



## MEASUREMENT REPORT

**Applicant** : Fanstel Corporation, Taipei

**Address** : 10F-10, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsi-Chih, New Taipei City 221 Taiwan

**Product** : BLG840F/X BLE/802.15.4 to LTE Gateways

**Model No.** : BLG840F, BLG840X, BLG40F, BLG840E, BLG840XE, BLG40E, BLE840F, BLE840X, BLE40F, LN60G840F, LN60G840X, LN60G40F, LN60G840E, LN60G840XE, LN60G40E, LN60E840F, LN60E840X, LN60E40F

**Trademark** : Fanstel

**Standards** : EN 303 413 V1.2.1 (2021-04)

**Result** : Complies

**Received Date** : May 24, 2022

**Test Date** : June 22, 2022~ June 23, 2022

**Tested By** : *Fran Chen*  
( Fran Chen )

**Reviewed By** : *Paddy Chen*  
( Paddy Chen )

**Approved By** : *Chenz Ker*  
( Chenz Ker )



The test results only relate to the tested sample.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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### Revision History

Report No.	Version	Description	Issue Date	Note
2205TWB901-E2	1.0	Original Report	2022-08-25	

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## 1. General Information

<b>Applicant</b>	Fanstel Corporation, Taipei
<b>Applicant Address</b>	10F-10, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsi-Chih, New Taipei City 221 Taiwan
<b>Manufacturer</b>	Fanstel Corporation, Taipei
<b>Manufacturer Address</b>	10F-10, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsi-Chih, New Taipei City 221 Taiwan
<b>Test Site</b>	MRT Technology (Taiwan) Co., Ltd
<b>Test Site Address</b>	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
<b>Test Device Serial No</b>	#1-1 <input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering

### Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan ( R.O.C )

- MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
- MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
- MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.

## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

Product Name	BLG840F/X BLE/802.15.4 to LTE Gateways
Trademark	Fanstel
Model No.	BLG840F, BLG840X, BLG40F, BLG840E, BLG840XE, BLG40E, BLE840F, BLE840X, BLE40F, LN60G840F, LN60G840X, LN60G40F, LN60G840E, LN60G840XE, LN60G40E, LN60E840F, LN60E840X, LN60E40F
Hardware Version	BT840XE-V5
Firmware Version	N/A
GNSS	GPS: 1559MHz~1610MHz
Power Adapter	Brand: GAT Model No: GA-0502000V Input: AC 100-240V~ 50/60Hz 0.6A Output: DC 5.0V, 2000mA

#### Note:

##### 1. Model Difference Description:

BLE to LTE Gateways		
BLG840F	LN60G840F	BT840F, nRF9160, integrated GPS antenna
BLG840X	LN60G840X	BT840X, nRF9160, integrated GPS antenna
BLG40F	LN60G40F	BT40F, nRF9160, integrated GPS antenna
BLG840E	LN60G840E	BT840E, nRF9160, integrated GPS antenna
BLG840XE	LN60G840XE	BT840XE, nRF9160, integrated GPS antenna
BLG40E	LN60G40E	BT40E, nRF9160, integrated GPS antenna
BLE840F	LN60E840F	BT840F, nRF9160, external GPS antenna (not included)
BLE840X	LN60E840X	BT840X, nRF9160, external GPS antenna (not included)
BLE40F	LN60E40F	BT40F, nRF9160, external GPS antenna (not included)

##### 2. The test was performed base on BLG840F.

## 2.2. Product Specification Subjective to this Report

GNSS	GPS
GNSS Signal Designations	L1
Frequency Range	1559 to 1610MHz
Type of Modulation	BPSK
Antenna Type	Integrated Chip Antenna External Ceramic Antenna

### 2.3. Operation Frequency

Global Navigation Satellite System (GNSS) User Equipment (GUE) is capable of operating as part of one or more radio navigation-satellite service (RNSS) systems in the RNSS frequency bands given below table.

GNSS	GNSS Signal Designations	RNSS Frequency Band (MHz)
BDS	B1I	1 559 to 1 610
Galileo	E1	1 559 to 1 610
	E5a	1 164 to 1 215
	E5b	1 164 to 1 215
	E6	1 215 to 1 300
GLONASS	G1	1 559 to 1 610
	G2	1 215 to 1 300
GPS	<b>L1</b>	<b>1 559 to 1 610</b>
	L2	1 215 to 1 300
	L5	1 164 to 1 215
SBAS	L1	1 559 to 1 610
	L5	1 164 to 1 215

## 2.4. Application Form for Testing

GNSS		GNSS Signal Designations	RNSS Frequency Band (MHz)
<input type="checkbox"/>	BDS	B1I	1 559 to 1 610
<input type="checkbox"/>	Galileo	E1	1 559 to 1 610
<input type="checkbox"/>		E5a	1 164 to 1 215
<input type="checkbox"/>		E5b	1 164 to 1 215
<input type="checkbox"/>		E6	1 215 to 1 300
<input type="checkbox"/>	GLONASS	G1	1 559 to 1 610
<input type="checkbox"/>		G2	1 215 to 1 300
<input checked="" type="checkbox"/>	GPS	<b>L1</b>	<b>1 559 to 1 610</b>
<input type="checkbox"/>		L2	1 215 to 1 300
<input type="checkbox"/>		L5	1 164 to 1 215
<input type="checkbox"/>	SBAS	L1	1 559 to 1 610
<input type="checkbox"/>		L5	1 164 to 1 215

## 2.5. Standards Applicable for Testing

The EUT complies with the requirements of EN 303 413 V1.2.1.

### **3. Test Configuration of Equipment under Test**

#### **3.1. Test Mode**

Test Mode
Mode 1: Receiver by GPS with Integrated Antenna
Mode 2: Receiver by GPS with External Antenna

#### **3.2. Test Software**

The test utility software used during testing was “Docklight”.

#### 4. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ }^{\circ}\text{C}$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

## 5. List of Measuring Instrument

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
GNSS Signal Simulator	Spectracom	GSG-5	MRTTWA00080	2 year	2023/4/24

### Radiated Emissions – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2022/10/4
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2023/3/9
Active Loop Antenna	Schwarzbeck	FMZB 1519B	MRTTWA00002	1 year	2023/5/24
Broadband Horn antenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2023/3/30
Breitband Hornantenna	Schwarzbeck	BBHA 9170	MRTTWA00004	1 year	2023/3/29
Broadband Amplifier	Schwarzbeck	BBV 9721	MRTTWA00006	1 year	2023/3/30
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2023/3/30
Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2023/6/14
Cable	Rosnol	K1K50-UP0264- K1K50-4M	MRTTWE00012	1 year	2023/6/19

### Conducted Test Equipment – SR5

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Keysight	N9010A	MRTTWA00012	1 year	2022/10/18
EXA Signal Analyzer	Keysight	N9010B	MRTTWA00074	1 year	2023/7/19
Communication Tester	R&S	CMW 500	MRTTWA00084	1 year	2022/10/18

### Test Software

Software	Version	Function
e3	9.160520a	EMI Test Software
EMI	V3	EMI Test Software

## 6. Test Summary

Clause (EN 303413)	Test Item	Result (Pass/Fail)	Remark
Receiver Parameters			
4.2.1	Adjacent signal selectivity	Pass	--
4.2.2	Spurious emissions	Pass	--

Note: Determining compliance is based on the test results met the regulation limits or requirements declared by clients, and the test results don't take into account the value of measurement uncertainty.

## 7. Adjacent signal selectivity

### 7.1. Limit

The  $C/N_0$  metric reported by the GUE for all GNSS signals and supported by the GUE shall not degrade by more than the value given in equation 1 when an adjacent frequency signal is applied. The adjacent frequency signal is defined in table 3, with the frequencies and power levels defined in table 1 and/or in table 2 depending on the RNSS bands supported by the GUE.

Equation 1: Maximum degradation in  $C/N_0$

$$\Delta C/N_0 \leq 1$$

**Table 1**

Adjacent frequency signal test point centre frequencies and power levels for the 1559 MHz to 1610 MHz RNSS band		
Frequency band (MHz)	Test point centre frequency (MHz)	Adjacent frequency signal power level (dBm)
1518 to 1525	1524	-65
1525 to 1549	1548	-95
1549 to 1559	1554	-105
1559 to 1610	GUE RNSS band under test	
1610 to 1626	1615	-105
1626 to 1640	1627	-85

**Table 2**

Adjacent frequency signal test point centre frequencies and power levels for the 1164 MHz to 1300 MHz RNSS band		
Frequency band (MHz)	Test point centre frequency (MHz)	Adjacent frequency signal power level (dBm)
960 to 1164	1154	-75
1164 to 1215	GUE RNSS band under test	
1215 to 1260		
1260 to 1300		
1300 to 1350	1310	-85

**Table 3**

Adjacent frequency signal	
Parameter	Value
Frequency	Table 1 & Table 2
Power level	Table 1 & Table 2
Bandwidth	1MHz
Format	AWGN

**GNSS signal details:**

The relevant GNSS and GNSS signals and the relative signal levels between signal types per GNSS are detailed in table 4.

**Table 4**

	Galileo		GPS/Modernized GPS		GLONASS		SBAS		BDS (see note 2)		
Signal Level relative to reference	E1	0 dB	L1 C/A	0 dB	G1	0 dB	L1	0 dB	B1I	D1	0 dB
	E6	+2 dB	L1C	+1.5 dB	G2	-6 dB				D2	+5 dB
	E5	+2 dB	L2C	-1.5 dB							
Power levels (see note 1)			L5	+ 3.6 dB							

NOTE 1: The signal levels represent the total signal power of the satellite per channel, not for example pilot and data channels separately.

NOTE 2: For BDS, D1 represents MEO/IGSO satellites B1I signal type and D2 represents GEO satellites B1I signal type.

Where more than one GNSS is supported then the relative signal levels between GNSS to be used during conformance testing are detailed in table 5.

**Table 5**

GNSS	Relative signal level for all satellites (see note)
GPS	0 dB
Galileo	+1.5 dB
GLONASS	-2.5 dB
SBAS	-2.5 dB
BDS	-4.5 dB

NOTE: GPS is used as the reference GNSS. If GPS is not supported then values shall be adjusted and referenced to another supported GNSS.

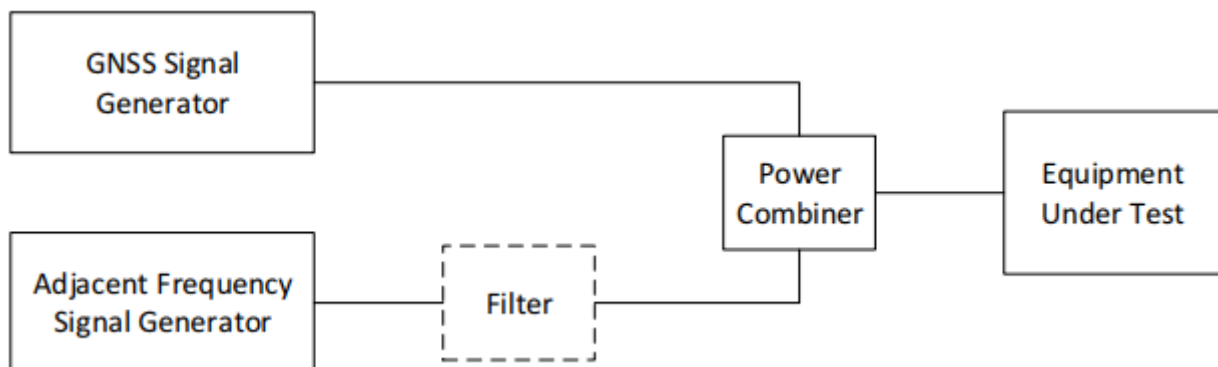
The signal level(s) for each GNSS shall be as detailed in table 6 which also gives the maximum signal level that shall be used for each GNSS when the effects of table 4 and table 5 are taken into account.

**Table 6**

GNSS	Parameters	Value
GPS	(Maximum) signal level	-128.5 dBm
Galileo	(Maximum) signal level	-127 dBm
GLONASS	(Maximum) signal level	-131 dBm
SBAS	(Maximum) signal level	-131 dBm
BDS	(Maximum) signal level	-133 dBm

## 7.2. Test Setup

### For Conducted Measurement



## 7.3. Test Procedure

Refer to EN 303 413 V1.2.1 (2021-04) Clause 5.3.

## 7.4. Test Result

### GPS

Frequency band (MHz)	Test point center frequency (MHz)	Adjacent frequency signal power level	Measured $C/N_0$ (dB-Hz)			
	From Table 1	From Table 1	No interfering signal	With interfering signal	Decrease of $C/N_0$	Pass / Fail
1518 to 1525	1524	-65 dBm	35	35	0	Pass
1525 to 1549	1548	-95 dBm		35	0	Pass
1549 to 1559	1554	-105 dBm		35	0	Pass
1610 to 1626	1615	-105 dBm		35	0	Pass
1626 to 1640	1627	-85 dBm		35	0	Pass
Note: The value of C/No is average.						

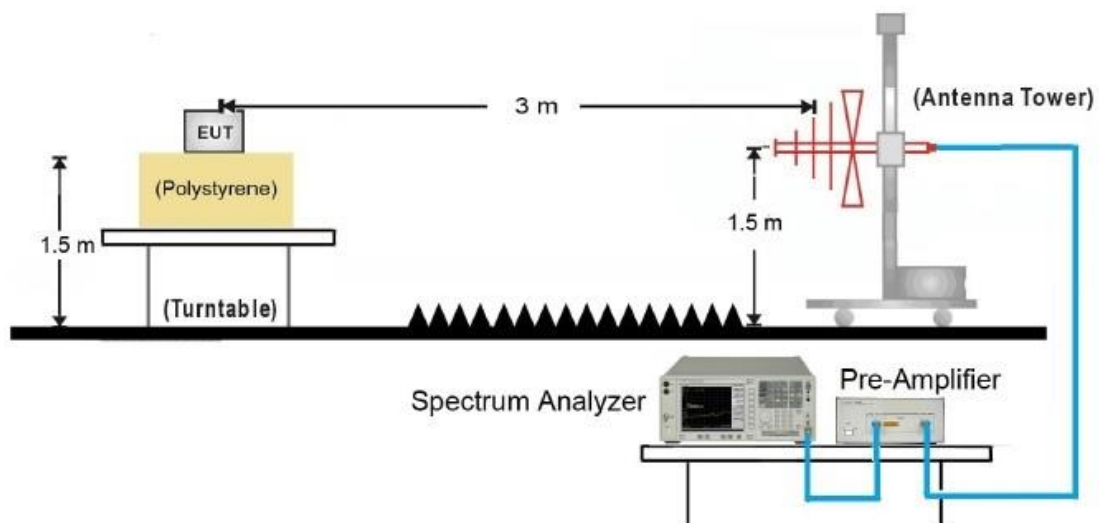
## 8. Receiver Spurious Emissions

### 8.1. Limit

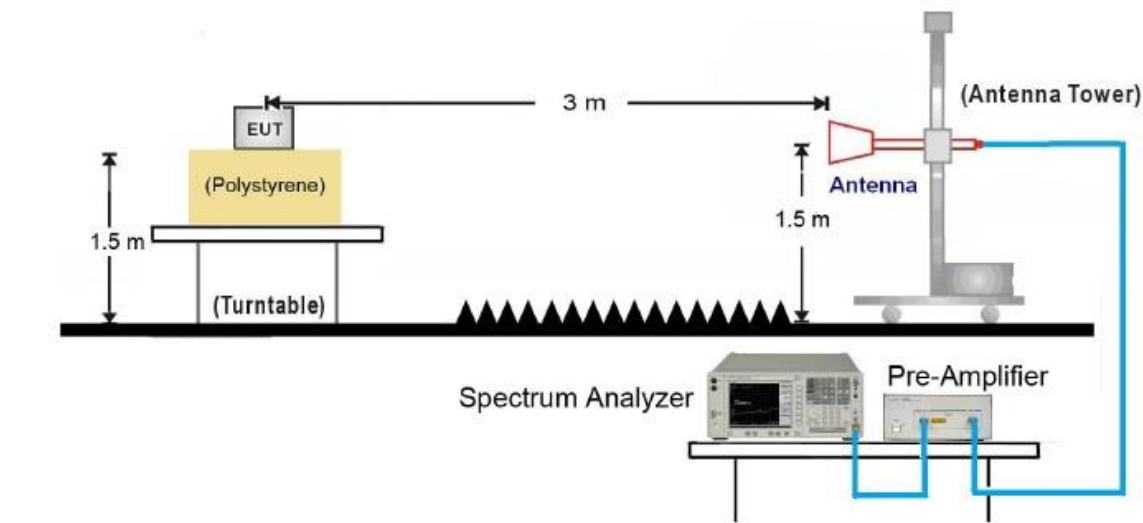
Spurious Emissions Limits for Receivers		
Frequency Range	Maximum Power E.R.P	Measurement Bandwidth
30 MHz to 1 GHz	-57dBm	100 kHz
1 GHz to 8.3 GHz	-47dBm	1 MHz

### 8.2. Test Setup

30MHz ~ 1GHz Test Setup:



1GHz ~ 12.5GHz Test Setup:

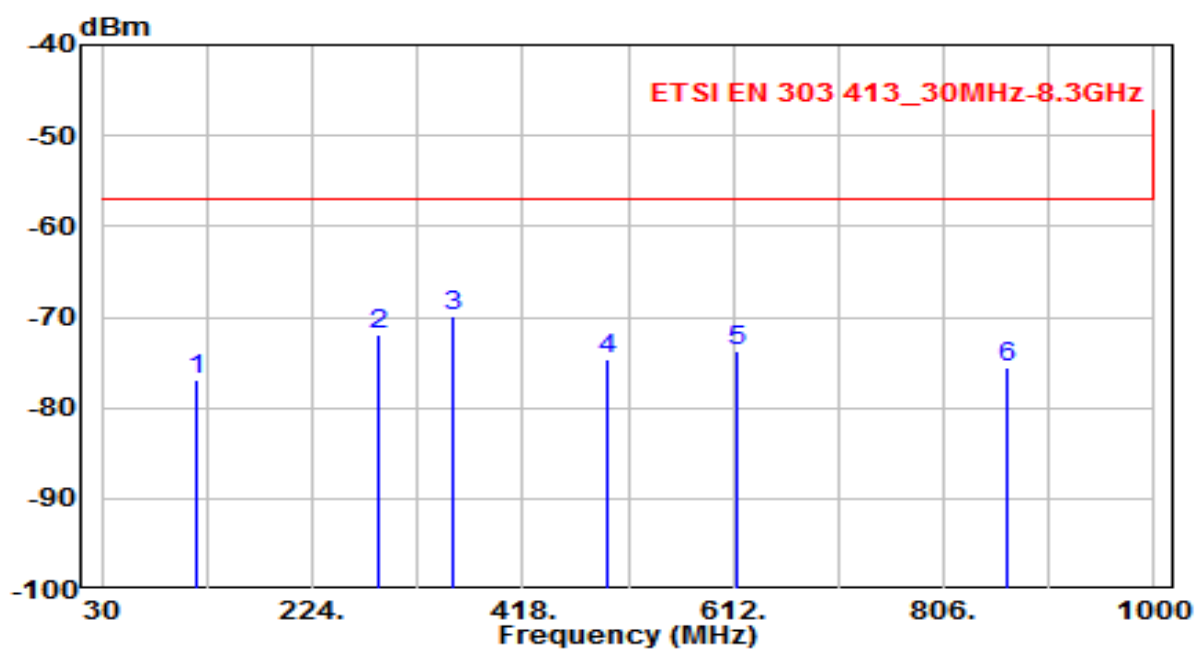


### 8.3. Test Procedure

Refer to EN 303 413 V1.2.1 (2021-04) Clause 5.5.

## 8.4. Test Result

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-22
Factor	ERP_30MHz~1GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with Integrated Antenna	Test Voltage	AC 230V/50Hz

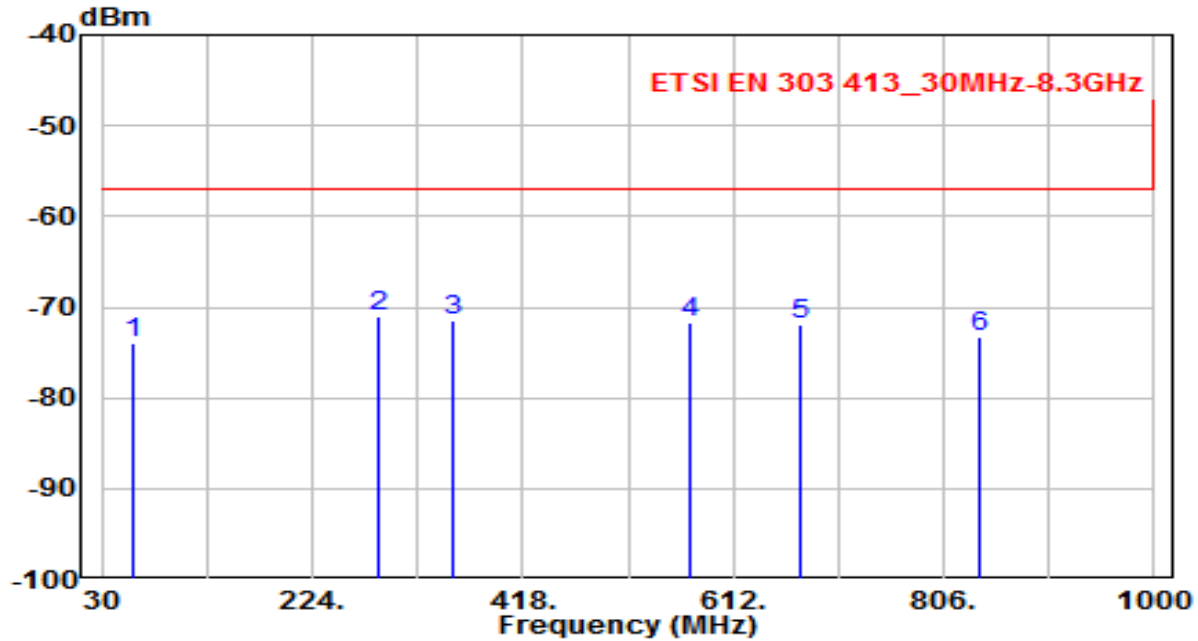


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	116.330	-93.52	16.69	-76.82	-19.82	-57.00	150	360	Peak
2	286.080	-92.59	20.73	-71.85	-14.85	-57.00	150	360	Peak
3	* 353.980	-91.66	21.86	-69.79	-12.79	-57.00	150	360	Peak
4	496.570	-99.38	24.72	-74.66	-17.66	-57.00	150	360	Peak
5	614.910	-99.77	26.13	-73.63	-16.63	-57.00	150	360	Peak
6	865.170	-105.42	29.84	-75.59	-18.59	-57.00	150	360	Peak

Note:

1. " \* ", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-22
Factor	ERP_30MHz~1GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with Integrated Antenna	Test Voltage	AC 230V/50Hz

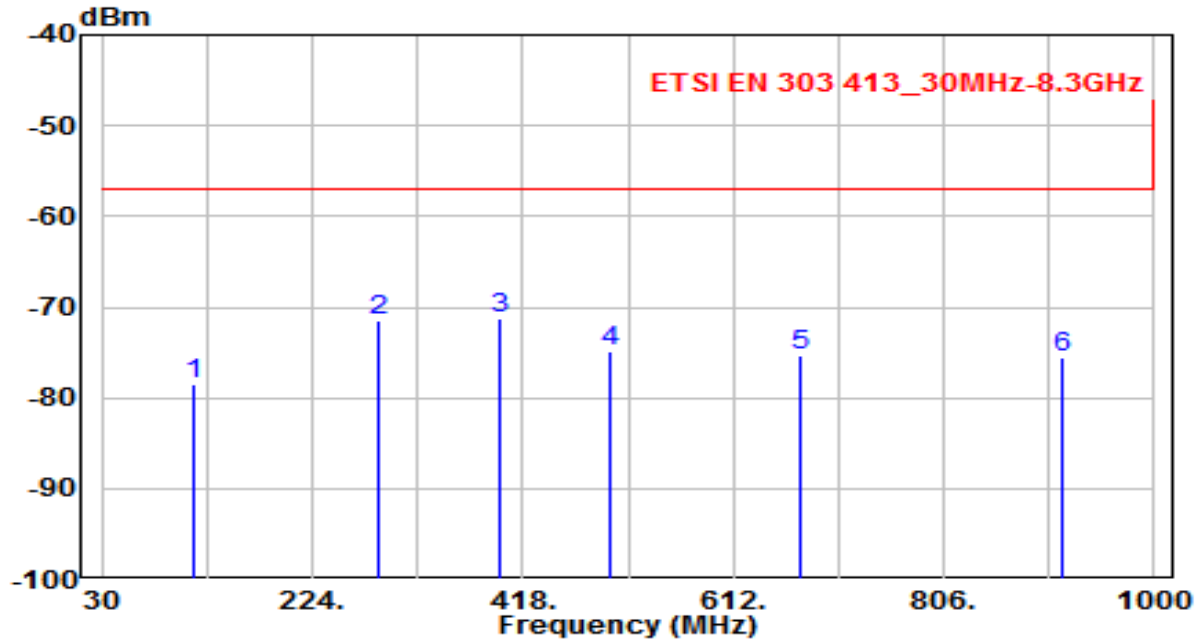


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	58.130	-92.59	18.67	-73.92	-16.92	-57.00	150	360	Peak
2	* 286.080	-93.05	21.95	-71.10	-14.10	-57.00	150	360	Peak
3	353.980	-95.35	23.82	-71.52	-14.52	-57.00	150	360	Peak
4	573.200	-99.51	27.89	-71.62	-14.62	-57.00	150	360	Peak
5	673.110	-100.54	28.68	-71.86	-14.86	-57.00	150	360	Peak
6	839.950	-104.46	31.26	-73.20	-16.20	-57.00	150	360	Peak

Note:

1. " \* ", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

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Factor	ERP_30MHz~1GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with External Antenna	Test Voltage	AC 230V/50Hz

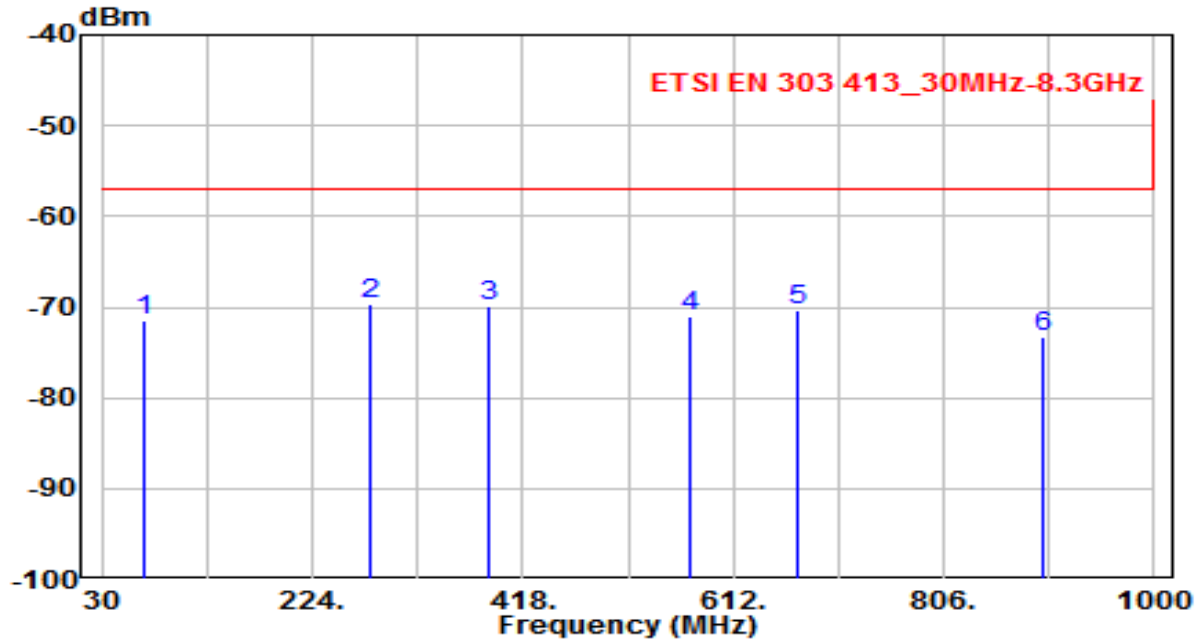


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	115.360	-95.71	17.20	-78.51	-21.51	-57.00	150	360	Peak
2	286.080	-92.21	20.73	-71.48	-14.48	-57.00	150	360	Peak
3	* 395.690	-94.12	22.83	-71.29	-14.29	-57.00	150	360	Peak
4	497.540	-99.62	24.76	-74.86	-17.86	-57.00	150	360	Peak
5	675.050	-102.55	27.15	-75.40	-18.40	-57.00	150	360	Peak
6	914.640	-105.59	30.11	-75.48	-18.48	-57.00	150	360	Peak

Note:

1. " \* ", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-22
Factor	ERP_30MHz~1GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with External Antenna	Test Voltage	AC 230V/50Hz

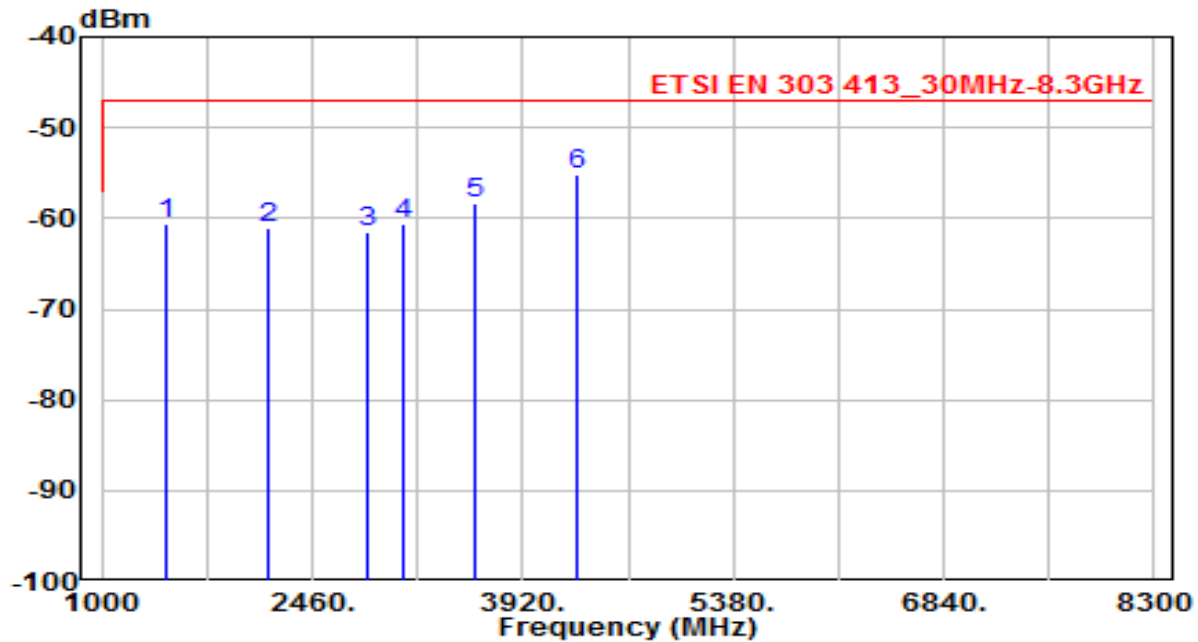


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	69.770	-88.45	16.93	-71.52	-14.52	-57.00	150	360	Peak
2	* 277.350	-91.12	21.48	-69.63	-12.63	-57.00	150	360	Peak
3	386.960	-95.04	25.04	-69.99	-12.99	-57.00	150	360	Peak
4	572.230	-98.82	27.87	-70.95	-13.95	-57.00	150	360	Peak
5	671.170	-99.00	28.63	-70.38	-13.38	-57.00	150	360	Peak
6	897.180	-104.95	31.69	-73.26	-16.26	-57.00	150	360	Peak

Note:

1. " \*", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-23
Factor	EIRP_1GHz~18GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with Integrated Antenna	Test Voltage	AC 230V/50Hz

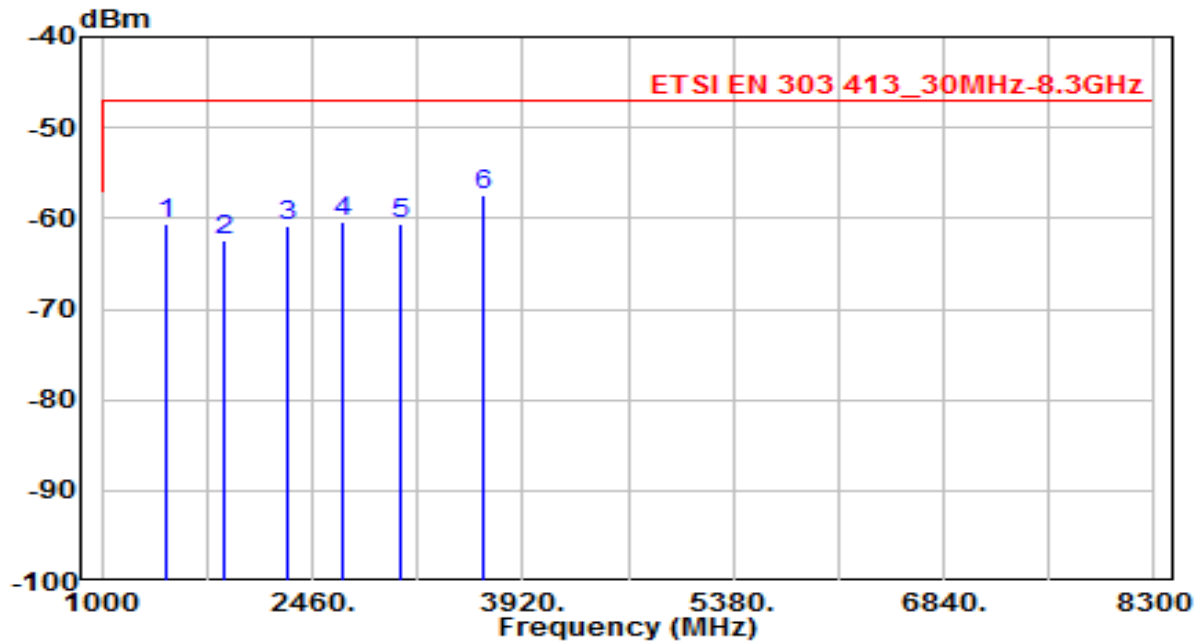


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1449.634	-65.85	5.26	-60.58	-13.58	-47.00	150	360	Peak
2	2149.978	-67.63	6.49	-61.13	-14.13	-47.00	150	360	Peak
3	2836.406	-68.80	7.22	-61.57	-14.57	-47.00	150	360	Peak
4	3084.606	-67.89	7.38	-60.52	-13.52	-47.00	150	360	Peak
5	3596.747	-68.31	9.96	-58.35	-11.35	-47.00	150	360	Peak
6	* 4299.828	-68.46	13.20	-55.26	-8.26	-47.00	150	360	Peak

Note:

1. " \*", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-23
Factor	EIRP_1GHz~18GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with Integrated Antenna	Test Voltage	AC 230V/50Hz

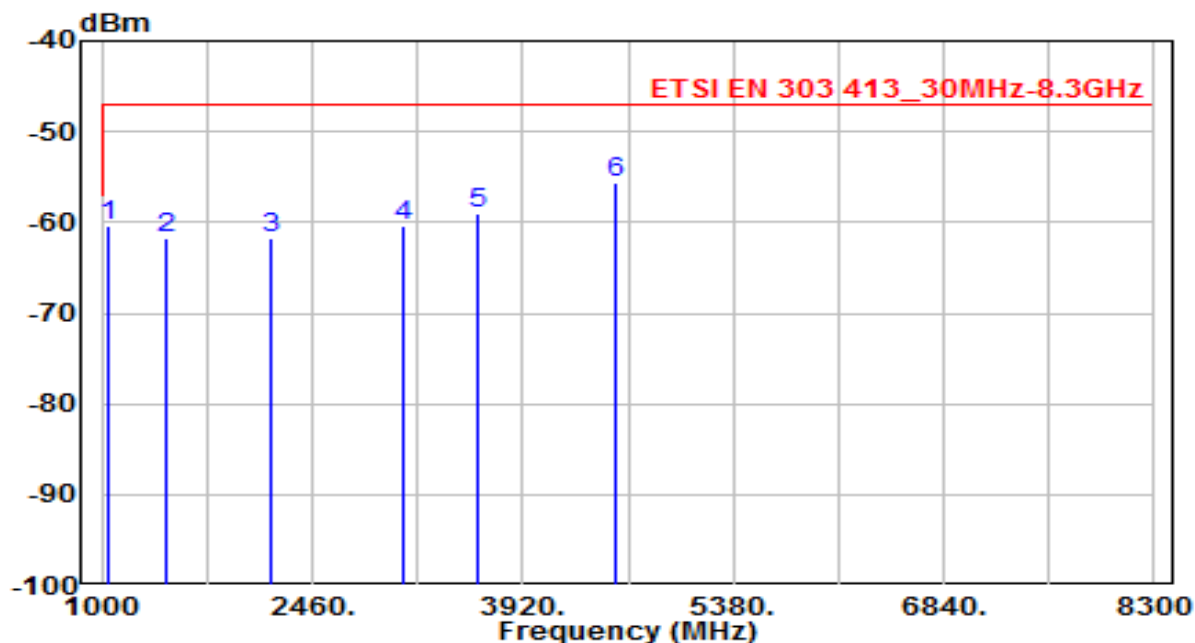


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1450.775	-66.57	5.92	-60.65	-13.65	-47.00	150	360	Peak
2	1856.609	-67.65	5.30	-62.35	-15.35	-47.00	150	360	Peak
3	2283.431	-69.11	8.20	-60.91	-13.91	-47.00	150	360	Peak
4	2678.087	-68.36	7.97	-60.39	-13.39	-47.00	150	360	Peak
5	3067.269	-67.86	7.21	-60.65	-13.65	-47.00	150	360	Peak
6	* 3641.231	-67.19	9.64	-57.54	-10.54	-47.00	150	360	Peak

Note:

1. " \*", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-23
Factor	EIRP_1GHz~18GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with External Antenna	Test Voltage	AC 230V/50Hz

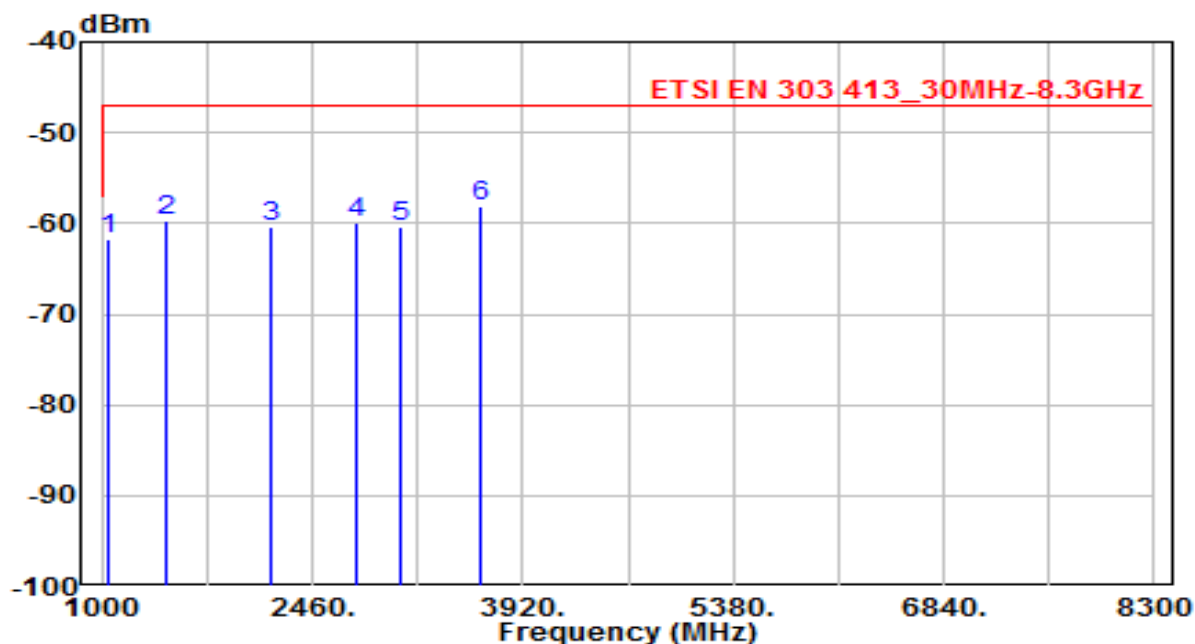


No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1044.256	-63.74	3.38	-60.36	-13.36	-47.00	150	360	Peak
2	1451.231	-66.87	5.23	-61.63	-14.63	-47.00	150	360	Peak
3	2176.897	-67.99	6.28	-61.70	-14.70	-47.00	150	360	Peak
4	3083.466	-67.67	7.38	-60.28	-13.28	-47.00	150	360	Peak
5	3605.644	-68.97	9.95	-59.02	-12.02	-47.00	150	360	Peak
6	* 4572.666	-69.96	14.40	-55.56	-8.56	-47.00	150	360	Peak

Note:

1. " \*", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	BLG840F/X BLE/802.15.4 to LTE Gateways	Date of Test	2022-06-23
Factor	EIRP_1GHz~18GHz (RX)	Temp. / Humidity	22°C /57%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	RX-GPS with External Antenna	Test Voltage	AC 230V/50Hz



No	Frequency (MHz)	Reading (dBm)	C.F (dB)	Measurement (dBm)	Margin (dB)	Limit (dBm)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1049.503	-64.08	2.26	-61.82	-14.82	-47.00	150	360	Peak
2	1448.494	-65.48	5.89	-59.59	-12.59	-47.00	150	360	Peak
3	2165.491	-68.25	7.82	-60.43	-13.43	-47.00	150	360	Peak
4	2758.844	-68.51	8.49	-60.02	-13.02	-47.00	150	360	Peak
5	3075.938	-67.56	7.24	-60.32	-13.32	-47.00	150	360	Peak
6	* 3629.597	-67.89	9.78	-58.11	-11.11	-47.00	150	360	Peak

Note:

1. " \*", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBm) = Reading(dBm) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

## Appendix A : Test Photograph

Test Mode: Mode1

Description: Radiated Emission Test Setup for below 1GHz



Test Mode: Mode1

Description: Radiated Emission Test Setup for above 1GHz



Test Mode: Mode2

Description: Radiated Emission Test Setup for below 1GHz



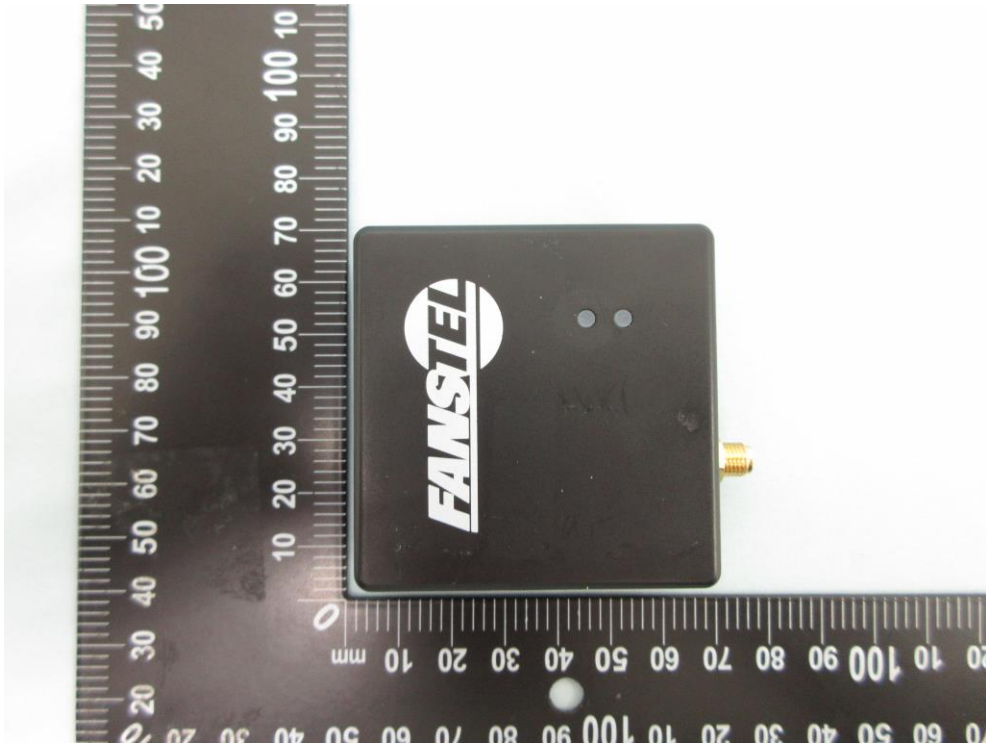
Test Mode: Mode2

Description: Radiated Emission Test Setup for above 1GHz

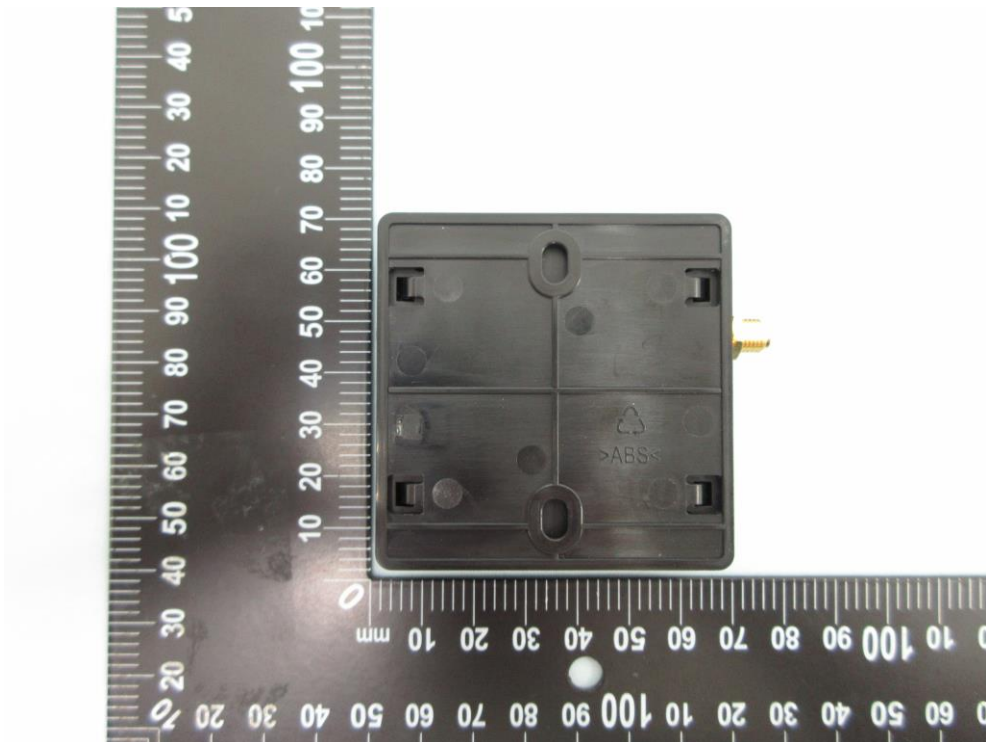


## Appendix B : External Photograph

(1) EUT Photo (BLG40F with GPS Integrated Antenna)



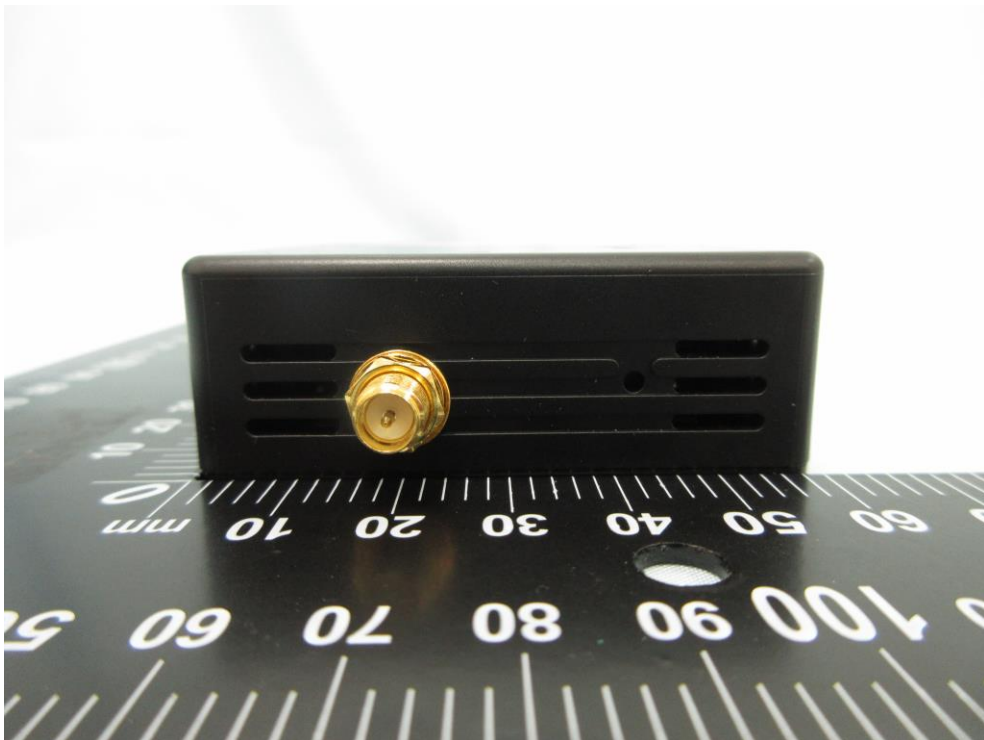
(2) EUT Photo (BLG40F with GPS Integrated Antenna)



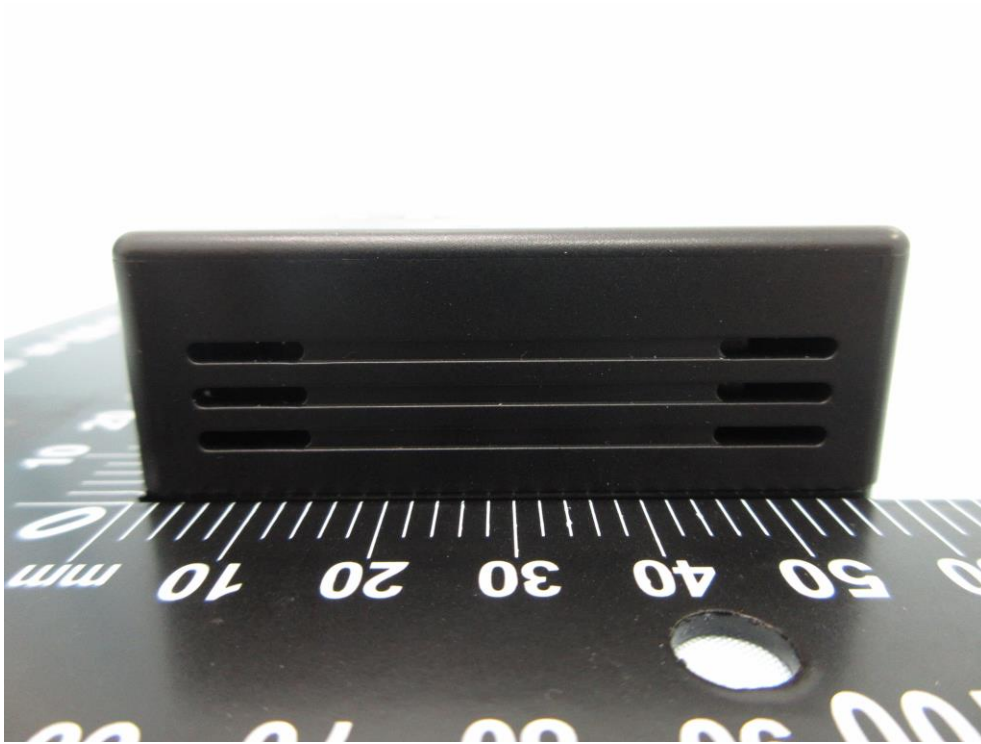
(3) EUT Photo (BLG40F with GPS Integrated Antenna)



(4) EUT Photo (BLG40F with GPS Integrated Antenna)



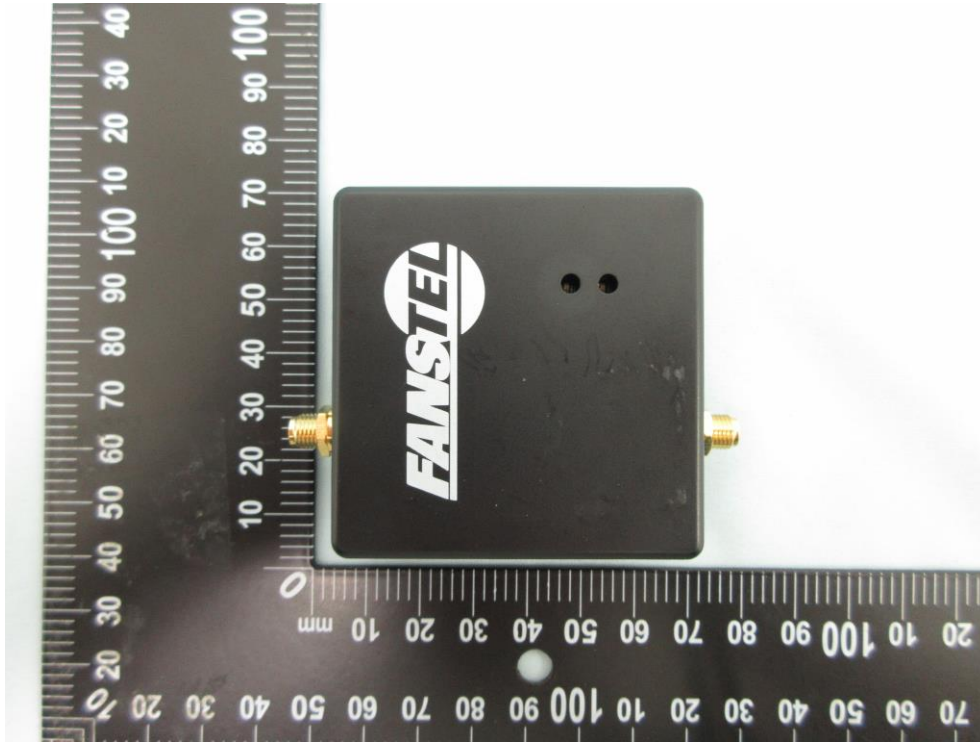
(5) EUT Photo (BLG40F with GPS Integrated Antenna)



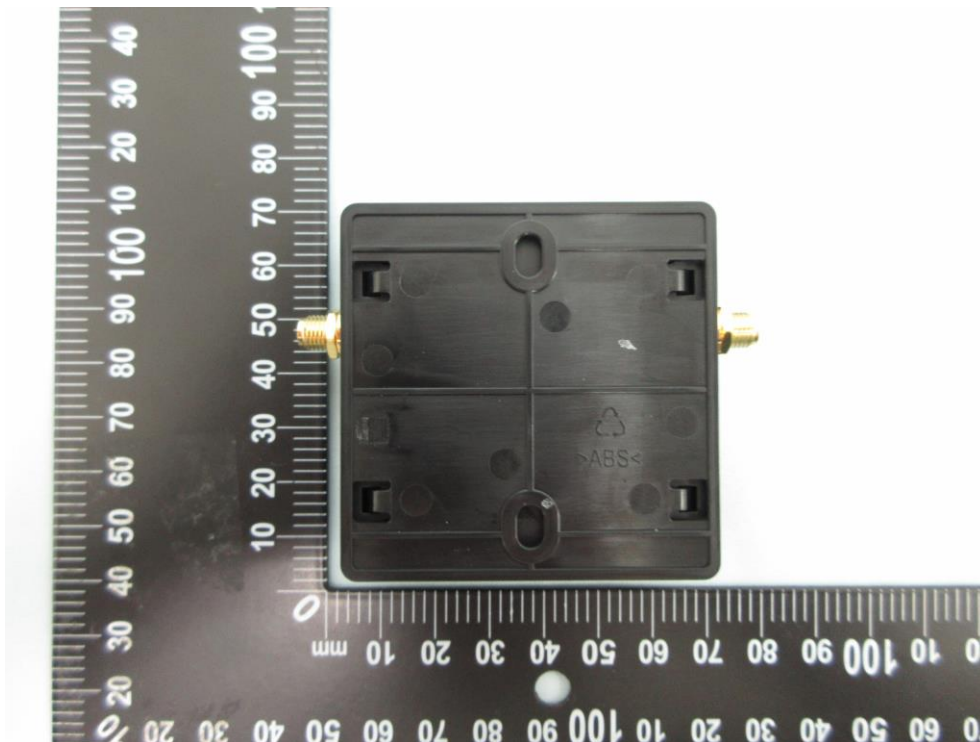
(6) EUT Photo (BLG40F with GPS Integrated Antenna)



(7) EUT Photo (BLE840X with GPS External Antenna)



(8) EUT Photo (BLE840X with GPS External Antenna)



(9) EUT Photo (BLE840X with GPS External Antenna)



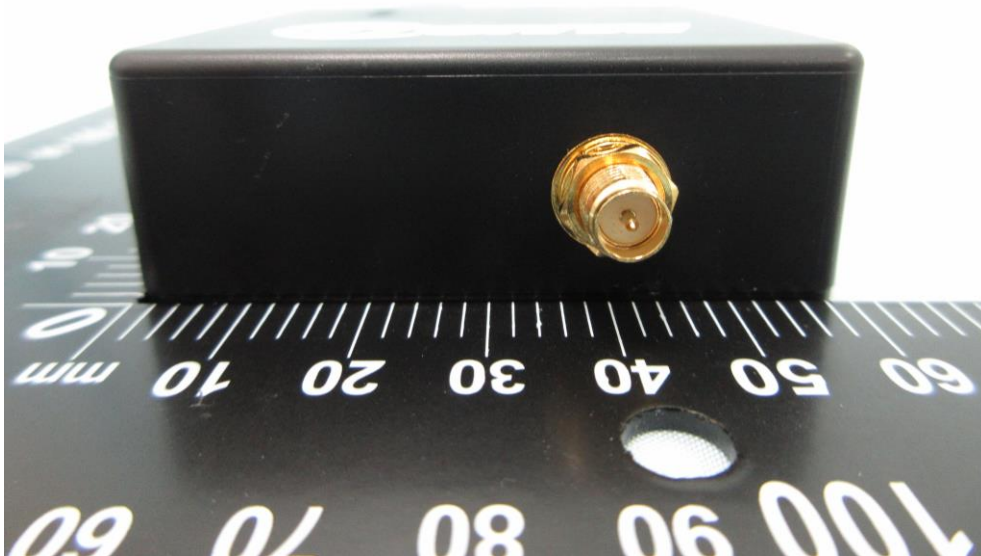
(10) EUT Photo (BLE840X with GPS External Antenna)



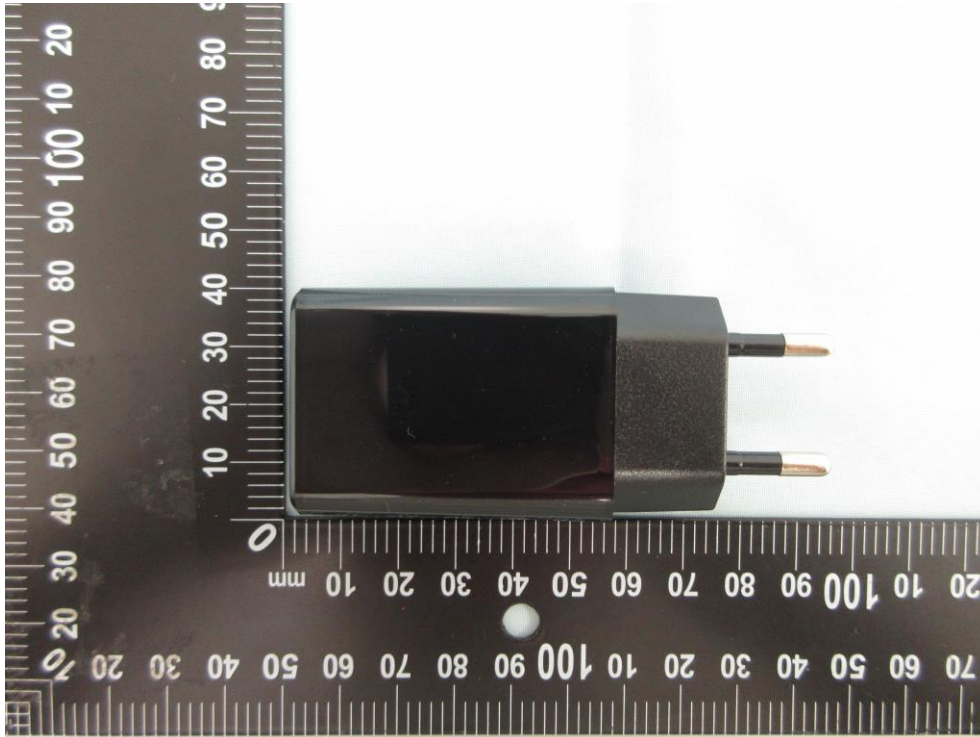
(11) EUT Photo (BLE840X with GPS External Antenna)



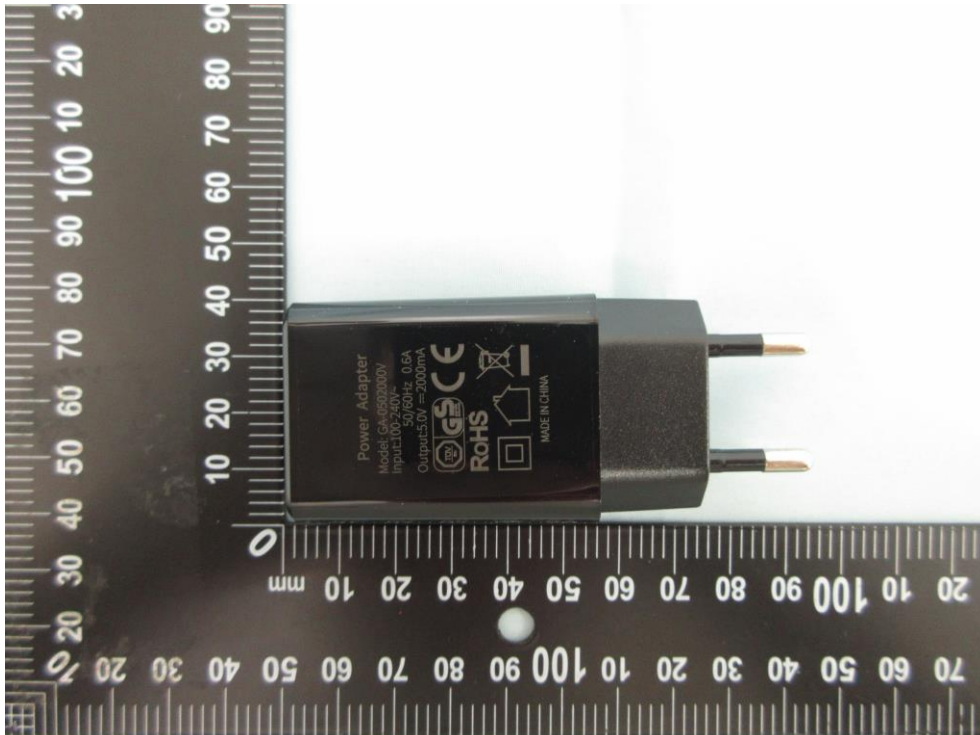
(12) EUT Photo (BLE840X with GPS External Antenna)



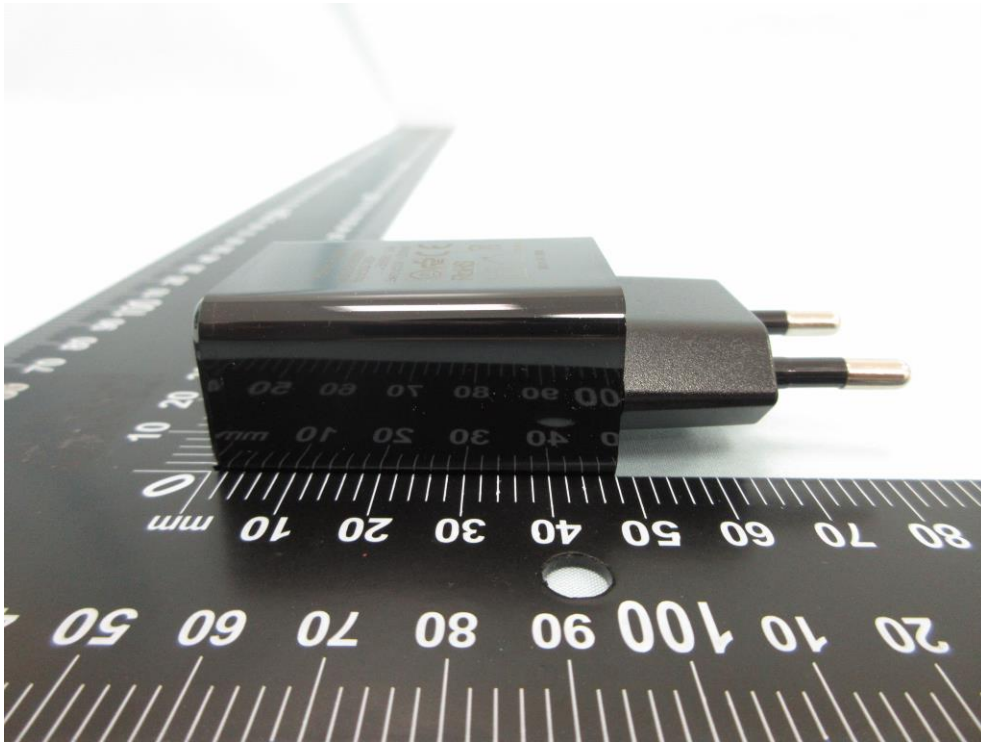
(13) EUT Photo (USB Adapter)



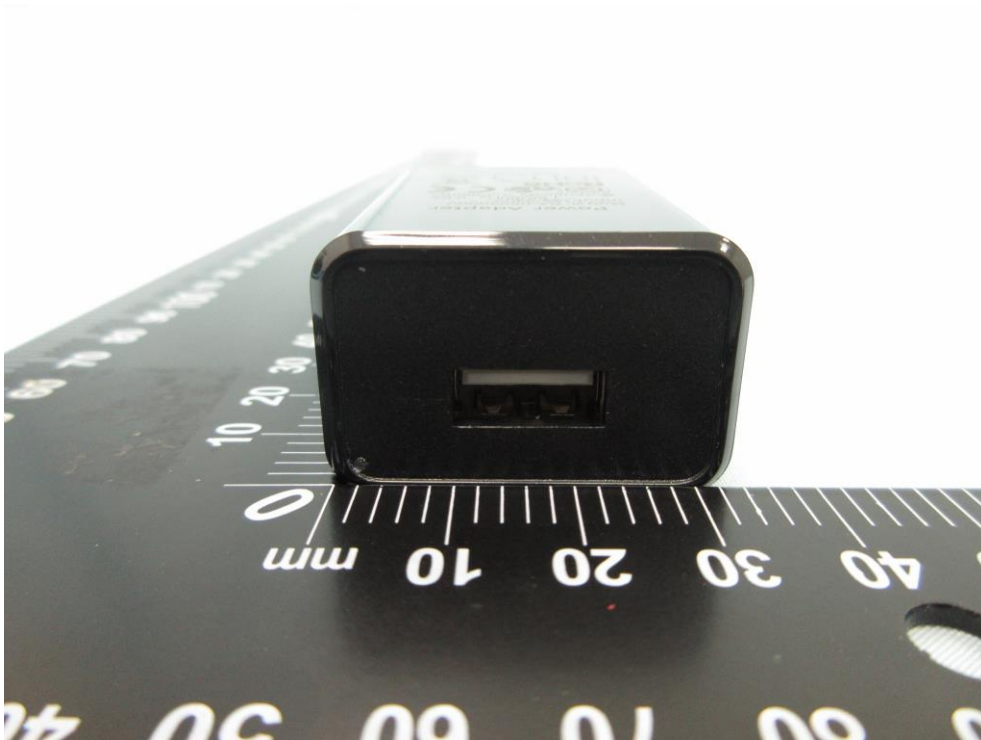
(14) EUT Photo (USB Adapter)



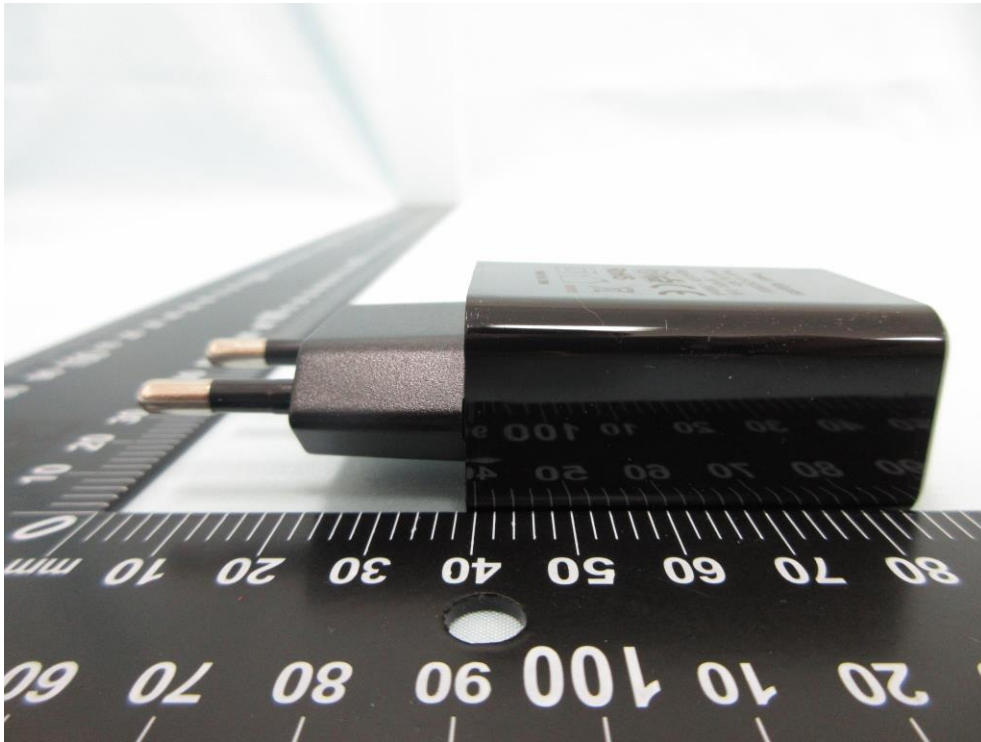
(15) EUT Photo (USB Adapter)



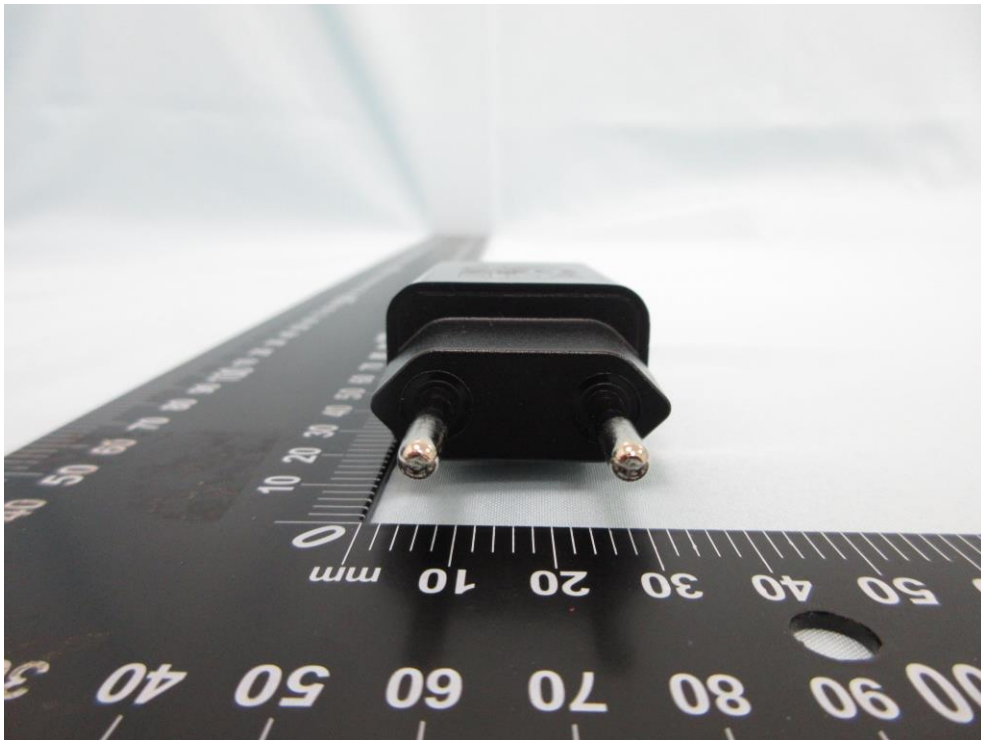
(16) EUT Photo (USB Adapter)



(17) EUT Photo (USB Adapter)



(18) EUT Photo (USB Adapter)



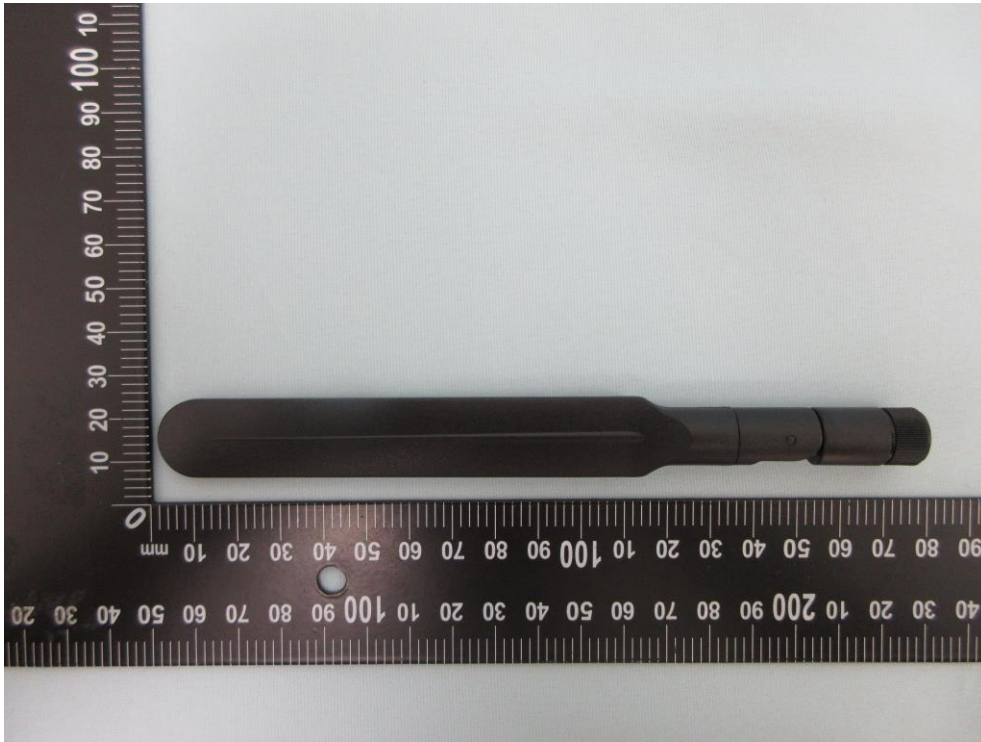
(19) EUT Photo (USB Adapter)



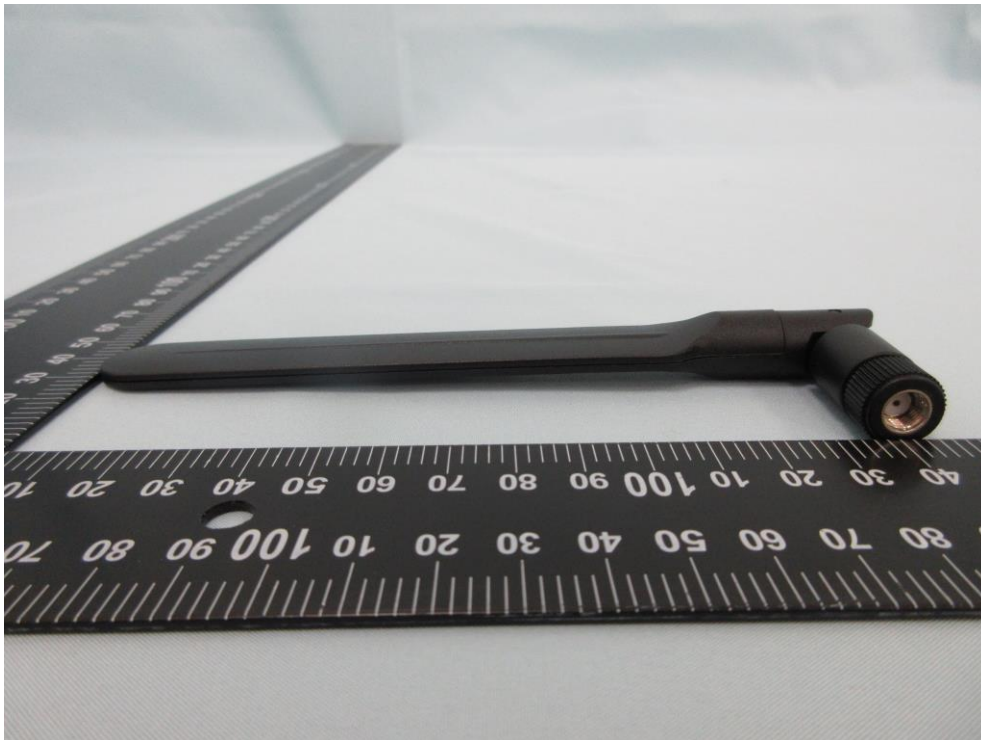
(20) EUT Photo (Micro USB Cable)



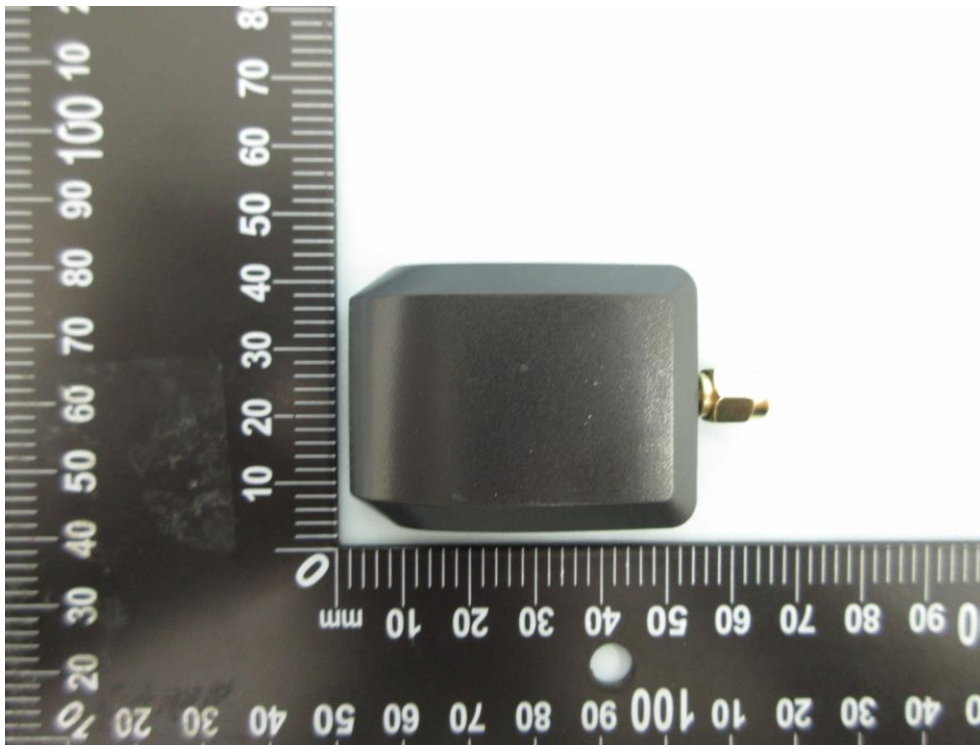
(21) EUT Photo (LTE External Antenna)



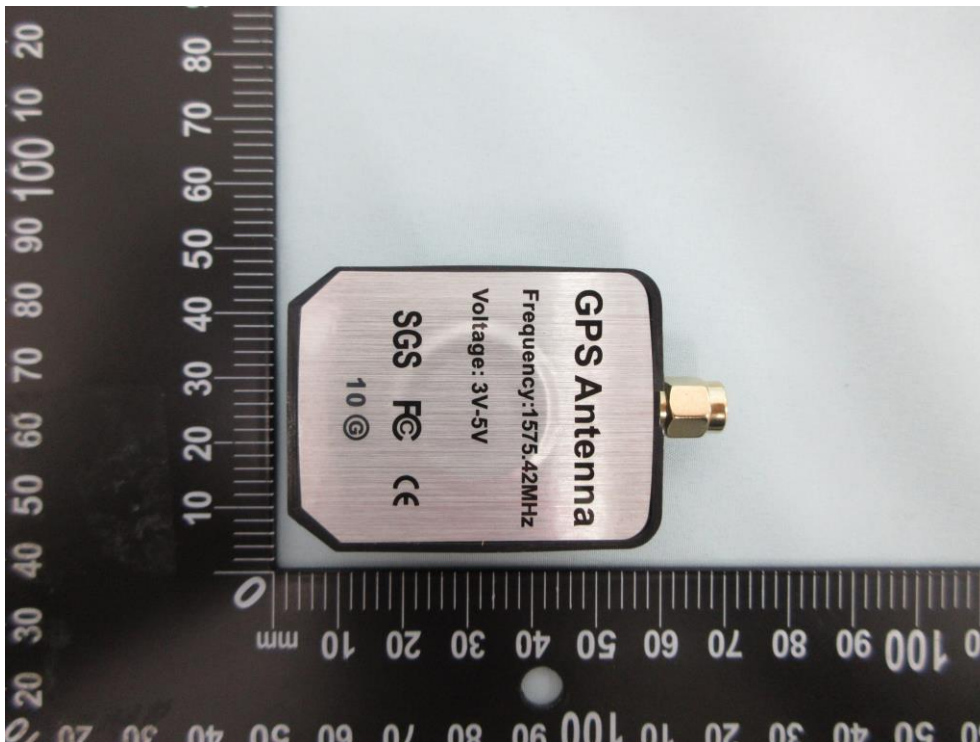
(22) EUT Photo (LTE External Antenna)



(23) EUT Photo (GPS External Antenna)

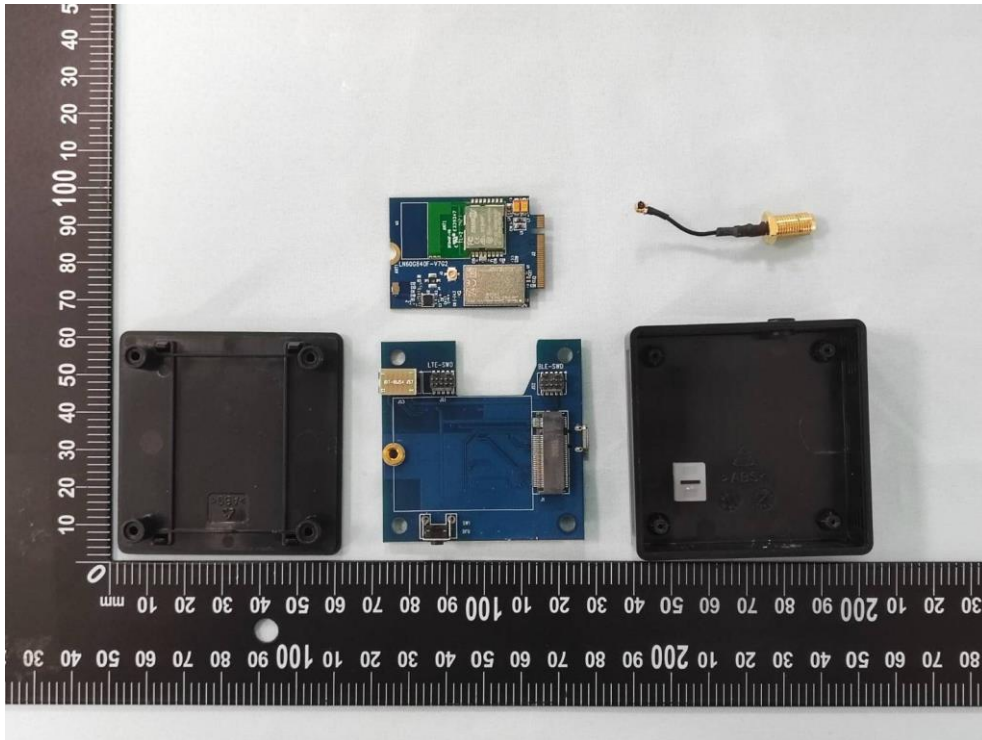


(24) EUT Photo (GPS External Antenna)

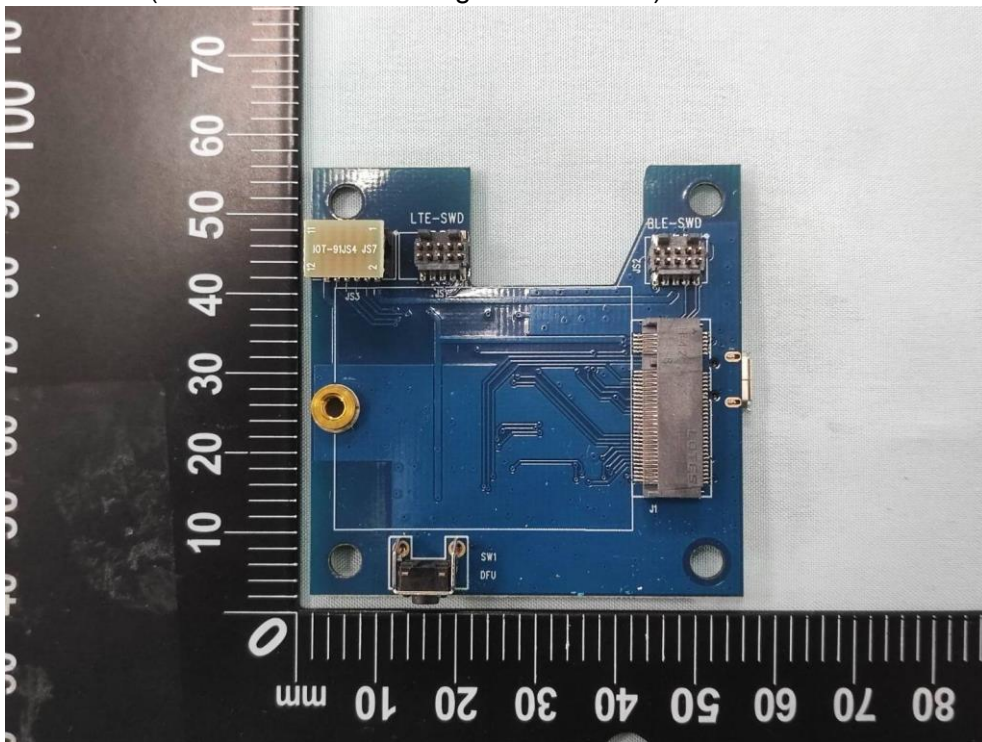


## Appendix C : Internal Photograph

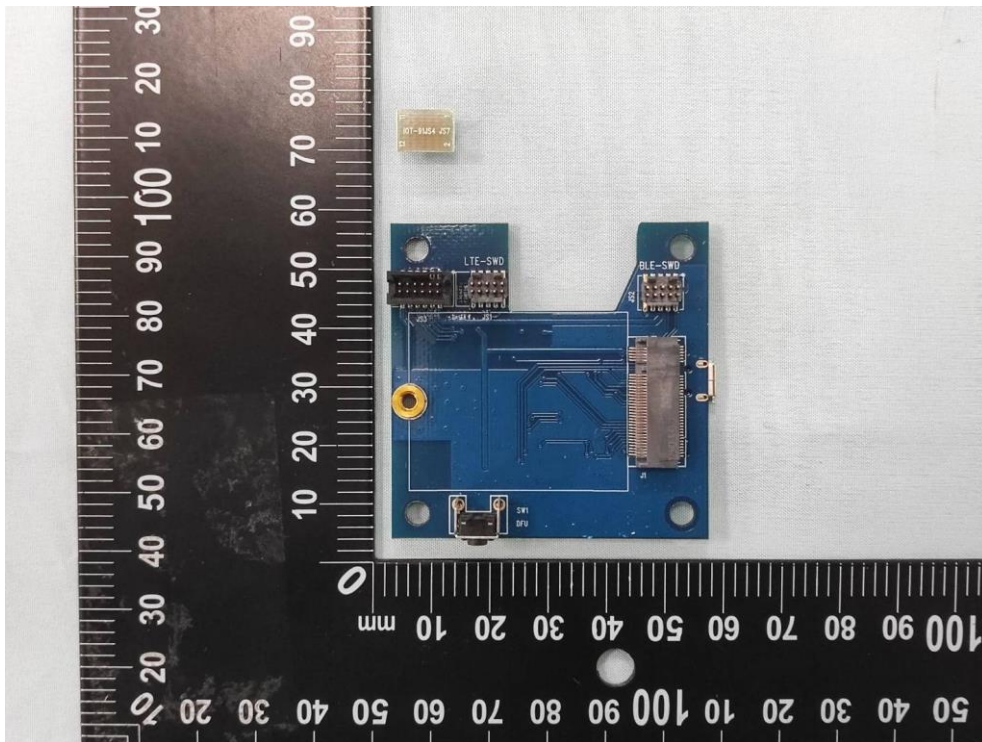
(1) EUT Photo (BLG40F with GPS Integrated Antenna)



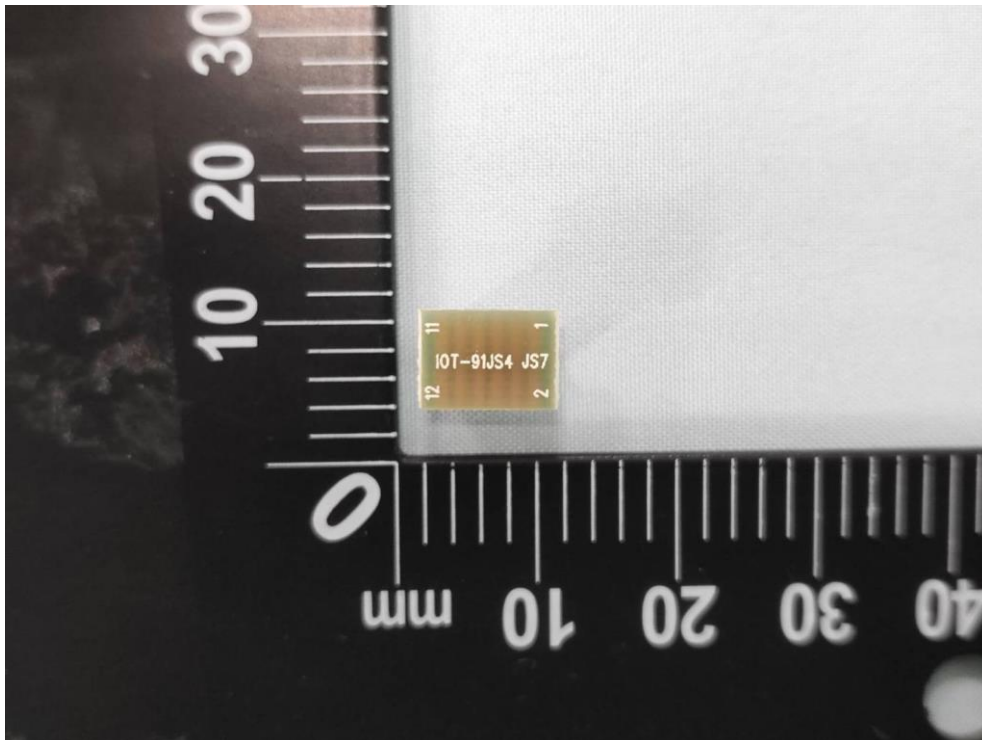
(2) EUT Photo (BLG40F with GPS Integrated Antenna)



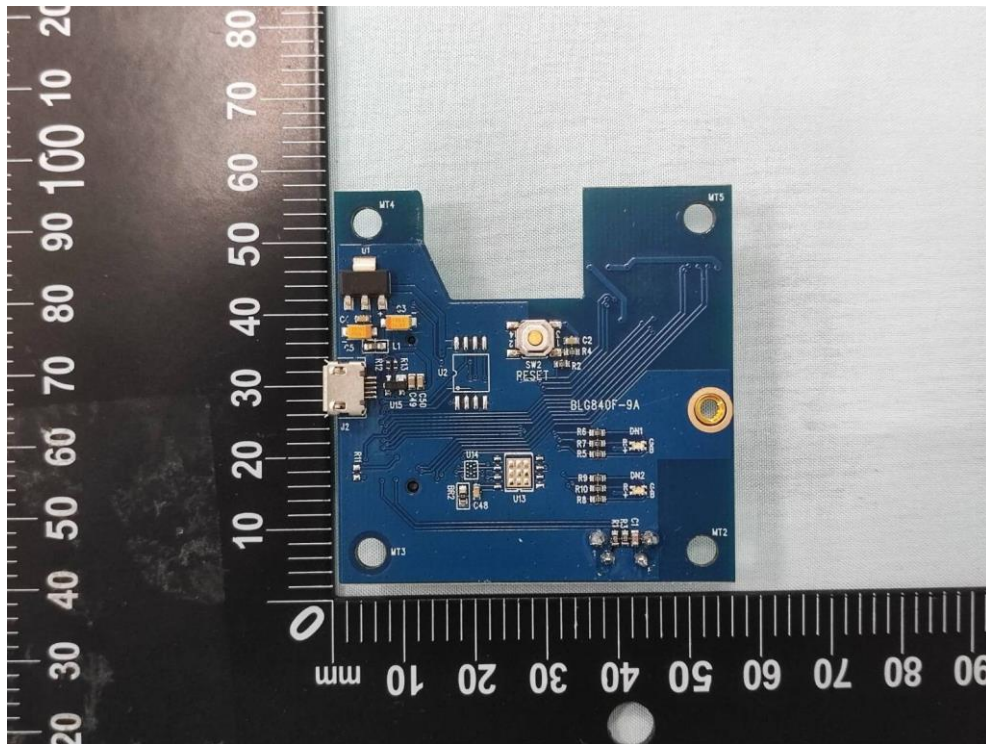
(3) EUT Photo (BLG40F with GPS Integrated Antenna)



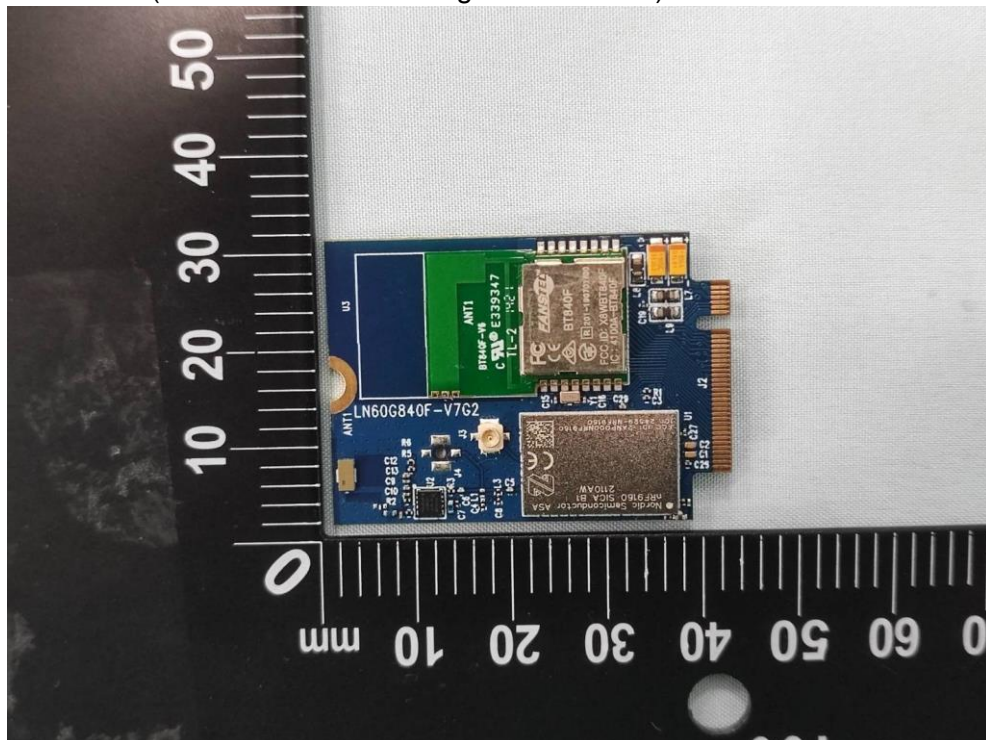
(4) EUT Photo (BLG40F with GPS Integrated Antenna)



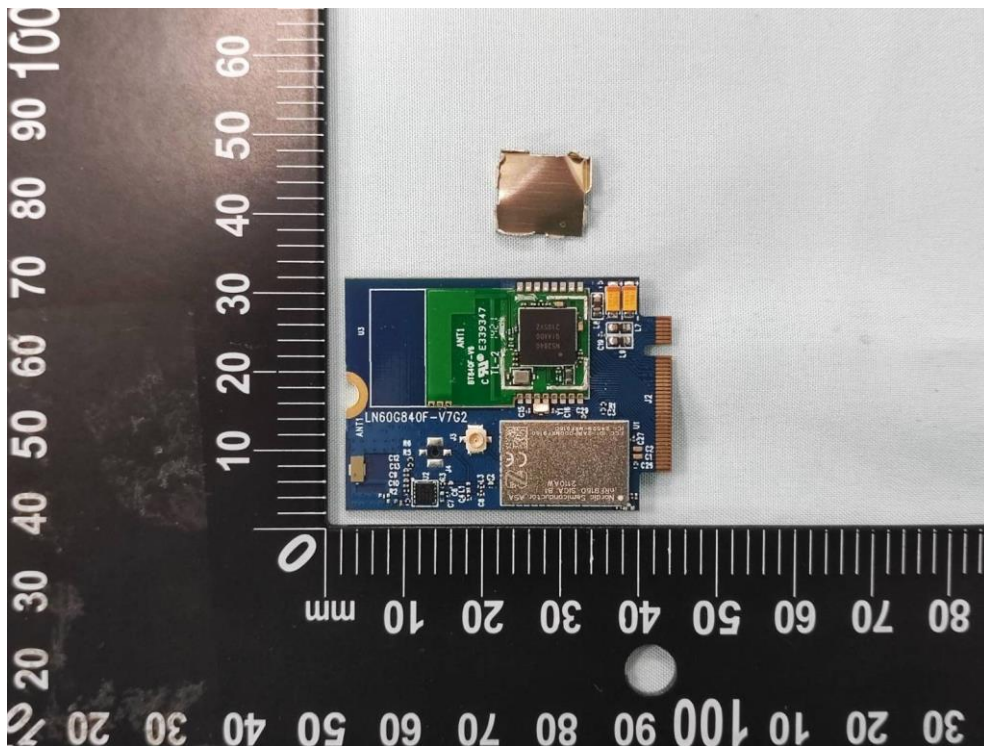
(5) EUT Photo (BLG40F with GPS Integrated Antenna)



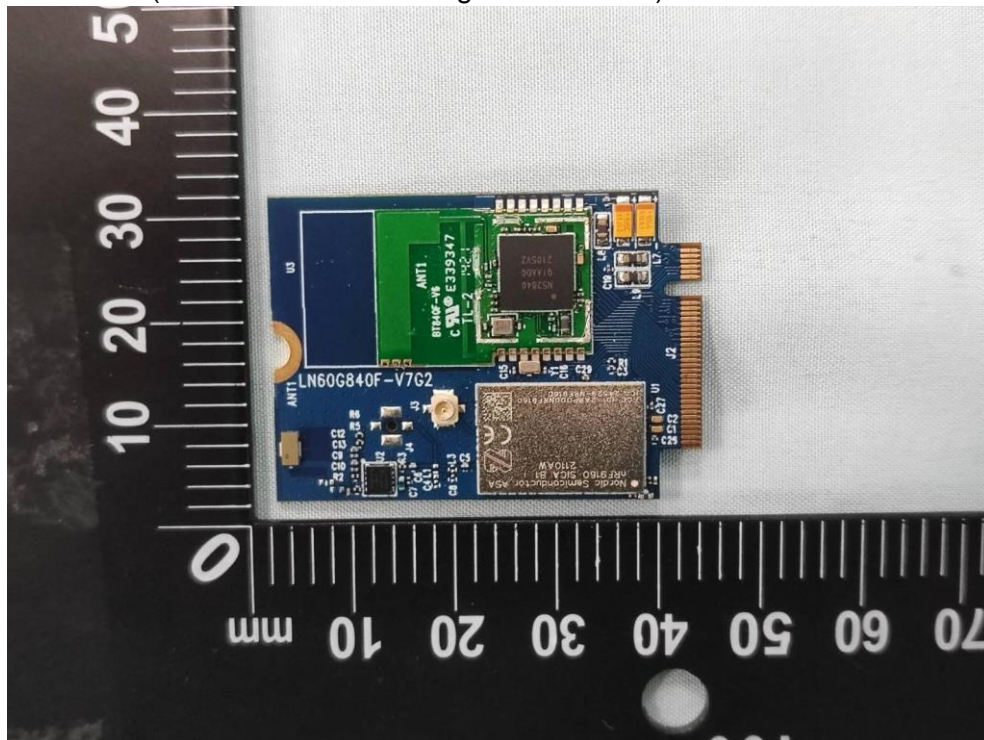
(6) EUT Photo (BLG40F with GPS Integrated Antenna)



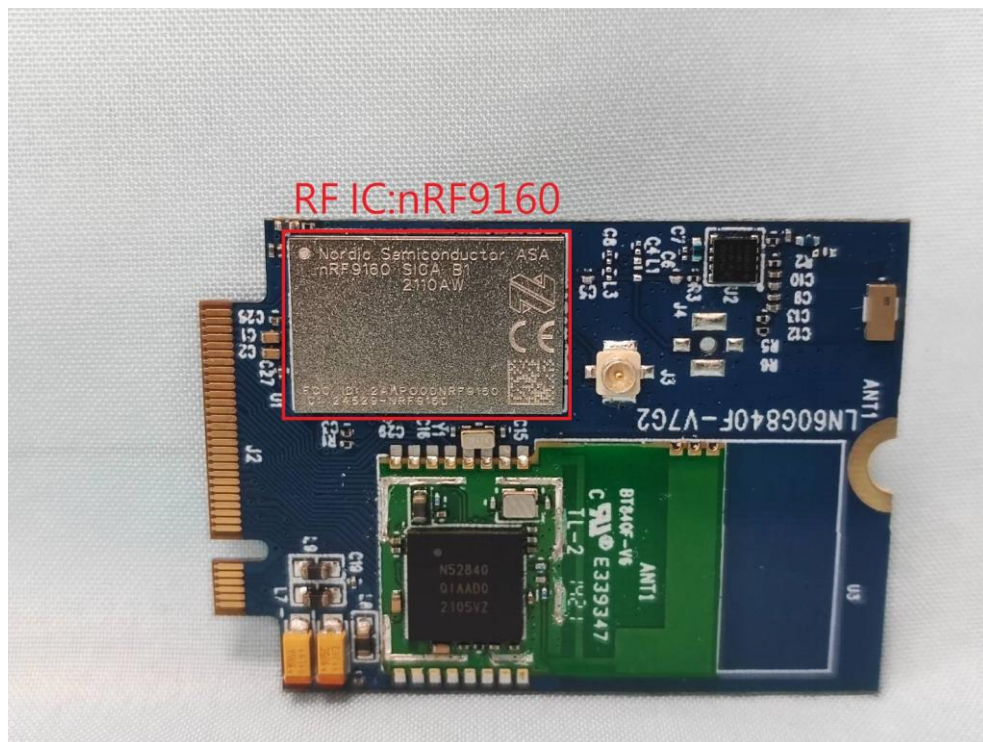
(7) EUT Photo (BLG40F with GPS Integrated Antenna)



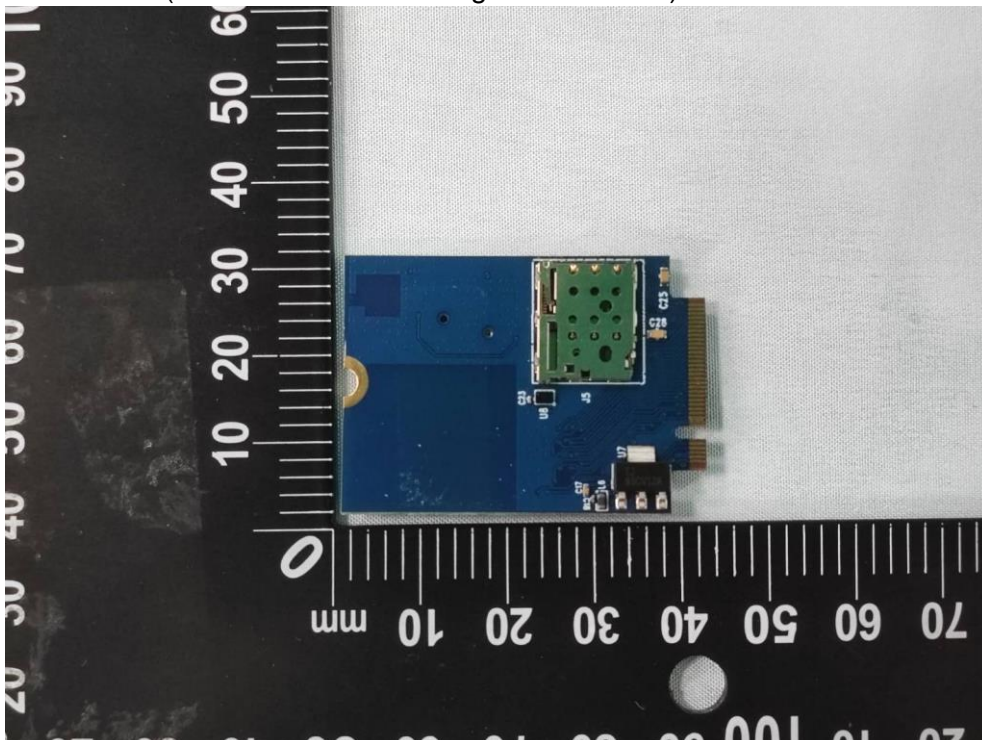
(8) EUT Photo (BLG40F with GPS Integrated Antenna)



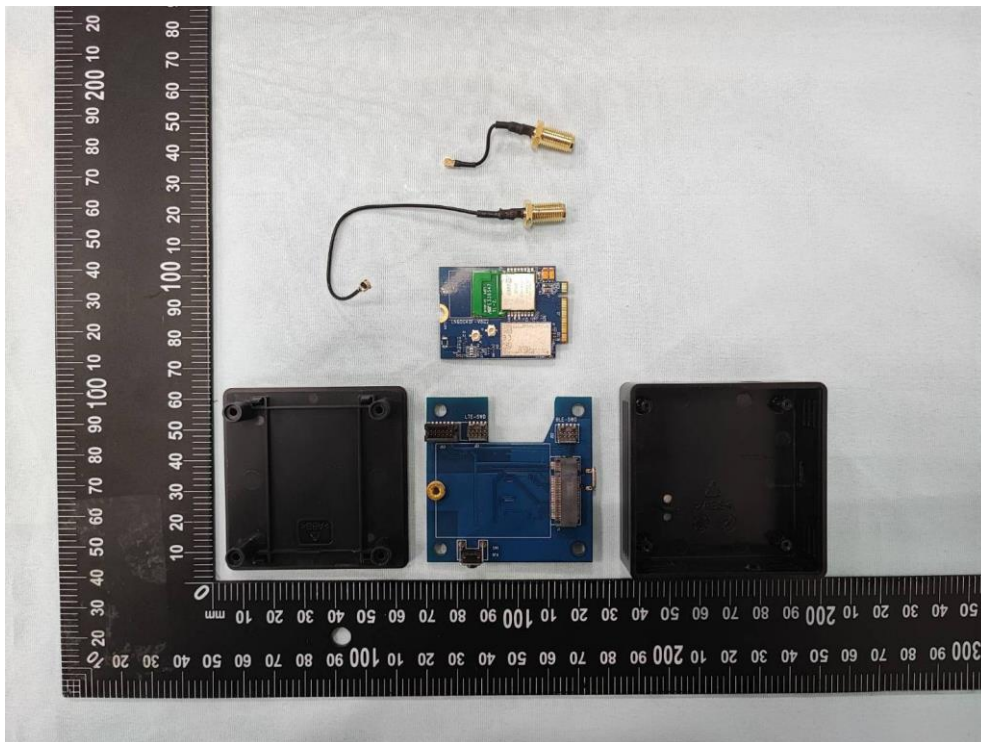
(9) EUT Photo (BLG40F with GPS Integrated Antenna)



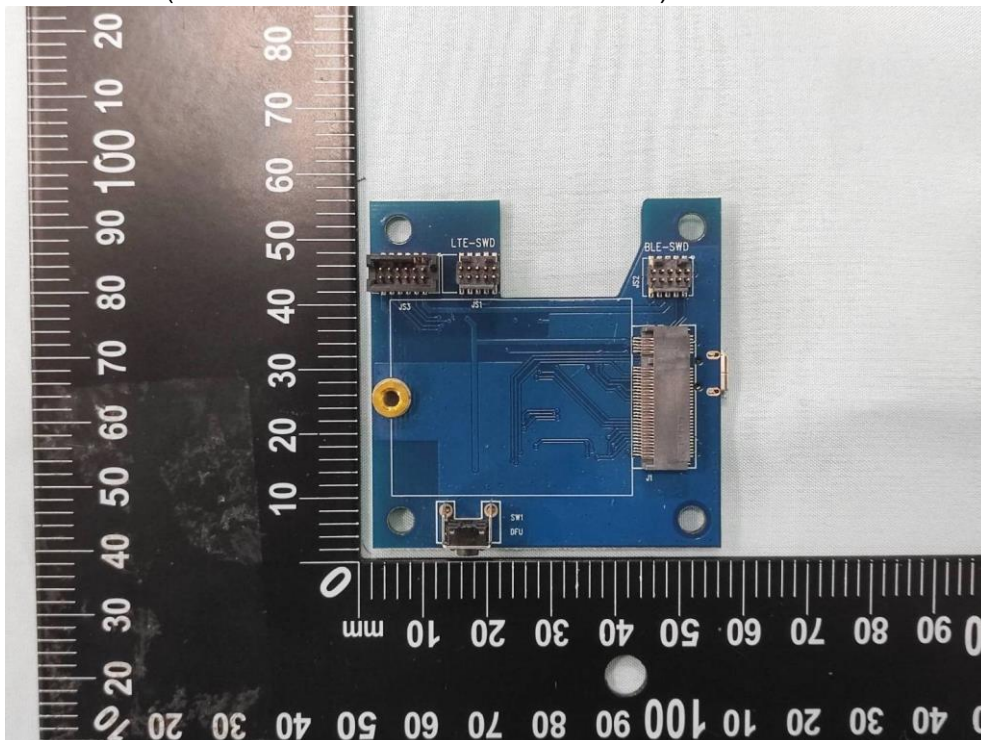
(10) EUT Photo (BLG40F with GPS Integrated Antenna)



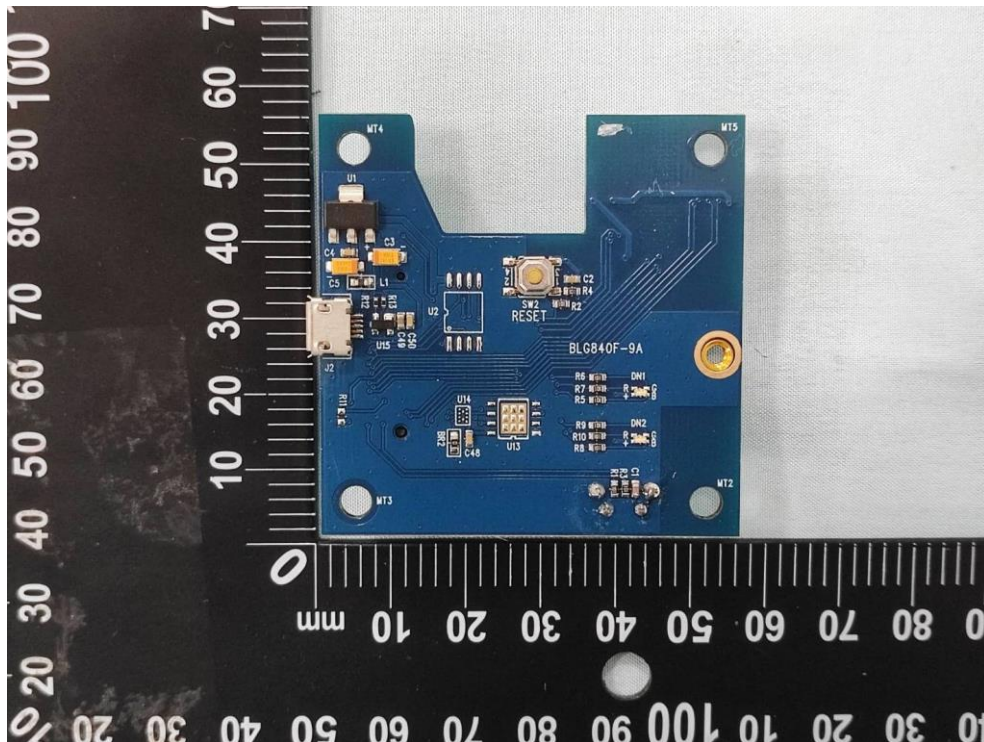
(11) EUT Photo (BLE840X with GPS External Antenna)



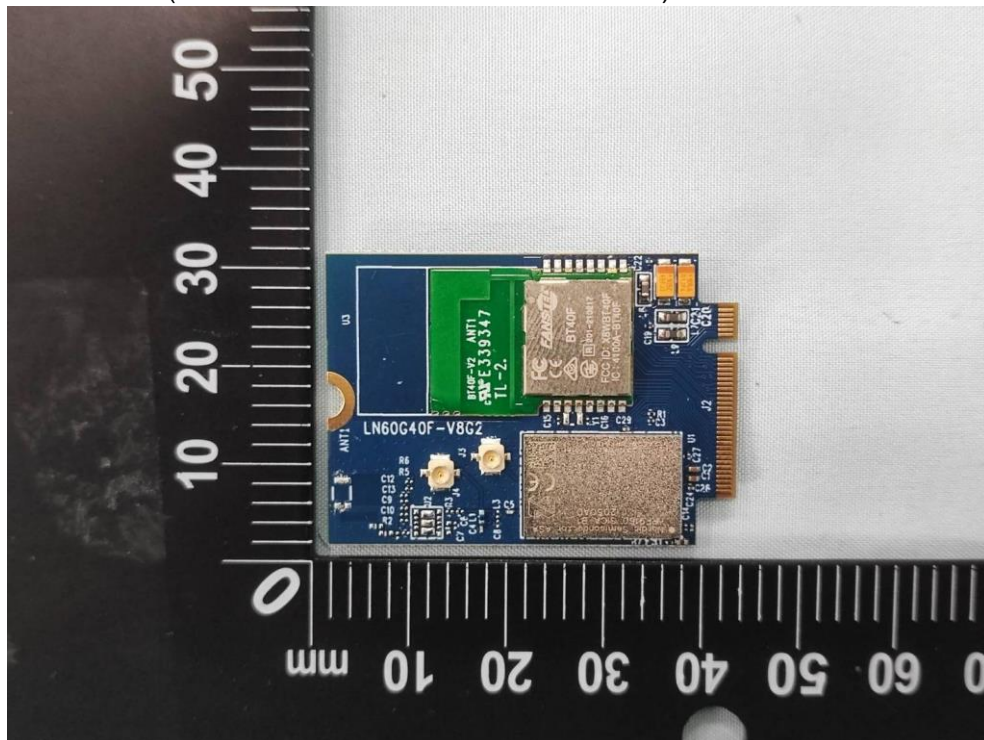
(12) EUT Photo (BLE840X with GPS External Antenna)



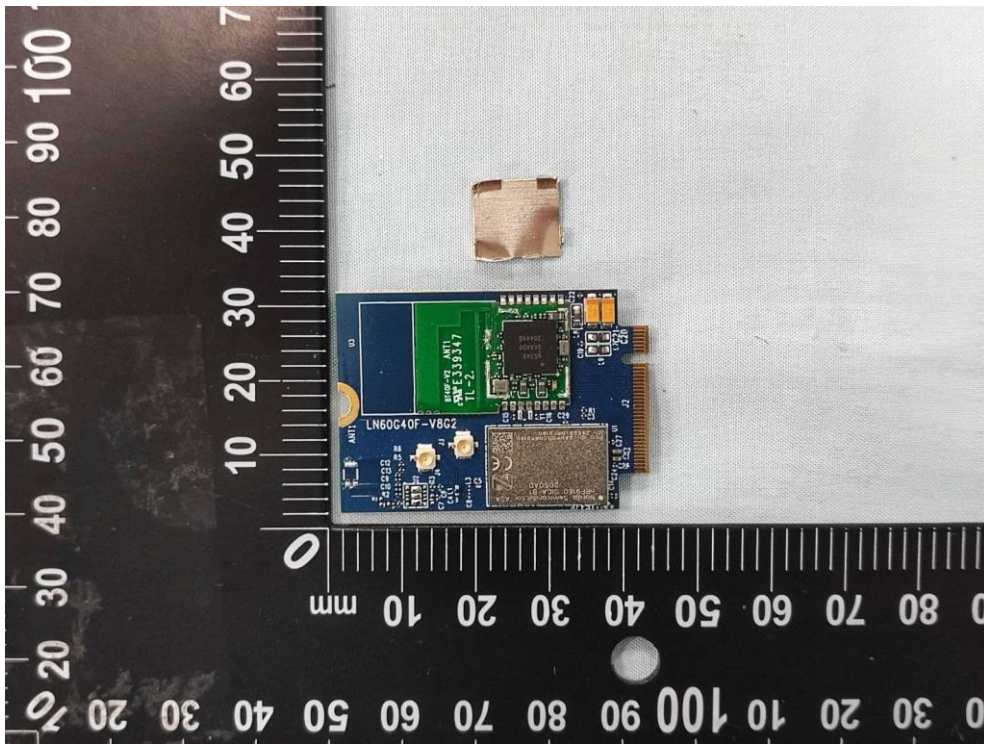
(13) EUT Photo (BLE840X with GPS External Antenna)



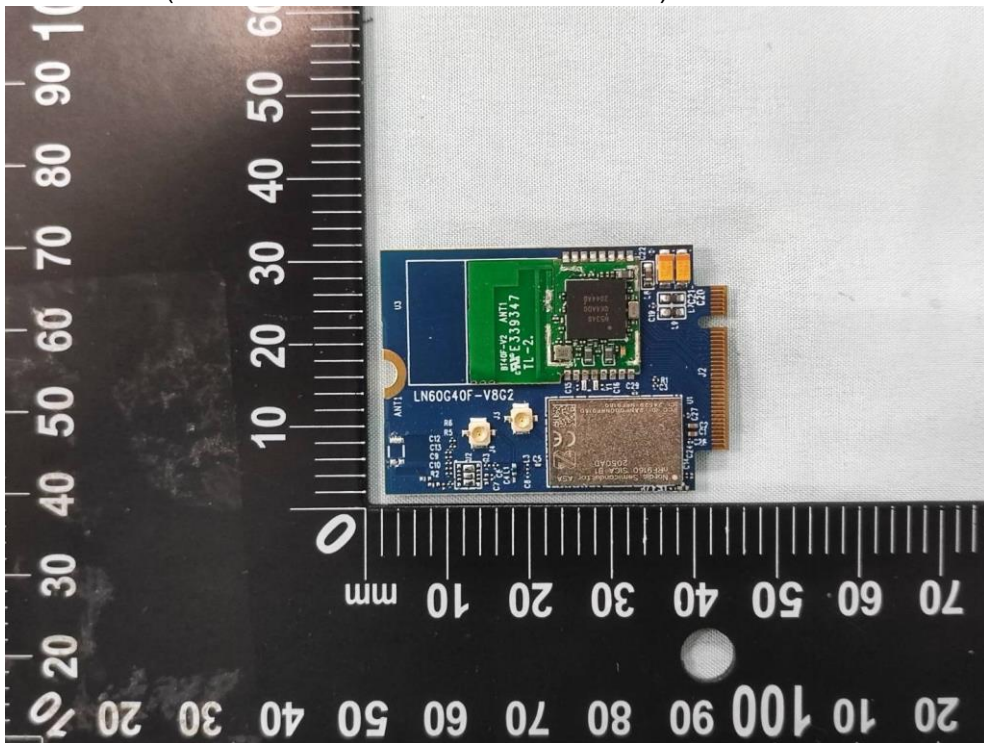
(14) EUT Photo (BLE840X with GPS External Antenna)



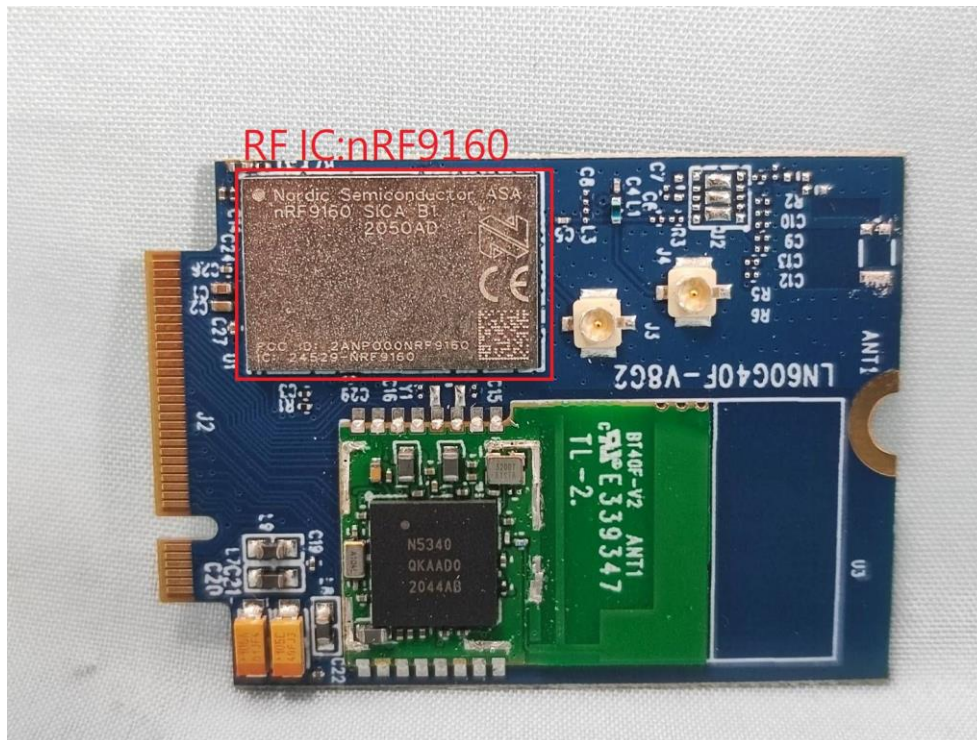
(15) EUT Photo (BLE840X with GPS External Antenna)



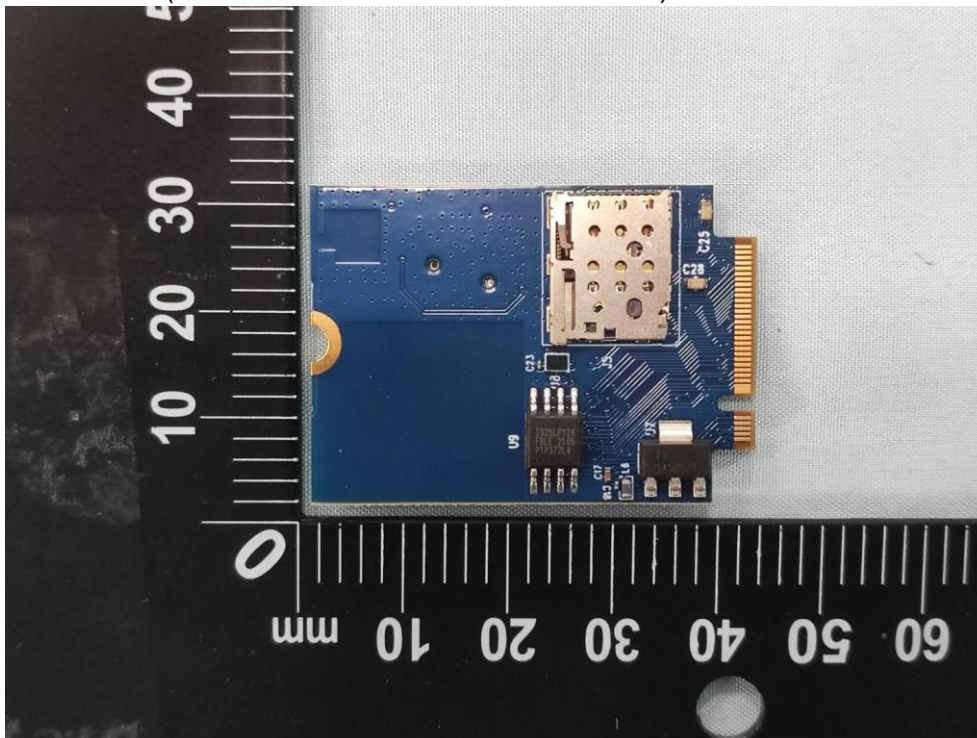
(16) EUT Photo (BLE840X with GPS External Antenna)



(17) EUT Photo (BLE840X with GPS External Antenna)



(18) EUT Photo (BLE840X with GPS External Antenna)



The End