

# EG915U-EU&EG912Y-EU

## Compatible Design

**LTE Standard Module Series**

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# About the Document

## Revision History

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-	2021-09-17	Len CHEN/ Cason QIN	Creation of the document
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# 1 Introduction

Quectel LTE standard EG915U-EU and EG912Y-EU modules are compatible with each other. This document briefly describes the compatible design among these modules.

## 1.1. Special Mark

**Table 1:Special Mark**

Mark	Definition
*	Unless otherwise specified, when an asterisk (*) is used after a function, feature, interface, pin name, AT command, or argument, it indicates that the function, feature, interface, pin, AT command, or argument is under development and currently not supported; and the asterisk (*) after a model indicates that the sample of such model is currently unavailable.



## 2 General Descriptions

### 2.1. Product Description

EG915U-EU, a LTE module, supports LTE-FDD and GSM network data connection. It also provides voice functionality, Bluetooth and Wi-Fi Scan for customer's specific applications.



EG912Y-EU module refer to LTE-FDD/LTE-TDD/GSM wireless communication modules, and can provide data connectivity on LTE-FDD, LTE-TDD, EDGE and GPRS networks. The modules also provide voice functionality for your specific applications.

**Table 2: Module Frequency Bands**

Module	LTE	GSM	Wi Fi/Bluetooth
<b>EG915U-EU</b>	FDD: B1/B3/B5/B7/B8/B20/B28	850/900 /1800 /1900MHz	Bluetooth/Wi-Fi Scan <sup>1</sup>
<b>EG912Y-EU</b>	FDD: B1/B3/B5/B7/B8/B20/B28 TDD: B38/B40/B41	850/900 /1800 /1900MHz	Realize Wi-Fi function through Wi-Fi interface*

<sup>1</sup> EG915U-EU supports Bluetooth and Wi Fi Scan functions. Due to the shared antenna interface, the two functions cannot be used simultaneously. Bluetooth and Wi-Fi Scan functions are optional (both supported or not), please contact Quectel Technical Support for details.

**Table 3: Module General Information**

Module Name	Picture	Packaging	Dimensions	Description
EG915U-EU		126 LGA pads	23.6 mm × 19.9 mm × 2.4 mm	LTE module
EG912Y-EU		126 LGA pads	29.0 mm × 25.0 mm × 2.4 mm	LTE module

## 2.2. Feature Overview

The following table compares the general features of EG915U-EU & EG912Y-EU.

**Table 4: Feature Overview**

Feature	EG915U-EU	EG912Y-EU
Power Supply	<ul style="list-style-type: none"> <li>3.3–4.3 V</li> <li>Typ. 3.8 V</li> </ul>	<ul style="list-style-type: none"> <li>3.4–4.5 V</li> <li>Typ. 3.8 V</li> </ul>
Peak Current	<b>VBAT_BB:</b> <ul style="list-style-type: none"> <li>Max 0.8 A</li> </ul> <b>VBAT_RF:</b> <ul style="list-style-type: none"> <li>Max 1.8 A</li> </ul>	<b>VBAT_BB:</b> <ul style="list-style-type: none"> <li>Max 0.8 A</li> </ul> <b>VBAT_RF:</b> <ul style="list-style-type: none"> <li>Max 1.8 A</li> </ul>
Sleep Current	<b>2G:</b> <ul style="list-style-type: none"> <li>1.54 mA @ DRX=5</li> </ul> <b>FDD LTE:</b> <ul style="list-style-type: none"> <li>3.50 mA @ PF = 32</li> <li>2.25 mA @ PF = 64</li> <li>1.64 mA @ PF = 128</li> <li>1.35 mA @ PF = 256</li> </ul>	<b>EGSM900:</b> <ul style="list-style-type: none"> <li>1.1 mA @ DRX = 5</li> </ul> <b>DCS1800:</b> <ul style="list-style-type: none"> <li>1.1 mA @ DRX = 5</li> </ul> <b>LTE FDD :</b> <ul style="list-style-type: none"> <li>1.3 mA @ PF = 64</li> </ul> <b>LTE TDD :</b> <ul style="list-style-type: none"> <li>1.3 mA @ PF = 64</li> </ul>
LTE Features	<ul style="list-style-type: none"> <li>Supports up to Cat 1 FDD</li> <li>Supports 1.4/3/5/10/15/20 MHz radio frequency bandwidth</li> <li>Supports uplink QPSK, 16QAM</li> <li>Supports downlink QPSK, 16QAM and 64QAM</li> </ul> <b>LTE FDD:</b> <ul style="list-style-type: none"> <li>Max 10 Mbps (DL) / 5 Mbps (UL)</li> </ul>	<ul style="list-style-type: none"> <li>Supports up to non-CA Cat 1 FDD and TDD.</li> <li>Supports 1.4/3/5/10/15/20 MHz radio frequency bandwidth;</li> </ul> <b>LTE FDD:</b> <ul style="list-style-type: none"> <li>Max 10 Mbps (DL) ,</li> <li>Max 5 Mbps (UL),</li> </ul> <b>LTE TDD:</b> <ul style="list-style-type: none"> <li>Max 7.5 Mbps (DL) ,</li> <li>Max 1 Mbps (UL)</li> </ul>
Temperature Range	Operating temperature range: 35°C ~ +75°C <sup>2</sup> Extended temperature range: 40°C ~ +85°C <sup>3</sup> Storage temperature range:	Operating temperature range: 35°C ~ +75°C <sup>2</sup> Extended temperature range: 40°C ~ +85°C <sup>3</sup> Storage temperature range:

<sup>2</sup> Within operating temperature range, the module is 3GPP compliant.

<sup>3</sup> Within extended temperature range, the module remains the ability to establish and maintain a voice, SMS, data transmission, emergency call, etc. There is no unrecoverable malfunction; there are also no effects on radio spectrum and no harm to radio network. Only one or more parameters like P<sub>out</sub> might reduce in their value and exceed the specified tolerances. When the temperature returns to normal operation temperature levels, the module is compliant with 3GPP specification again.

	40°C ~ +90°C	40°C ~ +90°C
UART Interface	<p><b>Main UART:</b></p> <ul style="list-style-type: none"> <li>Used for AT command communication and data transmission.</li> <li>Baud rate: 115200 bps by default.</li> <li>Supports RTS and CTS hardware flow control.</li> </ul> <p><b>Debug UART:</b></p> <ul style="list-style-type: none"> <li>Used for Linux console and log output.</li> <li>Baud rate: 921600 bps.</li> <li>Only use for debug UART, cannot use for universal UART.</li> </ul> <p><b>Auxiliary UART</b></p>	<p><b>Main UART:</b></p> <ul style="list-style-type: none"> <li>Transmits data (including AT commands).</li> <li>Default Baud rate: 115200 bps</li> <li>Supports RTS and CTS hardware flow control.</li> </ul> <p><b>Debug UART:</b></p> <ul style="list-style-type: none"> <li>Consoles Linux console and outputs logs.</li> </ul> <p>Baud rate: 115200 bps</p>
USB Interface	<ul style="list-style-type: none"> <li>Compliant with USB 2.0 specification (only slave), with transmission rates up to 480 Mbps</li> <li>Used for AT command communication, data transmission, software debugging, firmware upgrade</li> <li>USB Serial Driver: supports USB serial driver for Windows 7/8/8.1/10, Linux 2.6–5.12 and Android 4.x–11.x systems</li> </ul>	<ul style="list-style-type: none"> <li>Compliant with USB 2.0 specification (slave only), where the data transfer rate can reach up to 480 Mbps</li> <li>Used for AT command communication, data transmission, software debugging, and software upgrade</li> <li>Support virtual USB serial drivers for Windows 7/8/8.1/10, Linux 2.6–5.12, Android 4.x–11.0, etc.</li> </ul>
Digital Audio	PCM interface	PCM interface
I2C Interface	Supported	Supported
(U)SIM Interface	Supported	Supported
2G	Supported	Supported
LET FDD	Supported	Supported
LTE TDD	NO	Supported

Wi-Fi	Bluetooth/Wi-Fi Scan <sup>4</sup>	Realized through Wi-Fi interface <sup>*</sup>
Bluetooth	Bluetooth/Wi-Fi Scan	NO
Firmware Upgrade	USB interface and FOTA	USB interface and FOTA

<sup>4</sup> EG915U-EU supports Bluetooth and Wi-Fi Scan functions. Due to the shared antenna interface, the two functions cannot be used simultaneously. Bluetooth and Wi-Fi Scan functions are optional (both supported or not), please contact Quectel Technical Support for details.

## 2.3. Pin Assignment

The following figures show the pin assignment of EG915U-EU and EG912Y-EU.

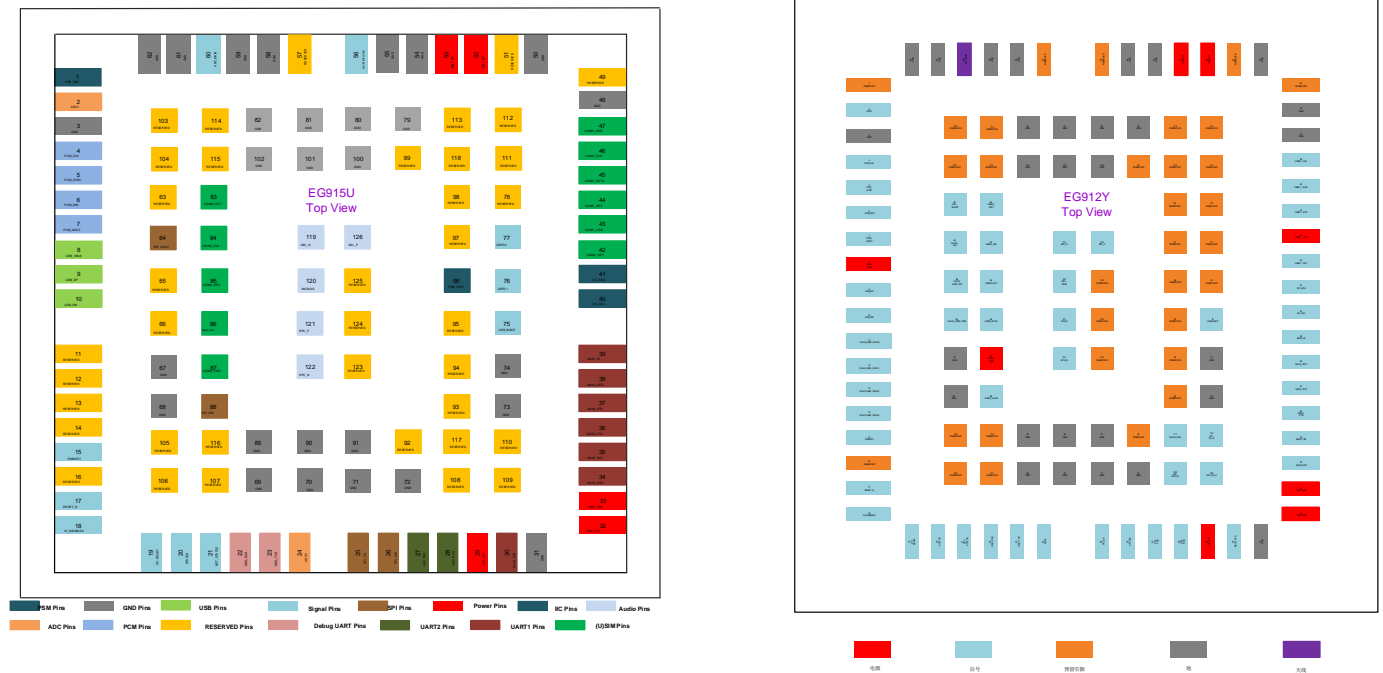


Figure 1: EG915U-EU & EG912Y-EU Pin Assignment

### NOTE

1. Keep all RESERVED pins and unused pins unconnected.
2. Connect GND pins to the ground in the design.
3. USB\_BOOT of EG915U-EU cannot be pulled up before the module startup.
4. USB\_BOOT and STATUS of EG912Y-EU cannot be pulled up before the module startup.
5. EG915U-EU and EG912Y-EU support dual card single standby function.

## 3 Pin Description

This chapter describes the pin definition of EG915U-EU and EG912Y-EU.

**Table 5: I/O Parameters Definition**

Type	Description
AI	Analog Input
AO	Analog Output
AIO	Analog Input/Output
DI	Digital Input
DO	Digital Output
DIO	Digital Input/Output
OD	Open Drain
PI	Power Input
PO	Power Output
PIO	Power Input/Output

### 3.1. Pins

The following table shows EG915U-EU, EG912Y-EU pins with the function.

**Table 6: Pin Comparison among EG915U-EU and EG912Y-EU**

EG915U-EU					EG912Y-EU			
Pin No	Pin Name	IO	Power domain	Description	Pin Name	IO	Power domain	Description
1	PSM_IND*	DO	1.8 V	Indicate the module's power saving mode	RESERVED	-	-	Reserved
2	ADC1	AI	0.1–VBAT	General purpose ADC interface	ADC1	AI	0–VBAT	General purpose ADC interface
3	GND	-	-	Ground	GND	-	-	Ground
4	PCM_CLK	DI	1.8 V	PCM clock	PCM_CLK	DO	1.8 V	PCM clock
5	PCM_SYNC	DI	1.8 V	PCM data frame sync	PCM_SYNC	DO	1.8 V	PCM data frame sync
6	PCM_DIN	DI	1.8 V	PCM data input	PCM_DIN	DI	1.8 V	PCM data input
7	PCM_DOUT	DO	1.8 V	PCM data output	PCM_DOUT	DO	1.8 V	PCM data output
8	USB_VBUS	AI	-	USB connection detect	USB_VBUS	AI	-	USB connection detect
9	USB_DP	AIO	-	USB differential data (+)	USB_DP	AIO	-	USB differential data (+)
10	USB_DM	AIO	-	USB differential data (-)	USB_DM	AIO	-	USB differential data (-)



11	RESERVED	-	-	Reserved	WLAN_SDIO_DATA0	DIO	1.8 V	WLAN SDIO data bit 0
12	RESERVED	-	-	Reserved	WLAN_SDIO_DATA1	DIO	1.8 V	WLAN SDIO data bit 1
13	RESERVED	-	-	Reserved	WLAN_SDIO_DATA2	DIO	1.8 V	WLAN SDIO data bit 2
14	RESERVED	-	-	Reserved	WLAN_SDIO_DATA3	DIO	1.8 V	WLAN SDIO data bit 3
15	PWRKEY	DI	VBAT	Turn on/off the module	PWRKEY	DI	VBAT	Turn on/off the module
16	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
17	RESET_N	DI	VBAT	Reset the module	RESET_N	DI	1.8 V	Reset the module
18	W_DISABLE#	DI	1.8 V	Airplane mode control	W_DISABLE#	DI	1.8 V	Airplane mode control
19	AP_READY	DI	1.8 V	Application processor ready	AP_READY	DI	1.8 V	Application processor ready
20	STATUS	DO	1.8 V	Indicate the module's operation status	STATUS	DO	1.8 V	Indicate the module's operation status
21	NET_STATUS	DO	1.8 V	Indicate the module's network activity status	NET_STATUS	DO	1.8 V	Indicate the module's network activity status
22	DBG_RXD	DI	1.8 V	Debug UART receive	DBG_RXD	DI	1.8 V	Debug UART receive
23	DBG_TXD	DO	1.8 V	Debug UART transmit	DBG_TXD	DO	1.8 V	Debug UART transmit
24	ADC0	AI	0.1–VBAT	General purpose ADC interface	ADC0	AI	0–VBAT	General purpose ADC interface
25	SPI_CS	DO	1.8 V	SPI chip select	SPI_CS	DO	1.8 V	SPI chip select
26	SPI_CLK	DO	1.8 V	SPI clock	SPI_CLK	DO	1.8 V	SPI clock

27	AUX_TXD	DO	1.8 V	Auxiliary UART transmit	SPI_TXD	DO	1.8 V	SPI transmit data
28	AUX_RXD	DI	1.8 V	Auxiliary UART receive	SPI_RXD	DI	1.8 V	SPI receive data
29	VDD_EXT	PO	-	Provide 1.8 V for external circuit	VDD_EXT	PO	-	Provide 1.8 V for external circuit
30	MAIN_DTR	DI	1.8 V	Main UART data terminal ready	MAIN_DTR	DI	1.8 V	Main UART data terminal ready
31	GND	-	-	Ground	GND	-	-	Ground
32	VBAT_BB	PI	3.3–4.3 V	Power supply for the module's baseband part	VBAT_BB	PI	3.4–4.5 V	Power supply for the module's baseband part
33	VBAT_BB	PI	3.3–4.3 V	Power supply for the module's baseband part	VBAT_BB	PI	3.4–4.5 V	Power supply for the module's baseband part
34	MAIN_RXD	DI	1.8 V	Main UART receive	MAIN_RXD	DI	1.8 V	Main UART receive
35	MAIN_TXD	DO	1.8 V	Main UART transmit	MAIN_TXD	DO	1.8 V	Main UART transmit
36	MAIN_CTS	DO	1.8 V	DTE clear to send signal to DCE (connect to DTE's CTS)	MAIN_CTS	DO	1.8 V	DTE clear to send signal to DCE (connect to DTE's CTS)
37	MAIN_RTS	DI	1.8 V	DTE request to send signal to DCE (connect to DTE's RTS)	MAIN_RTS	DI	1.8 V	DTE request to send signal to DCE (connect to DTE's RTS)
38	MAIN_DCD	DO	1.8 V	Main UART data carrier detect	MAIN_DCD	DO	1.8 V	Main UART data carrier detect
39	MAIN_RI	DO	1.8 V	Main UART ring indication	MAIN_RI	DO	1.8 V	Main UART ring indication
40	I2C_SCL	OD	-	I2C serial clock (for external codec)	I2C_SCL	OD	-	I2C serial clock (for external codec)
41	I2C_SDA	OD	-	I2C serial data (for external codec)	I2C_SDA	OD	-	I2C serial data (for external codec)
42	USIM1_DET	DI	1.8 V	(U)SIM1 card hot plug detect	USIM1_DET	DI	1.8 V	(U)SIM1 card hot plug detect

43	USIM1_VDD	PO	-	(U)SIM1 card power supply	USIM1_VDD	PO	-	(U)SIM1 card power supply
44	USIM1_RST	DO	-	(U)SIM1 card reset	USIM1_RST	DO	-	(U)SIM1 card reset
45	USIM1_DATA	DIO	-	(U)SIM1 card data	USIM1_DATA	DIO	-	(U)SIM1 card data
46	USIM1_CLK	DO	-	(U)SIM1 card clock	USIM1_CLK	DO	-	(U)SIM1 card clock
47	USIM1_GND	-	-	Specified ground for (U)SIM1 card	GND	-	-	Ground
48	GND	-	-	Ground	GND	-	-	Ground
49	RESERVED	-	-	Reserved	Reserved	-	-	Reserved
50	GND	-	-	Ground	GND	-	-	Ground
51	RESERVED	-	-	Reserved	Reserved	-	-	Reserved
52	VBAT_RF	PI	3.3–4.3 V	Power supply for the module's RF part	VBAT_RF	PI	3.4–4.5 V	Power supply for the module's RF part
53	VBAT_RF	PI	3.3–4.3 V	Power supply for the module's RF part	VBAT_RF	PI	3.4–4.5 V	Power supply for the module's RF part
54	GND	-	-	Ground	GND	-	-	Ground
55	GND	-	-	Ground	GND	-	-	Ground
56	ANT_BT/ WIFI_SCAN	AIO	-	Wi-Fi Scan/Bluetooth antenna interface	RESERVED	-	-	Reserved
57	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
58	GND	-	-	Ground	GND	-	-	Ground
59	GND	-	-	Ground	GND	-	-	Ground

60	ANT_MAIN	AIO	-	Main antenna interface	ANT_MAIN	AIO	-	Main antenna interface
61	GND	-	-	Ground	GND	-	-	Ground
62	GND	-	-	Ground	GND	-	-	Ground
63	RESERVED	-	-		CLK_32KHZ	DO	-	32 kHz clock signal output
64	SPI_DOUT	DO	-	SPI data output	WLAN_EN	DO	1.8 V	WLAN function enable control
65	RESERVED	-	-	Reserved	WLAN_SDIO_CLK	DO	1.8 V	WLAN SDIO clock
66	RESERVED	-	-	Reserved	WLAN_SDIO_CMD	DO	1.8 V	WLAN SDIO command
67	GND	-	-	Ground	GND	-	-	Ground
68	GND	-	-	Ground	GND	-	-	Ground
69	GND	-	-	Ground	GND	-	-	Ground
70	GND	-	-	Ground	GND	-	-	Ground
71	GND	-	-	Ground	GND	-	-	Ground
72	GND	-	-	Ground	GND	-	-	Ground
73	GND	-	-	Ground	GND	-	-	Ground
74	GND	-	-	Ground	GND	-	-	Ground
75	USB_BOOT	DI	1.8 V	Force the module into emergency download mode	USB_BOOT	DI	1.8 V	Force the module into emergency download mode

76	GRFC1*	DO	-	Generic RF Controller	RESERVED	-	-	Reserved
77	GRFC2*	DO	-	Generic RF Controller	RESERVED	-	-	Reserved
78	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
79	GND	-	-	Ground	GND	-	-	Ground
80	GND	-	-	Ground	GND	-	-	Ground
81	GND	-	-	Ground	GND	-	-	Ground
82	GND	-	-	Ground	GND	-	-	Ground
83	USIM2_DET	DI	1.8 V	(U)SIM2 card hot plug detect	USIM2_DET	DI	1.8 V	(U)SIM2 card hot plug detect
84	USIM2_CLK	DO	-	(U)SIM2 card clock	USIM2_CLK	DO	-	(U)SIM2 card clock
85	USIM2_RST	DO	-	(U)SIM2 card reset	USIM2_RST	DO	-	(U)SIM2 card reset
86	USIM2_DATA	DIO	-	(U)SIM2 card data	USIM2_DATA	DIO	-	(U)SIM2 card data
87	USIM2_VDD	PO	-	(U)SIM2 card power supply	USIM2_VDD	PO	-	(U)SIM2 card power supply
88	SPI_DIN	DI	-	SPI data input	WLAN_WAKE	DI	1.8 V	Wakes up the host (EG912Y-EU module) via an external Wi-Fi module
89	GND	-	-	Ground	GND	-	-	Ground
90	GND	-	-	Ground	GND	-	-	Ground
91	GND	-	-	Ground	GND	-	-	Ground
92	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved

93	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
94	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
95	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
96	PSM_EINT*	-	-	External interrupt pin; Wake up the module from PSM	RESERVED	-	-	Reserved
97	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
98	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
99	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
100	GND	-	-	Ground	GND	-	-	Ground
101	GND	-	-	Ground	GND	-	-	Ground
102	GND	-	-	Ground	GND	-	-	Ground
103	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
104	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
105	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
106	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
107	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
108	RESERVED	-	-	Reserved	VIB_DRV_N	OD	-	Control the motor drive
109	RESERVED	-	-	Reserved	LCD_BL_K	OD	-	Current sink for LCD backlight

110	RESERVED	-	-	Reserved	KP_BL_K	OD	-	Key backlight drive current input
111	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
112	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
113	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
114	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
115	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
116	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
117	RESERVED	-	-	Reserved	FLASH_LED	OD	-	Flash/Flashlight drive output
118	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
119	MIC_N	AI	-	Microphone analog input (-)	MIC_N	AI	-	Microphone analog input (-)
120	MICBIAS	PO	-	Bias voltage output for microphone	MICBIAS	PO	-	Bias voltage output for microphone
121	SPK_P	AO	-	Analog audio differential output (+)	SPK_P	AO	-	Analog audio differential output (+)
122	SPK_N	AO		Analog audio differential output (-)	SPK_N	AO	-	Analog audio differential output (-)
123	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
124	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
125	RESERVED	-	-	Reserved	RESERVED	-	-	Reserved
126	MIC_P	AI	-	Microphone analog input (+)	MIC_P	AI	-	Microphone analog input (+)

**NOTE**

1. Keep all reserved and unused pins unconnected.
2. All GND pins should be connected to ground.



# 4 Hardware Interfaces Design

## 4.1. Power Supply

Table 6: Pin Difference of VBAT\_BB & VBAT\_RF

Pin Name	Pin No.	Parameter	EG915U-EU	EG912Y-EU
VBAT_BB	32, 33	I/O	PI	PI
		Voltage	Vmax = 4.3 V Vmin = 3.3 V Vnorm = 3.8 V	Vmax = 4.5 V Vmin = 3.4 V Vnorm = 3.8 V
		Current	I <sub>max</sub> = 0.8 A	I <sub>max</sub> = 0.8 A
VBAT_RF	52, 53	I/O	PI	PI
		Voltage	Vmax = 4.3 V Vmin = 3.3 V Vnom = 3.8 V	Vmax = 4.5 V Vmin = 3.4 V Vnom = 3.8 V
		Current	I <sub>max</sub> = 1.8 A	I <sub>max</sub> = 1.8 A

### NOTE

1. Power design is critical for module's performance. The power supply of EG915U-EU and EG912Y-EU should be able to provide sufficient current up to 3.0 A.
2. Please refer to the corresponding reference design of the module for details about power supply design.

## 4.2. Power on/Power off

The turn on/turn off method of EG915U-EU is the same as EG912Y-EU.

- EG915U-EU/EG912Y-EU modules are powered on after pressing PWRKEY for a certain time.
- EG915U-EU/EG912Y-EU modules are powered off after pressing PWRKEY for a certain time.

It is also a safe way to use **AT+QPOWD** command to turn off the module, which is similar to turning off the module via PWRKEY pin. Please refer to **Document [6]** for details about **AT+QPOWD** command.

**Table 7: Pin Difference of PWRKEY**

Pin Name	Pin No.	Parameter	EG915U-EU	EG912Y-EU
PWRKEY	15	I/O	DI	DI
		Voltage	VBAT power domain. $V_{ILmax} = 0.5\text{ V}$	VBAT power domain. $V_{ILmax} = 0.5\text{ V}$
		Turn on: Pull down time	$\geq 2\text{ s}$	$\geq 500\text{ ms}$
		Turn off: Pull down time	$\geq 3\text{ s}$	$\geq 600\text{ ms}$

### NOTE

For EG915U-EU, when keeping the PWRKEY to the ground and the AT command cannot be used to turn off, the module can only be forced to turn off by cutting off the VBAT power supply. Therefore, we recommend that you can turn on or turn off the module by pulling up and pulling down the PWEKEY instead of keeping the PWRKEY to the ground.

### 4.3. Reset

EG915U-EU/EG912Y-EU module can be reset by driving RESET\_N pin to a low level voltage for a certain time.

**Table 8: Pin Difference of RESET\_N**

Pin Name	Pin No.	Parameter	EG915U-EU	EG912Y-EU
		I/O	DI	DI
RESET_N	17	Voltage	VBAT power domain. $V_{ILmax} = 0.5\text{ V}$	1.8 V power domain. $V_{ILmax} = 0.5\text{ V}$
		Turn on: Pull down time	$\geq 100\text{ ms}$	$\geq 300\text{ ms}$

#### NOTE

- RESET\_N should not be pulled down to GND permanently.
- It is recommended to use RESET\_N only when failing to turn off the module by **AT+QPOWD** command or PWRKEY pin.

### 4.4. USB Interface

EG915U-EU/EG912Y-EU contains one integrated Universal Serial Bus (USB) interface which complies with the USB 2.0 specification. The interface supports USB devices only.

The minimum input voltage of the USB\_VBUS pin of EG915U-EU is 3.5V.

**Table 9: Pin Difference of USB\_VBUS**

Pin Name	Pin No.	Parameter	EG915U-EU	EG912Y-EU
		I/O	PI	PI
USB_VBUS	8	Voltage	$V_{max} = 5.25\text{ V}$ $V_{min} = 3.5\text{ V}$ $V_{norm} = 5.0\text{ V}$	$V_{max} = 5.25\text{ V}$ $V_{min} = 3.0\text{ V}$ $V_{norm} = 5.0\text{ V}$

**NOTE**

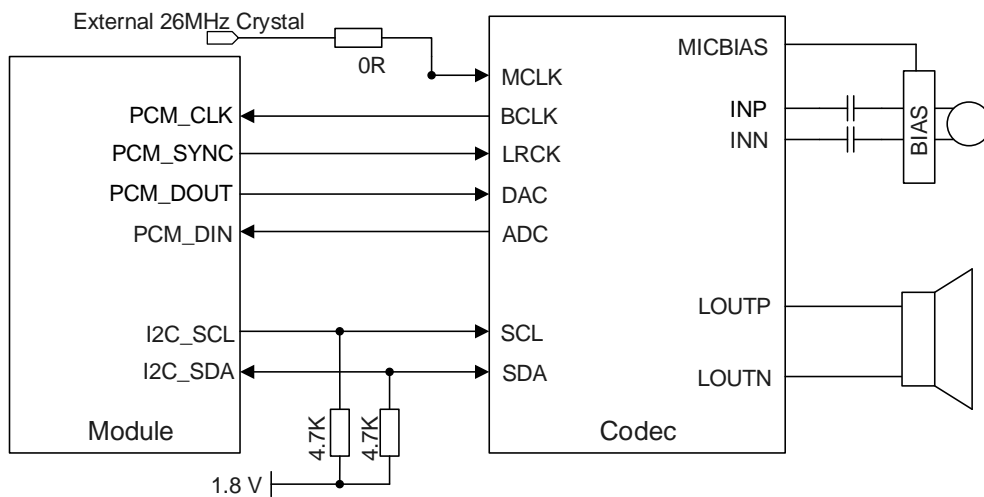
1. The minimum input voltage of the USB\_VBUS pin of EG915U-EU is 3.5 V
2. EG915U-EU and EG912Y-EU support high speed (480 Mbps) and full speed (12 Mbps) modes.

## 4.5. PCM Interface and I2C Interface

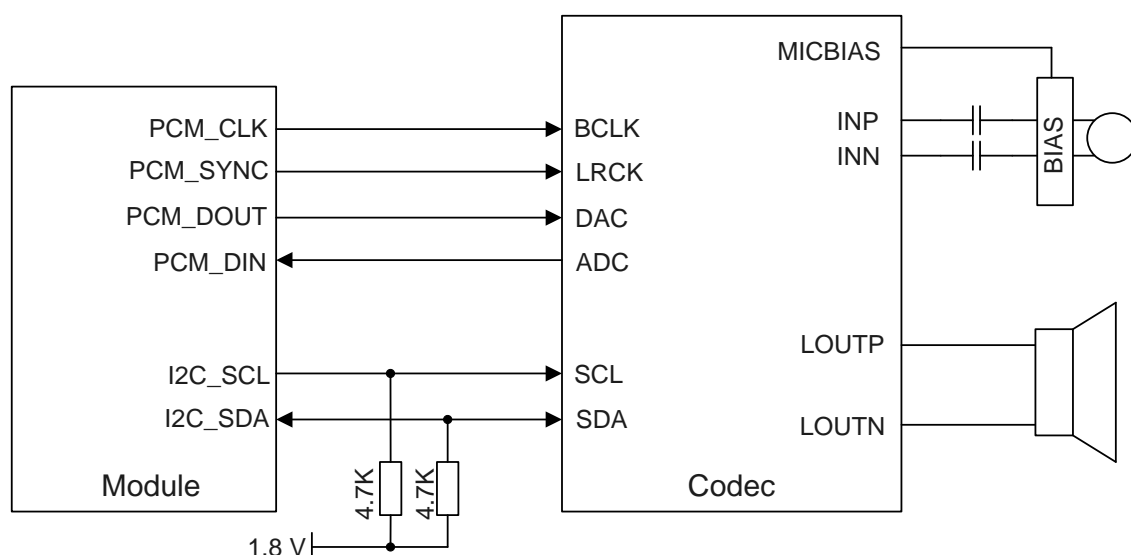
EG915U-EU/EG912Y-EU module provide one PCM digital interface and one I2C interface.

The PCM interface of EG915U-EU series only supports slave mode, not master mode. Therefore, an external clock must to be provided to the codec.

The PCM interface of EG912Y-EU series support long and short frame synchronization, works as master only.



**Figure 2: Reference Circuit of PCM Application with Audio Codec (EG915U-EU)**



**Figure 3: Reference Circuit of PCM Application with Audio Codec (EG912Y-EU)**

## 4.6. UART Interface

EG915U-EU provides three UART interfaces: main UART, debug UART and Auxiliary UART.

EG912Y-EU provides two UART interfaces: main UART and debug UART.

**Table 10: Pin Difference of UART**

Pin No.	EG915U-EU	EG912Y-EU	Comment
22	DBG_RXD	DBG_RXD	EG915U-EU: Only supports 921600 bps
23	DBG_TXD	DBG_TXD	EG912Y-EU: Only supports 115200 bps
27	AUX_TXD	SPI_TXD	EG915U-EU: supports AUX_UART function
28	AUX_RXD	SPI_RXD	EG912Y-EU: not support the AUX_UART function.

### NOTE

Transistor circuit solution is not suitable for applications with high baud rate exceeding 460 Kbps. Therefore, the debug UART of EG915U-EU cannot use transistor circuit solution.

## 4.7. ADC

EG915U-EU/EG912Y-EU provides two ADC interfaces: ADC0, ADC1.

Table 11: Pin Difference of ADC

Pin Name	Pin No.	Parameter	EG915U-EU	EG912Y-EU
ADC0	24	I/O	AI	AI
		Voltage	0.1 V to VBAT	0 V to VBAT
ADC1	2	I/O	AI	AI
		Voltage	0.1 V to VBAT	0 V to VBAT

## 4.8. Antenna Interfaces

ANT\_MAIN of EG915U-EU and EG912Y-EU are compatible.

Table 12: Pin Difference of ANT\_BT/ WIFI\_SCAN

Pin No.	EG915U-EU	EG912Y-EU	Comment
56	ANT_BT/WIFI_SCAN	RESERVED	EG912Y-EU does not support this function

### NOTE

- EG915U-EU support Bluetooth and Wi-Fi Scan functions. Due to the shared antenna interface, the two functions cannot be used simultaneously. Bluetooth and Wi-Fi Scan functions are optional (both supported or not), please contact Quectel Technical Support for details.
- EG915U-EU Wi-Fi Scan can only receive but not transmit.
- EG912Y-EU realizes WLAN function by providing an SDIO 3.0 WLAN interface\*. For more details,

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please contact Quectel Technical Support.

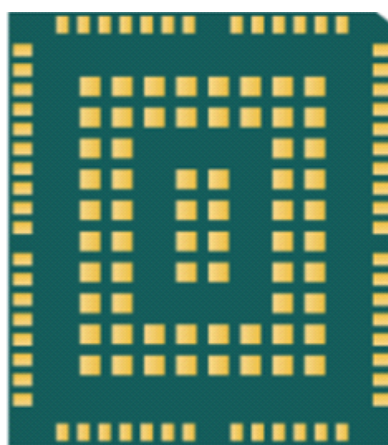
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# 5 Recommended Footprint

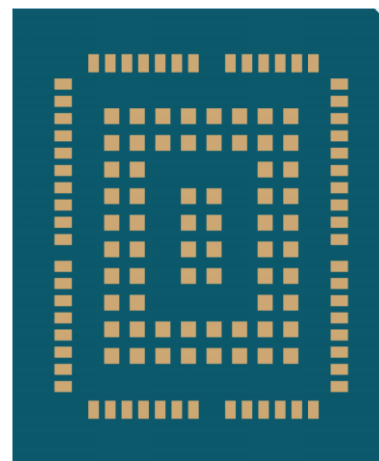
This chapter mainly introduces the recommended footprint and stencil design for EG915U-EU and EG912Y-EU modules. All dimensions are measured in mm, and the tolerances for dimensions without tolerance values are  $\pm 2$  mm.

## 5.1. Recommended Compatible Footprint

The following figure shows the bottom views of EG915U-EU and EG912Y-EU



EG915U-EU

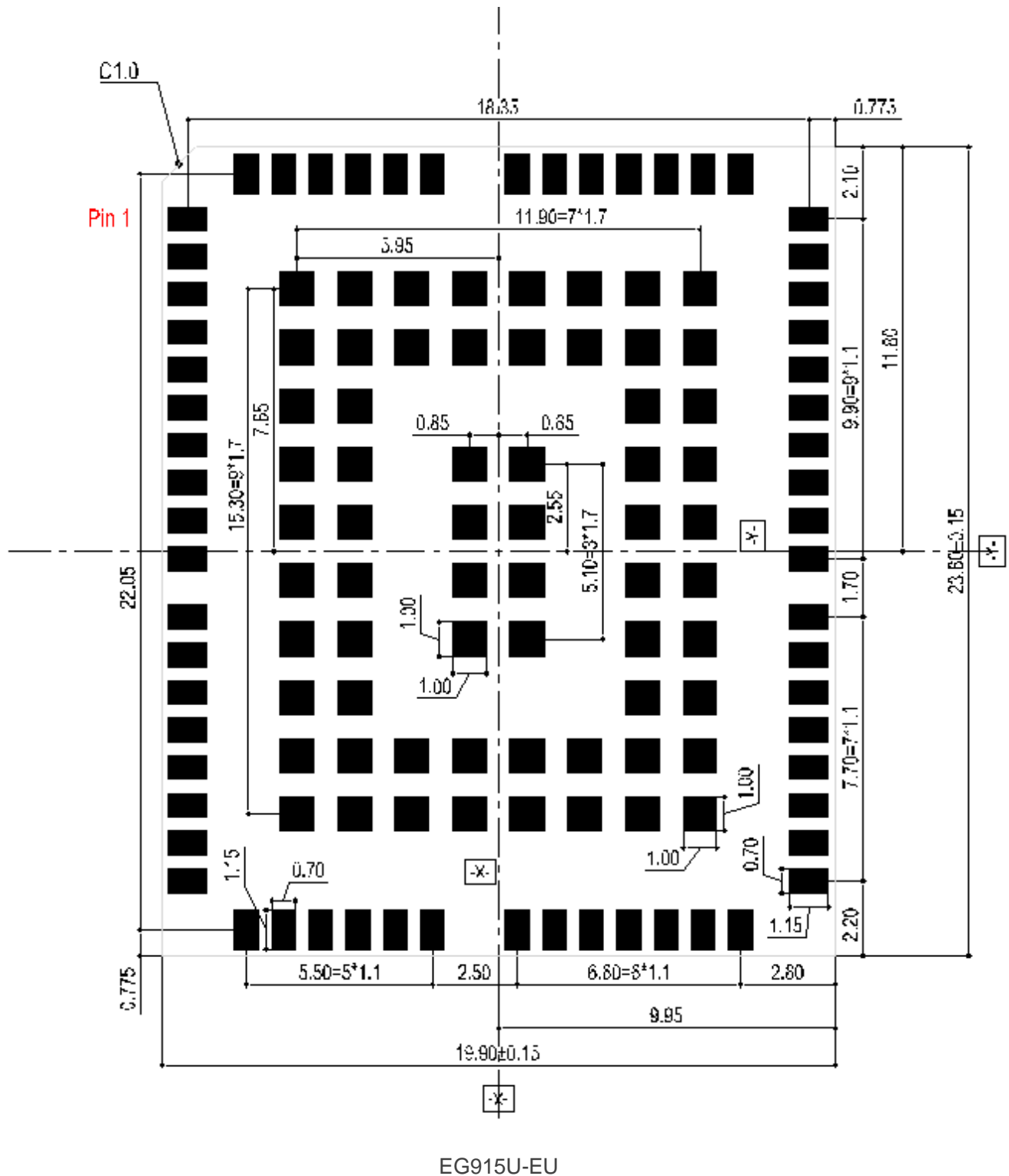


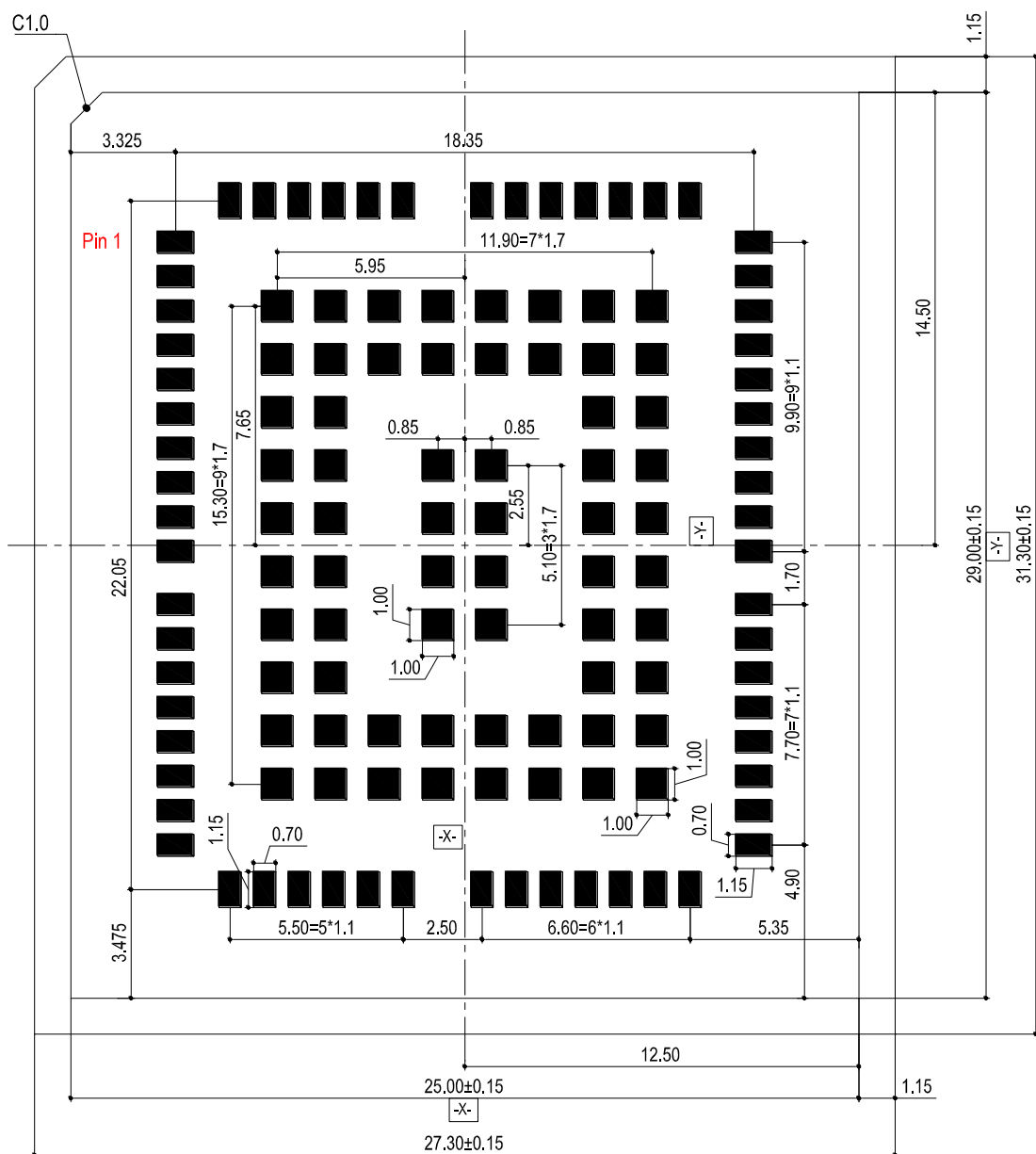
EG912Y-EU

Figure 14: Bottom Views of EG915U-EU/EG912Y-EU



The following figure shows the recommended compatible footprint of EG915U-EU/EG912Y-EU.





EG912Y-EU

**Figure 4: Recommended Footprint of EG915U-EU/EG912Y-EU**

## NOTE

1. For easy maintenance of this module, it is recommended to keep a distance of no less than 3 mm between the module and other components on a motherboard.
2. In the footprint drawing of EG912Y-EU, the outermost line is an extended size, please refer to the extended size to design.
3. The pad size of EG915U-EU and EG912Y-EU are the same, if you want to use a compatible design

that meets the requirements of EG915U-EU and EG912Y-EU, please use the expanded size of EG912Y-EU as the reference design size. For details, please contact Quectel Technical Support.

## 5.2. Installation Sketch Map

The following figure shows the sketch map of installation among EG915U-EU and EG912Y-EU.

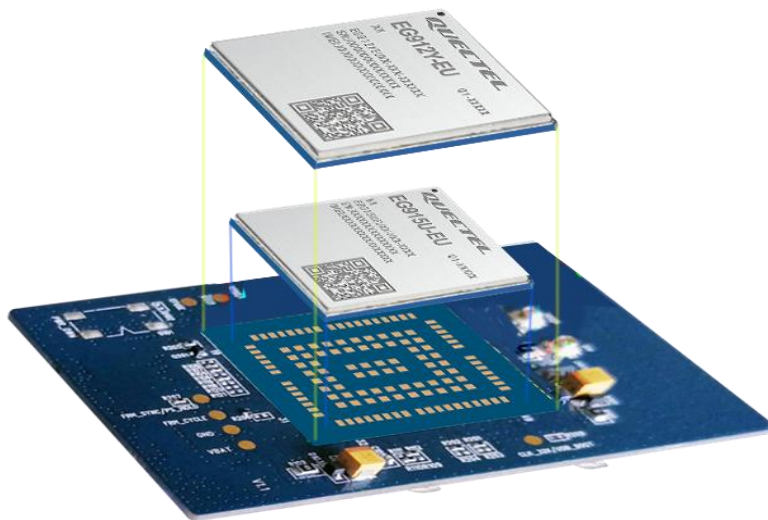


Figure 5: Installation Sketch Map for EG915U-EU and EG912Y-EU

# 6 Appendix References

**Table 13: Related Documents**

Document Name
[1] Quectel_EG915U-EU_Hardware_Design
[2] Quectel_EG912Y-EU_Hardware_Design
[3] Quectel_EG915U_Series_Reference_Design
[4] Quectel_EG912Y-EU_Reference_Design
[5] Quectel_UMTS&LTE_EVB_User_Guide
[6] Quectel_EC200x&EG912Y&EC100Y_Series_AT_Commands_Manual
[7] Quectel_Module_Secondary_SMT_User_Guide

**Table 14: Terms and Abbreviations**

Abbreviation	Description
DTE	Data Terminal Equipment
EDGE	Enhanced Data rates for GSM Evolution
FDD	Frequency Division Duplex
GNSS	Global Navigation Satellite System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
LDO	Low Dropout Regulator
LED	Light Emitting Diode

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LGA	Land Grid Array
LTE	Long Term Evolution
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
RF	Radio Frequency
SMS	Short Message Service
TDD	Time Division Duplexing
USB	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module

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