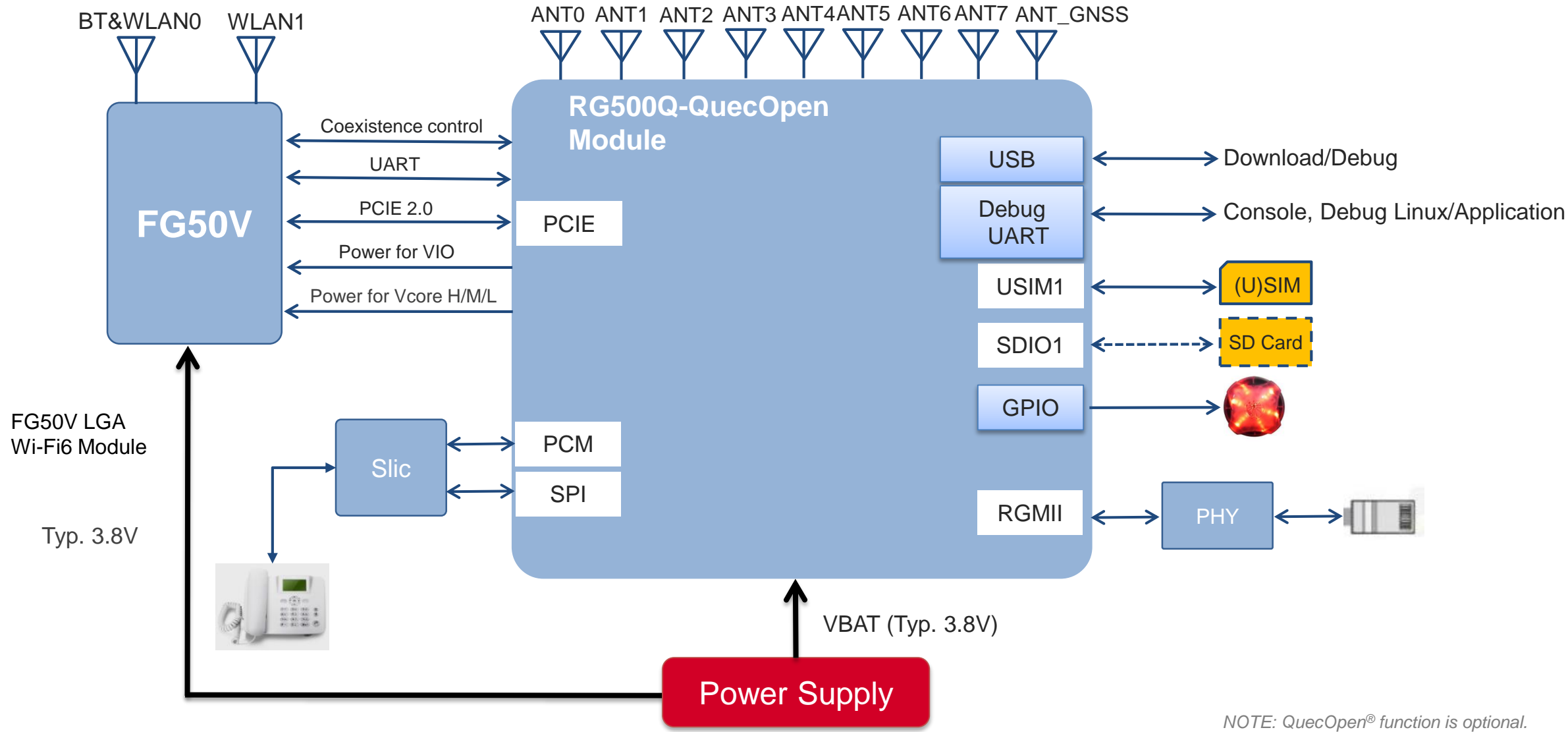


QuecOpen® is an open source embedded development platform based on Linux system, which is intended to simplify the design and development process for IoT applications.

Figure: Framework of QuecOpen®

NOTE: QuecOpen® function is optional.

QuecOpen[®] - Typical Router Solution



NOTE: QuecOpen[®] function is optional.

LTE-Advanced & 5G Roadmap

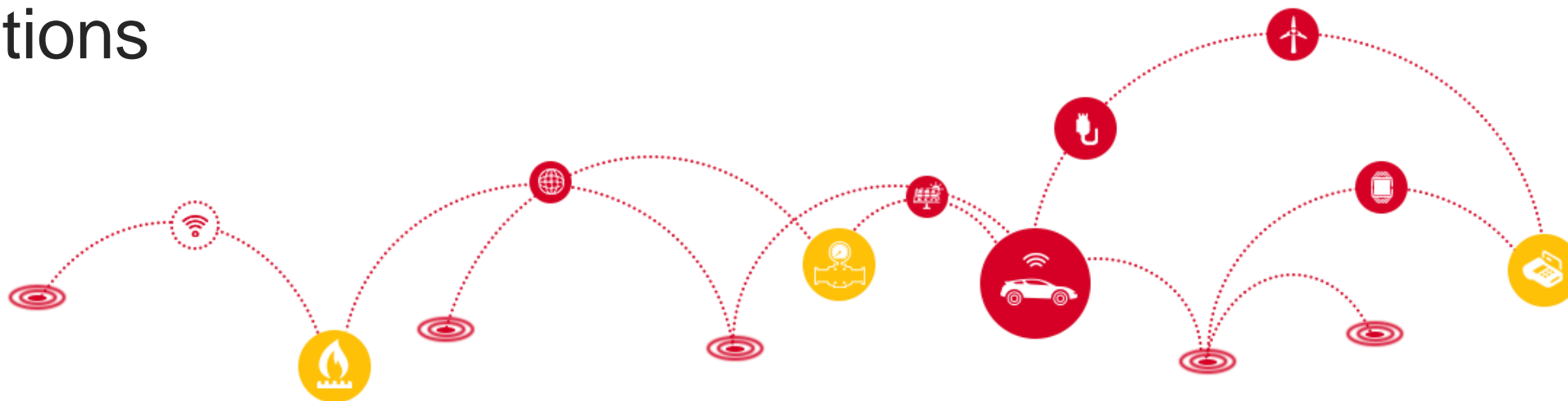
LTE-A Product Overview

5G Product Overview

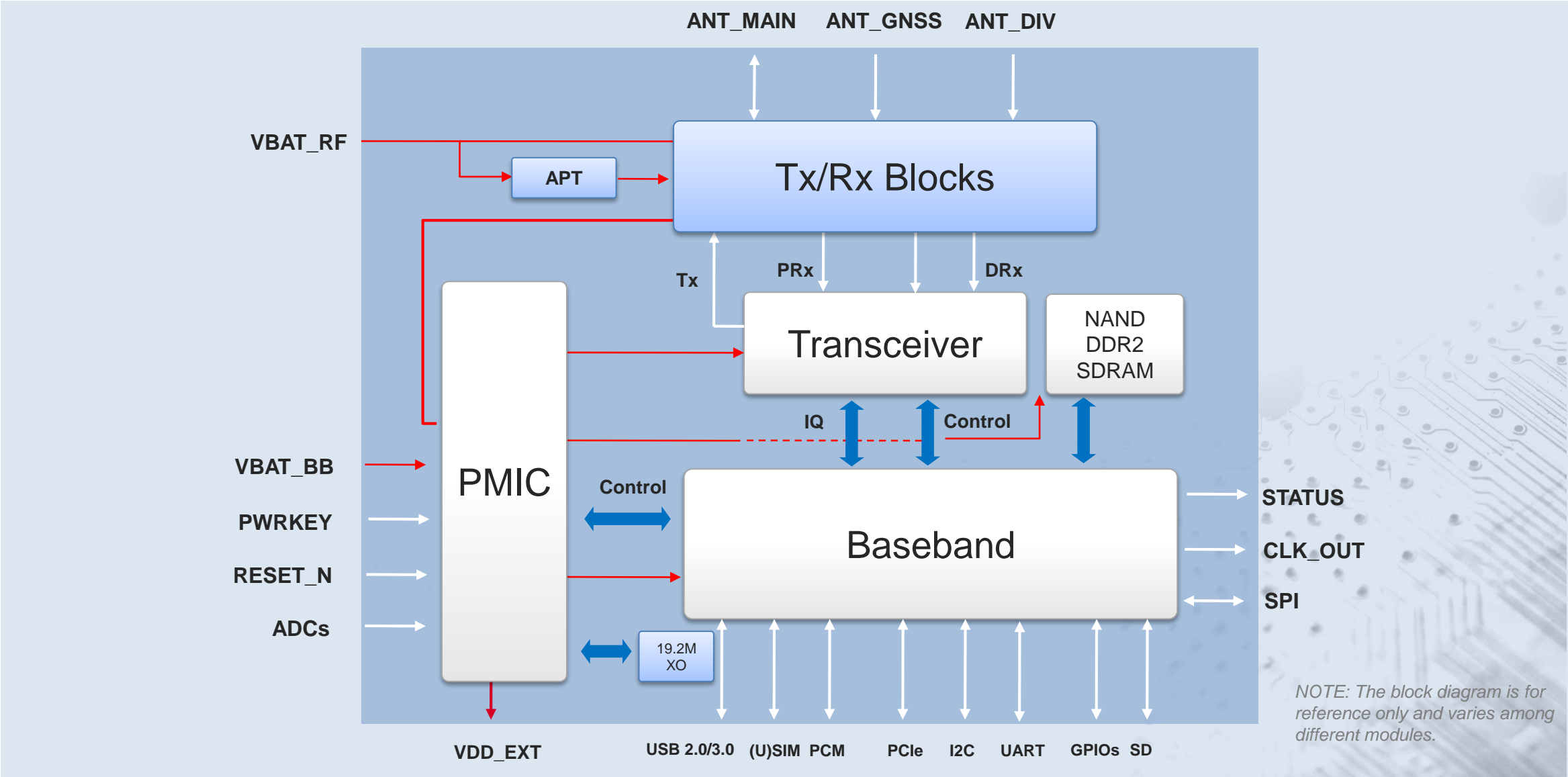
5G QuecOpen[®]

Technical Details

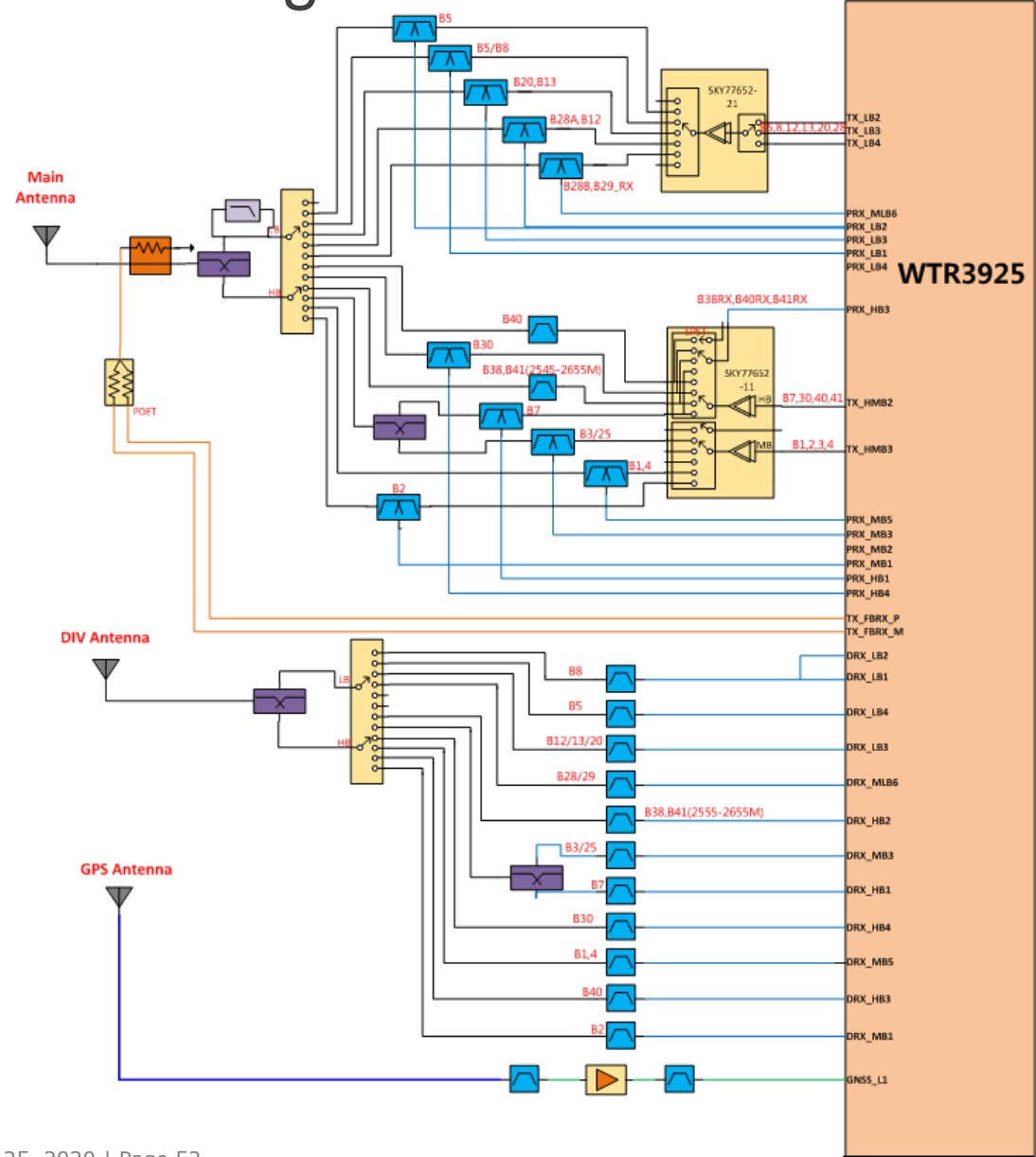
Applications



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 Driver

- Windows 7/8/8.1/10
- Linux 2.6~5.4
- Android 4.x/5.x/6.x/7.x/8.x/9.x

GNSS & RIL & NDIS & MBIM & GobiNet & QMI_WWAN Drivers

- GNSS Driver:
Android 4.x/5.x/6.x/7.x/8.x/9.x
- RIL Driver:
Android 4.x/5.x/6.x/7.x/8.x/9.x
- NDIS Driver:
Windows 7/8/8.1/10
- MBIM Driver:
Windows 8/8.1/10, Linux 3.18~5.4
- GobiNet Driver:
Linux 2.6~5.4
- QMI_WWAN Driver:
Linux 3.4~5.4

Quality Guarantee

- Reliable network protocol
- Steady flash protection mechanism
- Superior audio algorithms
- High sensitivity

Abundant Protocols

PPP/QMI/TCP*/UDP*/FTP*/HTTP*/
NTP*/PING*/HTTPS*/SMTP*/MMS*/
FTPS*/SMTPS*/SSL*

Flexible Applications

- eCall*
- (U)SIM card detection
- DTMF

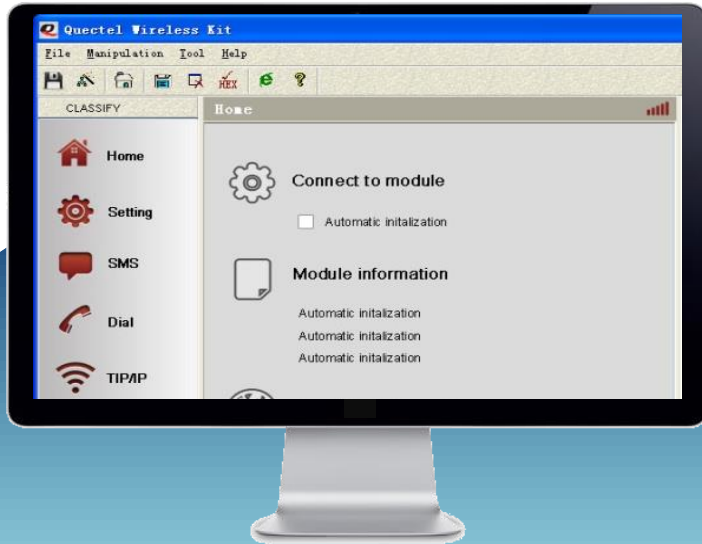
Special Features

- Over Temperature & Voltage Protection

** means under development.*

Support Package

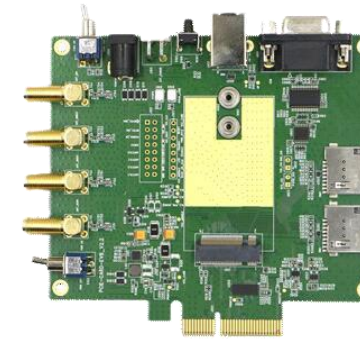
EVB Kits



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



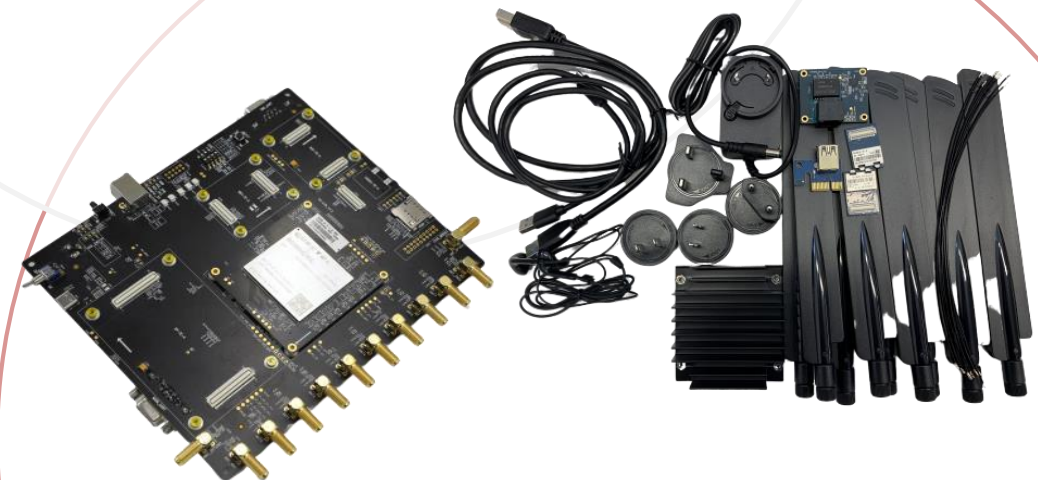
RG500Q EVB kit



RM500Q EVB kit



RM500Q mini EVB kit



LTE-Advanced & 5G Roadmap

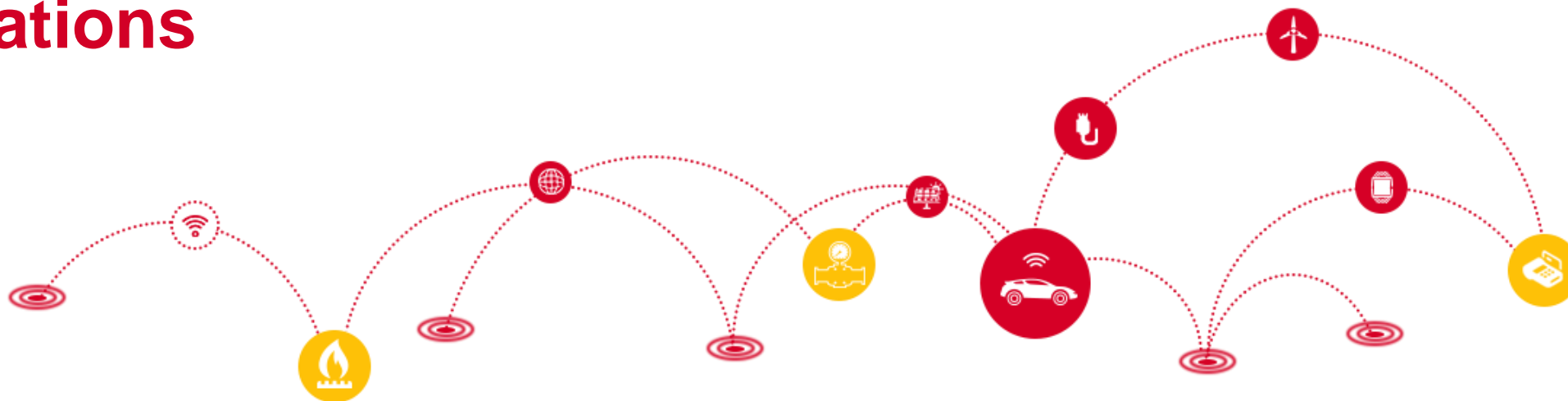
LTE-A Product Overview

5G Product Overview

5G QuecOpen[®]

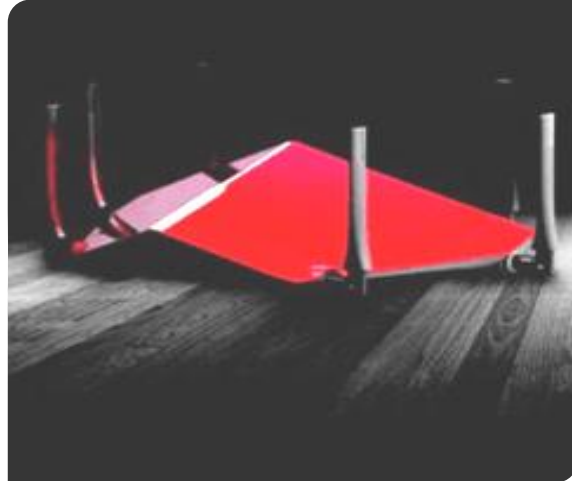
Technical Details

Applications



Target Applications

**Router
Gateway
CPE**



**Notebook
Tablet**



**Security
Surveillance**



Gateway/Router/CPE

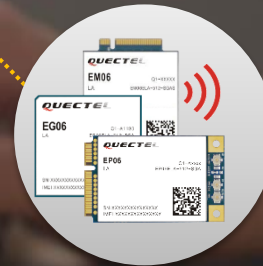


- DTU
- Consumer Router
- Industrial Router
- VoIP
- Server



Notebook/Tablet

- Consumer Laptop
- Industrial Laptop
 - Global Roaming
 - eSIM
 - Microsoft Certificate




Security/Surveillance

- Alarm System
- Video Surveillance
- Intrusion Detection



Thank you!

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 <https://www.facebook.com/quectelwireless>

 https://twitter.com/Quectel_IoT