

Report on the RF Testing of:

BML Solutions Co., Ltd.
BMF IoT-10111208, Model: 10111208
FCC ID: 2BG3S-10111208



In accordance with FCC Part 15 Subpart C

Prepared for: BML Solutions Co., Ltd..
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COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-24135-0

SIGNATURE			
A handwritten signature in black ink, appearing to read "Hiroaki Suzuki".			
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Hiroaki Suzuki	RF Deputy Manager of EMC Lab	Approved Signatory	2024.07.12

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

EXECUTIVE SUMMARY – Result: Complied

A sample(s) of this product was tested and the result above was confirmed in accordance with FCC Part 15 Subpart C.

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1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-24135-0	First Issue	Refer to the cover page

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.3 Test methods

ANSI C63.10-2013

1.4 Deviation from standards

None

1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
15.247(a)(1)	20dB Bandwidth	Conducted	PASS	-
15.247(a)(1)	Carrier Frequency Separation	Conducted	PASS	-
15.247(a)(1)(iii)	Number of Hopping Frequencies	Conducted	PASS	-
15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Conducted	PASS	-
15.247(b)(1)	Maximum Peak Output Power	Conducted	PASS	-
15.247(d)	Band Edge Compliance of RF Conducted Emissions	Conducted	PASS	-
15.247(d) 15.205 15.209	Restricted Bands of Operation and Spurious Emissions	Conducted Radiated	PASS PASS	- -
15.207	AC Power Line Conducted Emissions	Conducted	N/A	Note

* Note: The test was not carried out because it was battery driven.

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

13-June-2024 - 17-June-2024

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	BML Solutions Co., Ltd. 101112085-15-40, Matsushiro, Tsukubashi, Ibaraki, 305-0035, Japan Phone: +81-90-9979-3073
Equipment Under Test (EUT)	BMF IoT-10111208
Model number	10111208
Serial number	Sample #1 (Radiated test), Sample #2 (Conducted test)
Trade name	BMF IoT
Number of sample(s)	2
EUT condition	Pre-Production
Power rating	DC 3.3 V
Size	(W) 104 mm x (D) 72.44 mm x (H) 6.35 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 °C to 65 °C
Hardware version	Not applicable
Software version	Not applicable
Firmware version	Not applicable
RF Specification	
Protocol	LoRa
Frequency range	902.3 MHz-914.9 MHz
Number of RF Channels	0-63 ch
Modulation method/Data rate	980, 1760, 3125, 5470 kbps
Channel separation	200 kHz
Conducted power	5.284 mW
Antenna type	Internal antenna
Antenna gain	-1.21 dBi

2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

Modification State	Description of Modification	Modification fitted by	Date of Modification
Model: 10111208, Serial Number: Sample #1 (Radiated test), Sample #2 (Conducted test)			
0	As supplied by the applicant	Not Applicable	Not Applicable

2.3 Variation of family model(s)

2.3.1 List of family model(s)

Not applicable

2.3.2 Reason for selection of EUT

Not applicable

2.4 Operating channels and frequencies

Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
0	902.3	27	907.7	54	913.1
1	902.5	28	907.9	55	913.3
2	902.7	29	908.1	56	913.5
3	902.9	30	908.3	57	913.7
4	903.1	31	908.5	58	913.9
5	903.3	32	908.7	59	914.1
6	903.5	33	908.9	60	914.3
7	903.7	34	909.1	61	914.5
8	903.9	35	909.3	62	914.7
9	904.1	36	909.5	63	914.9
10	904.3	37	909.7		
11	904.5	38	909.9		
12	904.7	39	910.1		
13	904.9	40	910.3		
14	905.1	41	910.5		
15	905.3	42	910.7		
16	905.5	43	910.9		
17	905.7	44	911.1		
18	905.9	45	911.3		
19	906.1	46	911.5		
20	906.3	47	911.7		
21	906.5	48	911.9		
22	906.7	49	912.1		
23	906.9	50	912.3		
24	907.1	51	912.5		
25	907.3	52	912.7		
26	907.5	53	912.9		

2.5 Operating mode

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Tested Channel	Frequency [MHz]
Low	902.3
Middle	908.5
High	914.9

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

Tested Channel	Modulation Type	Data Rate
Low, Middle, High	LoRa	980 kbps: Radiated test 5470 kbps: Conducted test

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.

The worst emission was found in X-axis and the worst case recorded.

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

2.6 Operating flow

[Tx mode]

i) Test program setup to the Terminal Software

ii) Select a Test mode

Operating frequency: Channel Low: 902.3 MHz, Channel Middle: 908.5 MHz, Channel High: 914.9 MHz

iii) Start test mode

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.3 System configuration” correspond to the list in “3.1 Equipment used” and “3.2 Cable(s) used”.

This test configuration is based on the manufacturer's instruction.

Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

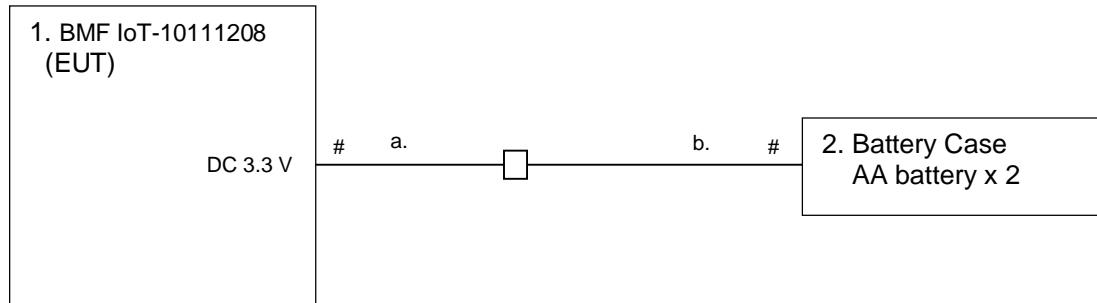
3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	BMF IoT-10111208	BMF IoT	10111208	Sample #1 (Radiated test), Sample #2 (Conducted test)	2BG3S-10111208	EUT
2	Battery Case	N/A	N/A	N/A	N/A	-

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
a	DC power cable	0.1	No	Plastic	-
b	DC power cable	0.15	No	Plastic	-

3.3 System configuration



□ : Connector
: Un-detachable cable

4 Test Result

4.1 20dB Bandwidth

4.1.1 Measurement procedure

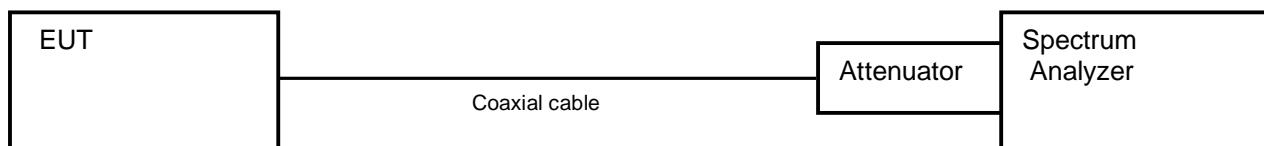
[FCC 15.247(a)(1)]

The bandwidth at 20 dB down from the highest inband spectral density is measured with spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- a) Span = 2-3 times the 20 dB bandwidth
- b) RBW \geq 1% of the 20 dB bandwidth
- c) VBW \geq RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

- Test configuration



4.1.2 Limit

None

4.1.3 Measurement result

Date : 17-June-2024
 Temperature : 23.9 [°C]
 Humidity : 61.8 [%]
 Test place : Shielded room No.4

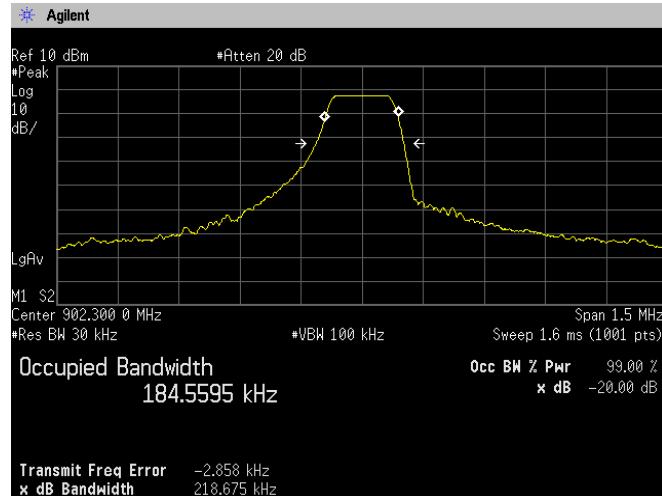
Test engineer :

Kazunori Saito

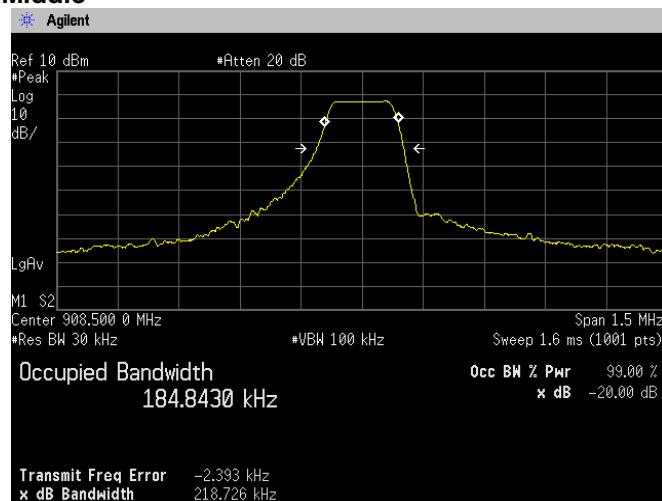
Channel	Frequency [MHz]	20dB bandwidth [MHz]
Low	902.3	0.219
Middle	908.5	0.219
High	914.9	0.219

4.1.4 Trace data

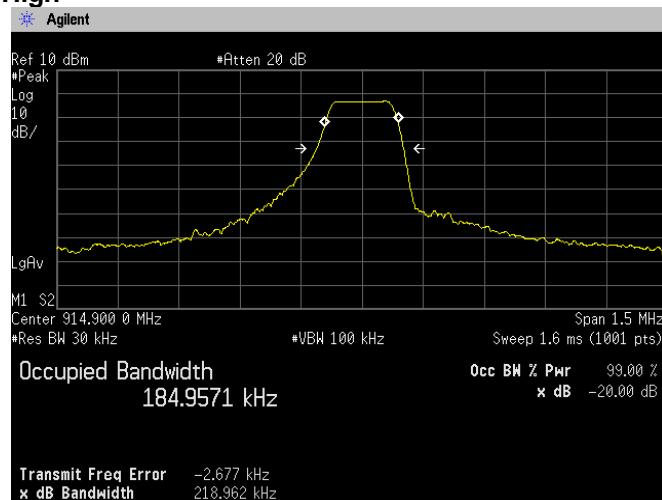
Channel Low



Channel Middle



Channel High



4.2 Carrier Frequency Separation

4.2.1 Measurement procedure

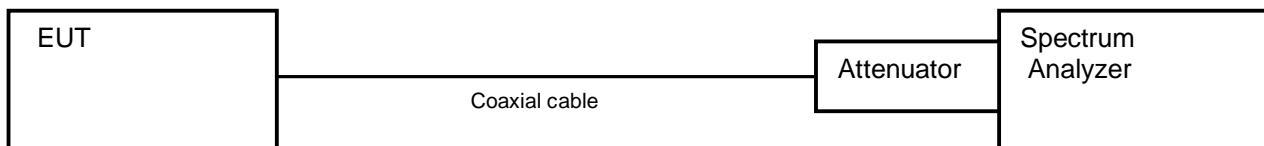
[FCC 15.247(a)(1)]

The adjacent channel interval is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to:

- a) Span = wide enough to capture the peaks of two adjacent channels
- b) RBW \geq 1% of the span
- c) VBW \geq RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

- Test configuration



4.2.2 Limit

System shall have hopping channel carrier frequencies separated by a minimum of, 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

4.2.3 Measurement result

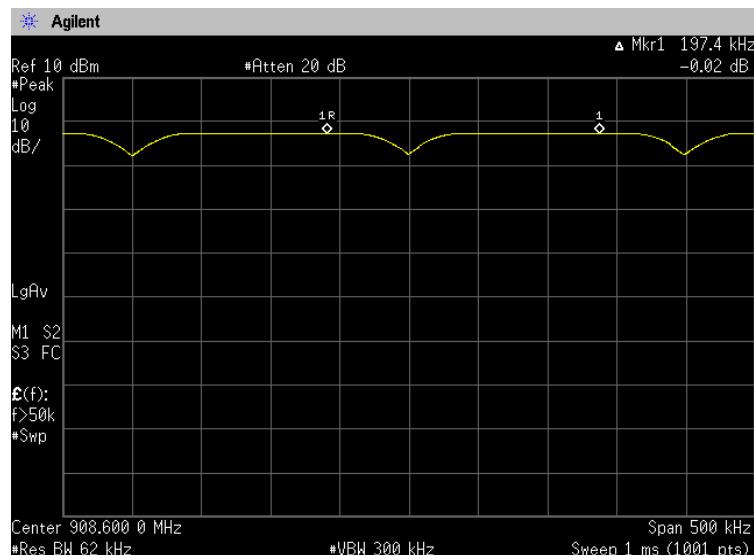
Date : 17-June-2024
 Temperature : 23.9 [°C]
 Humidity : 61.8 [%]
 Test place : Shielded room No.4

Test engineer : Kazunori Saito

Battery Full

Packet type	Channel separation [MHz]	Limit [MHz]	Result
LoRa	0.197	>two-thirds of the 20dB Bandwidth = 146kHz	PASS

4.2.4 Trace data



4.3 Number of Hopping Frequencies

4.3.1 Measurement procedure

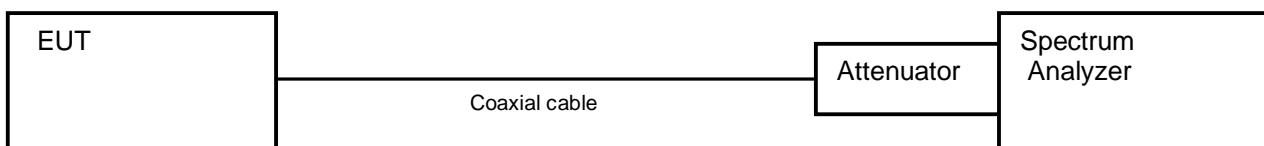
[FCC 15.247(a)(1)(iii)]

The number of hopping channels is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- a) Span = the frequency band of operation
- b) RBW \geq 1% of the Span
- c) VBW \geq RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

- Test configuration



4.3.2 Limit

20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels.

20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping channels.

4.3.3 Measurement result

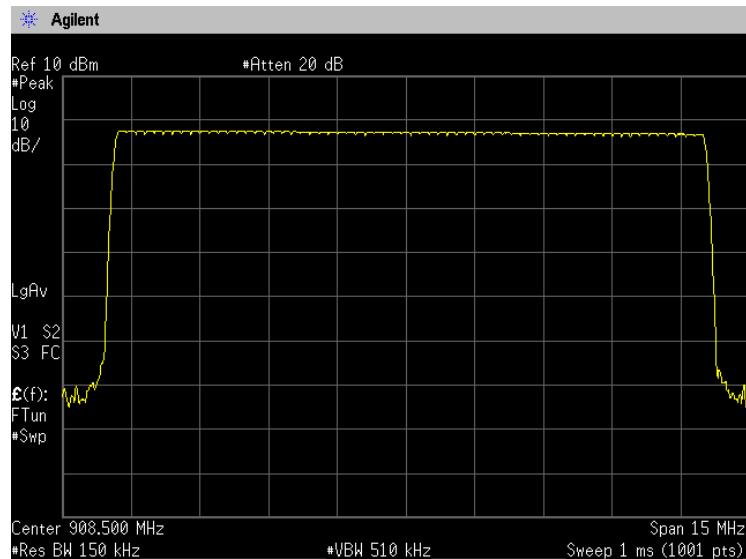
Date : 17-June-2024
 Temperature : 23.9 [°C]
 Humidity : 61.8 [%]
 Test place : Shielded room No.4

Test engineer :

Kazunori Saito

Number of channels	Limit	Result
64	\geq 50 channel	PASS

4.3.4 Trace data



4.4 Time of Occupancy (Dwell Time)

4.4.1 Measurement procedure

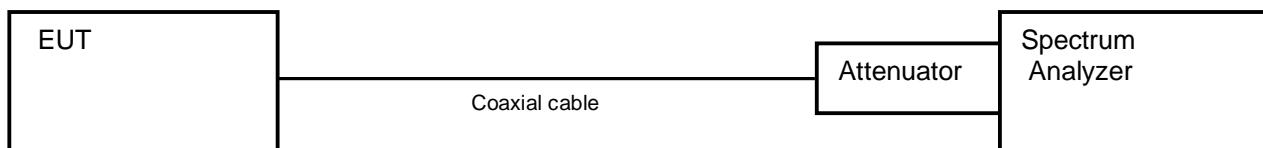
[FCC 15.247(a)(1)(iii)]

The time occupancy of hopping channel is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- a) Span = Zero span, centered on a hopping channel
- b) RBW = 1 MHz
- c) VBW \geq RBW
- d) Sweep time = Arbitrary setting
- e) Detector = peak
- f) Trace mode = Single

- Test configuration



4.4.2 Limit

20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 20-second period.

20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10-second period.

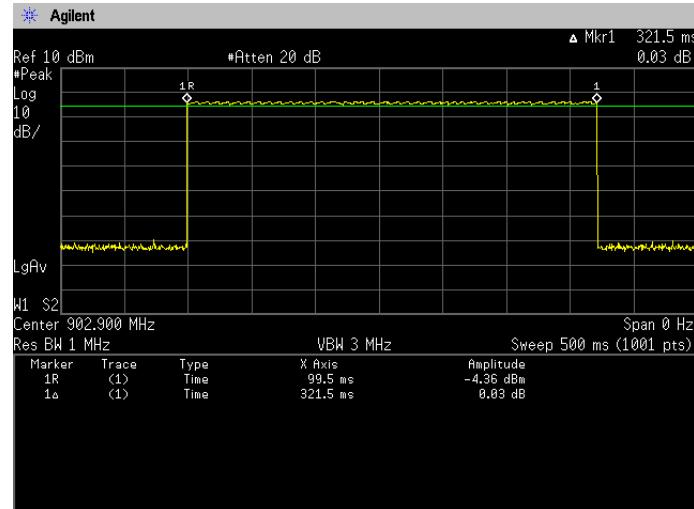
4.4.3 Measurement result

Date	:	17-June-2024		
Temperature	:	23.9 [°C]		
Humidity	:	61.8 [%]	Test engineer	:
Test place	:	Shielded room No.4	<u>Kazunori Saito</u>	

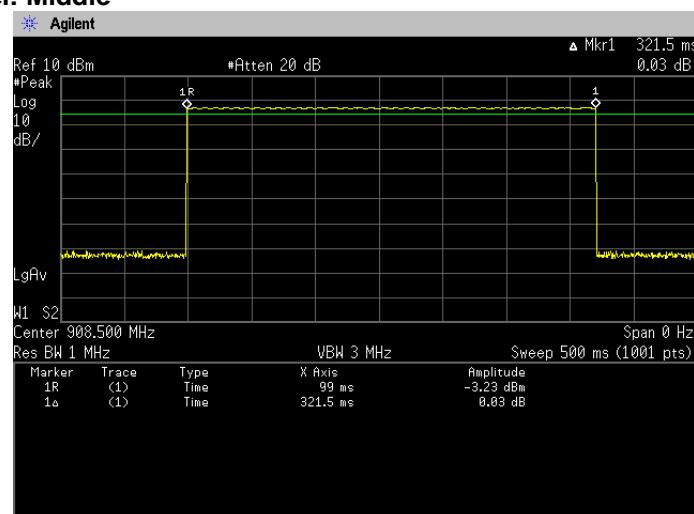
Channel	Frequency (MHz)	Pulse Width (ms)	Number of hops 20s	Total Dwell time in 20 seconds (ms)	Limit	Result
Low	902.3	321.500	1	321.500	<0.4s	PASS
Middle	908.5	321.500	1	321.500	<0.4s	PASS
High	914.9	321.500	1	321.500	<0.4s	PASS

4.4.4 Trace data

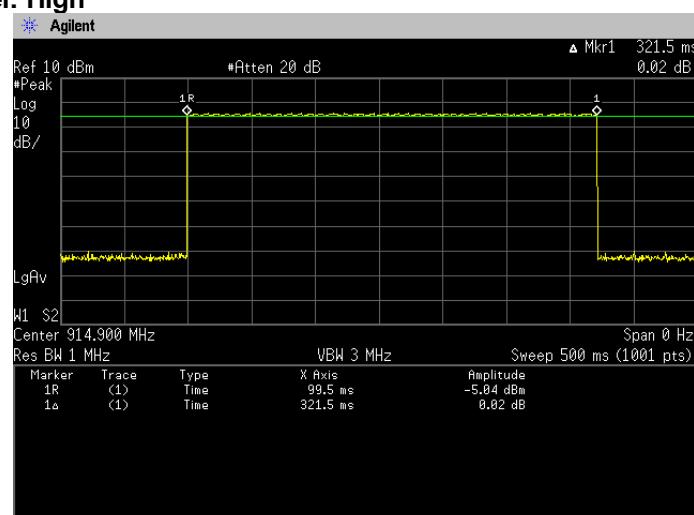
Channel: Low



Channel: Middle



Channel: High



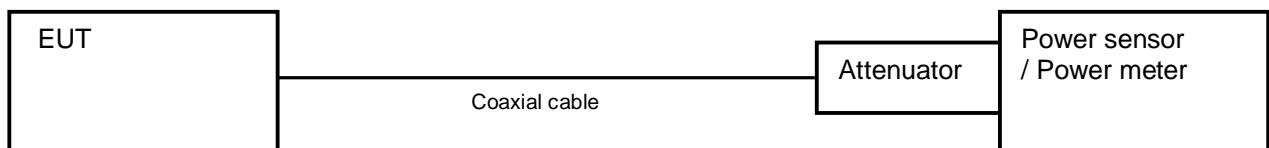
4.5 Maximum Peak Output Power

4.5.1 Measurement procedure

[FCC 15.247(b)(1)]

The peak power is measured with a power sensor connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

- Test configuration



4.5.2 Limit

1.0 W or less: Hop-set uses 50 or more hopping channels.

0.25 W or less: Hop-set uses less than 50 hopping channels.

4.5.3 Measurement result

Date : 17-June-2024
 Temperature : 23.9 [°C]
 Humidity : 61.8 [%]
 Test place : Shielded room No.4

Test engineer :

Kazunori Saito

Packet type	Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
LoRa	Low	902.3	-2.71	9.94	7.23	5.284	≤1000	PASS
	Middle	908.5	-3.04	9.94	6.90	4.898	≤1000	PASS
	High	914.9	-3.35	9.94	6.59	4.560	≤1000	PASS

Calculation:

Reading (dBm) + Factor (dB) = Level (dBm)

10logP = Level (dBm)

 $P = 10^{(\text{Maximum Peak Output Power} / 10)} \text{ (mW)}$

4.6 Band Edge Compliance of RF Conducted Emissions

4.6.1 Measurement procedure

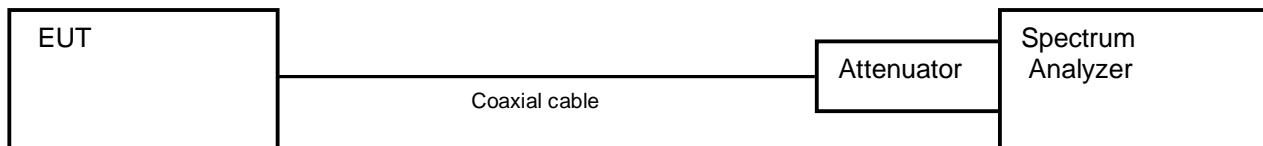
[FCC 15.247(d)]

The Band Edge is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- a) Span = Arbitrary setting (Setting suitable for measurement.)
- b) RBW = 1 % of the span
- c) VBW \geq RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

- Test configuration



4.6.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

4.6.3 Measurement result

Date : 17-June-2024
 Temperature : 23.9 [°C]
 Humidity : 62.8 [%]
 Test place : Shielded room No.4

Test engineer :

Kazunori Saito

[Hopping]

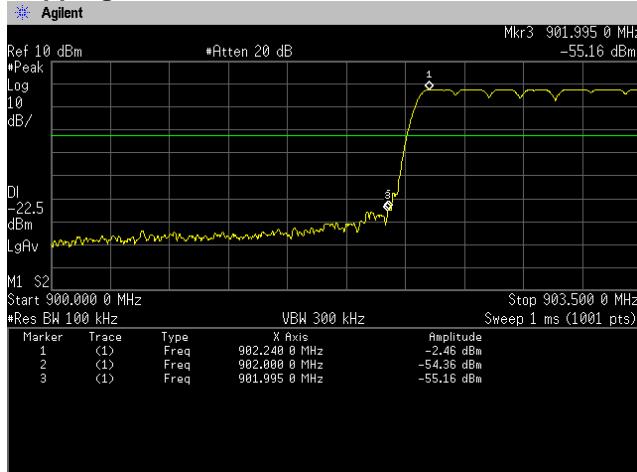
Packet type	Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
LoRa Hopping	Low	902.3	-2.46	902.00	-55.16	52.70	At least 20dB below from peak of RF	PASS
	High	914.9	-3.03	931.30	-70.01	66.98	At least 20dB below from peak of RF	PASS

[No hopping]

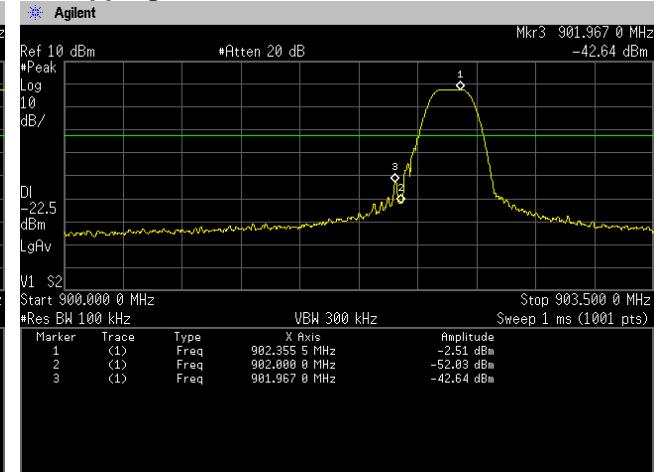
Packet type	Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
LoRa No hopping	Low	902.3	-2.51	901.97	-42.64	40.13	At least 20dB below from peak of RF	PASS
	High	914.9	-3.18	928.62	-70.36	67.18	At least 20dB below from peak of RF	PASS

4.6.4 Trace data

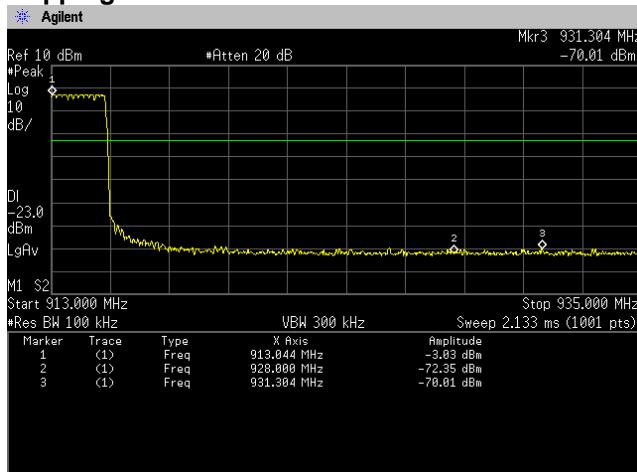
Channel Low Hopping



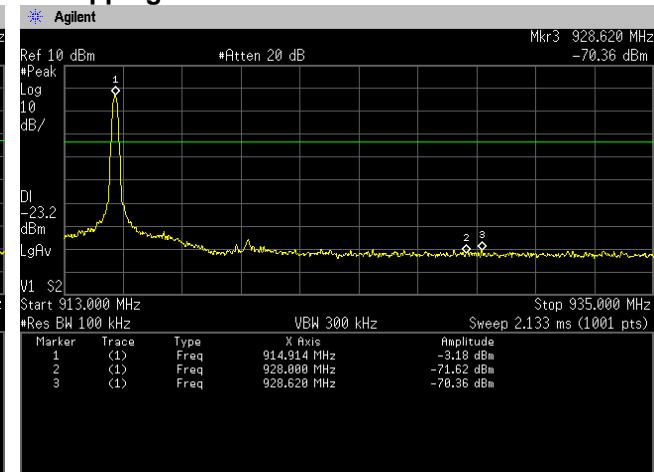
No hopping



Channel High Hopping



No hopping



4.7 Spurious emissions - Conducted -

4.7.1 Measurement procedure

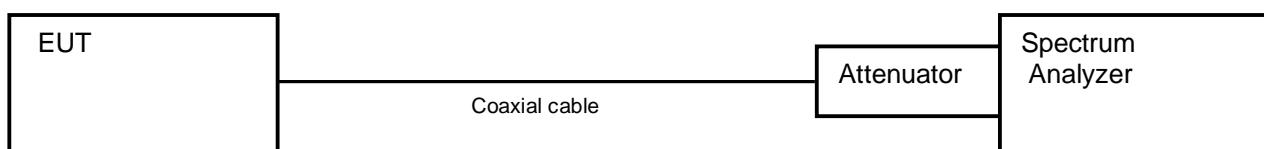
[FCC 15.247(d)]

The Spurious emissions (Conducted) are measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;

- a) Span = wide enough to fully capture the emission being measured
- b) RBW = 100 kHz
- c) VBW \geq RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

- Test configuration



4.7.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

4.7.3 Measurement result

Date : 17-June-2024
 Temperature : 23.9 [°C]
 Humidity : 61.8 [%]
 Test place : Shielded room No.4

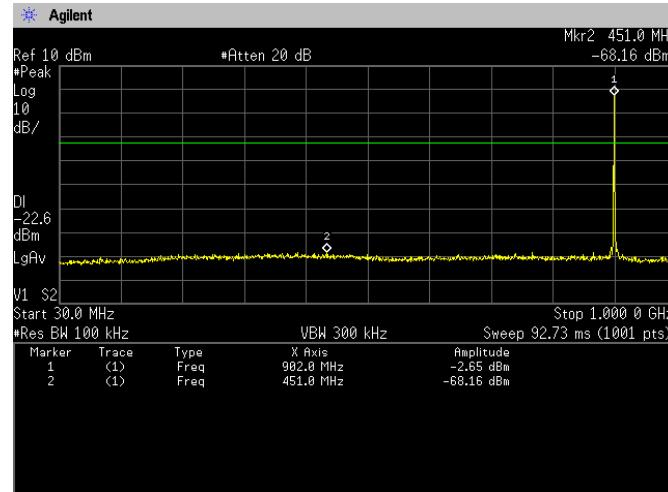
Test engineer :

Kazunori Saito

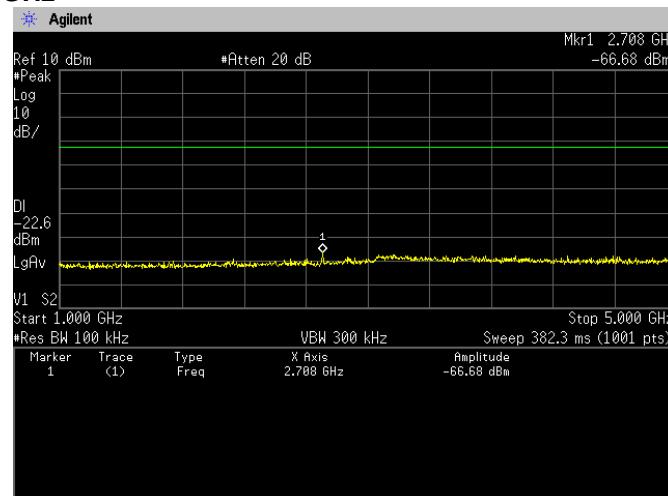
Channel	Frequency [MHz]	Limit [dB]	Results Chart	Result
Low	902.3	At least 20dB below from peak of RF	See the trace Data	PASS
Middle	908.5	At least 20dB below from peak of RF	See the trace Data	PASS
High	914.9	At least 20dB below from peak of RF	See the trace Data	PASS

4.7.4 Trace data

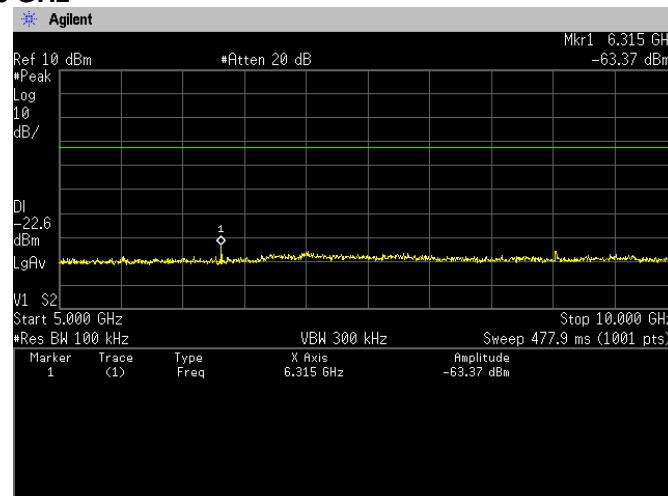
Channel Low 30 MHz-1 GHz



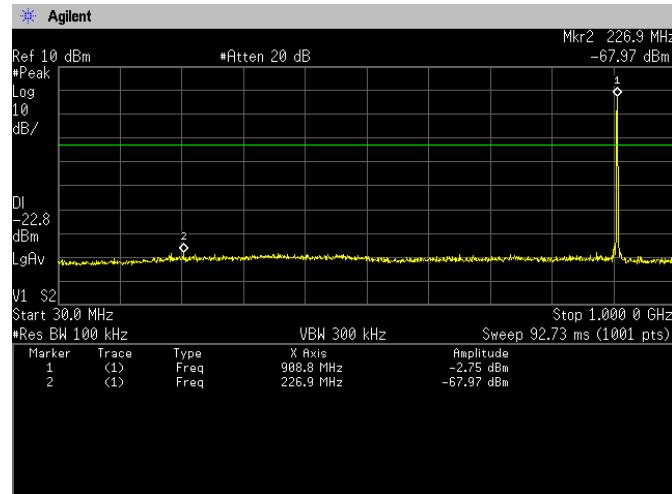
1 GHz-5 GHz



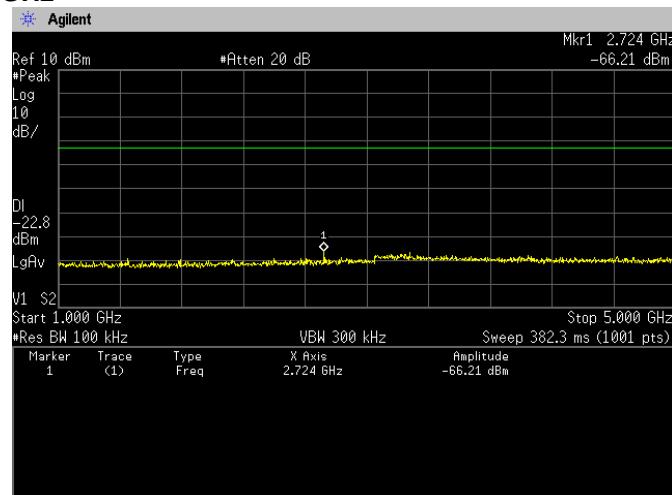
5 GHz-10 GHz



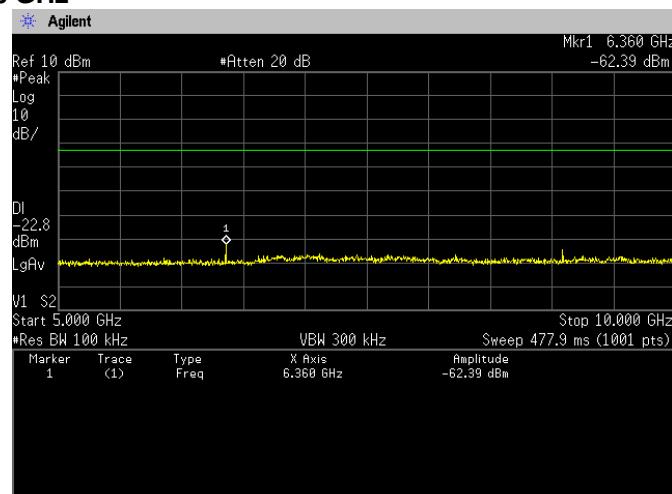
Channel Middle 30 MHz-1 GHz



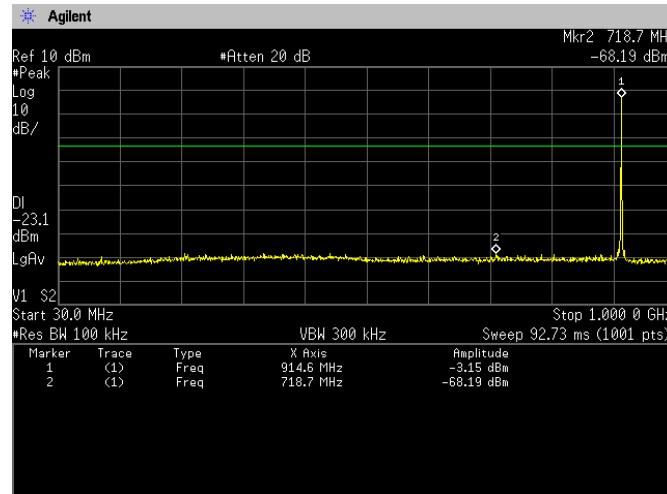
1 GHz-5 GHz



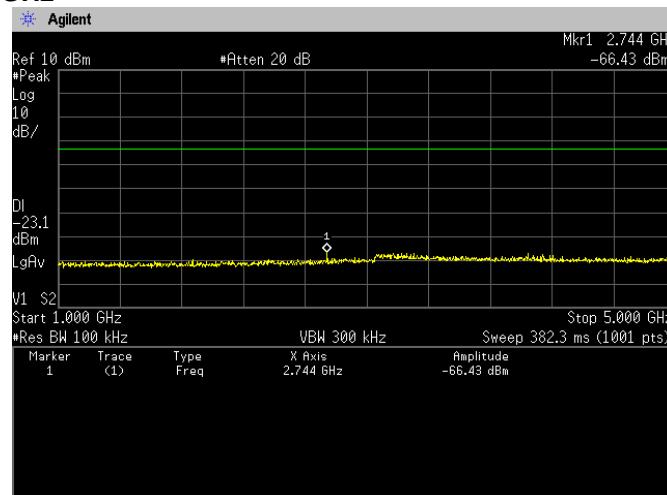
5 GHz-10 GHz



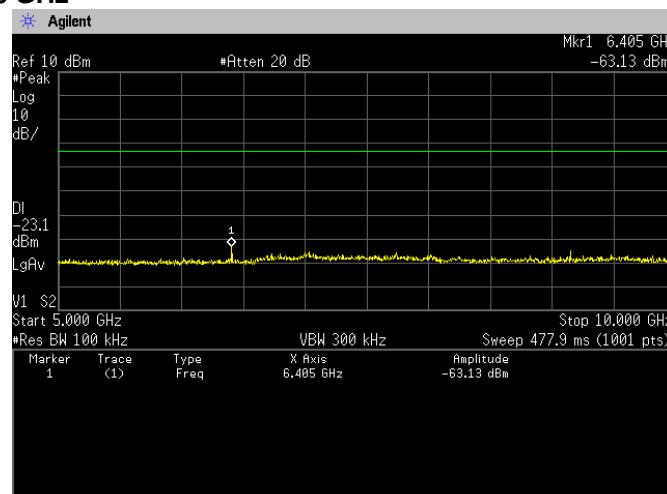
Channel High 30 MHz-1 GHz



1 GHz-5 GHz



5 GHz-10 GHz



4.8 Spurious Emissions - Radiated -

4.8.1 Measurement procedure

[FCC 15.247(d), 15.205, 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	9kHz to 10GHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)1.0m x (D)0.8m x (H)0.8m (below 1GHz) Styrofoam table / (W)0.6m x (D)0.6m x (H)1.5m (above 1GHz)
Antenna distance	:	3m
Test receiver setting		Below 1GHz
- Detector	:	Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	:	200Hz, 120kHz
Spectrum analyzer setting		Above 1GHz
- Peak	:	RBW=1MHz, VBW=3MHz, Span=0Hz, Sweep=auto
- Average	:	RBW=1MHz, VBW=10Hz, Span=0Hz, Sweep=auto Display mode=Linear

Average Measurement Setting [VBW]

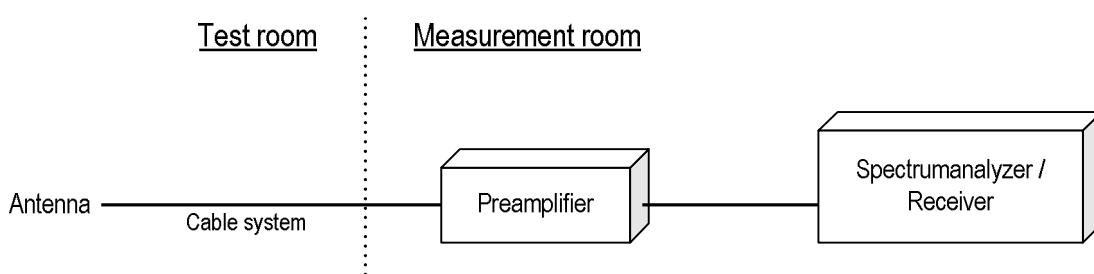
Mode	Duty Cycle (%)	T _{on} (us)	T _{off} (us)	1/T _{on} (kHz)	Determined VBW Setting
LoRa	100.00	-	-	-	10Hz

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.

Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, Biconical antenna, Log periodic antenna, Double ridged guide antenna and Broad-band horn Antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop antenna is 1m above the ground plane. The EUT is Placed on a turntable, which is 0.8m/1.5m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

- Test configuration



4.8.2 Calculation method

[9kHz to 150kHz]

Emission level = Reading + (Ant factor + Cable system loss)

Margin = Limit – Emission level

[150kHz to 25GHz]

Emission level = Reading + (Ant factor + Cable system loss - Amp. Gain)

Margin = Limit – Emission level

Example:

Limit @ 4804.0MHz : 74.0dBuV/m (Peak Limit)

S.A Reading = 49.0dBuV Cable system loss = 8.3dB

Result = 49.0 + 8.3 = 57.3dBuV/m

Margin = 74.0 - 57.3 = 16.7dB

4.8.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490-1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = $20\log E$ [uV/m]
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition modulation.

4.8.4 Test data

Date : 13-June-2024
 Temperature : 22.7 [°C]
 Humidity : 52.7 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Tadahiro Seino

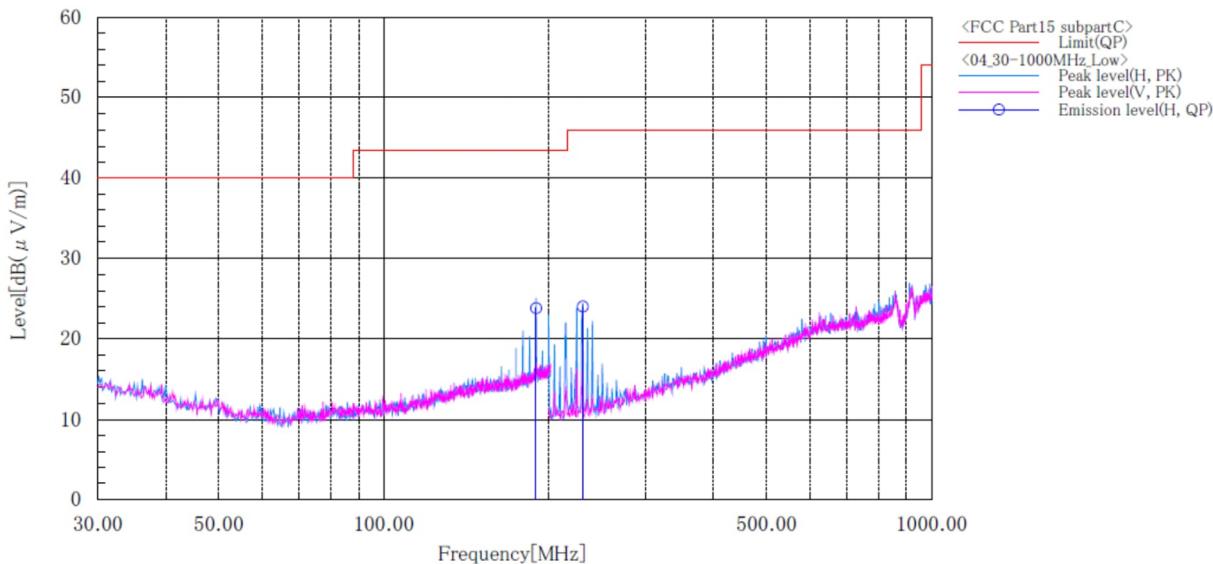
Date : 14-June-2024
 Temperature : 21.8 [°C]
 Humidity : 58.8 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Tadahiro Seino

[Transmission mode]
Channel: Low
BELOW 1 GHz

Company name : BMF Solutions Co., Ltd.
 EUT : BMF IoT-10111208
 Model No. : 10111208
 Serial No. : N/A
 Test mode : Continuous transmission

Sheet No. : 04
 Standard : FCC Part15 subpart C
 Operator : T.Seino
 Temp, Hum, Atm : 21.8 [° C], 58.8[%]
 Note1 : CH:Low (902.3MHz)


Final Result

No.	Frequency	Pol	Reading QP	c. f	Result QP	Limit QP	Margin QP	Height [cm]	Angle [deg]	Remark
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]			
1	189.690	H	35.3	-11.5	23.8	43.5	19.7	100.0	0.0	
2	230.710	H	40.3	-16.3	24.0	46.0	22.0	100.0	0.0	

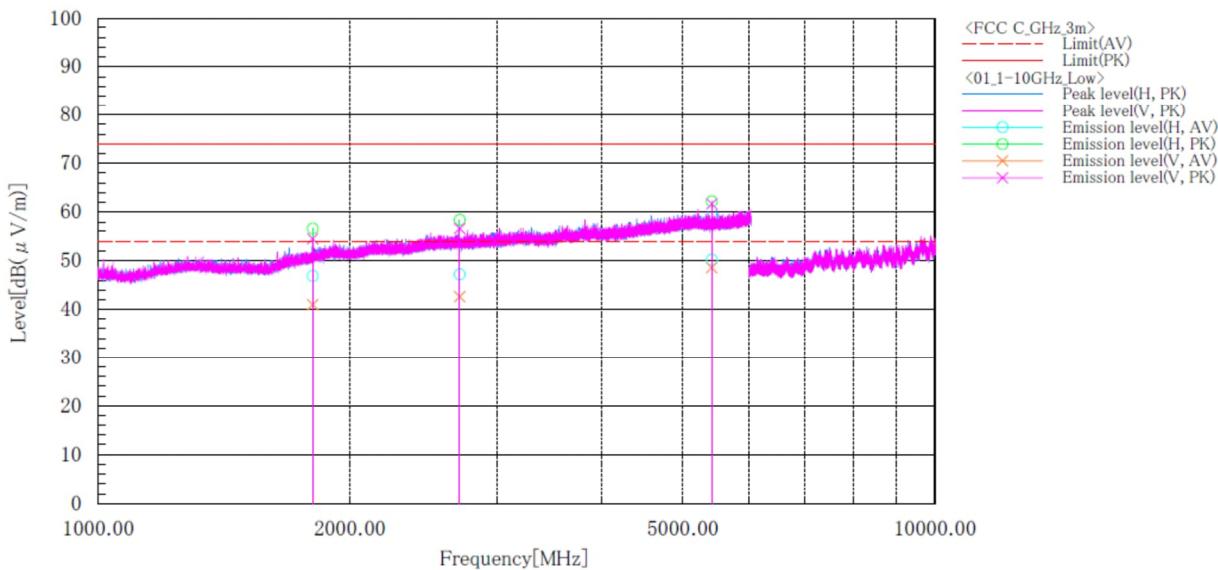
Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.

**Channel: Low
ABOVE 1 GHz**

Company name : BML Solutions Co., Ltd.
 EUT : BMF IoT-10111208
 Model No. : 10111208
 Serial No. : N/A
 Test mode : Continuous transmission

Sheet No. : 01
 Standard : FCC Part.15 subpart C
 Operator : T.Seino
 Temp,Hum,Atm : 22.7 [° C], 52.7 [%]
 Note1 : CH:Low (902.3MHz)



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f.	Result AV [dB(1/m)]	Result PK [dB(μV/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	R
1	1804.600	H	41.1	50.8	5.8	46.9	56.6	54.0	74.0	74.0	74.0	7.1	17.4	165.0	285.0	
2	1804.600	V	35.1	48.7	5.8	40.9	54.5	54.0	74.0	74.0	74.0	13.1	19.5	267.0	0.0	
3	2706.900	H	38.2	49.4	9.0	47.2	58.4	54.0	74.0	74.0	74.0	6.8	15.6	285.0	139.0	
4	2706.900	V	33.6	47.6	9.0	42.6	56.6	54.0	74.0	74.0	74.0	11.4	17.4	232.0	0.0	
5	5413.800	H	36.9	48.9	13.3	50.2	62.2	54.0	74.0	74.0	74.0	3.8	11.8	100.0	141.0	
6	5413.800	V	35.3	48.4	13.3	48.6	61.7	54.0	74.0	74.0	74.0	5.4	12.3	230.0	313.0	

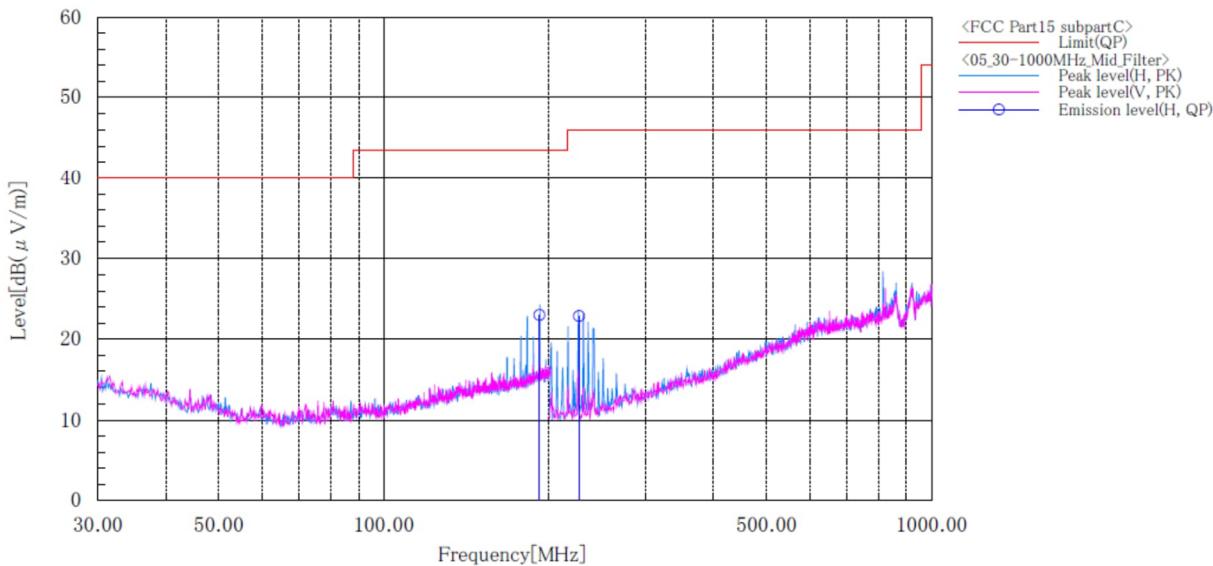
Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]

**Channel: Middle
BELOW 1 GHz**

Company name : BMF Solutions Co., Ltd.
 EUT : BMF IoT-10111208
 Model No. : 10111208
 Serial No. : N/A
 Test mode : Continuous transmission

Sheet No. : 05
 Standard : FCC Part15 subpart C
 Operator : T.Seino
 Temp,Hum,Atm : 22.7 [° C], 52.7[%]
 Note1 : CH:Mid (908.5MHz)


Final Result

No.	Frequency [MHz]	Pol	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	192.550	H	34.3	-11.3	23.0	43.5	20.5	100.0	195.0	
2	227.120	H	39.3	-16.4	22.9	46.0	23.1	100.0	0.0	

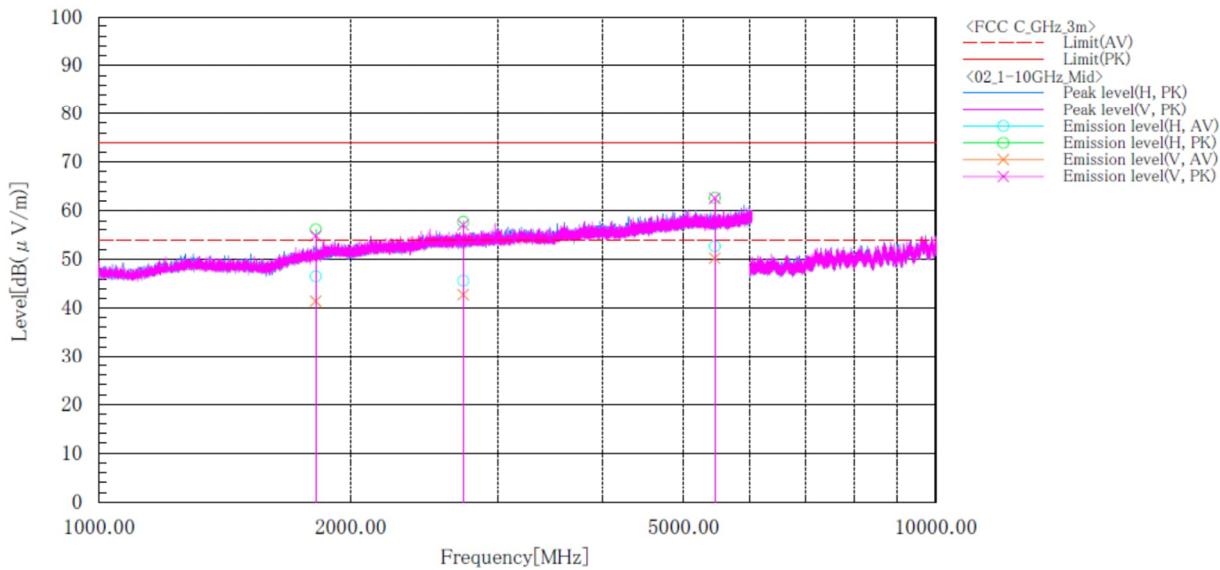
Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.

Channel: Middle ABOVE 1 GHz

Company name : BML Solutions Co., Ltd.
 EUT : BMF IoT-10111208
 Model No. : 10111208
 Serial No. : N/A
 Test mode : Continuous transmission

Sheet No. : 02
 Standard : FCC Part.15 subpart C
 Operator : T.Seino
 Temp,Hum,Atm : 22.7 [° C], 52.7 [%]
 Note1 : CH:Mid (908.5MHz)



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	R
1	1817.000	H	40.5	50.2	6.0	46.5	56.2	54.0	74.0	7.5	17.8	139.0	65.0	
2	1817.000	V	35.4	48.8	6.0	41.4	54.8	54.0	74.0	12.6	19.2	311.0	0.0	
3	2725.500	H	36.6	48.7	9.0	45.6	57.7	54.0	74.0	8.4	16.3	116.0	132.0	
4	2725.500	V	33.7	48.0	9.0	42.7	57.0	54.0	74.0	11.3	17.0	170.0	0.0	
5	5451.000	H	39.4	49.4	13.3	52.7	62.7	54.0	74.0	1.3	11.3	100.0	138.0	
6	5451.000	V	36.9	49.2	13.3	50.2	62.5	54.0	74.0	3.8	11.5	146.0	269.0	

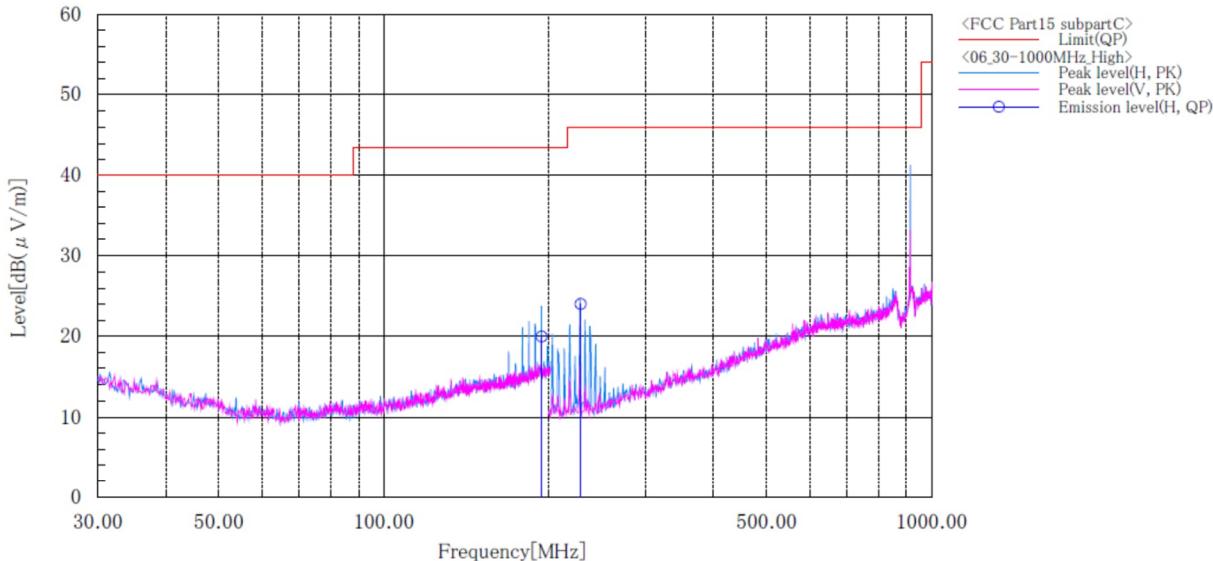
Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]

**Channel: High
BELOW 1 GHz**

Company name : BMF Solutions Co., Ltd.
 EUT : BMF IoT-10111208
 Model No. : 10111208
 Serial No. : N/A
 Test mode : Continuous transmission

Sheet No. : 06
 Standard : FCC Part15 subpart C
 Operator : T.Seino
 Temp,Hum,Atm : 21.8 [° C], 58.8[%]
 Note1 : CH:High (914.9MHz)



Final Result

No.	Frequency	Pol	Reading QP	c. f	Result QP	Limit QP	Margin QP	Height [cm]	Angle [deg]	Remark
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]			
1	193.920	H	31.2	-11.2	20.0	43.5	23.5	400.0	0.0	
2	228.730	H	40.3	-16.3	24.0	46.0	22.0	300.0	6.0	

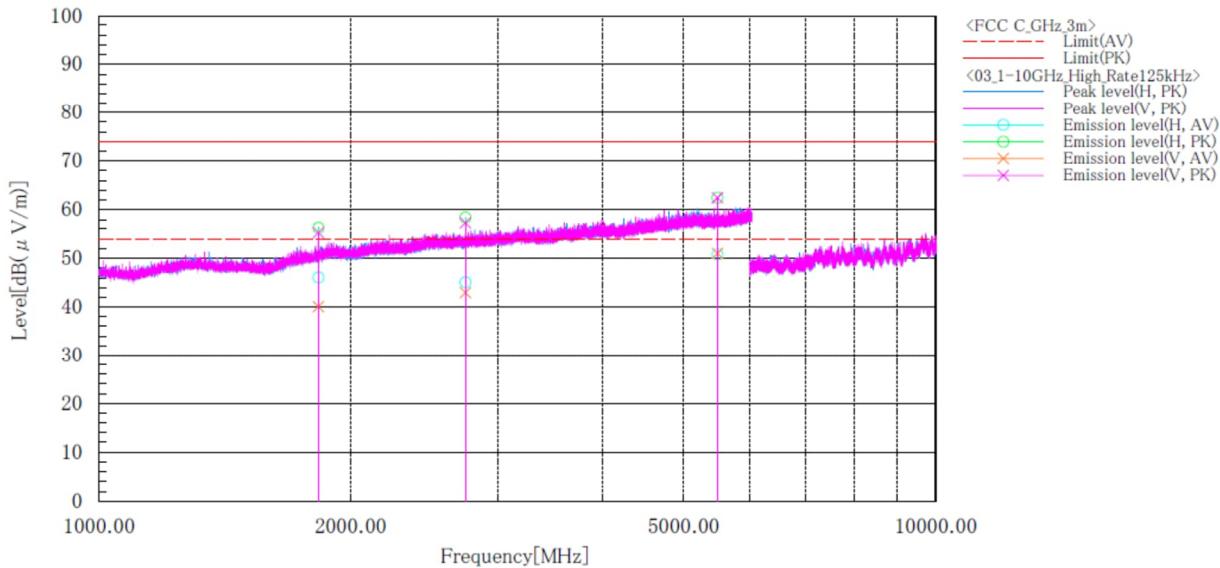
Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.

Channel: High ABOVE 1 GHz

Company name : BML Solutions Co., Ltd.
 EUT : BMF IoT-10111208
 Model No. : 10111208
 Serial No. : N/A
 Test mode : Continuous transmission

Sheet No. : 03
 Standard : FCC Part.15 subpart C
 Operator : T.Seino
 Temp,Hum,Atm : 22.7 [° C], 52.7 [%]
 Note1 : CH:High (914.9MHz)



Final Result

No.	Frequency	Pol	Reading AV	Reading PK	c. f.	Result AV	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle	R
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[deg]	
1	1829.800	H	40.0	50.2	6.1	46.1	56.3	54.0	74.0	7.9	17.7	194.0	280.0	
2	2744.700	H	36.0	49.3	9.1	45.1	58.4	54.0	74.0	8.9	15.6	168.0	133.0	
3	5489.400	H	37.4	49.0	13.4	50.8	62.4	54.0	74.0	3.2	11.6	100.0	144.0	
4	1829.800	V	33.9	49.2	6.1	40.0	55.3	54.0	74.0	14.0	18.7	261.0	330.0	
5	2744.700	V	33.9	48.2	9.1	43.0	57.3	54.0	74.0	11.0	16.7	337.0	196.0	
6	5489.400	V	37.6	49.0	13.4	51.0	62.4	54.0	74.0	3.0	11.6	130.0	51.0	

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]

5 Antenna requirement

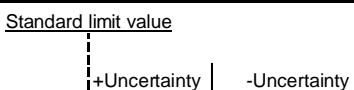
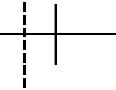
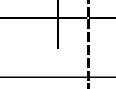
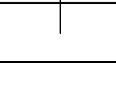
According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

6 Measurement Uncertainty

Expanded uncertainties stated are calculated with a coverage Factor k=2.
 Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission, AMN (9 kHz – 150 kHz)	±3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.8 dB
Radiated emission (30 MHz – 1000 MHz)	±5.4 dB
Radiated emission (1 GHz – 6 GHz)	±4.6 dB
Radiated emission (6 GHz – 18 GHz)	±4.7 dB
Radiated emission (18 GHz – 40 GHz)	±6.3 dB
Radio Frequency	±1.3 * 10 ⁻⁸
RF power, conducted	±0.7 dB
Adjacent channel power	±1.5 dB
Temperature	±0.6 °C
Humidity	±1.2 %
Voltage (DC)	±0.4 %
Voltage (AC, <10kHz)	±0.2 %

Judge	Measured value and standard limit value		
PASS	Case1		Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2		Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	Case3		Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4		Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

7 Laboratory Information

Testing was performed and the report was issued at:

TÜV SÜD Japan Ltd. Yonezawa Testing Center

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881

Accreditation and Registration

A2LA

Certificate #3686.03

VLAC

Accreditation No.: VLAC-013

BSMI

Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada

ISED#: 4224A

VCCI Council

Registration number: A-0166

Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Oct-2024	06-Oct-2023
Attenuator	Weinschel	56-10	J4993	31-Dec-2024	19-Dec-2023
Power meter	ROHDE&SCHWARZ	NRP2	103269	31-Mar-2025	26-Mar-2024
Power sensor	ROHDE&SCHWARZ	NRP-Z81	102467	31-Mar-2025	26-Mar-2024

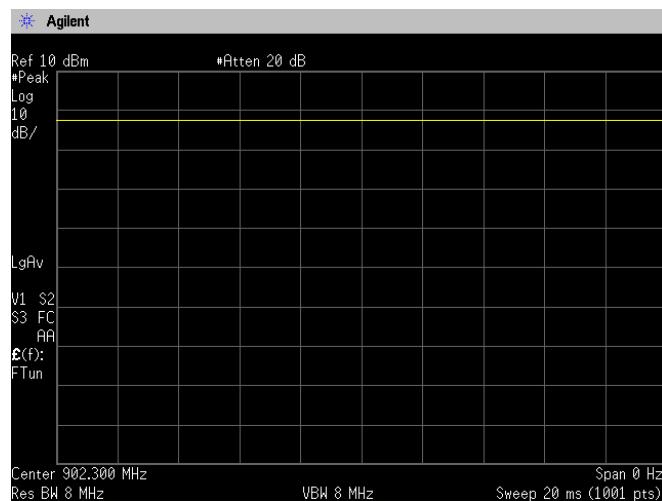
Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI receiver	ROHDE&SCHWARZ	ESW44	103171	31-Oct-2024	19-Oct-2023
Preamplifier	SONOMA	310	372170	30-Sep-2024	21-Sep-2023
Loop antenna	TESEQ	HLA6121	65079	31-Aug-2024	01-Aug-2023
Attenuator	TOYO Connector	NA-PJ-6/6dB	N/A(S542)	30-Jun-2024	22-Jun-2023
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1344	30-Jun-2024	19-Jun-2023
Log periodic antenna	Schwarzbeck	VUSLP9111B	346	31-Dec-2024	22-Dec-2023
Attenuator	TOYO Connector	NA-PJ-6/6dB	N/A(S541)	30-Sep-2024	21-Sep-2023
Attenuator	TAMAGAWA ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2024	20-Jul-2023
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Dec-2024	19-Dec-2023
Attenuator	AEROFLEX	26A-10	081217-08	31-Dec-2024	19-Dec-2023
Double ridged guide antenna	ETS LINDGREN	3117	00052315	30-Jun-2024	22-Jun-2023
Attenuator	HUBER+SUHNER	6803.17.B	N/A(2340)	31-Dec-2024	20-Dec-2023
Notch Filter	Micro-Tronics	BRC50706	003	31-Jul-2024	19-Jul-2023
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	800690/4	31-Oct-2024	20-Oct-2023
		SUCOFLEX104/1m	my24610/4	31-Dec-2024	20-Dec-2023
		SUCOFLEX104/9m	2001099/4	31-Dec-2024	20-Dec-2023
		SUCOFLEX104/1m	MY32976/4	31-Dec-2024	20-Dec-2023
		SUCOFLEX104/2m	SN MY28404/4	31-Dec-2024	20-Dec-2023
		SUCOFLEX104/7m	41625/6	31-Dec-2024	21-Dec-2023
Software	TOYO Technica	ES10/RE-AJ	Ver.2021.10.001	N/A	N/A
Absorber	RIKEN	PFP30	N/A	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2025	14-May-2024
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2025	14-May-2024

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

Appendix B. Duty Cycle

[Plot & Calculation]



$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$