TEST REPORT

REPORT NUMBER: 25B02W000010-009

ON

Type of Equipment:	Handheld Wireless Terminal
Type of Designation:	T8F1C
Brand Name:	SUNMI
Manufacturer:	Shanghai Sunmi Technology Co.,Ltd.
FCC ID:	2AH25T8F1C
IC:	22621-T8F1C

ACCORDING TO

FCC Part 15C, FCC Part 2,ANSI C63.10-2013,RSS-Gen Issue 5, RSS-247 Issue 3

Chongqing Academy of Information and Communications Technology

Month date, year
August 14, 2025
Signature

Zhou Jin
Director

Note:
The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.

Revision Version

Report Number	Revision	Date
25B02W000010-009	00	2025-08-14

CONTENTS

1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
Designation Number:	CN1239
IC Registration Number:	29397
Address:	No.19 EastRoad,Xiantao Big-data Valley,Yubei District,Chongqing,People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

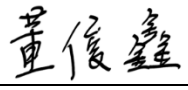
1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	30-60%RH

1.3. Project data

Testing Start Date:	2025-06-03
Testing End Date:	2025-07-09

1.4. Signature

	**2025-08-14**
Dong Junxin **(Prepared this test report)**	**Date**
	**2025-08-14**
Wang Lili **(Reviewed this test report)**	**Date**
	**2025-08-14**
Zhou Jin **Director of the laboratory** **(Approved this test report)**	**Date**

2. Client Information

2.1. Applicant Information

Company Name:	Shanghai Sunmi Technology Co.,Ltd.
Address /Post:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
City:	Shanghai
Country:	China
Telephone:	8618501703215
Fax:	N/A
Email:	fang.lu@sunmi.com
Contact Person:	Fang Lu

2.2. Manufacturer Information

Company Name:	Shanghai Sunmi Technology Co.,Ltd.
Address /Post:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
City:	Shanghai
Country:	China
Telephone:	8618501703215
Fax:	N/A
Email:	fang.lu@sunmi.com
Contact Person:	Fang Lu

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	Handheld Wireless Terminal
Model name	T8F1C
Brand name	SUNMI
Frequency Band	902.75MHz-927.25MHz
Type of modulation	ASK
Extreme Temperature	-20/+55℃
Nominal Test Voltage	3.87V
Extreme Test High Voltage	4.45V
Extreme Test Low Voltage	3.6V

Note1: Photographs of EUT are shown in ANNEX A of this test report.
Note2: High and low voltage values in extreme condition test are given by manufacturer.
Note3: The Extreme Temperature is provided by the manufacturer and has not been verified by the laboratory.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
25B02W000010#S1	862072070057563;862072070057571	V00	4.0.0	2025-05-23
25B02W000010#S4	862072070057688;862072070057696	V00	4.0.0	2025-05-23

*EUT ID: is used to identify the test sample in the lab internally.

No.	Item(s)	Data
1	Antenna gain of EUT	0.72 dBi
Note: The data of aantenna gain is provided by the Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

3.3. Outline of Equipment under Test

Technology	Band	UL Freq. (MHz)	DL Freq. (MHz)	Channel Separation
RFID	CH1-50	902.75-927.25		0.5MHz

Test frequency list:

Channel	Freq.(MHz)
1	902.75
25	914.75
50	927.25

Note: This report is for RFID only.

3.4. Internal Identification of AE used during the test

AE ID*	Description	Note	dB*
C1	USB Cable	SSM-A033A	--
A1	Adapter	TPA-141A050200UU01	--
A2	Adapter	UC13US	--
A3	Adapter	TPA-10120150UU	--
B1	Battery	GYPA	--
AE1	RF cable	--	0.5

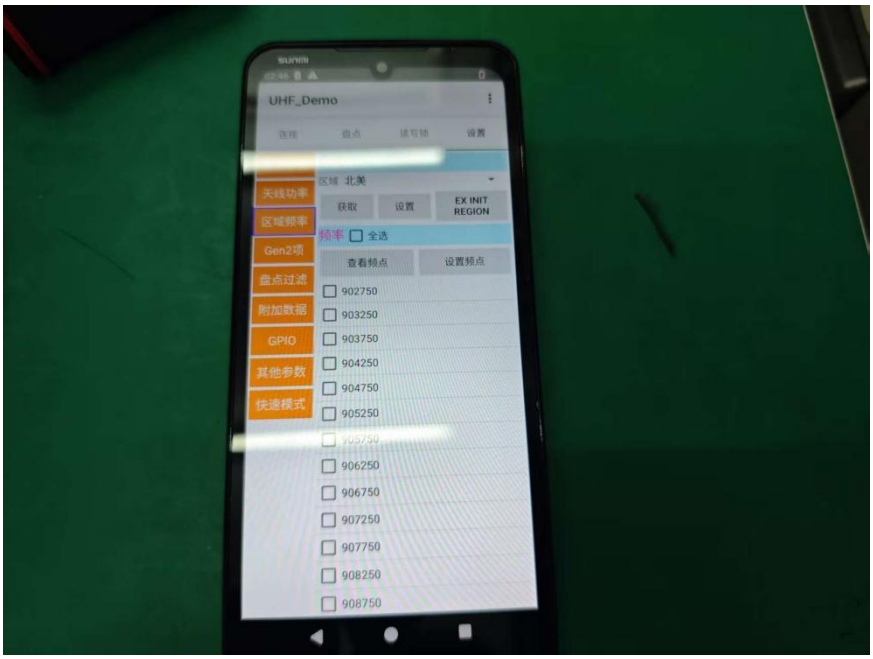
AE ID*: is used to identify the test sample in the lab internally.

dB*： is provided customer.

NOTE: The RF cable is connected to the 6db attenuator.

3.5. EUT Test RF Configuration

EUT uses engineering mode to control RF emissions, changing power levels, channels



4. Reference Documents

4.1. Documents supplied by applicant

PICS/PIXIT, referring to Annex B for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15C	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz	--
FCC Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations	--
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB 558074 D01	Guidance for Performing Compliance Measurements on Frequency Hopping Spread Spectrum systems (DSS) Operating Under §15.247	v05r02
RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus	2021
RSS-247 Issue 3	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2023
Note: FCC Part 2 and KDB 558074 D01 is not A2LA certified.		

5. Test Equipments Utilized

5.1. RF Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal. Interval	Cal.Due Date
1	Spectrum analyzer	FSQ 26	201137	--	--	R&S	1 Year	2026-06-15

5.2. RSE and CE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal. Interval	Cal.Due Date
1	EMI Test Receiver	ESU40	100307	--	--	R&S	1 Year	2025-06-28
2	TRILOG Broadband Antenna	VULB9163	9163-586	--	--	Schwarzbeck	2 Years	2026-10-28
3	Horn antenna	9120D	1083	--	--	Schwarzbeck	2 Years	2026-11-08
4	Horn antenna	DATE 1152	LM7127	--	--	ETS	2 Years	2026-09-30
5	Horn antenna	DATE 1012	LM5945	--	--	ETS	2 Years	2026-09-30
6	Loop Antenna	6502	00143163	--	--	ETS	2 Year	2026-09-04
7	Amplifier 1	SCU-08F1	8320027	--	--	R&S	--	--
8	Amplifier 2	SCU-18F	180093	--	--	R&S	--	--
9	2-Line V-Network	ENV216	102368	--	--	R&S	1 Year	2026-05-23
10	Test Receiver	ESR 3	101382	03	3.48 SP2	R&S	1 Year	2025-06-28
11	Test Receiver	ESW 26	101382	00	1.50 SP1	R&S	1 Year	2025-06-28

5.3. Anechoic chamber Vibration table

No.	Name	Type	SN	Manufacture	Cal. Interval	Cal.Due Date
1	Fully-Anechoic Chamber	FAC5	--	TDK	3 Years	2027-11-04
2	Anechoic Chamber	SAC 10	--	TDK	3 Years	2027-11-05

5.4. Test software

No.	Name	version	SN	Manufacture
1	EMC32 (Transmitter Spurious Emission-Radiated Above 1GHz)	V9.26.01	--	R&S
2	EMC32 (Transmitter Spurious Emission-Radiated Below 1GHz)	V 10.20.01	--	R&S
3	EMC32 (AC Powerline Conducted Emission)	V 10.40.10	--	R&S

6. Test Results

6.1. Summary of Test Results

A brief summary of the tests carried out is shown as following.

FCC Rules	IC Rules	Name of Test	Result
15.247(b)	RSS-247 5.4	Maximum Peak Output Power	Pass
15.247(a)	RSS-247 5.1	20dB Occupied Bandwidth	Pass[Note3]
2.1049	RSS-GEN 6.7	99% Occupied Bandwidth	Pass[Note3]
15.247 (d)	RSS-247 5.5	Band Edges Compliance	Pass
15.247(a)	RSS-247 5.1	Time Of Occupancy (Dwell Time)	Pass
15.247(a)	RSS-247 5.1	Carrier Frequency Separation	Pass
15.247(a)	RSS-247 5.1	Number Of Hopping Channels	Pass
15.247(d)	RSS-247 5.5	Transmitter Spurious Emission-Conducted	Pass
15.247,15.209,15.205	RSS-GEN 8.9, 8.10	Transmitter Spurious Emission-Radiated	Pass
15.207	RSS-GEN 8.8	AC Powerline Conducted Emission	Pass
15.203/15.247(c)	RSS Gen 6.8, RSS-247 5.4	Antenna requirement	Pass [Note 2]

Note1：The T8F1C, manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new product for testing.
Note2：RFID used an Internal antenna with max Gain 0.72 dBi that complied with 15.203/15.247(c) Requirements.
Note3：This project has no restrictions on requirements.

6.2. Peak Output Power-Conducted

Specifications:	FCC 47 Part 15.247(b), RSS-247 5.4
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Conducted Limit(dBm)
FCC 47 Part 15.247(b)	≤30
RSS-247 5.4(b)	≤30

Measurement Uncertainty:

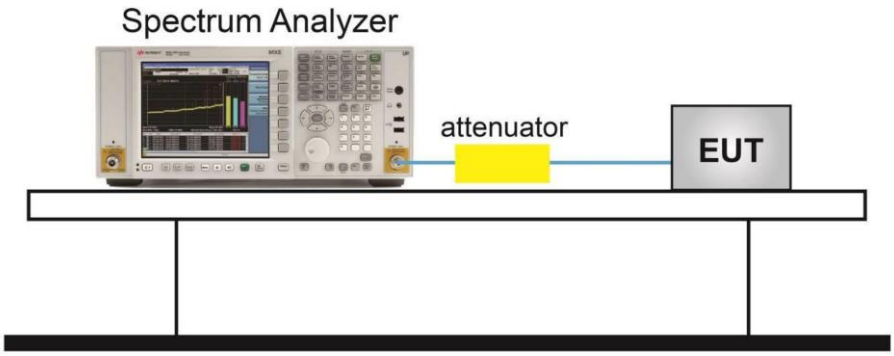
Measurement Uncertainty	0.66dB

Test Procedure

The measurement is according to ANSI C63.10 clause 7.8.5.

1. The output power of EUT was connected to the spectrum analyzer by cable and divide. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Use the following spectrum analyzer settings:
   a) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
   b) RBW > 20 dB bandwidth of the emission being measured.
   c) VBW ≥ RBW.
   d) Sweep: Auto.
   e) Detector function: Peak.
   f) Trace: Max hold.
4. Allow trace to stabilize.
5. Use the marker-to-peak function to set the marker to the peak of the emission.
6. The indicated level is the peak output power, after any corrections for external attenuators and cables.
7. Record the results.

Test setup:



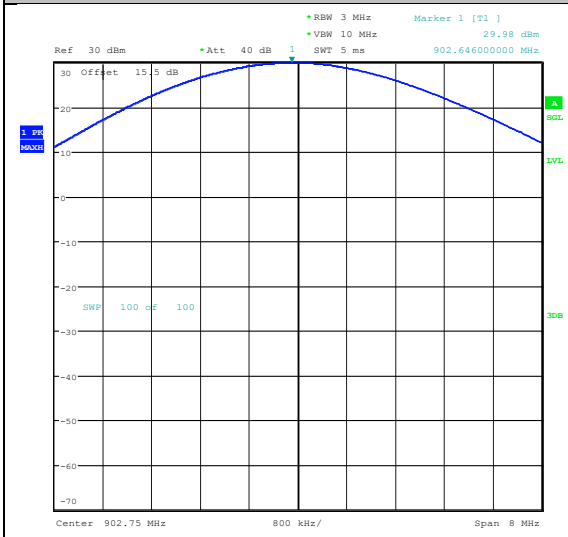
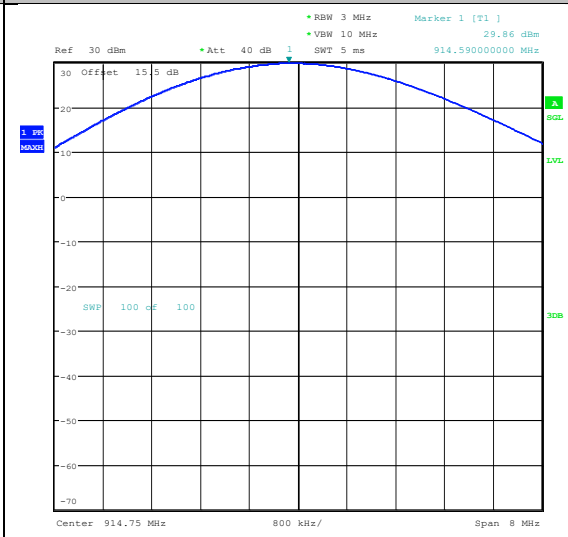
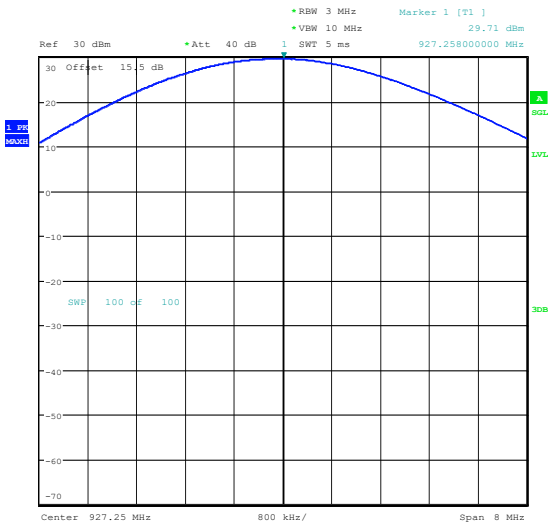
Antenna gain of EUT:

No.	Item(s)	Data
1	Antenna gain of EUT	0.72dBi
Note: The data is provided by the customer may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

Measurement Results:

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
LORA	Ant1	902.75	29.98	≤30	PASS
LORA	Ant1	914.75	29.86	≤30	PASS
LORA	Ant1	927.25	29.71	≤30	PASS

Test Graphs

LORA_FHSS_SF7-Ant1-902.75-PASS	LORA_FHSS_SF7-Ant1-914.75-PASS
	
LORA_FHSS_SF7-Ant1-927.25-PASS	**/**
	/

6.3. 20dB Bandwidth

Specifications:	FCC 47 Part 15.247(a), RSS-247 5.1
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	--

Measurement Uncertainty:

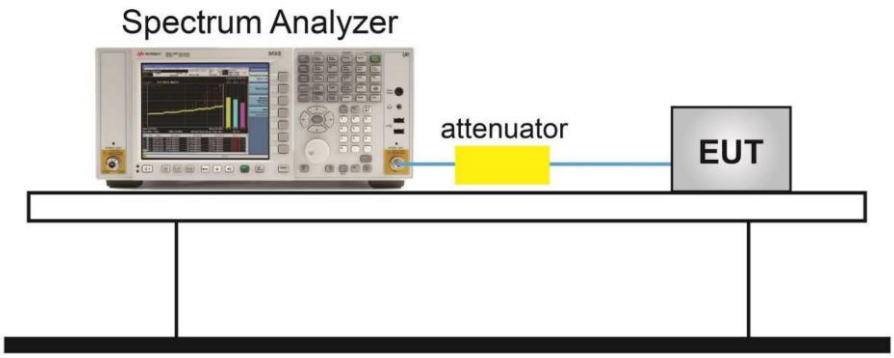
Measurement Uncertainty	1.78kHz

Test procedures:

The measurement is according to ANSI C63.10 clause 7.8.7

1. Connect the EUT through cable and divide with spectrum analyzer.
2. Enable the EUT transmit maximum power.
3. Set the spectrum analyzer as step 4 to step 7.
4. Span: two or five times of OBW
5. RBW= 1% to 5% of the OBW; VBW is approximately three times of RBW; Max Hold.
6. Select the max peak, and N DB DOWN=20dB.
7. Record the results.

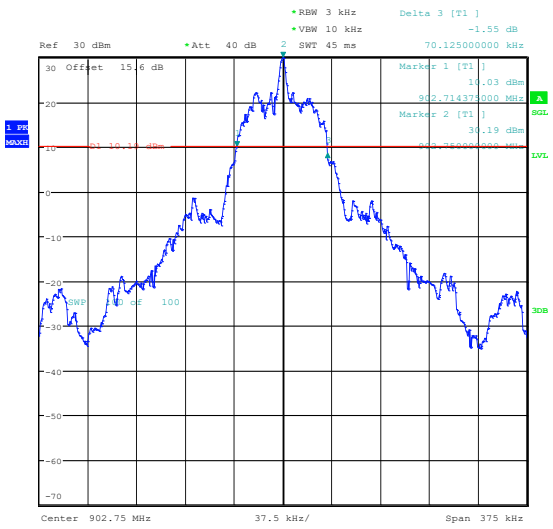
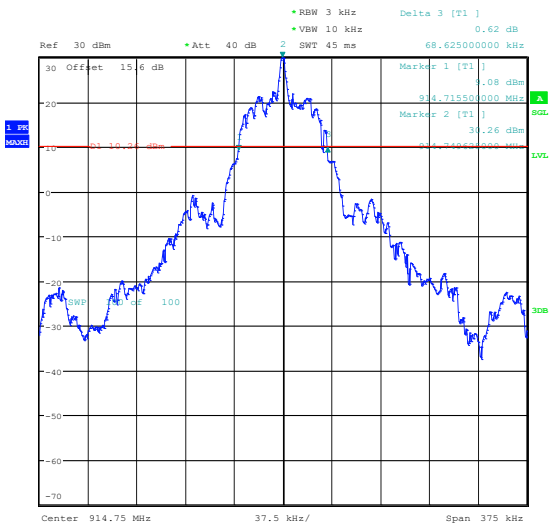
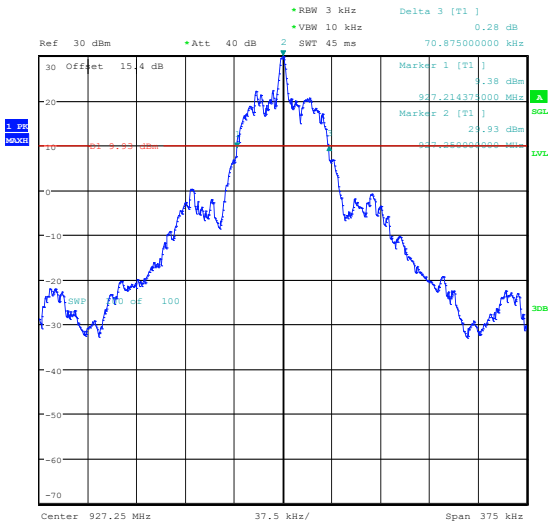
Test Setup:



Measurement Results:

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
LORA	Ant1	902.75	0.07	902.71	902.78
LORA	Ant1	914.75	0.07	914.72	914.78
LORA	Ant1	927.25	0.07	927.21	927.29

Test graphs

LORA_FHSS-Ant1-902.75	LORA_FHSS-Ant1-914.75
	
LORA_FHSS-Ant1-927.25	/
	/

6.4. 99% Occupied Bandwidth

Specifications:	2.1049，RSS-GEN 6.7
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	--

Measurement Uncertainty:

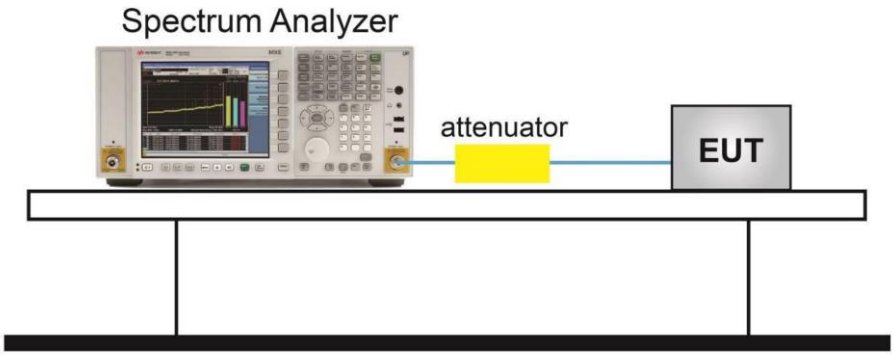
Measurement Uncertainty	1.78kHz

Test procedures:

The measurement is according to ANSI C63.10 clause 6.9.3.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW shall be in the range of 1% to 5% of the OBW.
4. Set the VBW ≥ [3 × RBW].
5. Detector = peak.
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

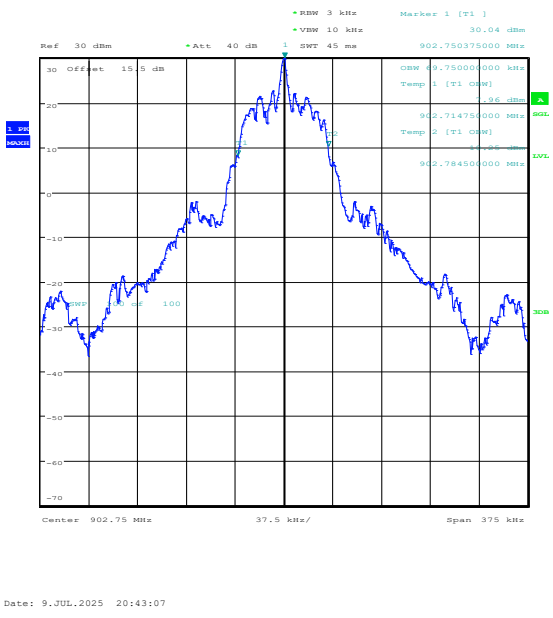
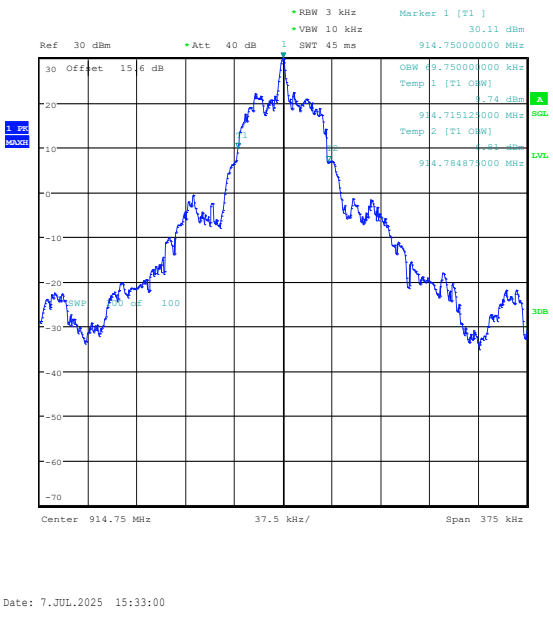
Test setup:

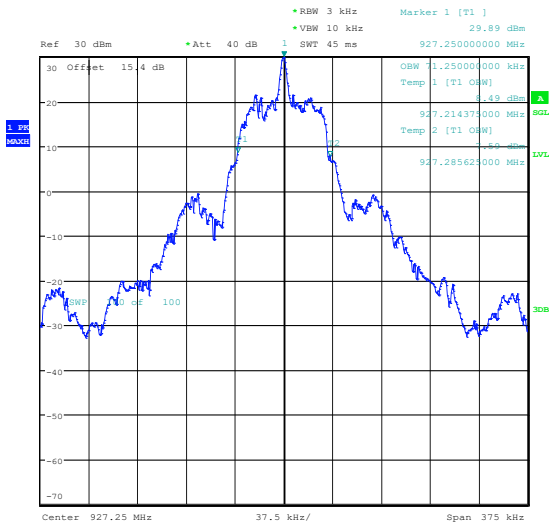


Measurement Results:

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
LORA	Ant1	902.75	0.07	902.7148	902.7845
LORA	Ant1	914.75	0.07	914.7151	914.7849
LORA	Ant1	927.25	0.07	927.2144	927.2856

Test graph

LORA_FHSS-Ant1-902.75	LORA_FHSS-Ant1-914.75
	
LORA_FHSS-Ant1-927.25	/


RBW 3 kHz
VBW 10 kHz
SWT 45 ms
Ref 30 dBm
Att 40 dB
Offset 15.4 dB
Marker 1 [T1]
29.89 dBm
927.250000000 MHz
OBW 71.250000000 kHz
Temp 1 [T1 OBW]
8.49 dBm
927.214375000 MHz
Temp 2 [T1 OBW]
-7.59 dBm
927.285625000 MHz
SWP 10 of 100
Center 927.25 MHz
37.5 kHz/
Span 375 kHz
Date: 7.JUL.2025 15:48:34

/

6.5. Frequency Band Edges-Conducted

Specifications:	FCC 47 Part 15.247(d), RSS-247 5.5
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit(dBc)
FCC 47 Part 15.247(d)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.
RSS-247 5.5	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Measurement Uncertainty:

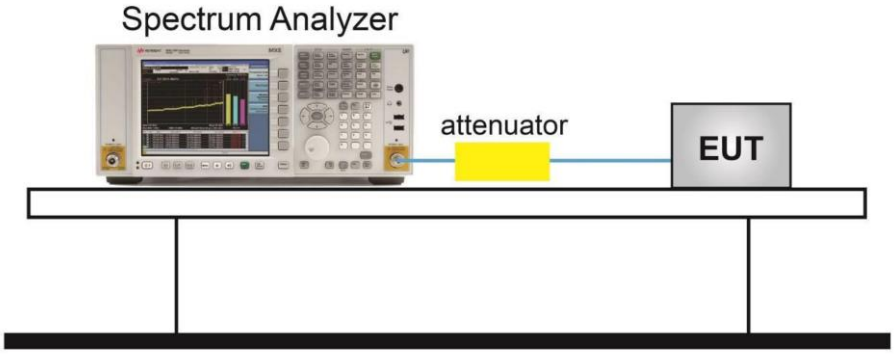
Measurement Uncertainty	1.4dB

Test procedures:

The measurement is according to ANSI C63.10 clause 7.8.6.

1. Connect the EUT to spectrum analyzer.
2. Set RBW=100k, VBW=300k, span more than 1.5 times channel bandwidth .
3. Detector =peak, sweep time=auto couple, trace mode=max hold. Allow sweep to continue until the trace stabilizes.

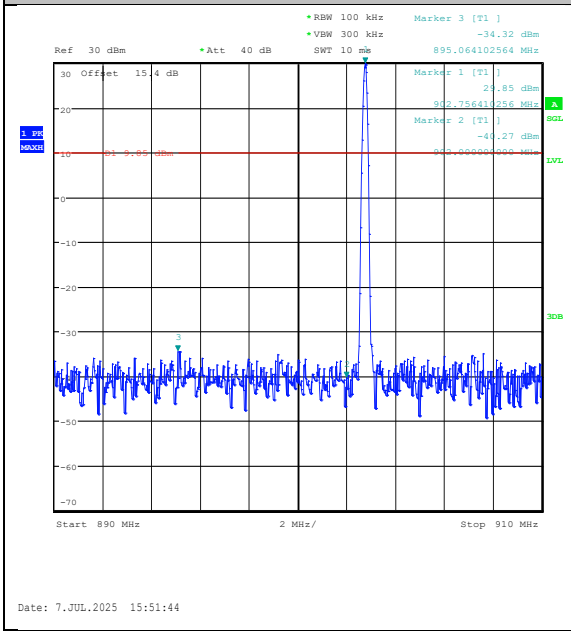
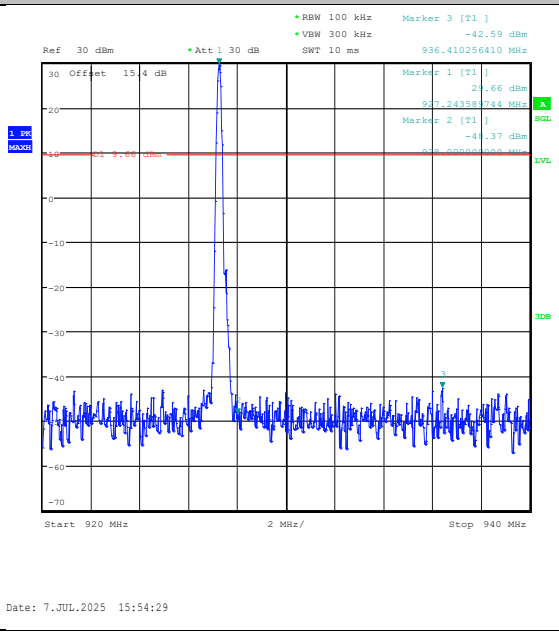
Test setup:



Measurement Results:

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
LORA	Ant1	Low	902.75	29.85	-34.32	≤9.85	PASS
LORA	Ant1	High	927.25	29.66	-42.59	≤9.66	PASS

Test Graphs

LORA_FHSS-Ant1-902.75-PASS	LORA_FHSS-Ant1-927.25-PASS
	

6.6. Time Of Occupancy (Dwell Time)

Specifications:	FCC 47 Part 15.247(a) , RSS-247 5.1
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit
FCC Part 15.247(a)	<400ms
RSS-247 5.1	<400ms

Measurement Uncertainty:

Measurement Uncertainty	0.12ms

Test procedures

The measurement is according to ANSI C63.10 clause 7.8.4

1. Connect the EUT through cable and divide with spectrum analyzer.
2. Enable the EUT transmit maximum power.
3. Set the spectrum analyzer as step 4 to step 8.
4. Span: Zero span, centered on a hopping channel.
5. RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
6. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
7. Detector function: Peak.
8. Trace: Clear-write, single sweep
9. Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.

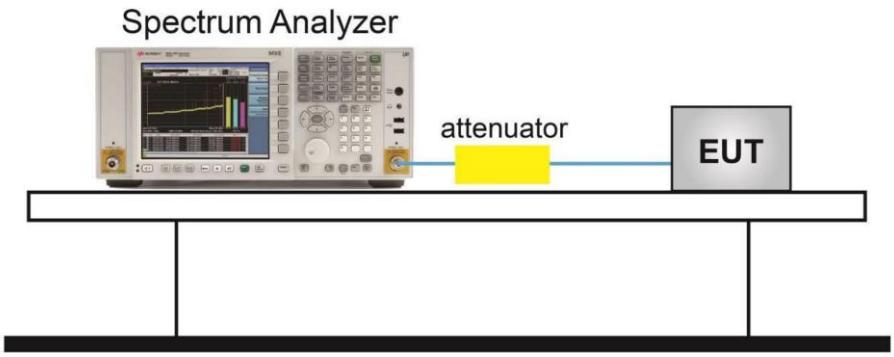
To determine the number of hops on a channel in the regulatory observation period repeat the measurement using a longer sweep time. When the device uses a single hopping sequence the period of measurement should be sufficient to capture at least 2 hops. When the device uses a dynamic hopping sequence, or the sequence varies, the period of measurement may need to capture multiple hops to better determine the average time of occupancy. Count the number of hops on the channel across the sweep time.

The average number of hops on the same channel within the regulatory observation period is calculated from

the number of hops on the channel divided by the spectrum analyzer sweep time multiplied by the regulatory observation period. For example, if three hops are counted with an analyzer sweep time of 500 ms and the regulatory observation period is 10 s, then the number of hops in that ten seconds is 3 / 0.5 × 10, or 60 hops. The average time of occupancy is calculated by multiplying the dwell time per hop by the number of hops in the observation period. Where the device shares the same hopping algorithms (dwell time, channel selection) across multiple data rates or modulation schemes then the time of occupancy need only be measured for one of those modulation schemes or data rates. If the dwell time value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in dwell time.

Spectral plots of the channel occupancy shall be included in the report.

Test Setup



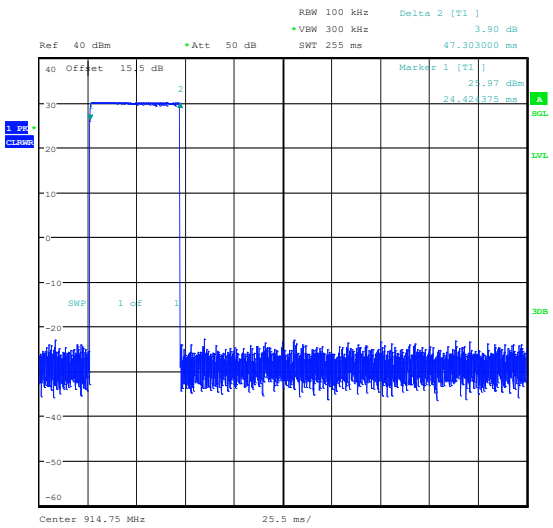
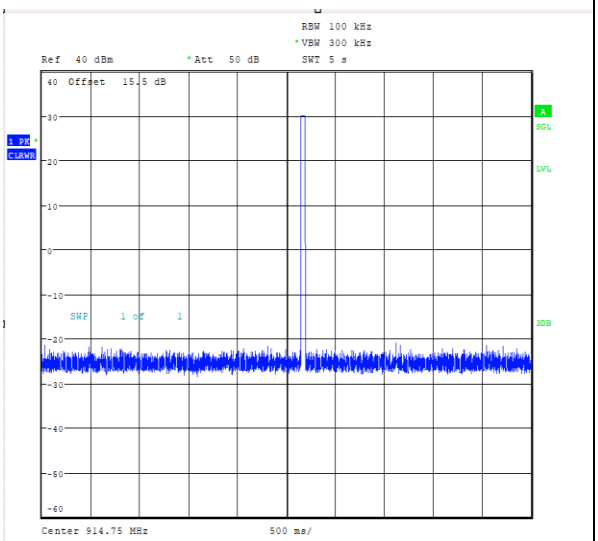
Measurement Results:

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[ms]	Limit[s]	Verdict
LORA	Ant1	Hop	47.303	1	47.303	≤0.4	PASS

Note:

1. Result= BurstWidth* TotalHops.

Test Graphs

LORA_FHSS-Ant1-Hop-PASS	LORA_FHSS-Ant1-Hop-PASS
	

6.7. Carrier Frequency Separation

Specifications:	FCC 47 Part 15.247(a) , RSS-247 5.1
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit
FCC 47 Part 15.247(a)	Over 25kHz or 20dB bandwidth
RSS-247 5.1	Over 25kHz or 20dB bandwidth

Measurement Uncertainty:

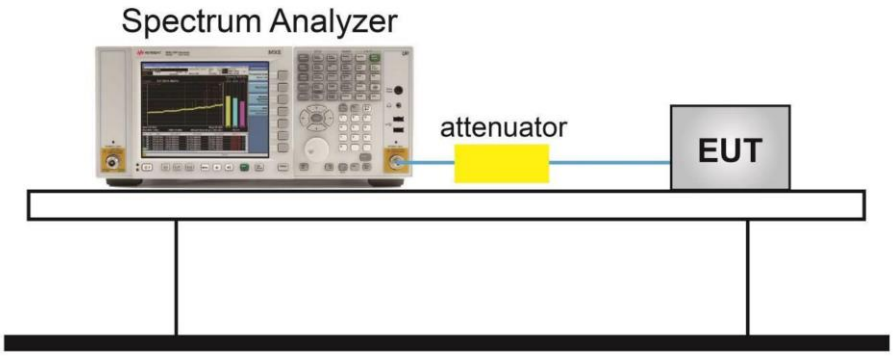
Measurement Uncertainty	2.6kHz

Test procedures:

The measurement is according to ANSI C63.10 clause 7.8.2.

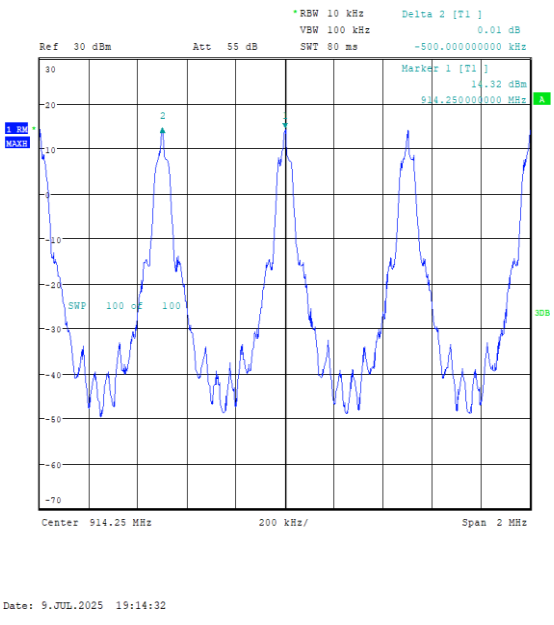
1. Connect the EUT through cable and divide and spectrum analyzer.
2. Enable the EUT transmit in hopping mode.
3. Span: Wide enough to capture the peaks of two adjacent channels.
4. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
5. Video (or average) bandwidth (VBW) ≥ RBW.
6. Sweep: Auto.
7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.

Test Setup:



Measurement Results:

TestMode	Antenna	Frequency[MHz]	Result[kHz]	Limit[kHz]	Verdict
LORA HOP	Ant1	Hop	500	70	PASS

LORA_FHSS-Ant1-Hop-PASS	/
	/

6.8. Number Of Hopping Channels

Specifications:	FCC 47 Part 15.247(a) , RSS-247 5.1
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit
FCC 47 Part 15.247(a)	≥50 channels for 20dB bandwidth less than 250KHz >25 channels for 20dB bandwidth greater than 250KHz
RSS-247 5.1	≥50 channels for 20dB bandwidth less than 250KHz ≥25 channels for 20dB bandwidth greater than 250KHz

Measurement Uncertainty:

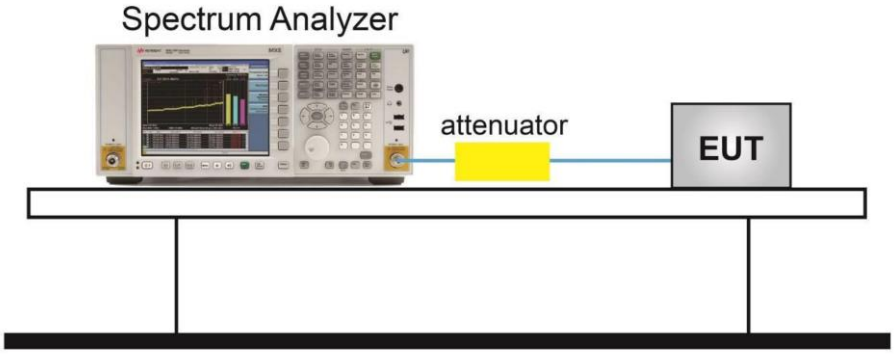
Measurement Uncertainty	--

Test procedure:

The measurement is according to ANSI C63.10 clause 7.8.3.

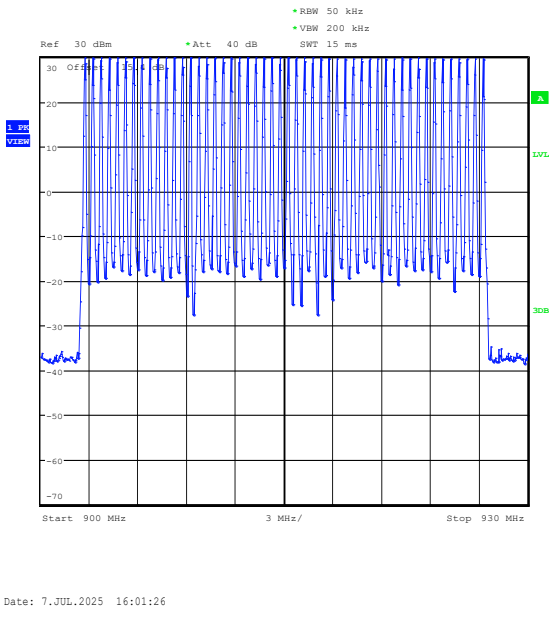
1. Connect the EUT through cable and divide with spectrum analyzer.
2. Enable the EUT transmit in hopping mode.
3. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
4. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
5. VBW ≥ RBW.
6. Sweep: Auto.
7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.
10. Record the test results.

Test Setup:



Measurement Results:

TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
LORA HOP	Ant1	Hop	50	≥50	PASS

LORA_FHSS-Ant1-Hop-PASS	/
	/

6.9. Transmitter Spurious Emission-Conducted

Specifications:	FCC 47 Part 15.247(d) , RSS-247 5.5
DUT Serial Number:	862072070057563;862072070057571
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit
FCC 47 Part 15.247(d)	20dB below peak output power in 100kHz
RSS-247 5.5	20dB below peak output power in 100kHz bandwidth

Measurement Uncertainty:

Measurement Uncertainty	1.4dB

Test procedures:

Reference level measurement

a) Set instrument center frequency to DTS channel center frequency.

b) Set the span to ≥ 1.5 times the DTS bandwidth.

c) Set the RBW = 100 kHz.

d) Set the VBW ≥ [3 × RBW].

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Emission level measurement

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW ≥ [3 × RBW].

d) Detector = peak.

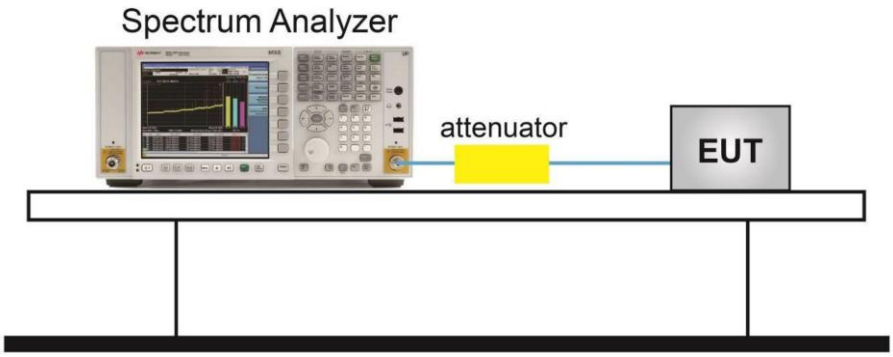
e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

Test Setup:

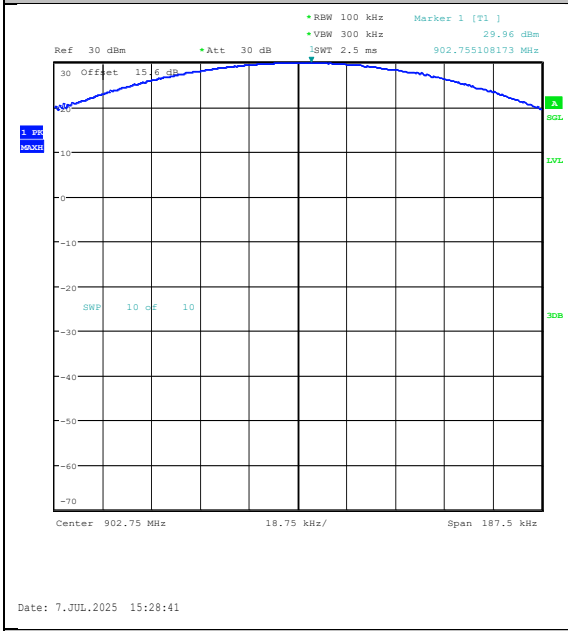


Measurement Results:

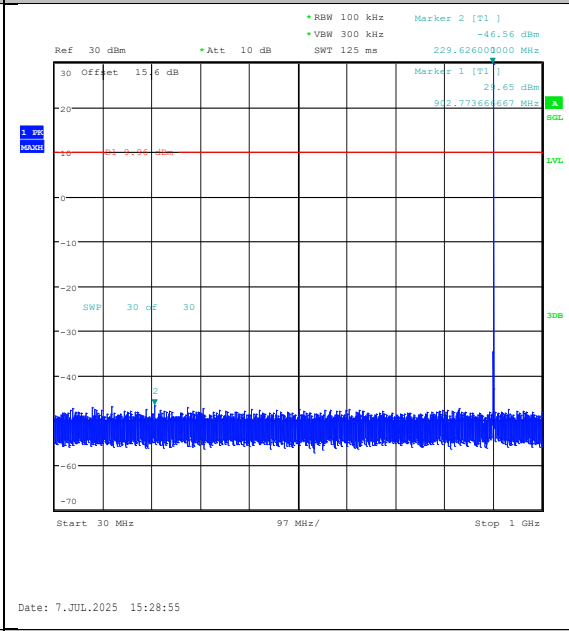
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
LORA_FHSS	Ant1	902.75	0~Reference	29.96	29.96	---	PASS
LORA_FHSS	Ant1	902.75	30~1000	29.96	-46.56	≤9.96	PASS
LORA_FHSS	Ant1	902.75	1000~26500	29.96	-34.79	≤9.96	PASS
LORA_FHSS	Ant1	914.75	0~Reference	29.95	29.95	---	PASS
LORA_FHSS	Ant1	914.75	30~1000	29.95	-46.31	≤9.95	PASS
LORA_FHSS	Ant1	914.75	1000~26500	29.95	-36.74	≤9.95	PASS
LORA_FHSS	Ant1	927.25	0~Reference	29.72	29.72	---	PASS
LORA_FHSS	Ant1	927.25	30~1000	29.72	-45.73	≤9.72	PASS
LORA_FHSS	Ant1	927.25	1000~26500	29.72	-37.58	≤9.72	PASS

Test Graphs

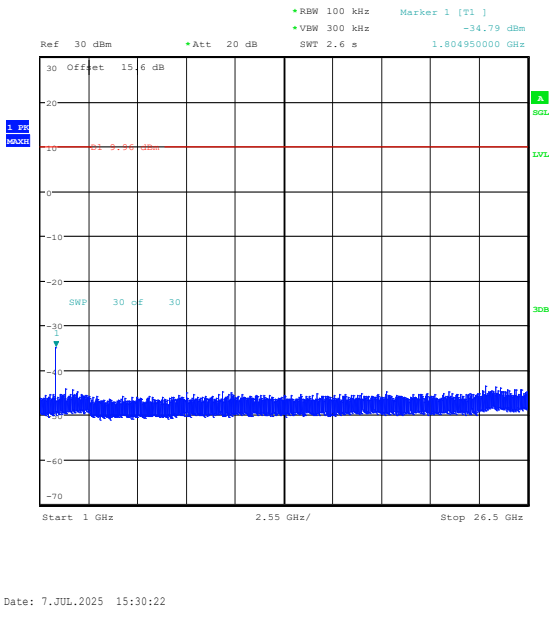
LORA_FHSS-Ant1-902.75-0~Reference-PASS



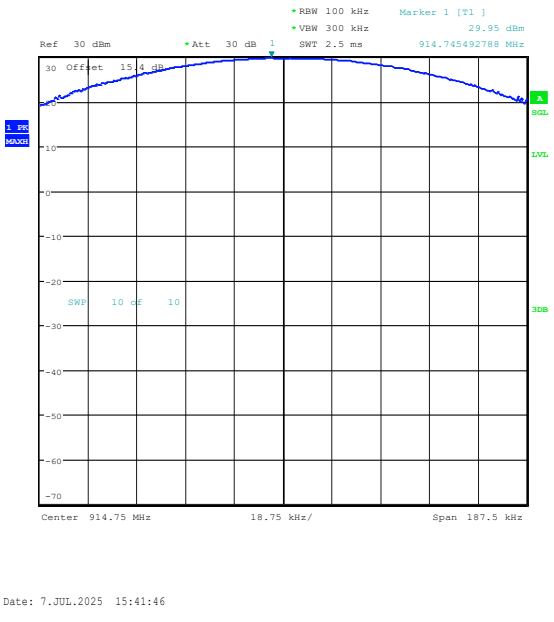
LORA_FHSS-Ant1-902.75-30~1000-PASS

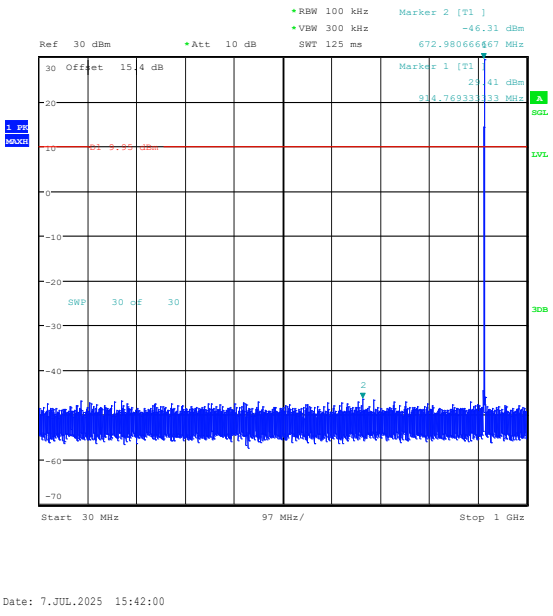
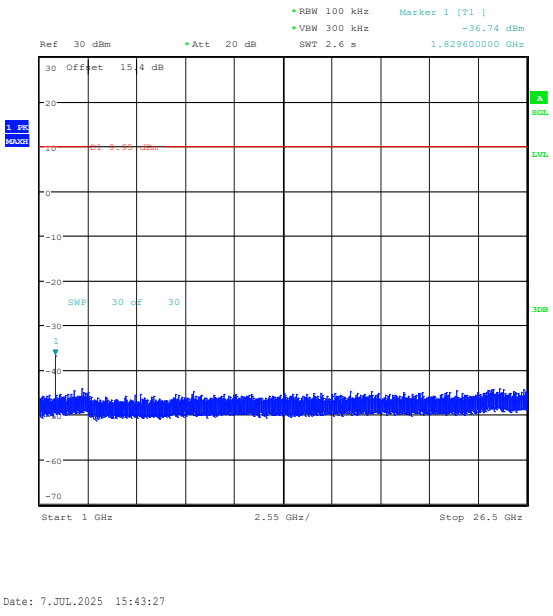
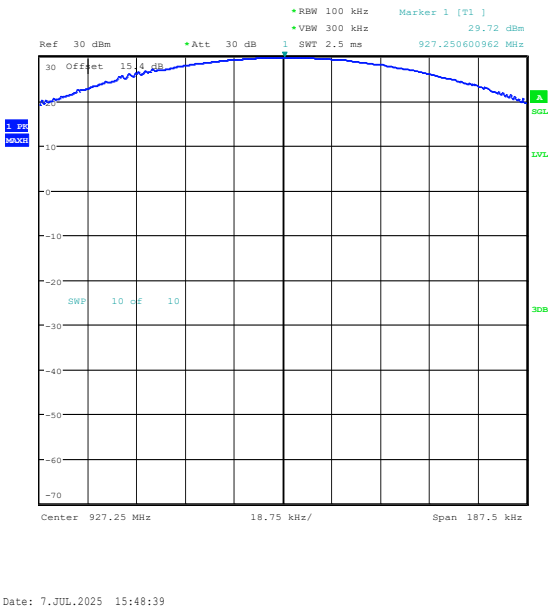
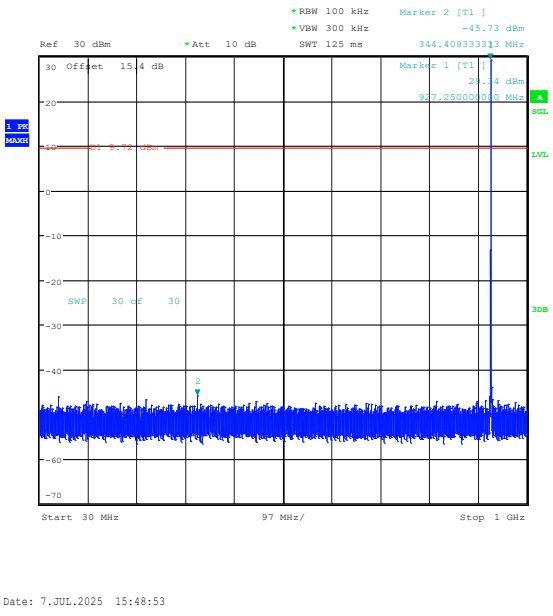


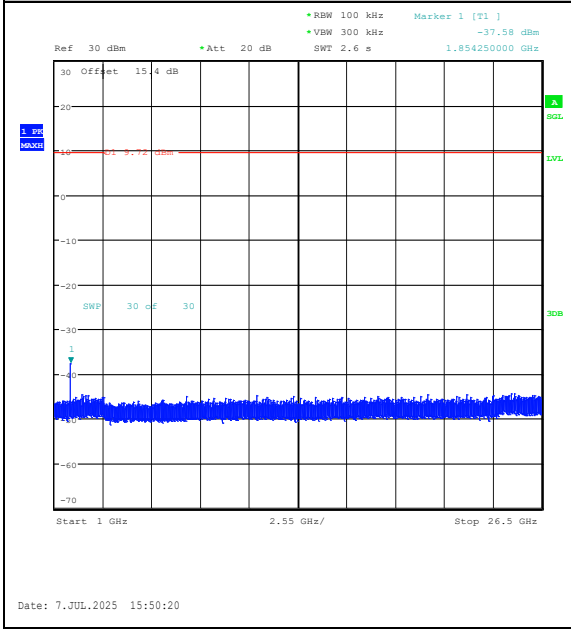
LORA_FHSS-Ant1-902.75-1000~26500-PASS



LORA_FHSS-Ant1-914.75-0~Reference-PASS



LORA_FHSS-Ant1-914.75-30~1000-PASS	LORA_FHSS-Ant1-914.75-1000~26500-PASS
	
LORA_FHSS-Ant1-927.25-0~Reference-PASS	LORA_FHSS-Ant1-927.25-30~1000-PASS
	

LORA_FHSS-Ant1-927.25-1000~26500-PASS	/
	/

6.10. Transmitter Spurious Emission-Radiated

Specifications:	FCC Part 15.247(d), RSS-247 5.5
DUT Serial Number:	IMEI:862072070057688;862072070057696
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Limit in restricted band

Frequency of emission (MHz)	Field strength (mV/m)	Field strength (dBuV/m)
0.009~0.49	2400/F (kHz)	129-94
0.49~1.705	24000/F (kHz)	74-63
1.705~30	30	70
30~88	100	40
88~216	150	43.5
216~960	200	46
Above 960	500	54

Measurement Uncertainty:

Measurement Uncertainty	30MHz-150MHz 3.38 dB (k=2) 150MHz-1000MHz 4.09dB (k=2) 1000MHz-6000MHz 4.84 dB (k=2) 6000MHz-18000MHz 4.52 dB (k=2) 18000MHz-26500MHz 6.19 dB (k=2) 26500MHz-40000MHz 6.03 dB (k=2)

Test procedures:

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height varied from 1m to 4m and the EUT azimuth were varied from 0° to 360° in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Test Settings – Below 1GHz (Quasi-Peak Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 100 kHz.
3. Set the VBW = 300 kHz.
4. Detector = quasi-peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Trace was allowed to stabilize.

Test Settings – Above 1GHz (Peak Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Detector = peak
5. Trace mode = max hold
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

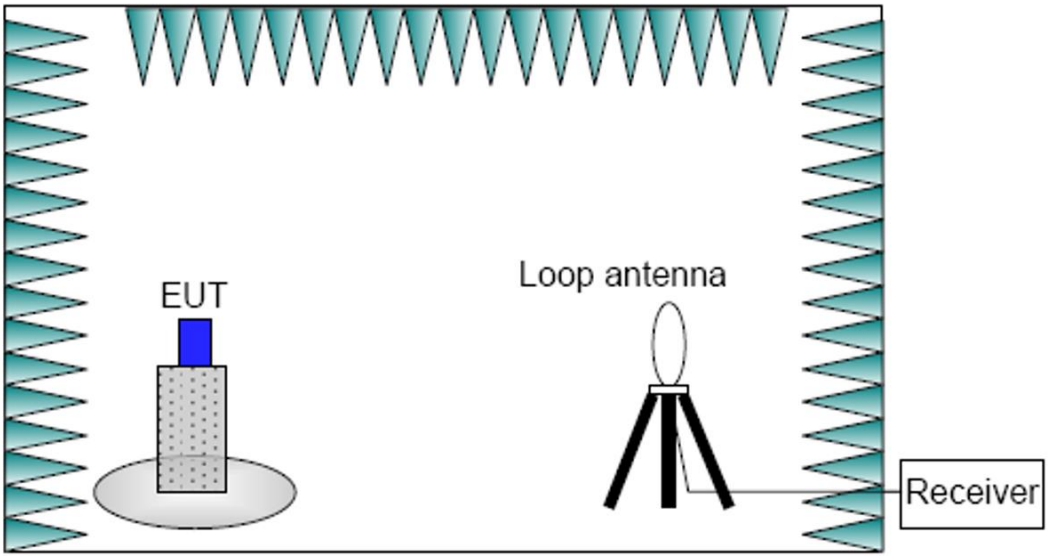
Test Settings – Above 1GHz (Average Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Detector = power average (RMS).
5. Number of measurement points = 1001 (Number of points must be ≥ 2 × span\\RBW)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

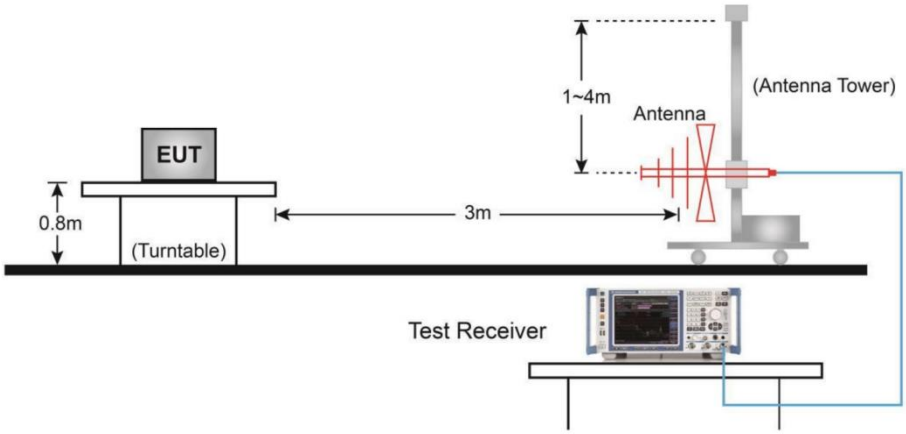
Frequency of emission	RBW/VBW	Sweep Time (s)
0.009~30	9KHz/30KHz	Auto
30~1000	100KHz/300KHz	5
1000~4000	1MHz/3MHz	15
4000~18000	1MHz/3MHz	40
18000~26500	1MHz/3MHz	20

Test Setup:

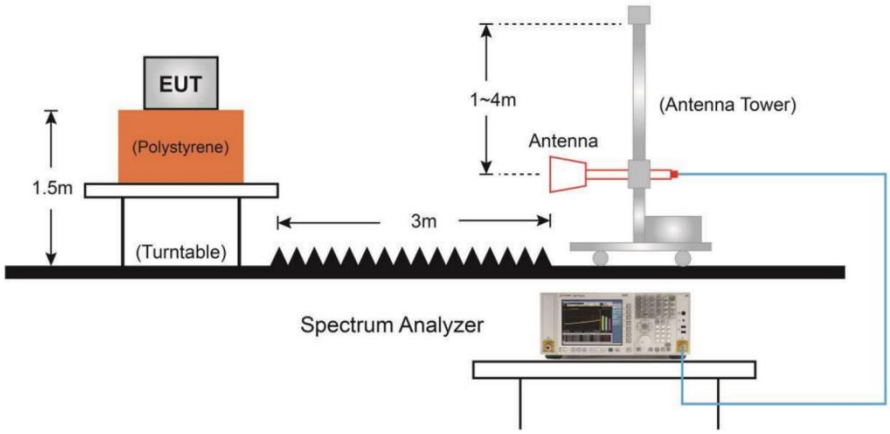
Below 30MHz Test Setup



Below 1GHz Test Setup



Above 1GHz Test Setup



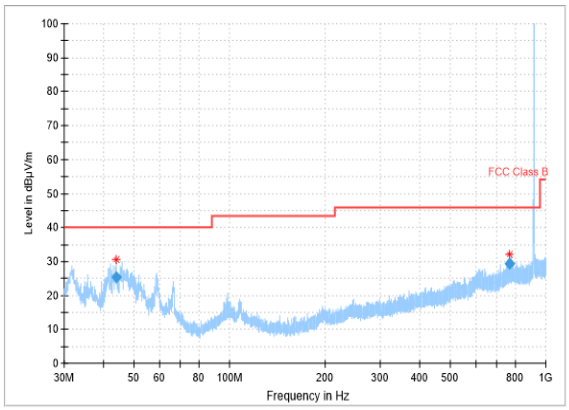
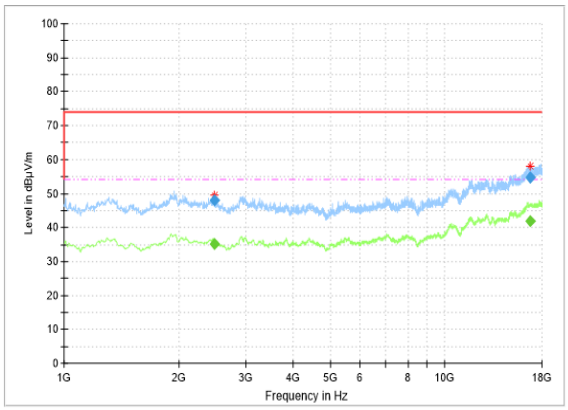
Measurement Results:

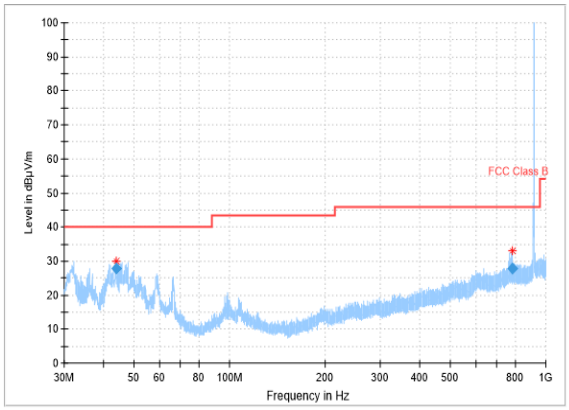
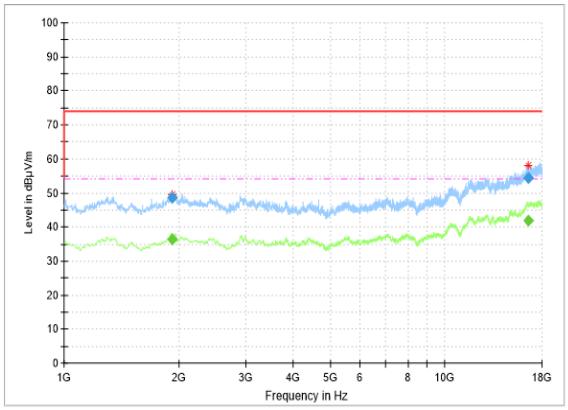
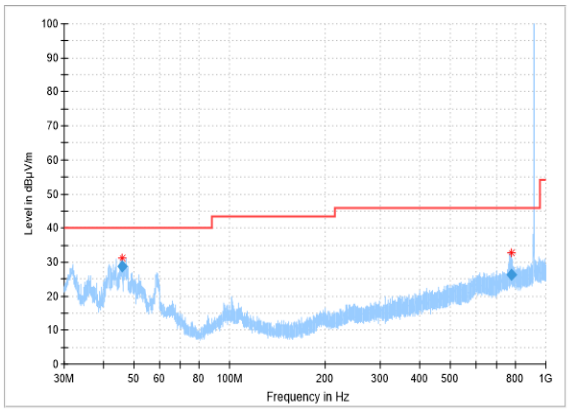
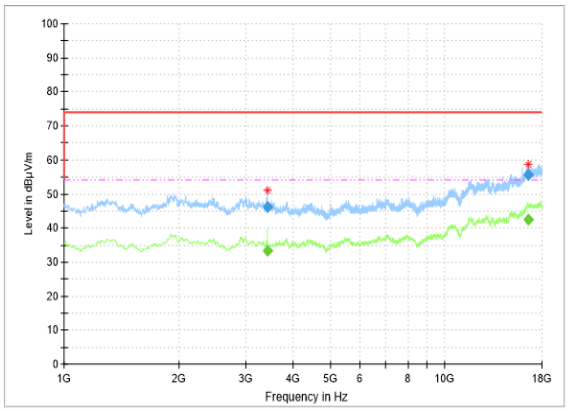
A “reference path loss” is established and ARpi is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

ARpi = Cable loss + Antenna Factor-Preamplifier gain

Result=PMea + Arpi

RSE-30MHz-1GHz-902.75MHz	RSE-1GHz-18GHz-902.75MHz
	

RSE-30MHz-1GHz-914.75MHz	RSE-1GHz-18GHz-914.75MHz
	
RSE-30MHz-1GHz-927.25MHz	RSE-1GHz-18GHz-927.25MHz
	

Note:

1. The out-of- limit signal in the picture is the main frequency signal.
2. Only data in worst mode is provided.
3. Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the Emissions in the frequency band 18GHz-26.5GHz is more than 20dB below the limit are not report.
4. The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.
5. Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

RSE-30MHz-1GHz-902.75MHz

Frequency (MHz)	QuasiPeak(dBµV/m)	ARpl (dB)	PMea (dBµV/m)	Margin(dB)	Limit(dBµV/m)	Polarity
43.7	25.34	-12	37.34	14.66	40.00	V
768.9	29.26	0	29.26	16.74	46.00	V

RSE-1GHz-18GHz-902.75MHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2477.9	47.89	3	44.89	26.11	74.00	H
16747.2	54.62	18	36.62	19.38	74.00	V

RSE-1GHz-18GHz-902.75MHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2477.9	35.23	3	32.23	18.77	54.00	H
16747.2	41.81	18	23.81	12.19	54.00	V

RSE-30MHz-1GHz-914.75MHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
43.8	27.7	-12	39.7	12.30	40.00	V
784.6	27.83	0	27.83	18.17	46.00	V

RSE-1GHz-18GHz-914.75MHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1925.4	48.57	5	43.57	25.43	74.00	H
16550.8	54.55	18	36.55	19.45	74.00	V

RSE-1GHz-18GHz-914.75MHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1925.4	36.26	5	31.26	17.74	54.00	H
16550.8	42.02	18	24.02	11.98	54.00	V

RSE-30MHz-1GHz-927.25MHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
45.8	28.84	-12	40.84	11.16	40.00	V
777.4	26.36	0	26.36	19.64	46.00	V

RSE-1GHz-18GHz-927.25MHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3418.2	46.06	1	45.06	27.94	74.00	H

16516.8	55.65	18	37.65	18.35	74.00	H

RSE-1GHz-18GHz-927.25MHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3418.2	33.48	1	32.48	20.52	54.00	H
16516.8	42.37	18	24.37	11.63	54.00	H

6.11. AC Powerline Conducted Emission

Specifications:	FCC Part 15.207, RSS-GEN 8.8
DUT Serial Number:	IMEI:862072070057688;862072070057696
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60%RH Air pressure: 86-106kPa
Test Results:	Pass

Method of Measurement: ANSI C63.10-2013-clause 6.2

1.The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.

2.If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.

3.The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.

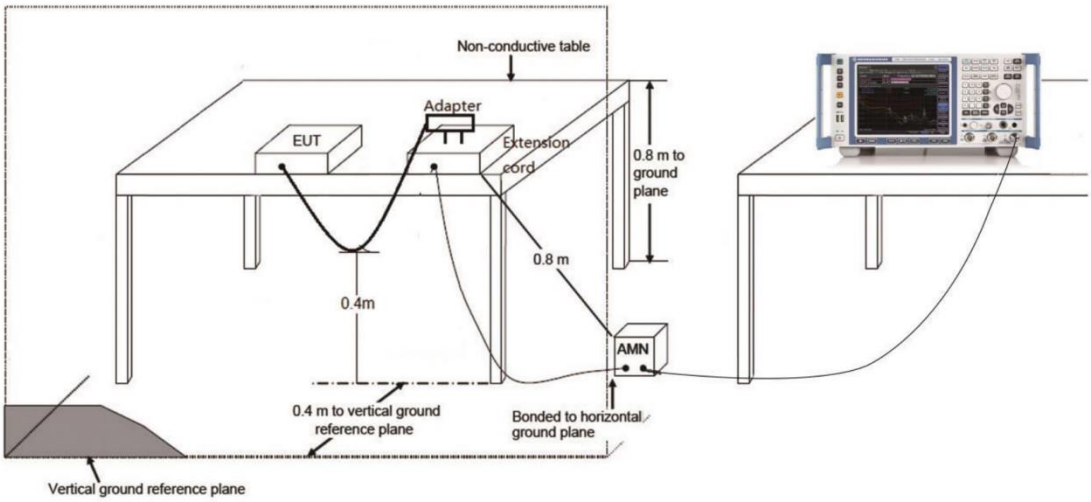
4.If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.36 Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

Measurement Uncertainty:

Measurement Uncertainty	1.97db（k=2）

Test Setup



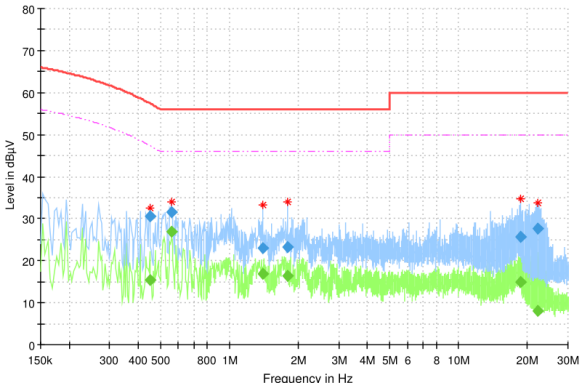
Test Condition

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

(Quasi-peak-average Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	66 to 56	56 to 46	P
0.5 to 5	56	46	
5 to 30	60	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

902.75	/
	/

Frequency (MHz)	QuasiPeak (dBµV)	Average (dµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.448500	30.57	---	57.47	26.90	15000.0	9.000	L1	ON	9.9
0.448500	---	15.42	47.47	32.05	15000.0	9.000	L1	ON	9.9
0.556706	31.63	---	56.00	24.37	15000.0	9.000	N	ON	10.1
0.556706	---	26.85	46.00	19.15	15000.0	9.000	N	ON	10.1
1.403700	22.98	---	56.00	33.02	15000.0	9.000	N	ON	10.0
1.403700	---	16.99	46.00	29.01	15000.0	9.000	N	ON	10.0
1.799213	23.25	---	56.00	32.75	15000.0	9.000	N	ON	9.9
1.799213	---	16.42	46.00	29.58	15000.0	9.000	N	ON	9.9
18.578644	---	14.89	50.00	35.11	15000.0	9.000	L1	ON	9.5
18.578644	25.74	---	60.00	34.26	15000.0	9.000	L1	ON	9.5
22.100944	---	8.07	50.00	41.93	15000.0	9.000	L1	ON	9.4
22.100944	27.61	---	60.00	32.39	15000.0	9.000	L1	ON	9.4

Note:

1. All modes have been tested and only the worst mode is recorded in the report.
2. L1 and N is all have been tested, the result of them is synthesized in the above data diagram.

ANNEX A EUT Photos

See the document ”25B02W000010-External Photos”.
See the document ”25B02W000010-Internal Photos”.

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

*****END OF REPORT*****