Nemko Korea Co., Ltd.

155, 153 and 159, Osan-ro, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 16885 Republic of Korea
TEL : + 82 31 330 1700 FAX : + 82 31 322 2332

FCC PART 18 Class II Permissive Change

Applicant :

WINIADAEWOO Co., Ltd.
509, Dunchon-daero, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea, Republic of
Attn : Mr. Youjin Choi

Dates of Issue : August 24, 2020
Test Report No. : NK-20-E-0656
Test Site : Nemko Korea Co., Ltd.
EMC site, Korea

FCC ID	***C5F7NF1DMO100N***
Trade Mark	***DAEWOO, WINIA, SHARP***
Contact Person	**WINIADAEWOO Co., Ltd.** **509, Dunchon-daero, Jungwon-gu,** **Seongnam-si, Gyeonggi-do, Korea, Republic of** **Mr. Youjin Choi** **Telephone No. : + 82 31 639 7754**

Applied Standard :	FCC Part 18 & Part 2
Classification :	Consumer ISM equipment
EUT Type :	Microwave Oven

The device bearing the Trade Mark and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in MP-5:1986.
I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Aug 24. 2020
Tested By : Yeonsuk Jung
Engineer

Aug 24, 2020
Reviewed By : Taegyun Kim
Technical Manager

TABLE OF CONTENTS

SCOPE

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 18.

Responsible Party :	WINIADAEWOO Co., Ltd.
Contact Person :	Mr. Youjin Choi
	Tel No.: + 82 31 639 7754
Manufacturer :	WINIADAEWOO Co., Ltd. 509, Dunchon-daero, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea, Republic of

- FCC ID: C5F7NF1DMO100N
- Model: KOR-1D**, SMC1449FS
  Note) The asterisk "*" can be any alphanumeric character (A-Z or 0-9) to denote enclosure design.
- Trade Mark: DAEWOO, WINIA, SHARP
- EUT Type: Microwave Oven
- Applied Standard: FCC Part 18 & Part 2
- Test Procedure(s): MP-5:1986
- Dates of Test: July 23, 2020 to August 18, 2020
- Place of Tests: Nemko Korea Co., Ltd. EMC Site
- Test Report No.: NK-20-E-0656

*** The model KOR-1D** was tested for the representative model.**

INTRODUCTION

The measurement procedure described in MP5:1986 for Methods of Measurement of radiated, powerline conducted radio noise, frequency and power output was used in determining emissions emanating from **WINIADAEWOO Co., Ltd.**
FCC ID : **C5F7NF1DMO100N, Microwave Oven.**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory***.
The site address is 155, 153 and 159, Osan-ro, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 16885 Republic of Korea
The area of Nemko Korea Corporation Ltd. EMC Test Site is located in a mountain area at 80 kilometers (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 kilometers (18 miles) south-southeast from central Seoul.

The Nemko Korea Co., Ltd. has been accredited as a Conformity Assessment Body (CAB).

Nemko Korea Co., Ltd.
155, 153 and 159, Osan-ro, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 16885 Republic of Korea
Tel) + 82 31 330 1700
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Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. EMC Lab and Incheon Airport.

EUT INFORMATION

EUT Information

Intended use	Household
Type of appliance	Microwave Oven
Model	KOR-1D**, SMC1449FS
Rated voltage & frequency	a.c. 120 V, 60 ㎐ Single Phase
Rated power output	1 000 W
Rated power consumption(MW)	1 500 W
Magnetron	RM269 (WINIA)

Component List

Item	**Model**	**Manufacturer**	**Serial Number**
MAGNETRON	RM269	WINIADAEWOO Co., Ltd.	N/A
TRANS H.V.	DYAS10A0-1DA A	DPC	N/A
CAPACITOR H.V.	2100VAC 0.98 ㎌ #187	BICAI	N/A
DIODE H.V.	CL01-12	GAOXING	N/A
TRAY MOTOR	49TYD-16A1	JING CHENG	N/A
FAN MOTOR	OEM-10DWX1-A07(A)	OH SUNG	N/A
NOISE FILTER	DWLF-M17	YUNLU	N/A
INTERLOCK SWITCH	16 A, 125/250 V ac	GERSUNG	N/A
Main PCB	M378	WINIADAEWOO Co., Ltd.	N/A

Description of the Changes according to FCC part 2.1043

Report No.	Difference
NK-16-E-0750 (Basic Report)	Main PCB : M345
NK-20-E-0656	Main PCB : M378

DESCRIPTION OF TESTS

Radiation Hazard

A 700 ㎖ water load was placed in the center of the oven.
The power setting was set to maximum power.
While the oven was operating, the Microwave Survey Meter probe was moved slowly around the door seams to check for leakage.

Input Power Measurement

A 700 ㎖ water load was placed in the center of the oven and the oven set to maximum power. A 700 ㎖ water load was chosen for its compatibility.
Input power and current were measured using a Power Analyzer.
Manufacturers to determine their input ratings commonly use this procedure.

Output Power Measurement

The Caloric Method was used to determine maximum output power.
The initial temperature of a 1000 ㎖ water load was measured. The water load was placed in the center of the oven. The oven was operated at maximum output power for 47 seconds. Then the temperature of the water re-measured.

Frequency Measurements

Following the above test, after operating the oven long enough to assure that stable operating temperature were obtained, the operating frequency was monitored as the input voltage was varied between 80 percent to 125 percent of the nominal rating.
And the load quantity was reduced by evaporation to approximately 20 % of the original quantity with nominal rating.

DESCRIPTION OF TESTS

Conducted Emissions

The Line conducted emission test facility is located inside a 4 x 7 x 2.5 m shielded enclosure.
It is manufactured by EM engineering. The shielding effectiveness of the shielded room is in accordance with MIL-STD-285 or NSA 65-6.
A 1 m x 1.5 m wooden table 0.8 m height is placed 0.4 m away from the vertical wall and 0.5 m away from the side of wall of the shielded room Rohde & Schwarz (ENV216) and Rohde & Schwarz (ESH2-Z5) of the 50 ohm / 50 uH Line Impedance Stabilization Network(LISN) are bonded to the shielded room.
The EUT is powered from the Rohde & Schwarz (ENV216) LISN and the support equipment is powered from the Rohde & Schwarz (ESH2-Z5) LISN.
Power to the LISN s are filtered by high-current high insertion loss power line filters.
The purpose of filter is to attenuate ambient signal interference and this filter is also bonded to shielded enclosure. All electrical cables are shielded by tinned copper zipper tubing with inner diameter of 1/2”.
If d.c. power device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the LISNs,
All interconnecting cables more than 1 m were shortened by non-inductive bundling (serpentine fashion) to a 1 m length.
Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.
The spectrum was scanned from 150 ㎑ to 30 ㎒ with 15 s sweep time.
The frequency producing the maximum level was re-examined using the EMI test receiver. (Rohde & Schwarz ESCI).
The detector functions were set to quasi-peak mode & CISPR average mode.
The bandwidth of receiver was set to 9 ㎑. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.
Each emission was maximized by; switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux a.c. outlet, if applicable; whichever determined the worst case emission.
Each EME reported was calibrated using the R&S signal generator.

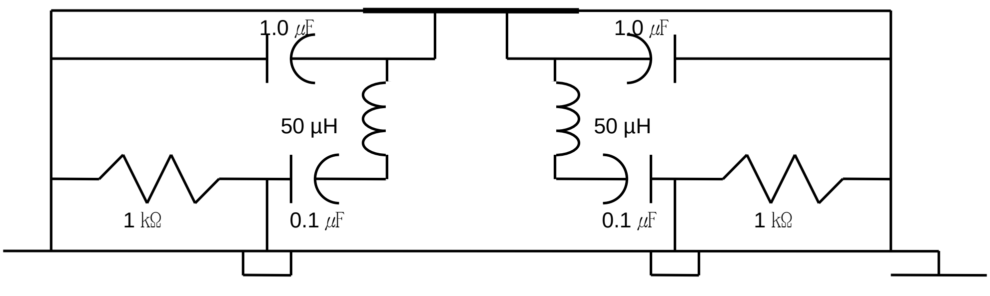


Fig. 2. LISN Schematic Diagram

DESCRIPTION OF TESTS

Radiated Emissions

Measurement were made indoors at 10 m & 3 m using antenna, signal conditioning unit and EMI test receiver to determine the frequency producing the maximum EME.
Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The Technology configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was note for each frequency found.
The spectrum was scanned from 0.15 ㎒ to 30 ㎒ using Loop Antenna
(ROHDE & SCHWARZ/HFH2-Z2)
and from 30 ㎒ to 1000 ㎒ using TRILOG Broadband Test Antenna (Schwarzbeck, VULB 9163).
Above 1 ㎓, Double Ridged Broadband Horn antenna (Schwarzbeck, HF907) was used.
Final Measurements were made indoors at 3 m using Loop Antenna
(ROHDE & SCHWARZ/HFH2-Z2) for measurement from 0.15 to 30 ㎒ with RBW 9 ㎑ and made indoor at 10 m using TRILOG Broadband Test Antenna (Schwarzbeck, VULB 9163) for measurement from 30 ㎒ to 1000 ㎒ with RBW 120 ㎑ and made indoors at 3 m using Double Ridged Broadband Horn antenna (Schwarzbeck, HF907) for measurement from 1 ㎓ to 18 ㎓ with RBW 1 ㎒.
The detector function were set to quasi peak mode and the bandwidth of the receiver were set to 9 ㎑, 120 ㎑ and peak mode 1 ㎒ depending on the frequency or type of signal.
The Double Ridged Broadband Horn antenna was tuned to the frequency found during preliminary radiated measurements.
The EUT support equipment and interconnecting cables were re-configured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non- metallic 1.0 X 1.5 meter table.
The EUT, support equipment and interconnecting cables were re-arranged and manipulated to maximize each EME emission.
The EUT is rotated about its vertical axis on the turntable, and the polarization and height of the receiving antenna are varied to obtain the highest field strength on the particular frequency under observation.
Each EME reported was calibrated using the R/S signal generator.

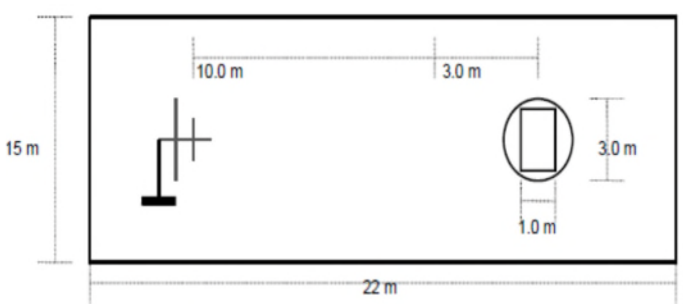


Fig. 3. Dimensions of 10 semi anechoic chamber

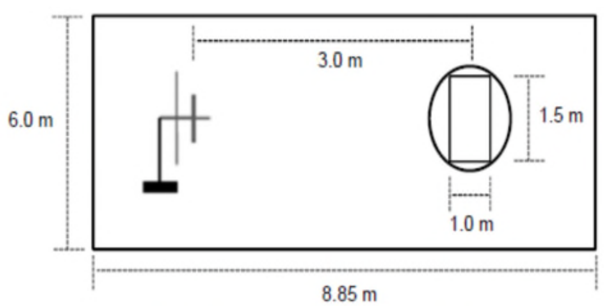


Fig. 4. Dimensions of 3 m full anechoic chamber

TEST DATA

Radiation Hazard

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
A	0.1	1.00
B	0.1	1.00
C	0.2	1.00
D	0.1	1.00
E	0.1	1.00
F	0.2	1.00

Input Power Measurement

Operation mode	P rated (W)	P (W)	dP (%)	Required dP (%)
Power Input	1 500	1 496	0.4	+ 15 %

Output Power Measurement

Quantity of Water [ml]	Mass of the container [g]	Ambient temperature [℃]	Initial temperature [℃]	Final temperature [℃]	Heating time [s]	Power output [W]
1 000	400	22.1	10.0	19.7	42	954

Formula :

$$P = \frac{4.187 \times m_w \times (T_1 - T_0) + 0.55 \times m_c \times (T_1 - T_A)}{t}$$

NOTE :

P is the microwave power output (W)

m_w is the mass of the water (g)

m_c is the mass of the container (g)

T_A is the ambient temperature (℃)

T_0 is the initial temperature of the water (℃)

T_1 is the final temperature of the water (℃)

t is the heating time (s), excluding the magnetron filament heating-up time.

Tested by : ***Yeonsuk Jung***

TEST DATA

Frequency measurements

▶ Frequency vs Line Voltage Variation Test

[Room Temperature : 19.5 ± 1.0 ℃]

Line Voltage Variation (a.c. V)	*Pole	Frequency [㎒]	Allowed Tolerance for the ISM Band
96 (80 %)	H	Lower : 2 444.8	Lower : 2 400 ㎒ Upper : 2 500 ㎒
	H	Upper : 2 466.3	
	V	Lower : 2 433.3	
	V	Upper : 2 467.2	
108 (90 %)	H	Lower : 2 434.9	
	H	Upper : 2 465.3	
	V	Lower : 2 429.8	
	V	Upper : 2 466.3	
120 (100 %)	H	Lower : 2 436.8	
	H	Upper : 2 462.4	
	V	Lower : 2 443.2	
	V	Upper : 2 464.4	
132 (110 %)	H	Lower : 2 430.1	
	H	Upper : 2 465.3	
	V	Lower : 2 429.1	
	V	Upper : 2 460.8	
150 (125 %)	H	Lower : 2 440.3	
	H	Upper : 2 463.1	
	V	Lower : 2 427.9	
	V	Upper : 2 459.6	

NOTE :

*1. *Pol. H = Horizontal V = Vertical*
2. Initial load : 1 000 ㎖ of water in the beaker.
3. Line voltage varied from 80 % to 125 %.
4. ISM Frequency : 2 450 ㎒, Tolerance : ± 50 ㎒

RESULT : Pass

*Tested by : **Yeonsuk Jung***

TEST DATA

▶ **Frequency vs Load Variation Test**

[Room Temperature : 19.5 ± 1.0 ℃]

Volume of water (㎖)	*)Pole	Frequency [㎒]	Allowed Tolerance for the ISM Band
200	H	Lower : 2 437.8	Lower : 2 400 ㎒ Upper : 2 500 ㎒
	H	Upper : 2 462.8	
	V	Lower : 2 443.2	
	V	Upper : 2 467.2	
400	H	Lower : 2 436.8	
	H	Upper : 2 461.8	
	V	Lower : 2 441.9	
	V	Upper : 2 469.5	
600	H	Lower : 2 436.5	
	H	Upper : 2 461.5	
	V	Lower : 2 445.1	
	V	Upper : 2 468.8	
800	H	Lower : 2 437.5	
	H	Upper : 2 461.8	
	V	Lower : 2 445.8	
	V	Upper : 2 466.3	
1000	H	Lower : 2 436.8	
	H	Upper : 2 462.4	
	V	Lower : 2 443.2	
	V	Upper : 2 464.4	

NOTE :

*1. *Pol. H = Horizontal, V = Vertical*

2. The water load was varied between 200 ㎖ to 1 000 ㎖.

3. Frequency was measured by using nominal voltage (a.c. 120 V).

4. ISM Frequency : 2 450 ㎒, Tolerance : ± 50 ㎒

RESULT : Pass

Tested by : ***Yeonsuk Jung***

TEST DATA

Conducted Emissions

FCC ID : C5F7NF1DMO100N

[Room Temperature : 19.5 ± 1.0 ℃]

EMI Auto Test(12) 1 / 2

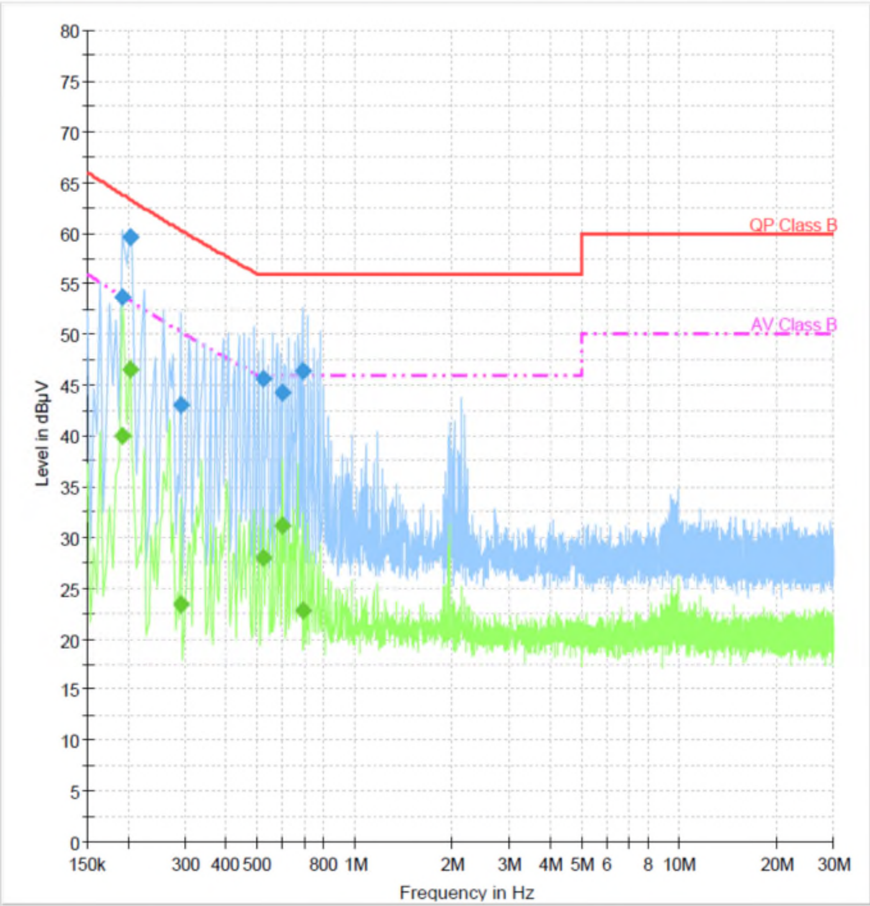
Test Report

Common Information

Test Description:	Conducted emission (NK-20-E-0656)
Test Site:	3rd building shielded room
Test Standard:	FCC Part 18
Environment Conditions:	a.c. 120 V, 60 Hz
Operator Name:	Yeonsuk, Jung
Mode:	Microwave

2.EMI Auto Test_4-Line Voltage LISN

2.EMI Auto Test_4-Line Voltage LISN



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EMI Auto Test(12) 2 / 2

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.191044	53.8	15000.0	9.000	GND	L1	10.6	10.1	63.9	
0.202238	59.7	15000.0	9.000	GND	L1	10.6	3.7	63.4	
0.291788	43.0	15000.0	9.000	GND	N	10.7	17.3	60.3	
0.523125	45.6	15000.0	9.000	GND	N	10.7	10.4	56.0	
0.601481	44.3	15000.0	9.000	GND	N	10.7	11.7	56.0	
0.691031	46.4	15000.0	9.000	GND	L1	10.7	9.6	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.191044	40.0	15000.0	9.000	GND	L1	10.6	13.8	53.8	
0.202238	46.5	15000.0	9.000	GND	L1	10.6	6.8	53.3	
0.291788	23.4	15000.0	9.000	GND	N	10.7	26.8	50.2	
0.523125	28.0	15000.0	9.000	GND	N	10.7	18.0	46.0	
0.601481	31.1	15000.0	9.000	GND	N	10.7	14.9	46.0	
0.691031	22.9	15000.0	9.000	GND	L1	10.7	23.1	46.0	

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NOTES:

1. Measurements using quasi-peak mode & average mode.
2. If no frequencies are specified in the tables, no measurement for quasi-peak or average was necessary.
3. Line : L = Line , N = Neutral
4. The limit for consumer device is on the FCC Part section 18.307(b).

Tested by : ***Yeonsuk Jung***

TEST DATA

Radiated Emissions (150 ㎑ to 30 ㎒)

FCC ID : C5F7NF1DMO100N

[Room Temperature : 19.5 ± 1.0 ℃]

EMI Auto Test(1) 1 / 2

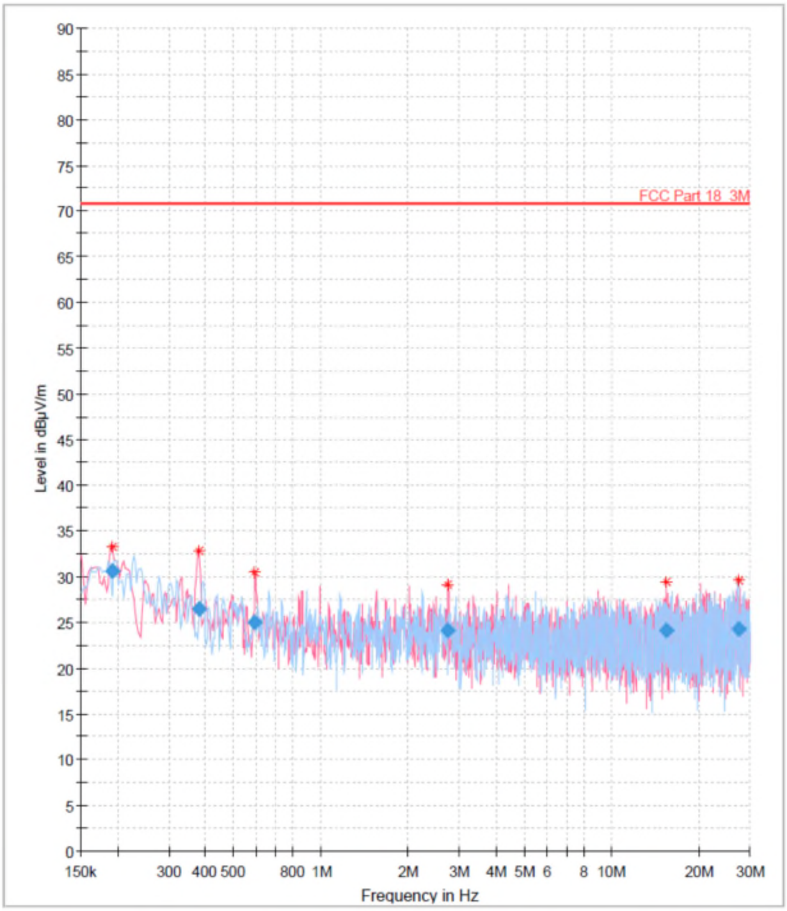
Test Report

Common Information

Test Description :	Radiated Emission(NK-20-E-0656)
Test Site :	3rd Building 10 m Chamber
Test Standard :	FCC Part 18
Environment Conditions :	a.c. 120 V, 60 Hz
Operator Name :	Yeonsuk, Jung
Mode :	Microwave

Full Spectrum

Full Spectrum



8/15/2020

EMI Auto Test(1) 2 / 2

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB)
0.191790	30.59	70.80	40.21	15000.0	9.000	V	334.0	-22.8
0.379845	26.45	70.80	44.35	15000.0	9.000	V	17.0	-23.1
0.594765	24.95	70.80	45.85	15000.0	9.000	V	308.0	-23.1
2.746950	24.09	70.80	46.71	15000.0	9.000	V	54.0	-22.6
15.394395	24.05	70.80	46.75	15000.0	9.000	V	99.0	-22.0
27.438870	24.26	70.80	46.54	15000.0	9.000	H	354.0	-20.9

(continuation of the "Final_Result" table from column 15 ...)

Frequency (MHz)	Comment
0.191790	5:42:43 PM - 8/15/2020
0.379845	5:40:58 PM - 8/15/2020
0.594765	5:43:00 PM - 8/15/2020
2.746950	5:41:25 PM - 8/15/2020
15.394395	5:41:52 PM - 8/15/2020
27.438870	5:39:52 PM - 8/15/2020

8/15/2020

<Radiated Measurements at 3 meters >

NOTES:

1. *Pol. H = Horizontal V = Vertical

2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.

3. Distance Correction factor : 20 * log (300 / 3) = 40 dBuV/m

4. The limit at 300 meters is 20 * log (25 * SQRT (RF Power / 500))

5. All other emissions were measured while a 700 ㎖ load was placed in the center of the oven.

6. The limit for consumer device is on the FCC Part section 18.305.

Tested by : ***Yeonsuk Jung***

TEST DATA

Radiated Emissions (30 ㎒ to 1 ㎓)

FCC ID : C5F7NF1DMO100N

[Room Temperature : 19.5 ± 1.0 ℃]

EMI Auto Test(1) 1 / 2

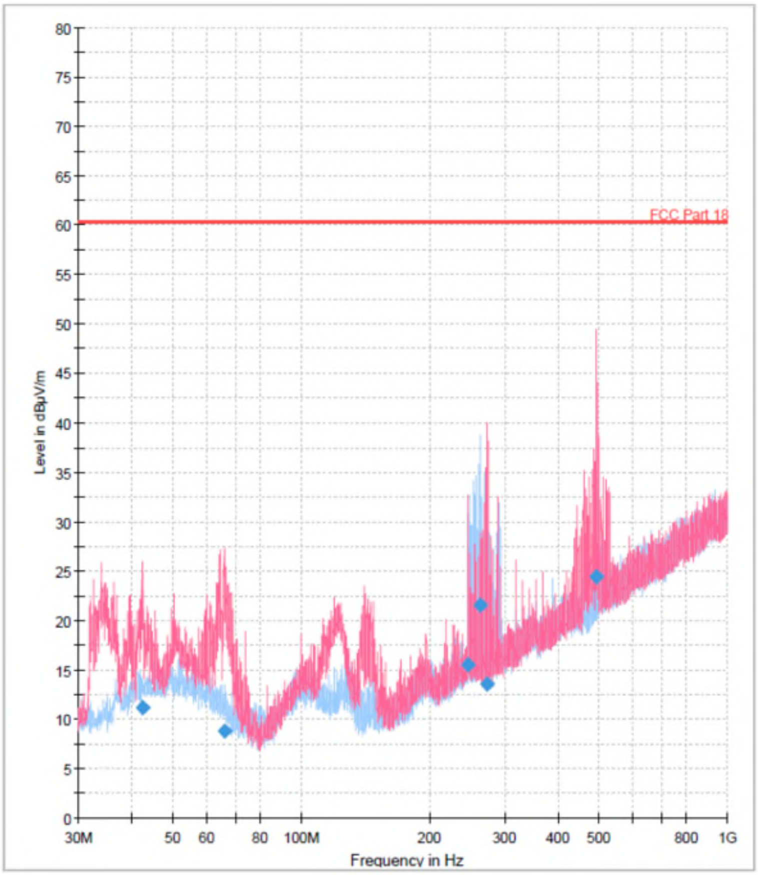
Test Report

Common Information

Test Description :	Radiated Emission(NK-20-E-0656)
Test Site :	3rd Building 10 m Chamber
Test Standard :	FCC Part 18
Environment Conditions :	a.c. 120 V, 60 Hz
Operator Name :	Yeonsuk, Jung
Mode :	Microwave

Full Spectrum

Full Spectrum



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EMI Auto Test(1) 2 / 2

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.286667	11.16	60.30	49.14	15000.0	120.000	106.0	V	316.0	-21.0
65.857667	8.74	60.30	51.56	15000.0	120.000	277.0	V	3.0	-23.0
246.568667	15.50	60.30	44.80	15000.0	120.000	106.0	V	288.0	-18.2
262.929333	21.59	60.30	38.71	15000.0	120.000	230.0	H	315.0	-18.1
273.567000	13.47	60.30	46.83	15000.0	120.000	130.0	V	239.0	-17.9
492.528333	24.41	60.30	35.89	15000.0	120.000	176.0	V	93.0	-10.0

(continuation of the "Final_Result" table from column 16 ...)

Frequency (MHz)	Comment
42.286667	
65.857667	
246.568667	
262.929333	
273.567000	
492.528333	

8/12/2020

<Radiated Measurements at 10 meters>

NOTES:

1. *Pol. H = Horizontal   V = Vertical

2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.

3. Distance Correction factor : 20 * log (300/10) ≒ 29.5 dB ㎶/m

4. The limit at 300 meters is 20 * log (25 * SQRT (RF Power/500))

5. All other emissions were measured while a 700 ㎖ load was placed in the center of the oven.

6. The limit for consumer device is on the FCC Part section 18.305.

Tested by : ***Yeonsuk Jung***

TEST DATA

Radiated Emissions (Above 1 ㎓)

FCC ID : C5F7NF1DMO100N

[Room Temperature : 18.8 ± 1.0 ℃]

Frequency	Pol*	Antenna Heights	Turntable Angles	Reading Level	Total Loss**	Result at 3 m		K	Results at 300 m	Limits at 300 m
(MHz)	(H/V)	(cm)	(˚)	(dBµV)	(dB)	(dBµV/m)	(µV/m)		(µV/m)	(µV/m)
2204	H	99.8	315	51.48	-13	38.48	83.95	0.0058	0.49	34.50
2708	H	99.8	315	45.66	-10.39	35.27	58.01	0.0069	0.40	34.50
4239	V	300.1	0	39.17	-5	34.17	51.11	0.0102	0.52	34.50
4921	H	99.8	0	45.79	-3.5	42.29	130.17	0.0117	1.52	34.50
6152	V	99.8	45	34.66	-1.9	32.76	43.45	0.0144	0.63	34.50
6878	V	99.8	135	33.80	-1	32.8	43.65	0.0160	0.70	34.50
7108	H	99.8	315	32.20	-0.3	31.9	39.36	0.0165	0.65	34.50
7393	H	400.2	315	39.28	-0.1	39.18	90.99	0.0171	1.56	34.50
7655	H	99.8	315	30.77	0.8	31.57	37.89	0.0177	0.67	34.50
8236	H	99.8	45	30.04	1.2	31.24	36.48	0.0190	0.69	34.50
8505	V	99.8	90	30.92	1.1	32.02	39.90	0.0195	0.78	34.50
8636	H	199.8	315	30.51	1.6	32.11	40.32	0.0198	0.80	34.50
9842	H	400.2	315	28.95	2.5	31.45	37.37	0.0225	0.84	34.50
10111	V	400	45	28.08	2.7	30.78	34.59	0.0231	0.80	34.50
12314	H	99.8	0	26.21	4.1	30.31	32.77	0.0279	0.91	34.50
14779	H	99.8	0	22.38	8.1	30.48	33.42	0.0333	1.11	34.50
17215	H	400.2	315	19.45	11	30.45	33.30	0.0386	1.29	34.50
17519	H	99.8	315	18.92	11.9	30.82	34.75	0.0392	1.36	34.50

<Radiated Measurements at 3 meters>

NOTES:

1. * Pol. H =Horizontal V=Vertical

2. ** Total Loss = Antenna Factor + Cables Loss + Amplifier + HPF (High Pass Filter)

3. Field Strength (at 300 m) (uV/m) = K * 10 $^{[Fieldstrength\ at\ 3\ m\ (dBuV/m)\ /\ 20]}$

4. The limit at 300 meters is 25 * SQRT (RF Power/500)

5. Load for measurement of radiation on second and third harmonic : Two loads, one of 700 ㎖ and the other of 300 ㎖, of water were used. Each load was tested both with the beaker located in the center of the oven and with it in the corner.

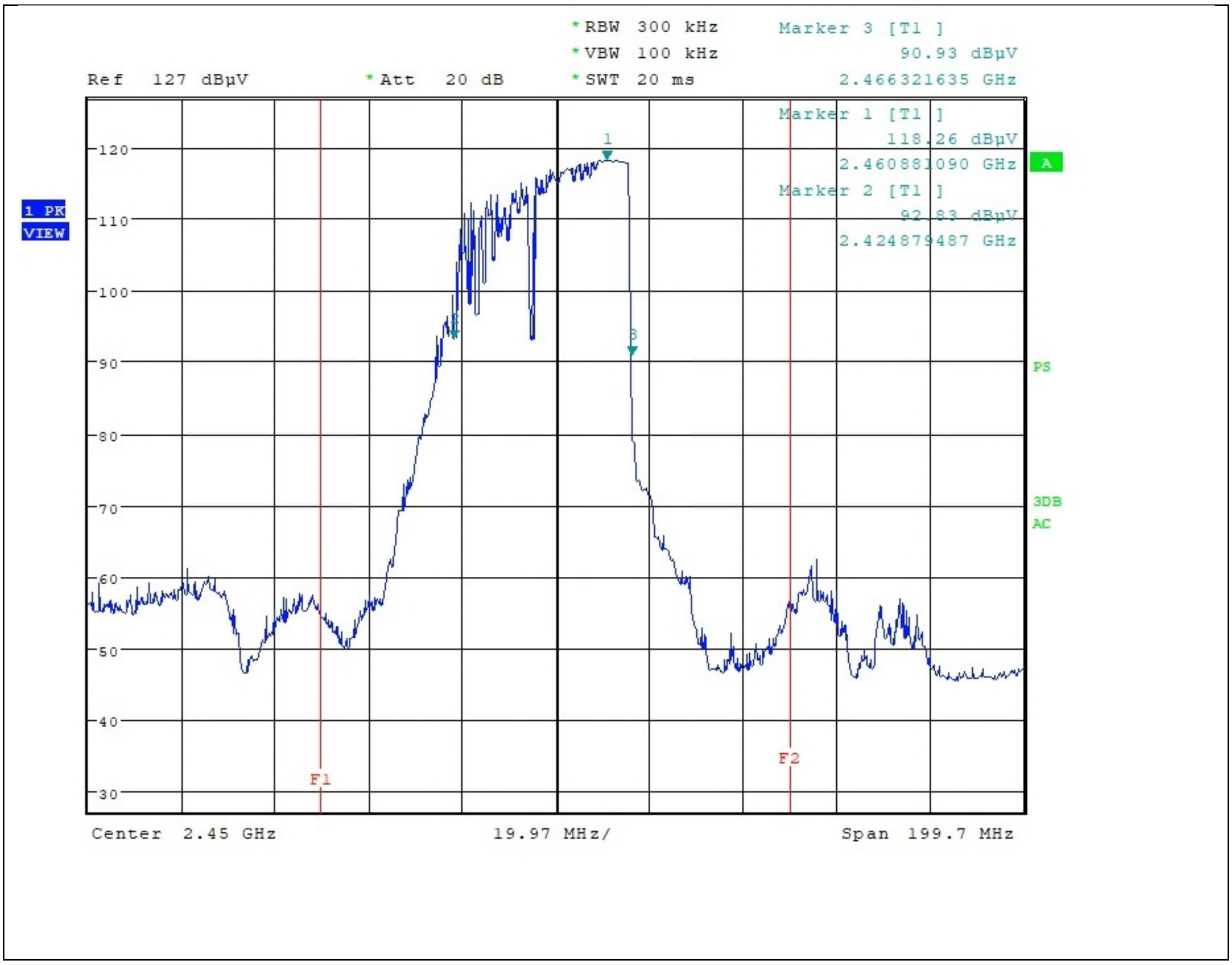
6. The test was performed at peak detector mode with average.

7. The limit for consumer device is on the FCC Part section 18.305.

Tested by : ***Yeonsuk Jung***

PLOTS OF EMISSIONS

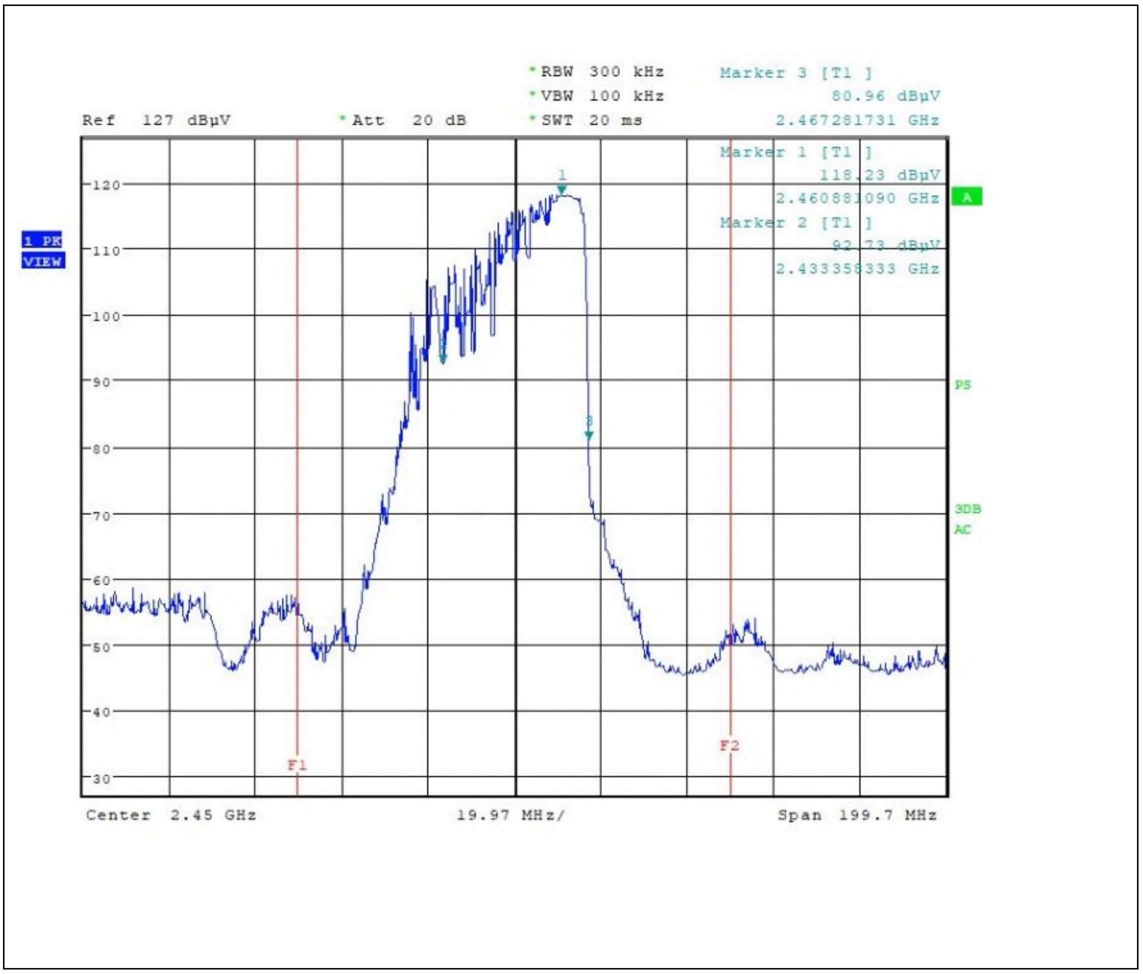
- ***Frequency vs Line Voltage Variation Test***



Horizontal (96 V, 1000 ㎖)

PLOTS OF EMISSIONS

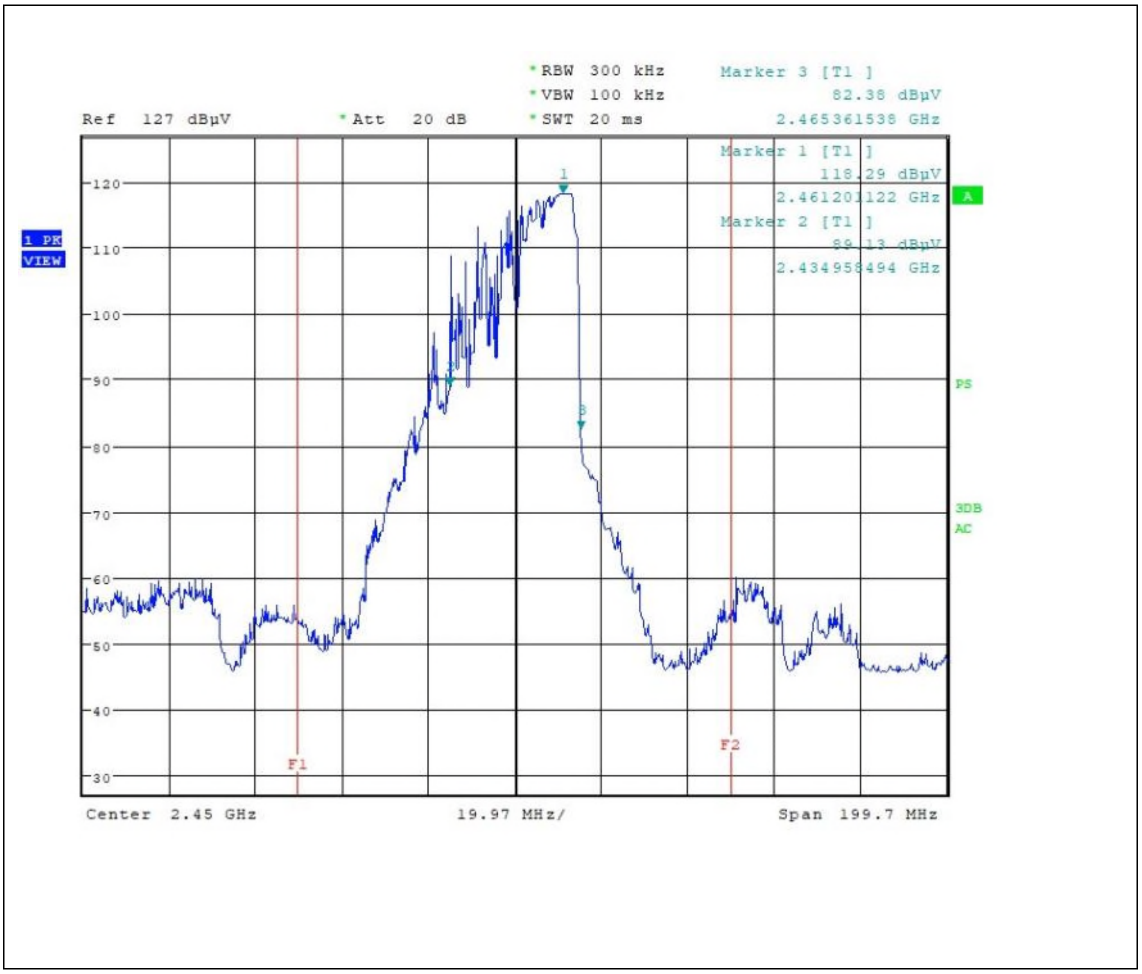
- ***Frequency vs Line Voltage Variation Test***



Vertical (96 V, 1000 ㎖)

PLOTS OF EMISSIONS

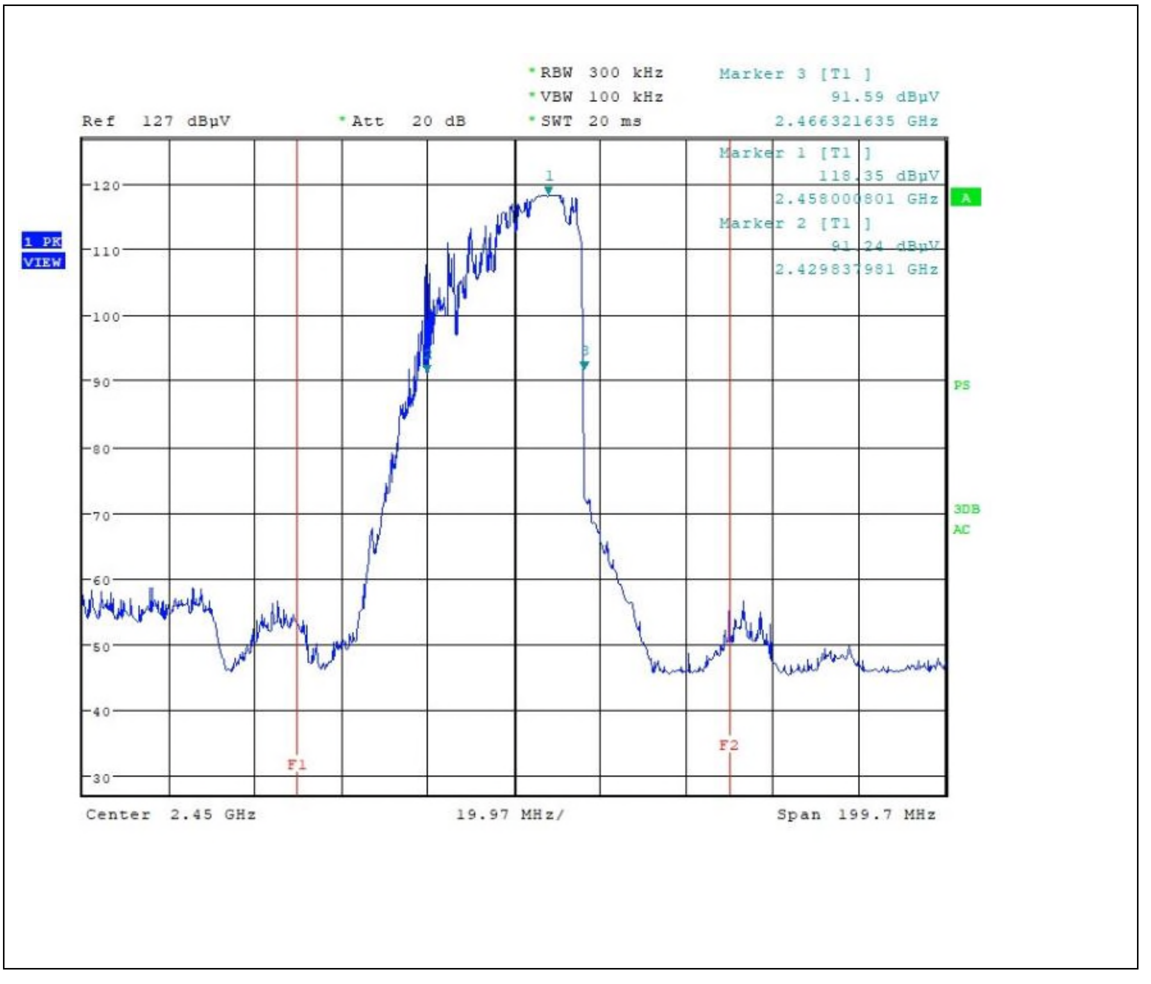
- ***Frequency vs Line Voltage Variation Test***



Horizontal (108 V, 1000 ㎖)

PLOTS OF EMISSIONS

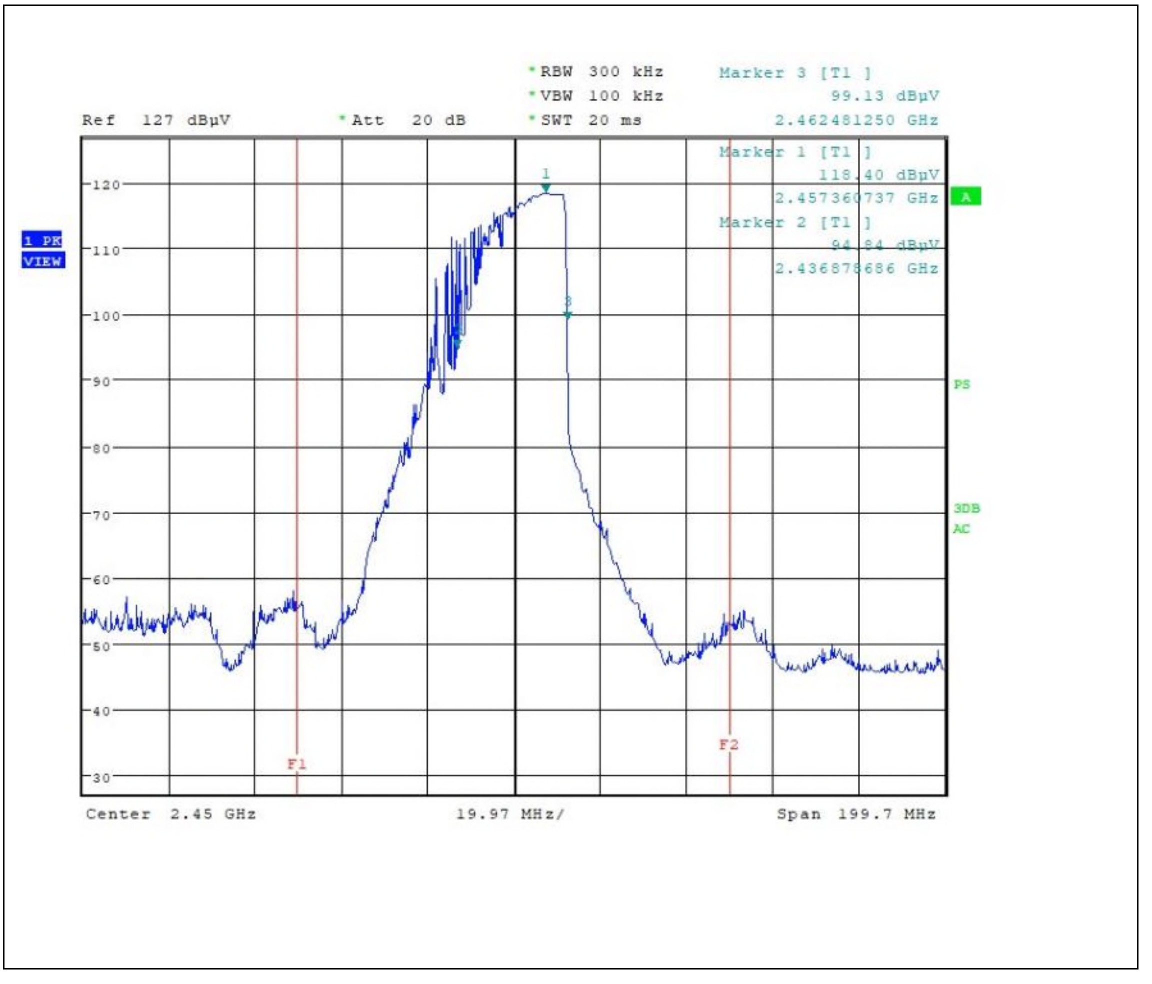
- ***Frequency vs Line Voltage Variation Test***



Vertical (108 V, 1000 ㎖)

PLOTS OF EMISSIONS

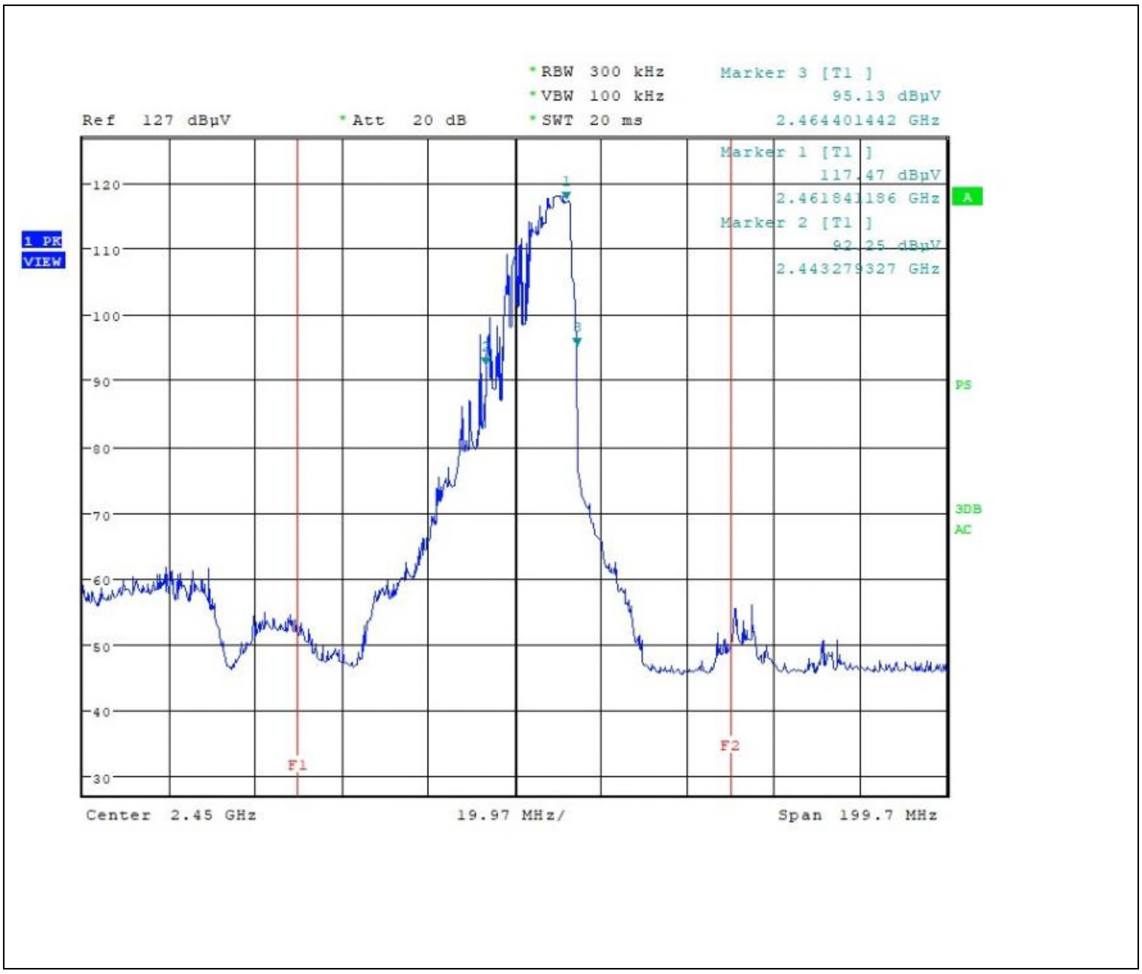
- ***Frequency vs Line Voltage Variation Test***



Horizontal (120 V, 1000 ㎖)

PLOTS OF EMISSIONS

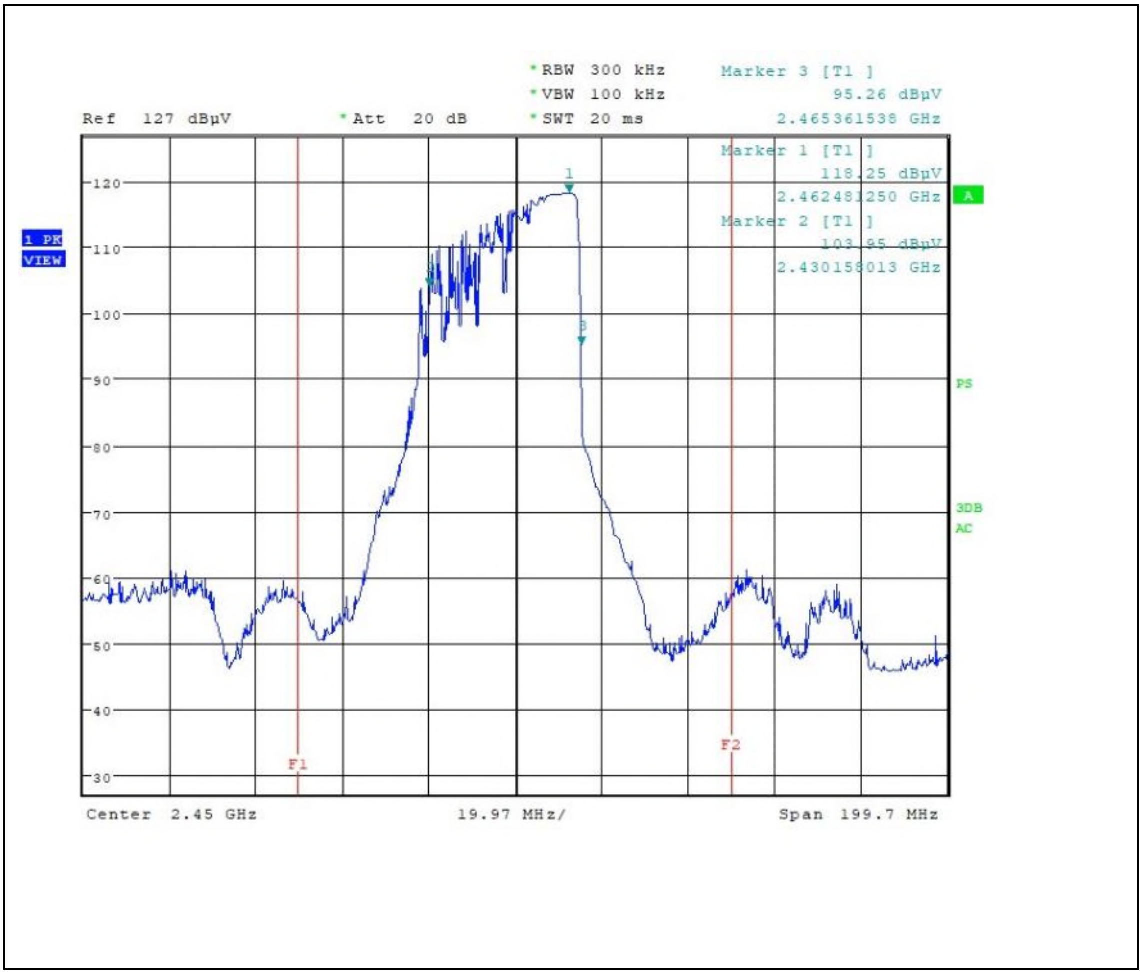
- ***Frequency vs Line Voltage Variation Test***



Vertical (120 V, 1000 ㎖)

PLOTS OF EMISSIONS

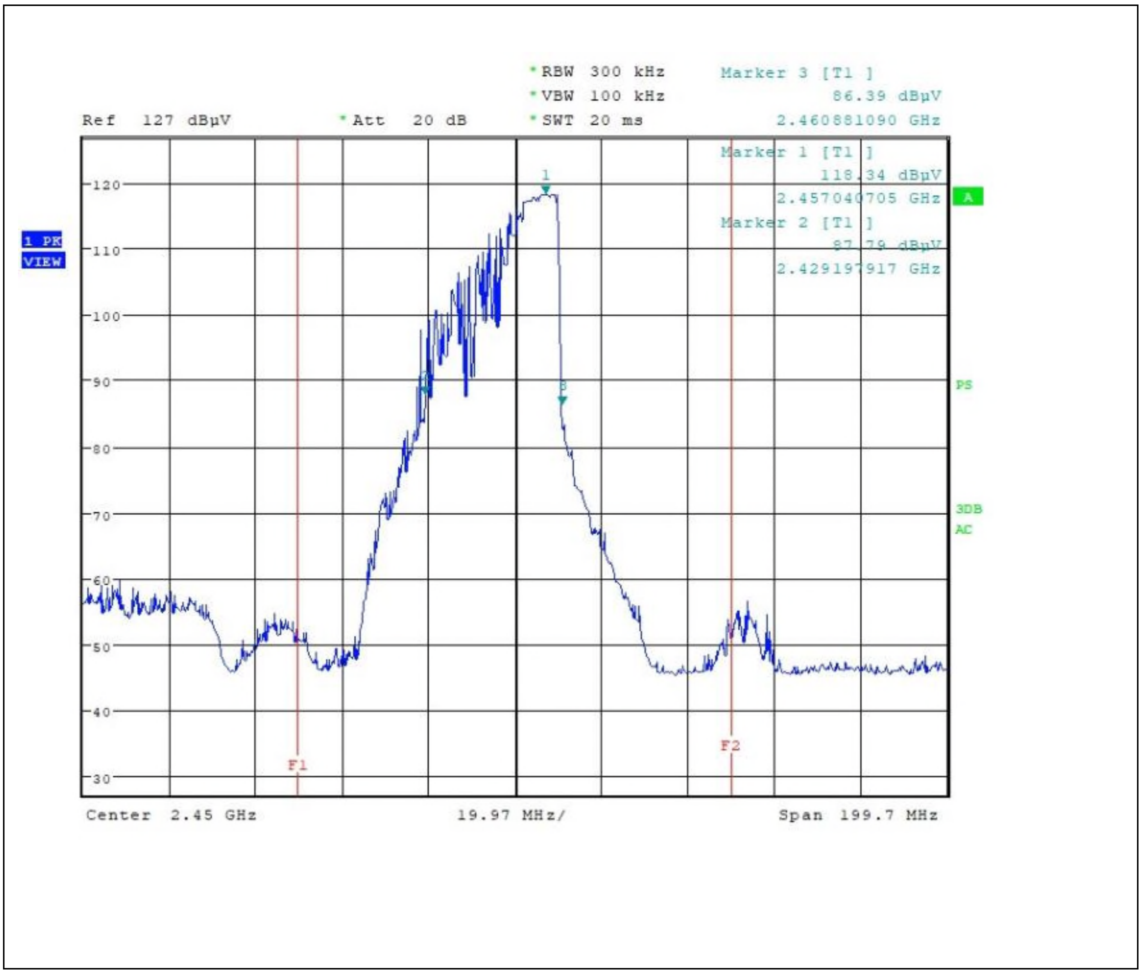
- ***Frequency vs Line Voltage Variation Test***



Horizontal (132 V, 1000 ㎖)

PLOTS OF EMISSIONS

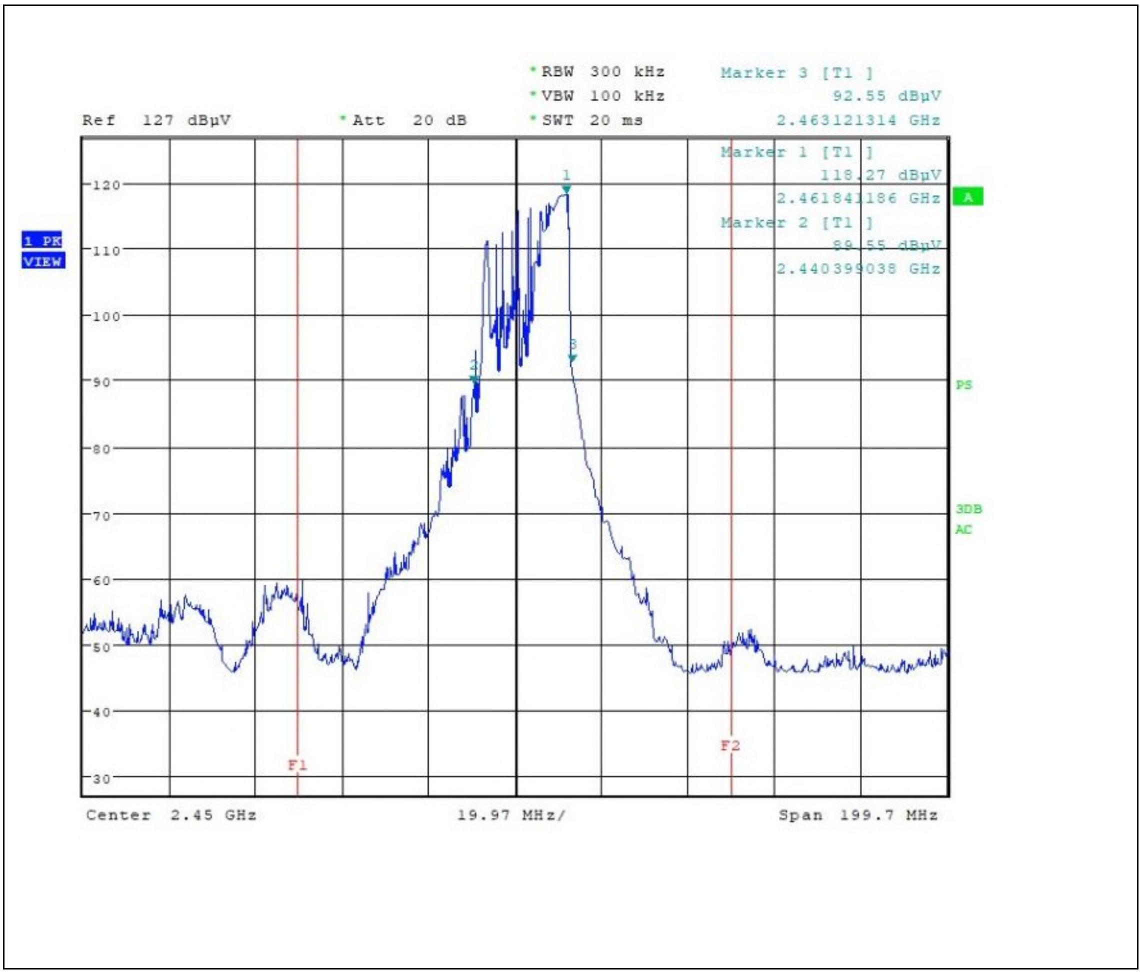
- ***Frequency vs Line Voltage Variation Test***



Vertical (132 V, 1000 ㎖)

PLOTS OF EMISSIONS

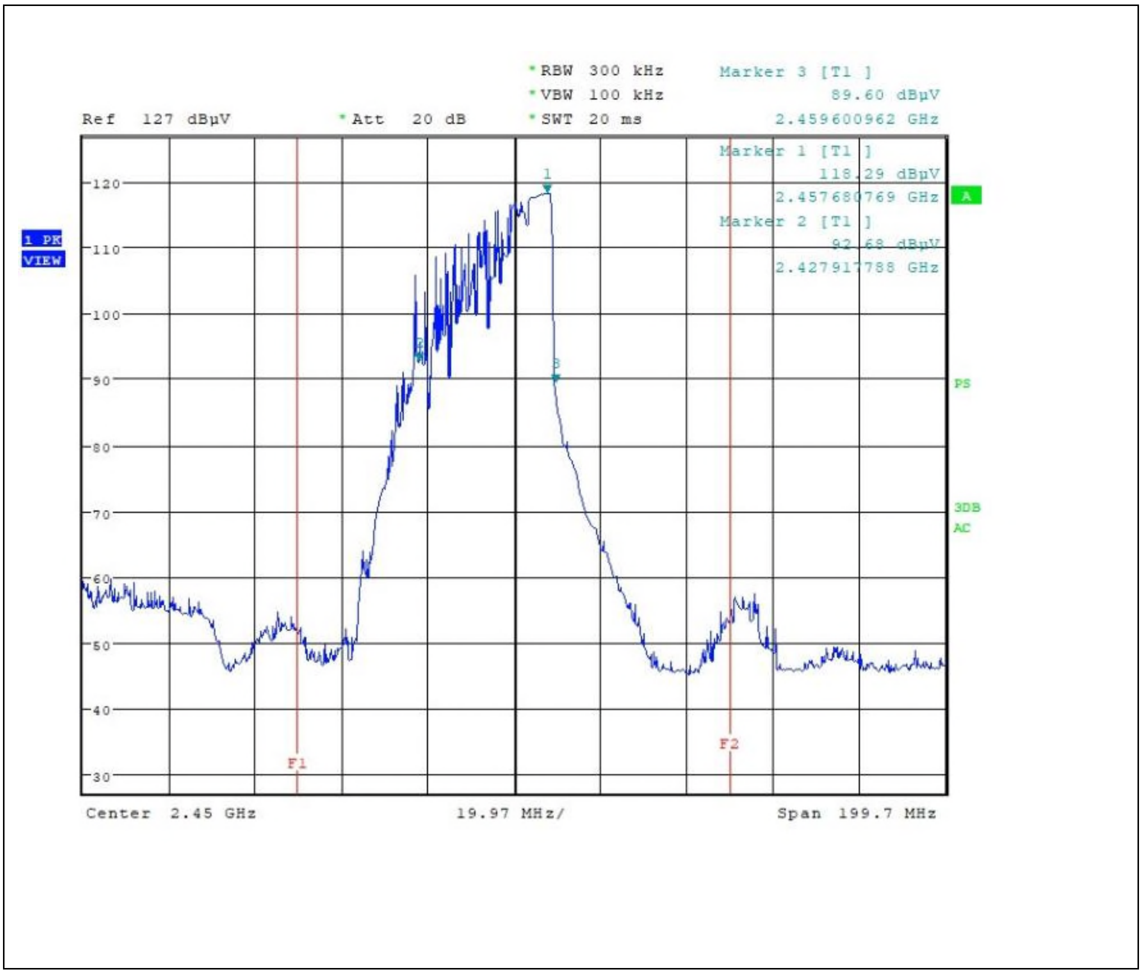
- ***Frequency vs Line Voltage Variation Test***



Horizontal (150 V, 1000 ㎖)

PLOTS OF EMISSIONS

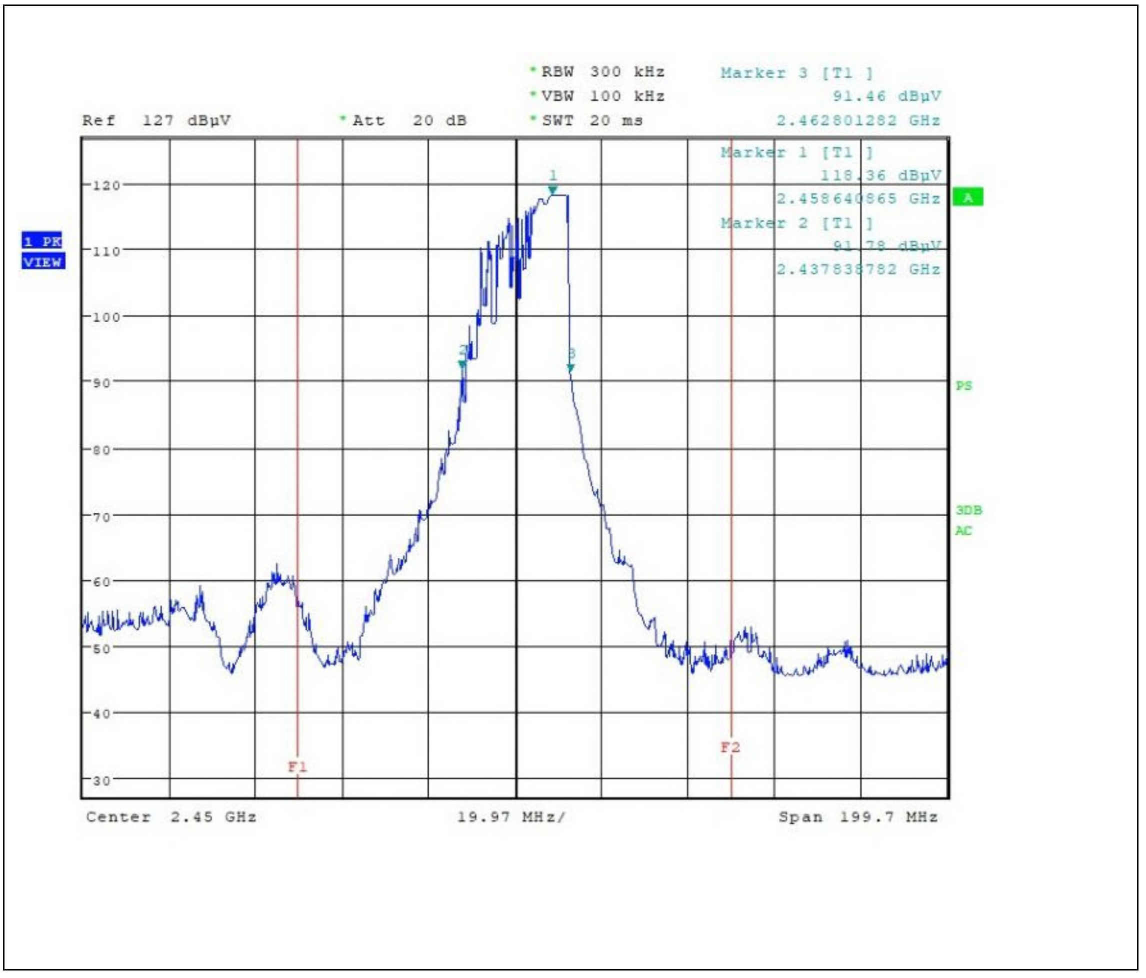
- ***Frequency vs Line Voltage Variation Test***



Vertical (150 V, 1000 ㎖)

PLOTS OF EMISSIONS

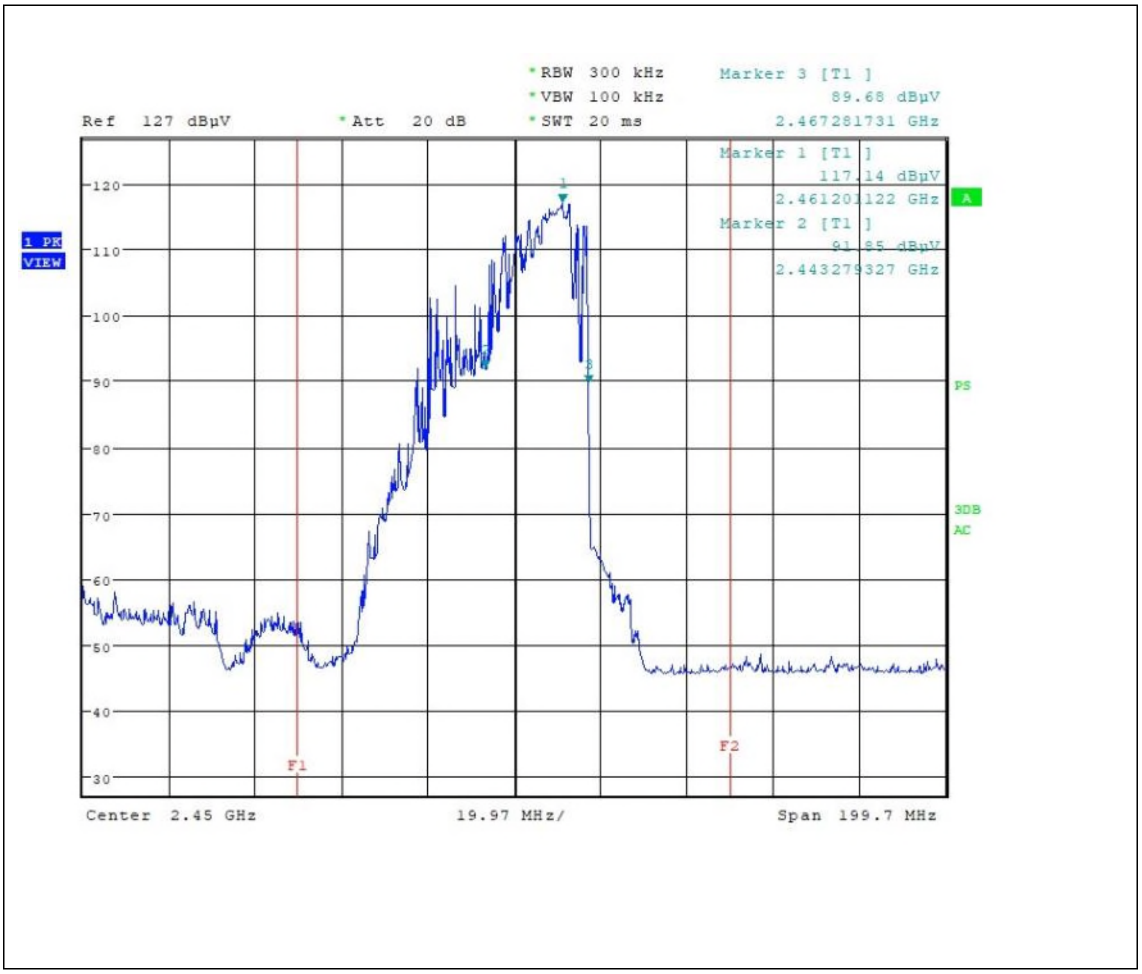
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 200 ㎖)

PLOTS OF EMISSIONS

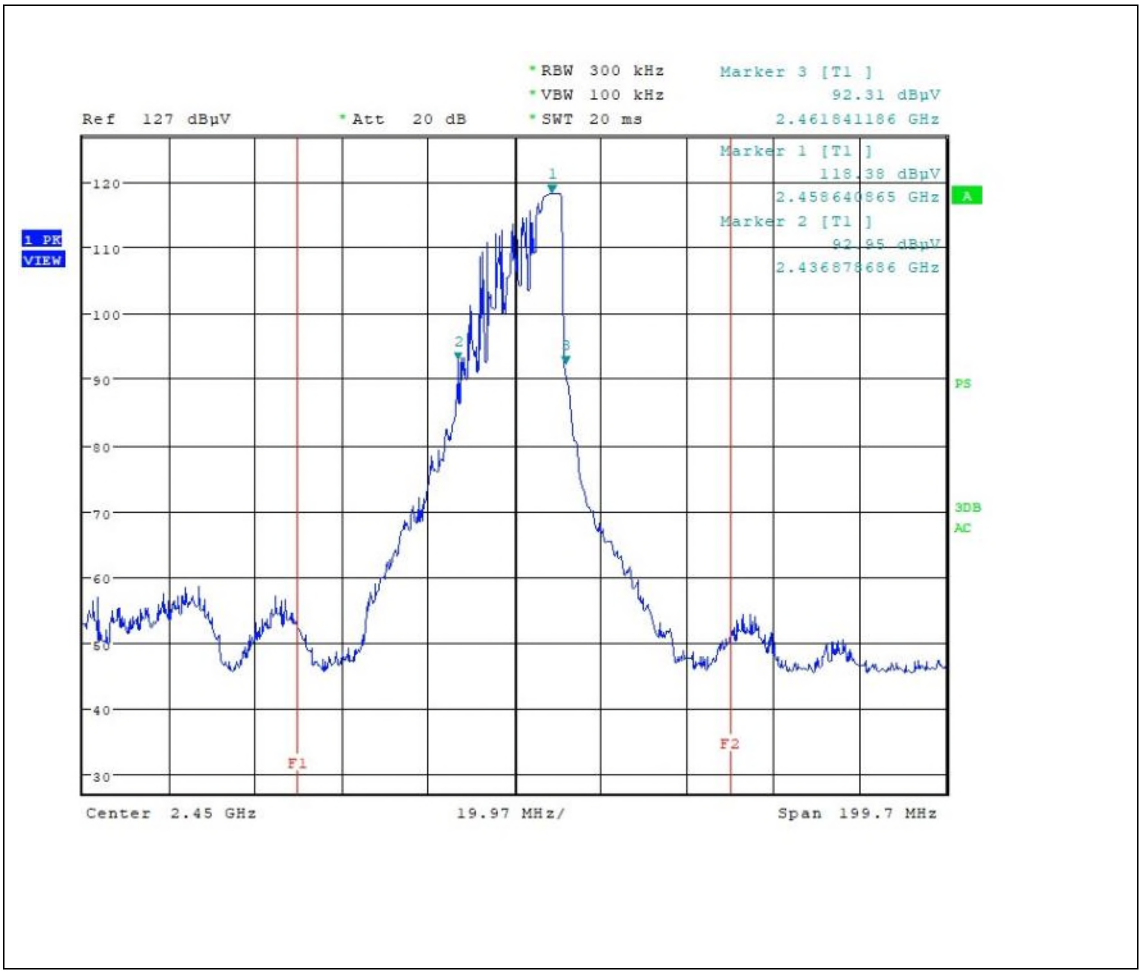
- ***Frequency vs Load Variation Test***



Vertical (120 V, 200 ㎖)

PLOTS OF EMISSIONS

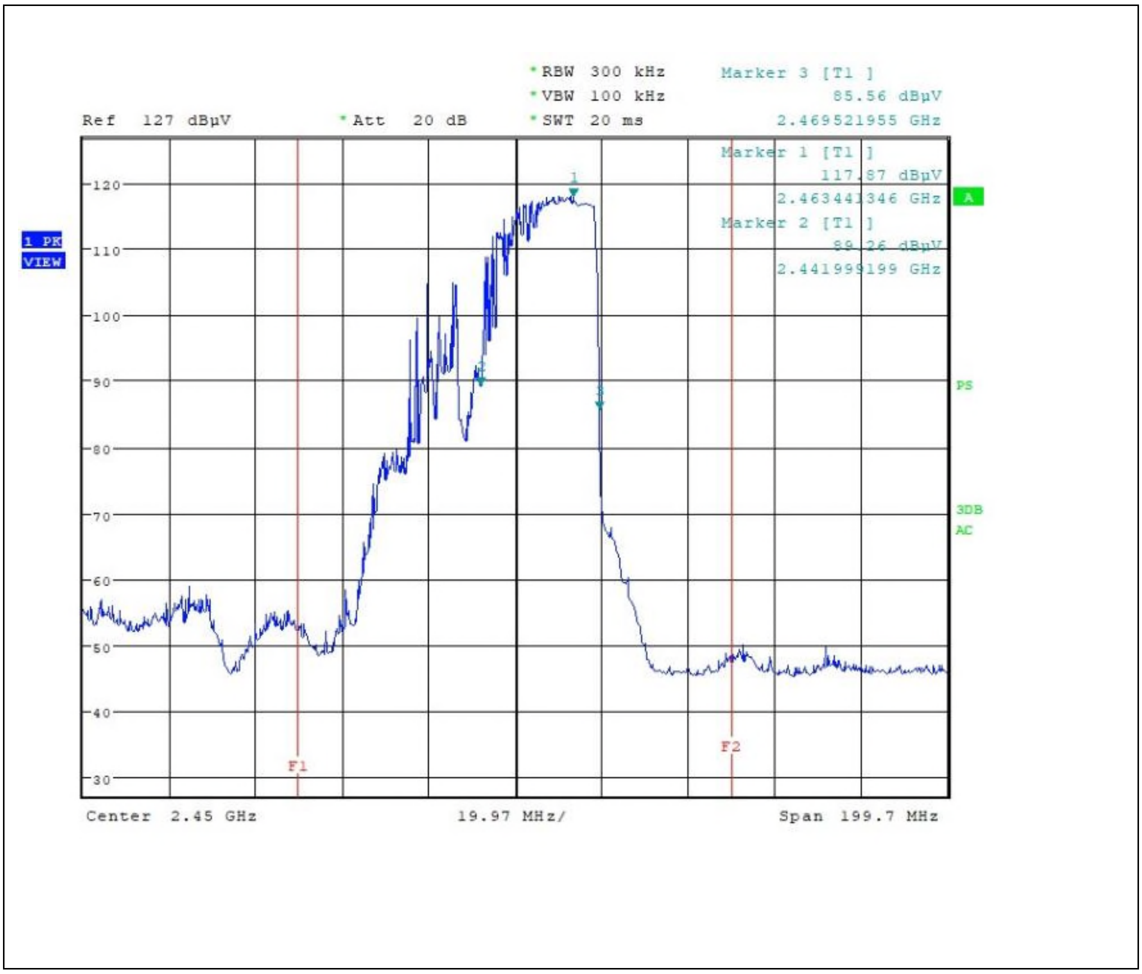
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 400 ㎖)

PLOTS OF EMISSIONS

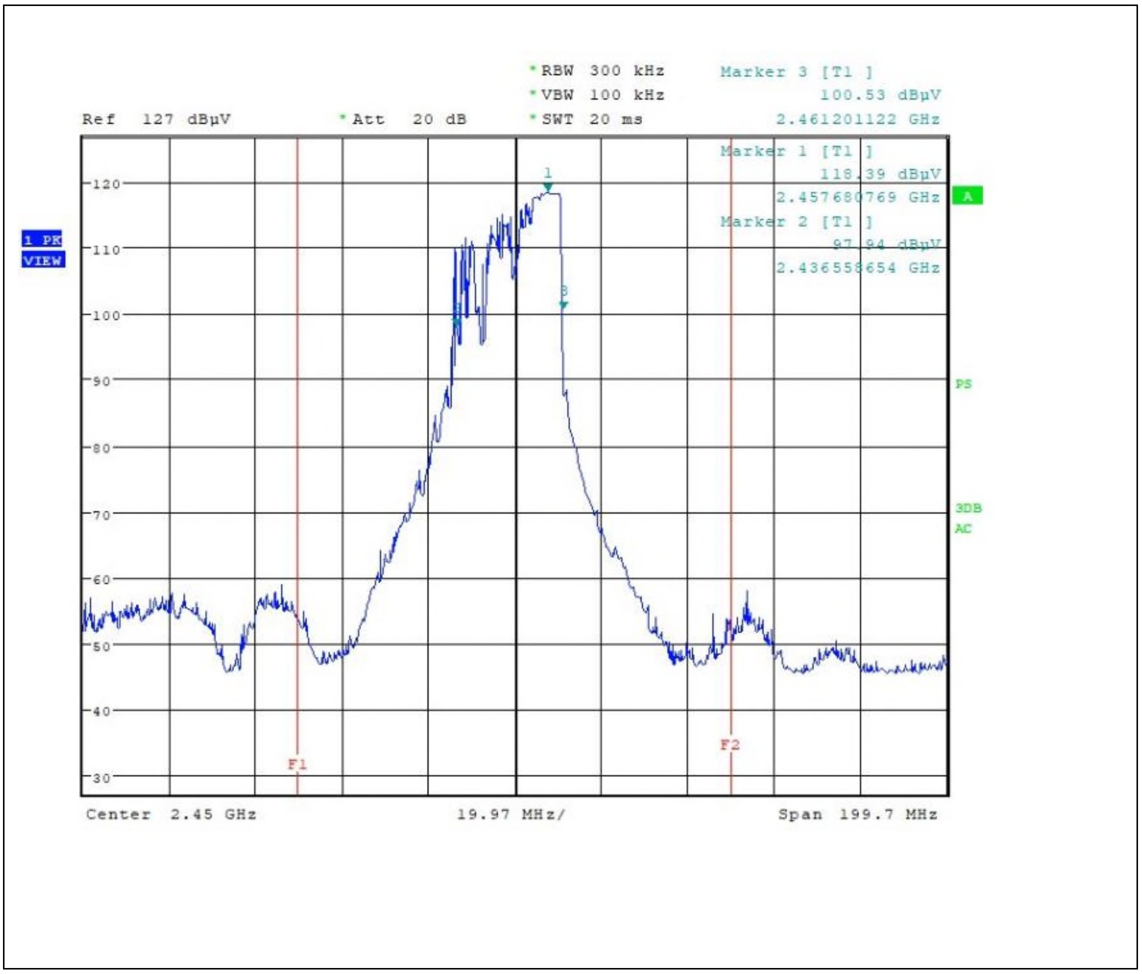
- ***Frequency vs Load Variation Test***



Vertical (120 V, 400 ㎖)

PLOTS OF EMISSIONS

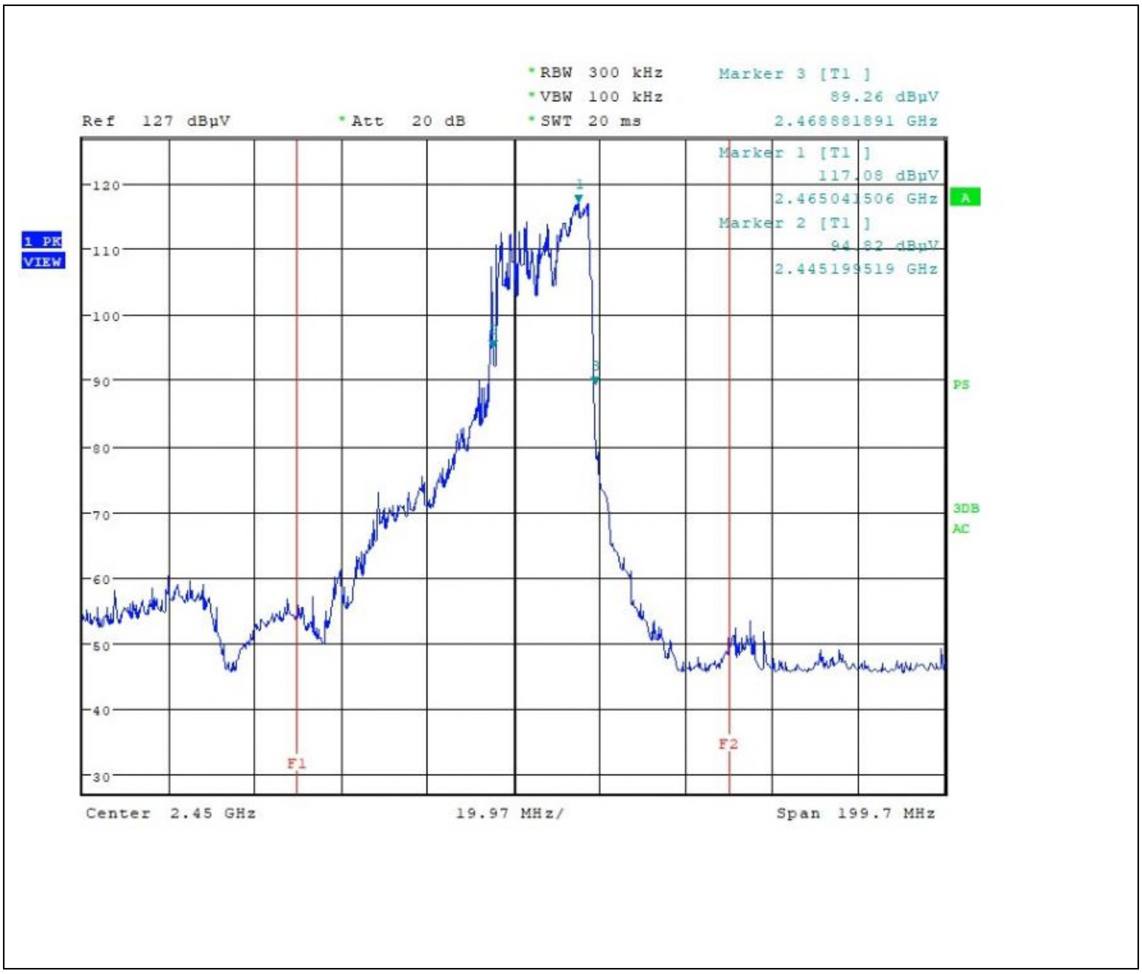
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 600 ㎖)

PLOTS OF EMISSIONS

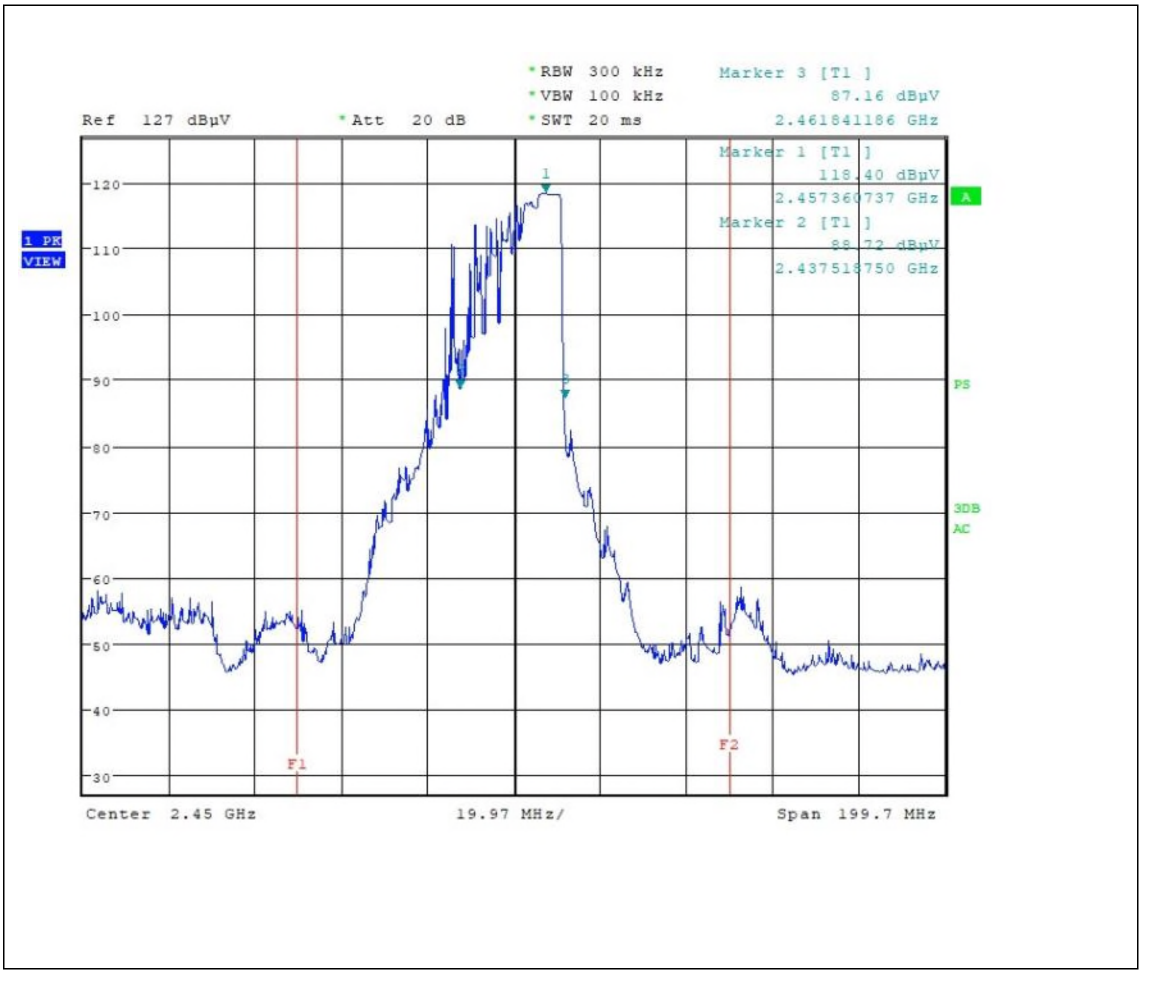
- ***Frequency vs Load Variation Test***



Vertical (120 V, 600 ㎖)

PLOTS OF EMISSIONS

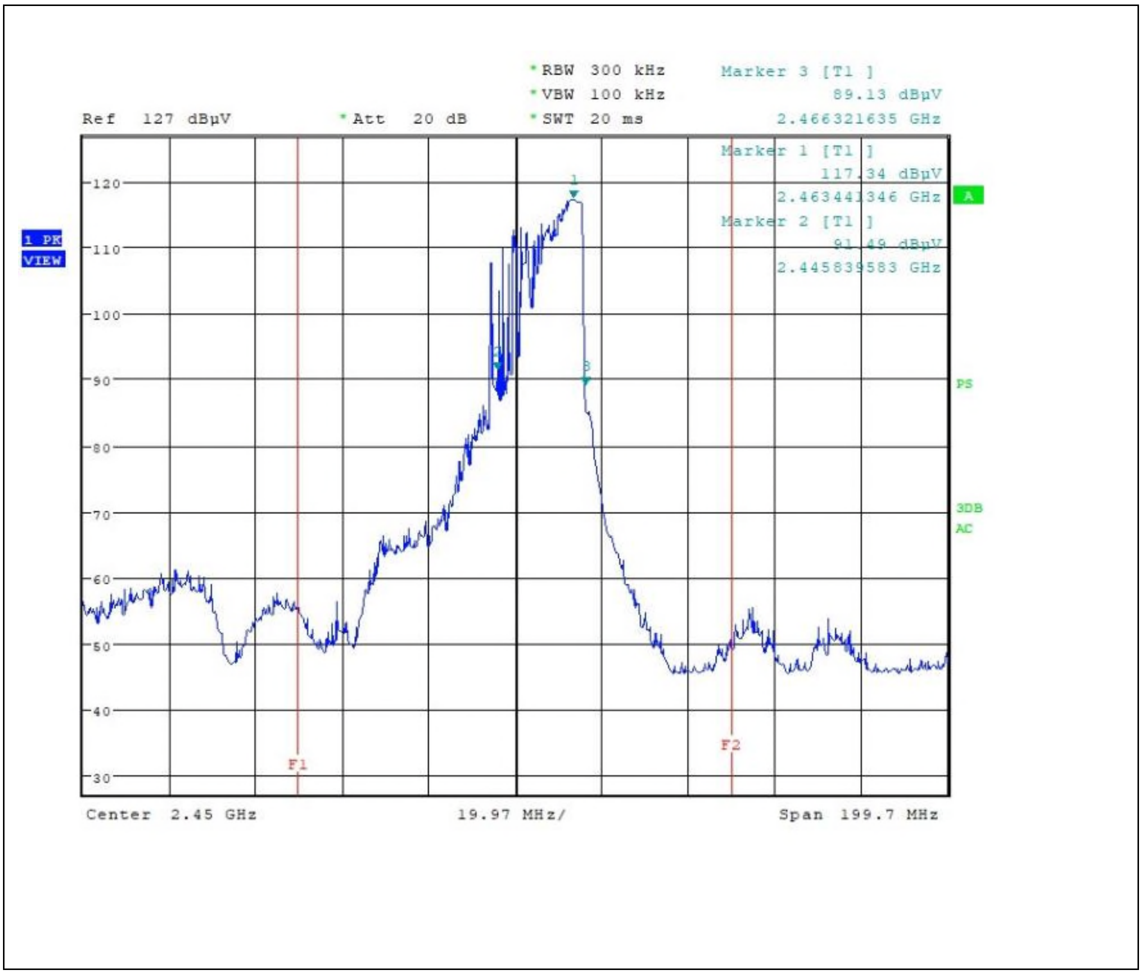
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 800 ㎖)

PLOTS OF EMISSIONS

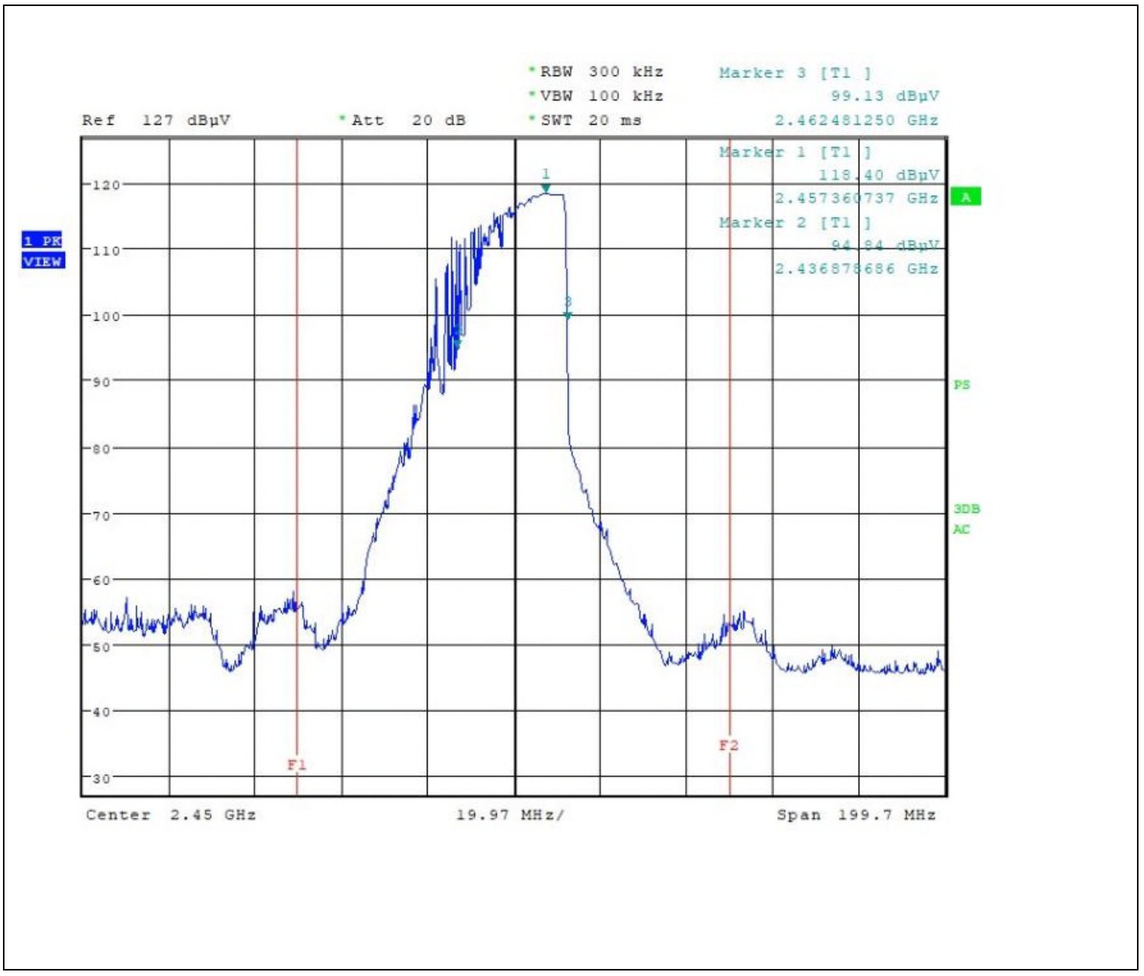
- ***Frequency vs Load Variation Test***



Vertical (120 V, 800 ㎖)

PLOTS OF EMISSIONS

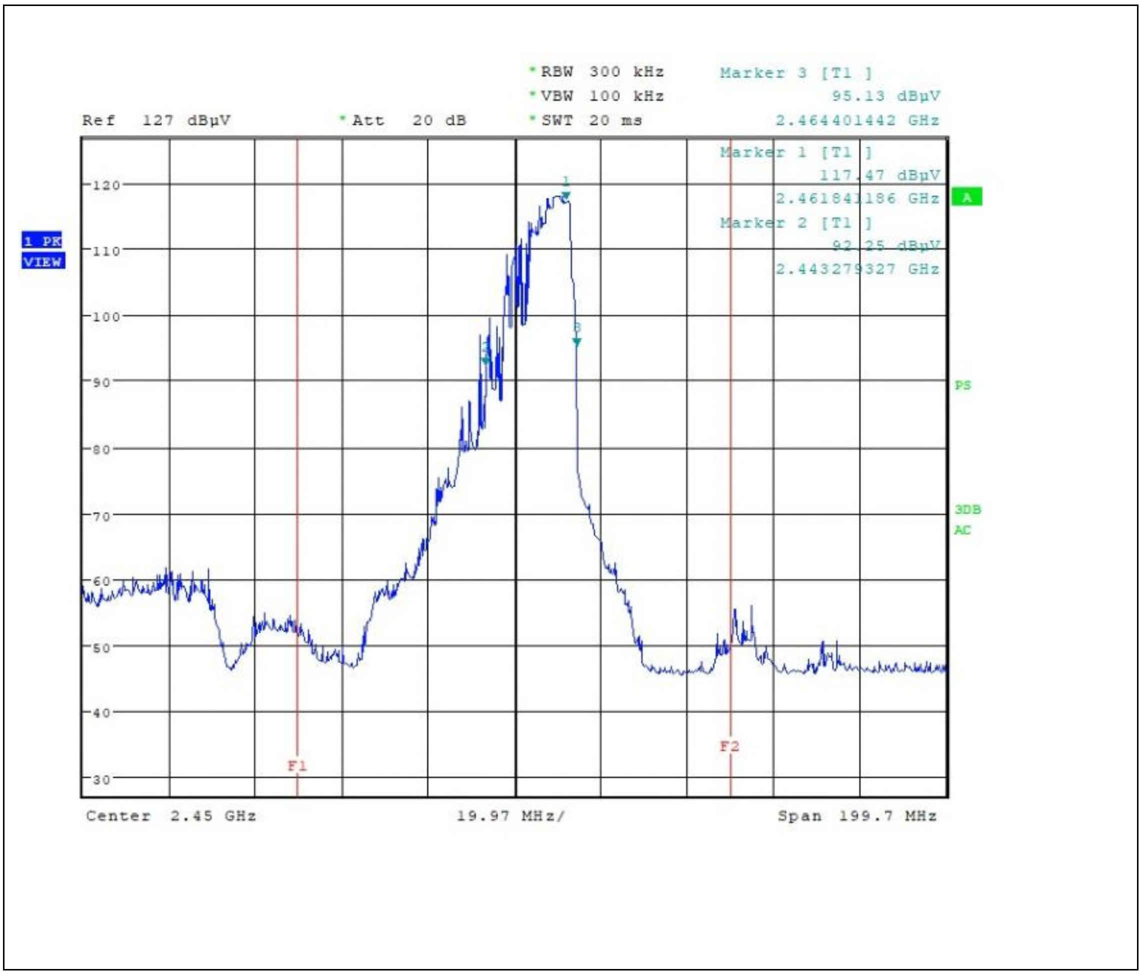
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 1000 ㎖)

PLOTS OF EMISSIONS

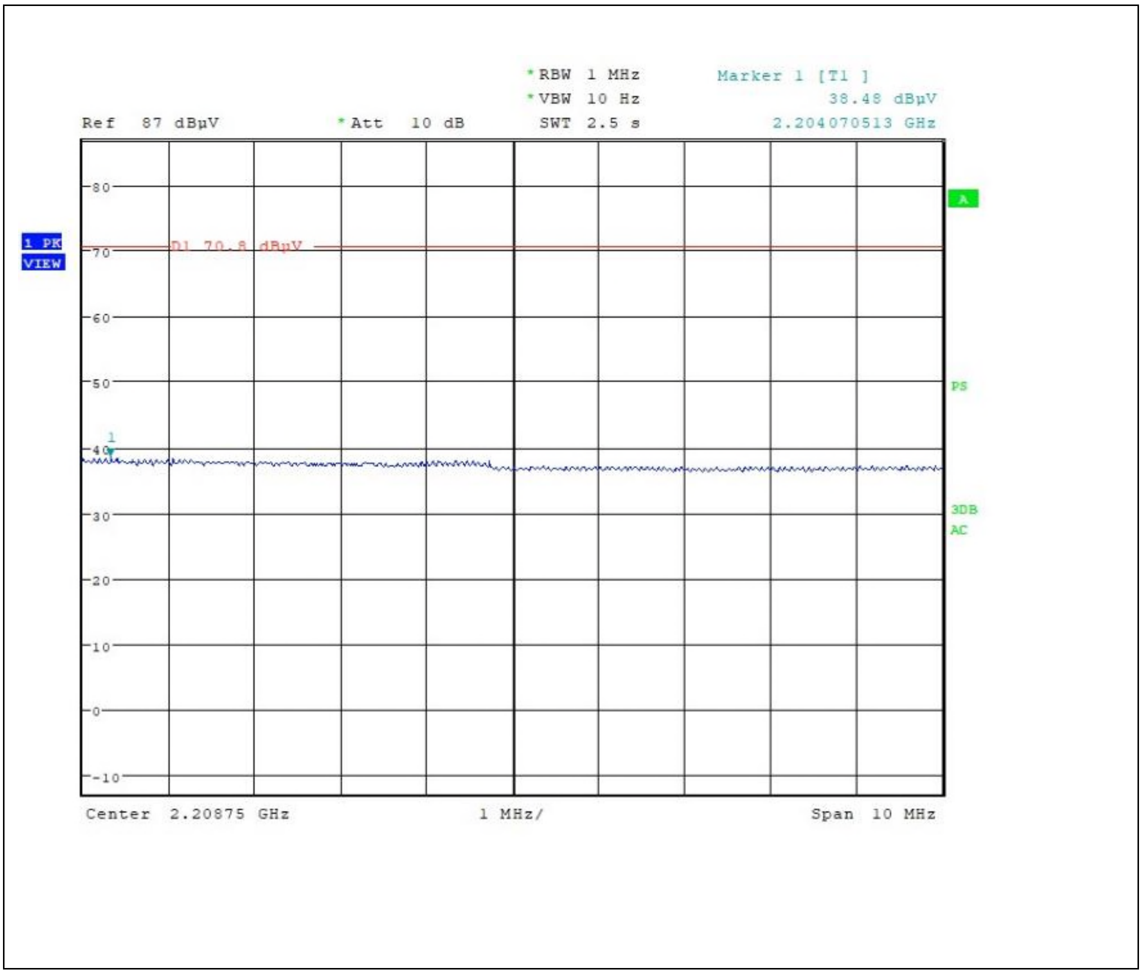
- ***Frequency vs Load Variation Test***



Vertical (120 V, 1000 ㎖)

PLOTS OF EMISSIONS

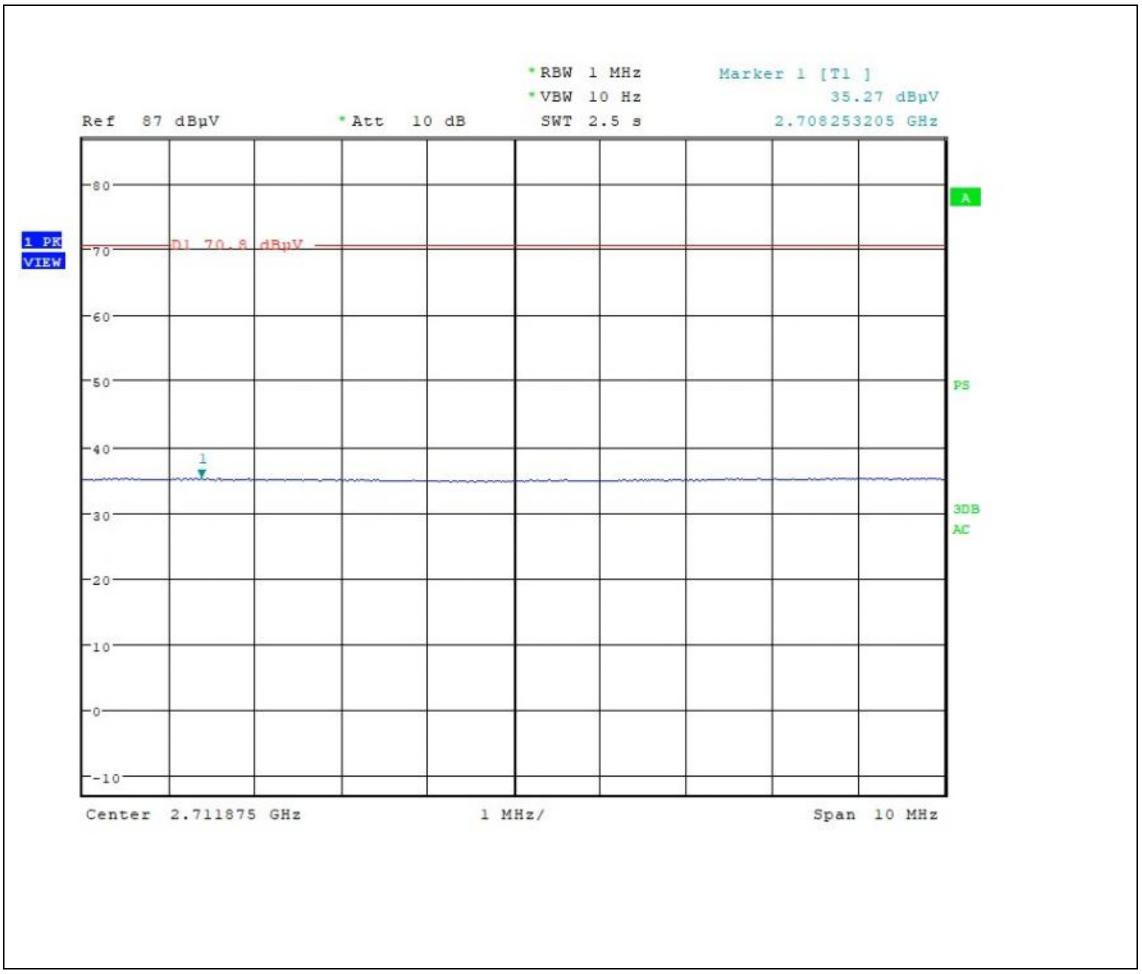
- ***Radiated Emissions (Above 1 GHz)***



2204.07 MHz

PLOTS OF EMISSIONS

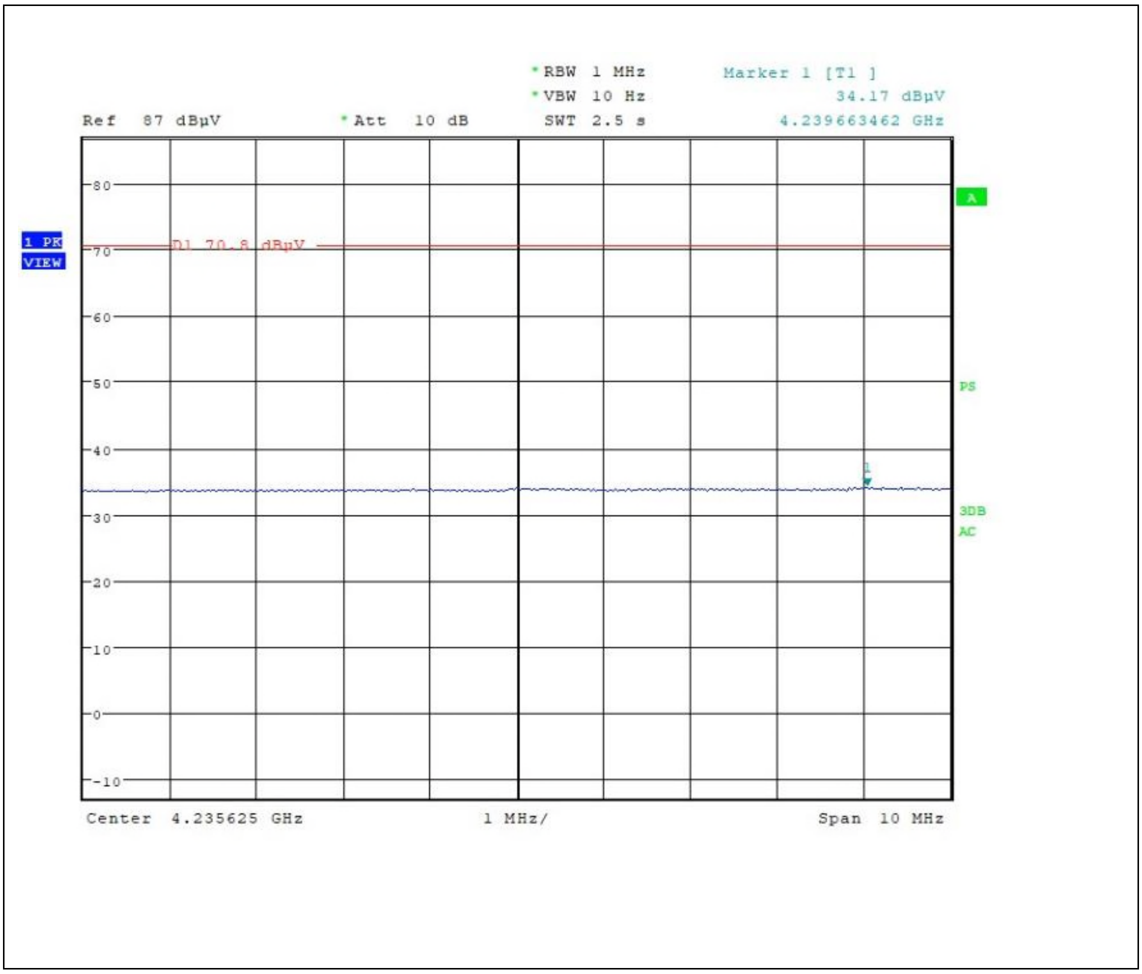
- ***Radiated Emissions (Above 1 GHz)***



2708.25 MHz

PLOTS OF EMISSIONS

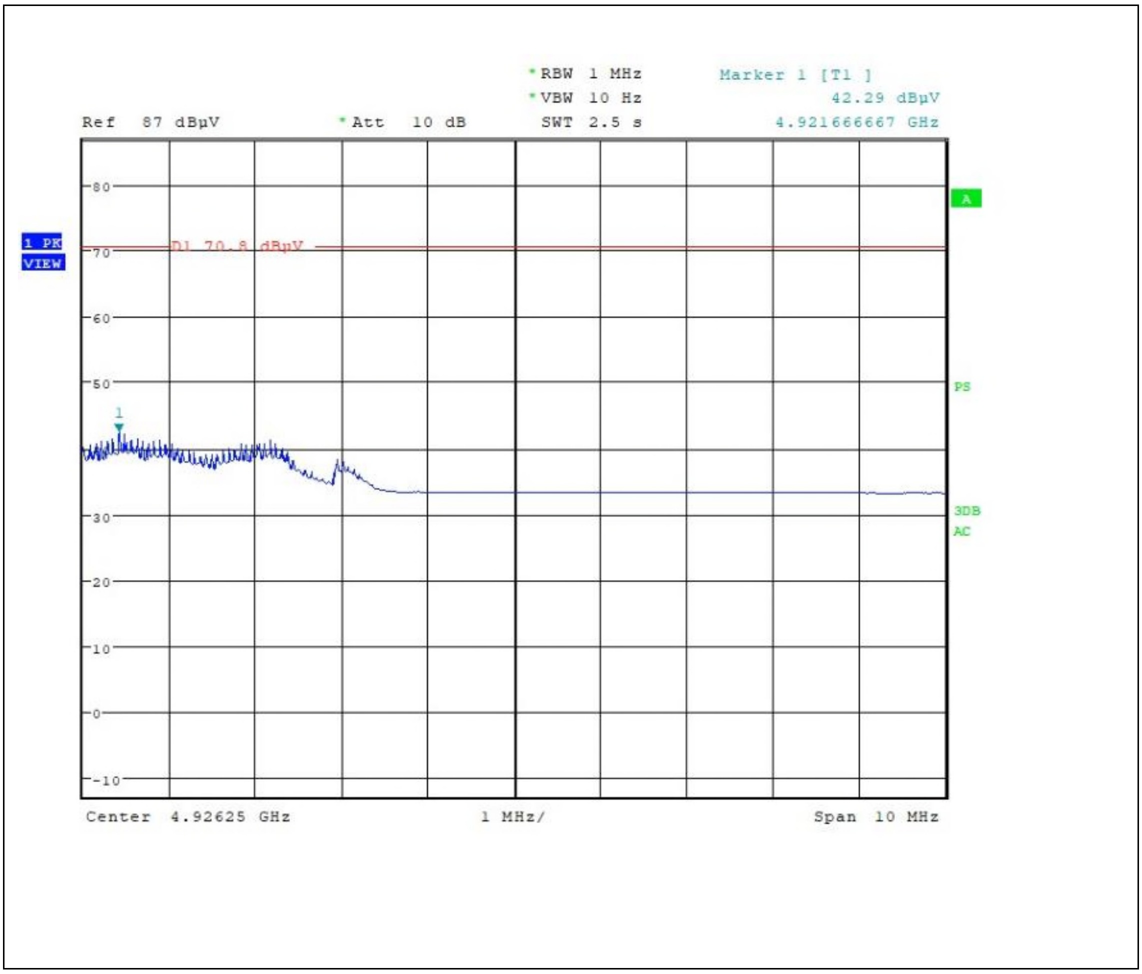
- ***Radiated Emissions (Above 1 GHz)***



4239.66 MHz

PLOTS OF EMISSIONS

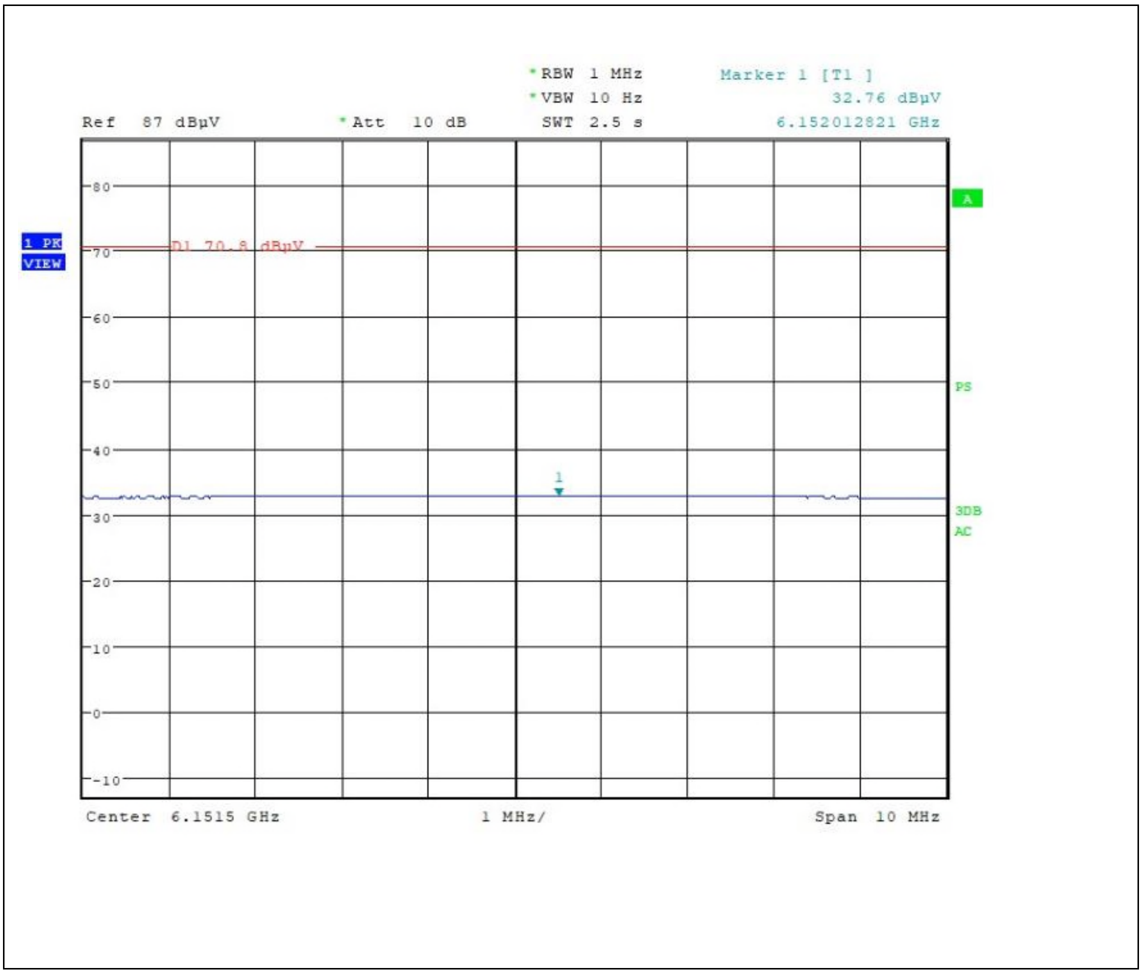
- ***Radiated Emissions (Above 1 GHz)***



4921.66 MHz

PLOTS OF EMISSIONS

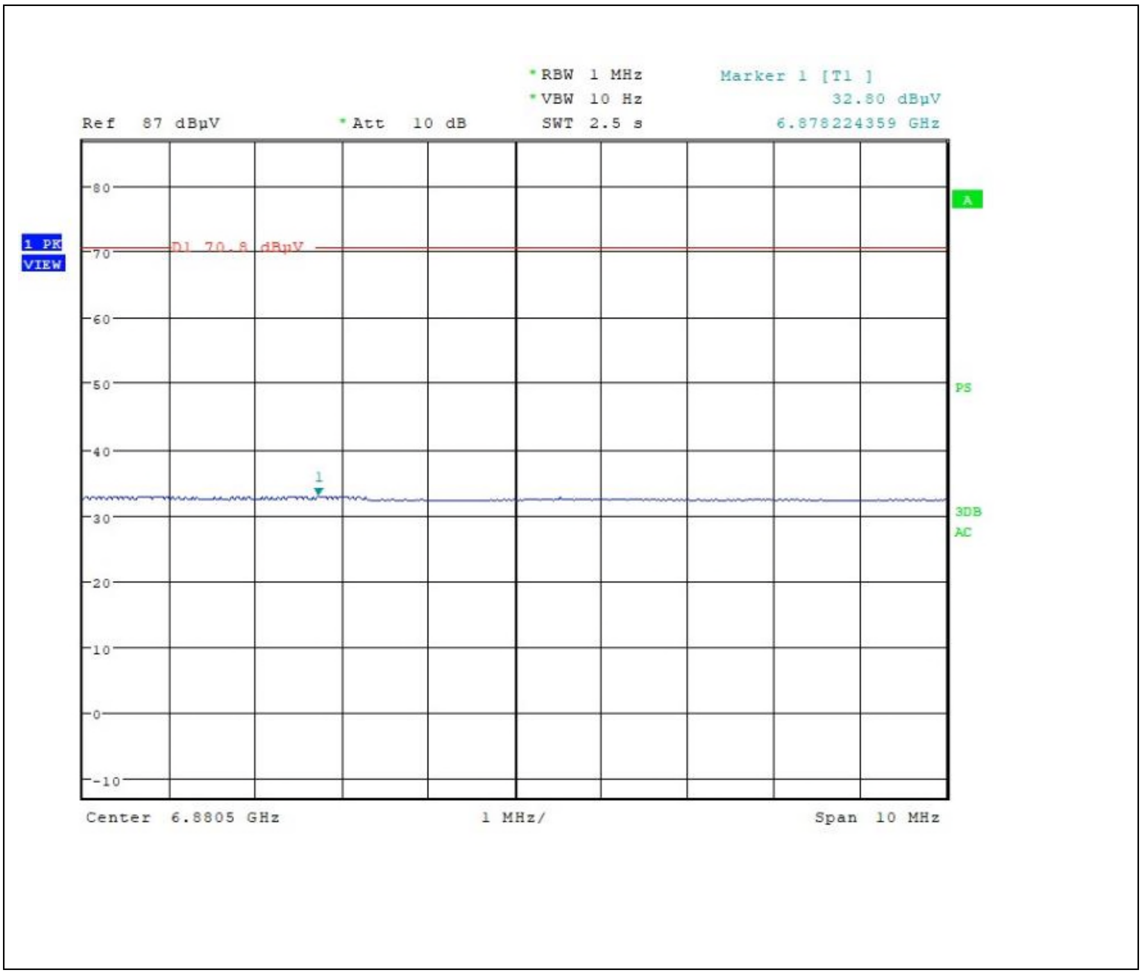
- ***Radiated Emissions (Above 1 GHz)***



6152.01 MHz

PLOTS OF EMISSIONS

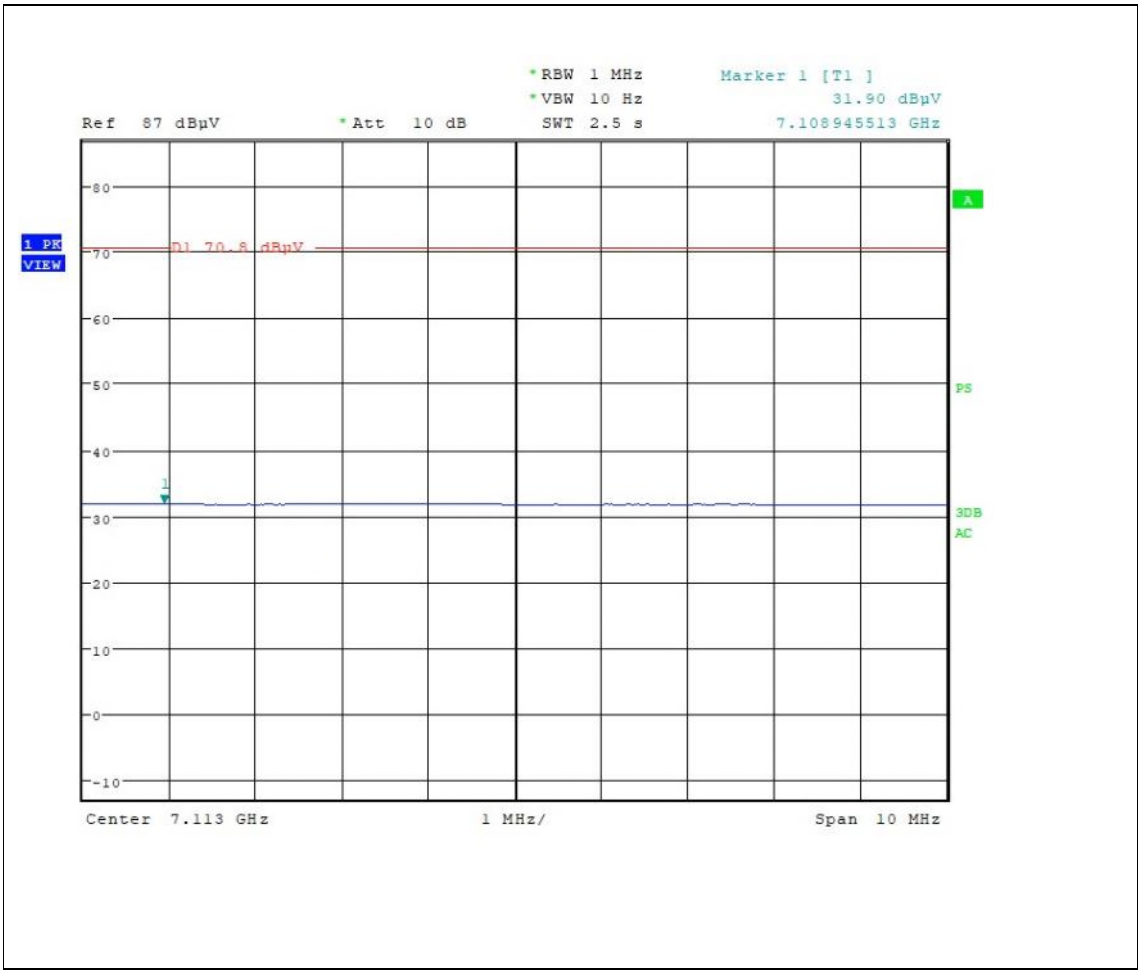
- ***Radiated Emissions (Above 1 GHz)***



6878.22 MHz

PLOTS OF EMISSIONS

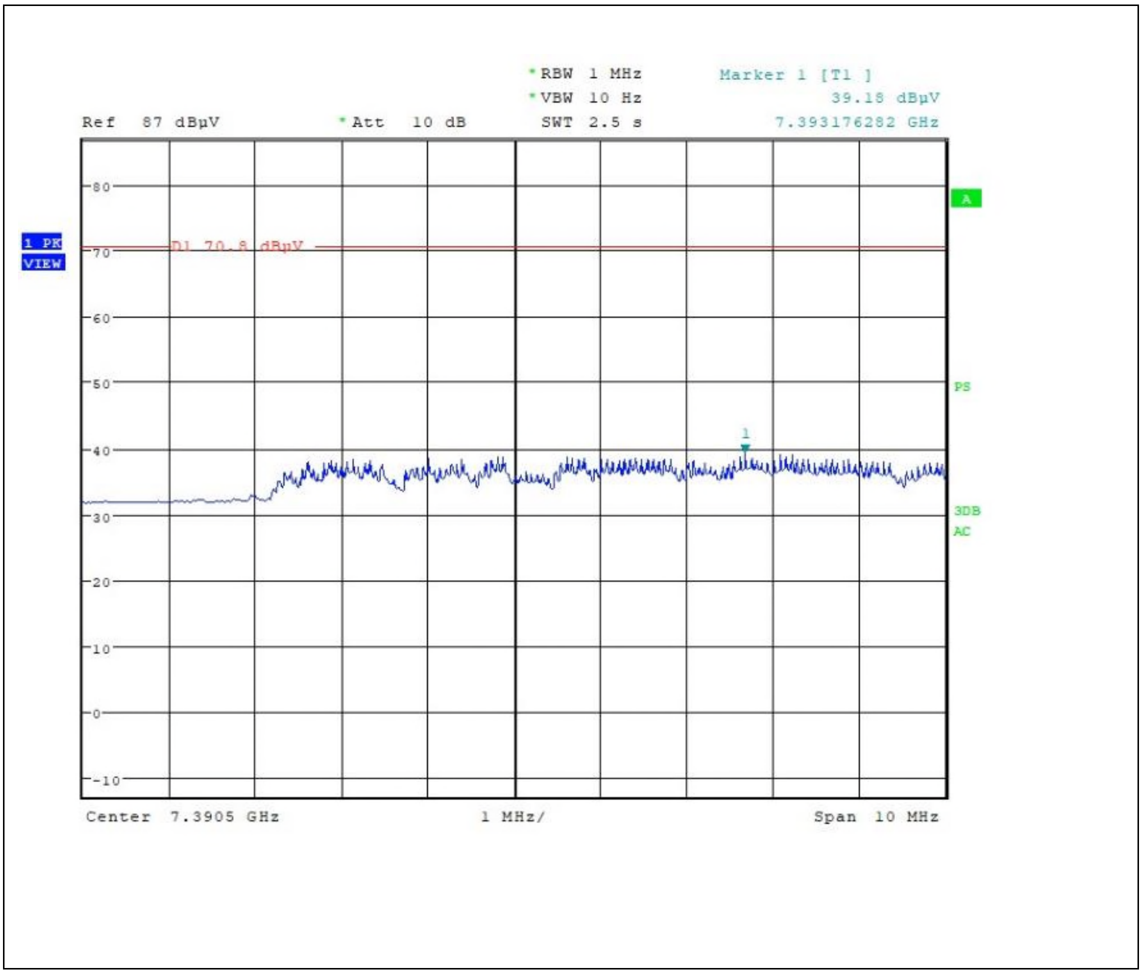
- ***Radiated Emissions (Above 1 GHz)***



7108.94 MHz

PLOTS OF EMISSIONS

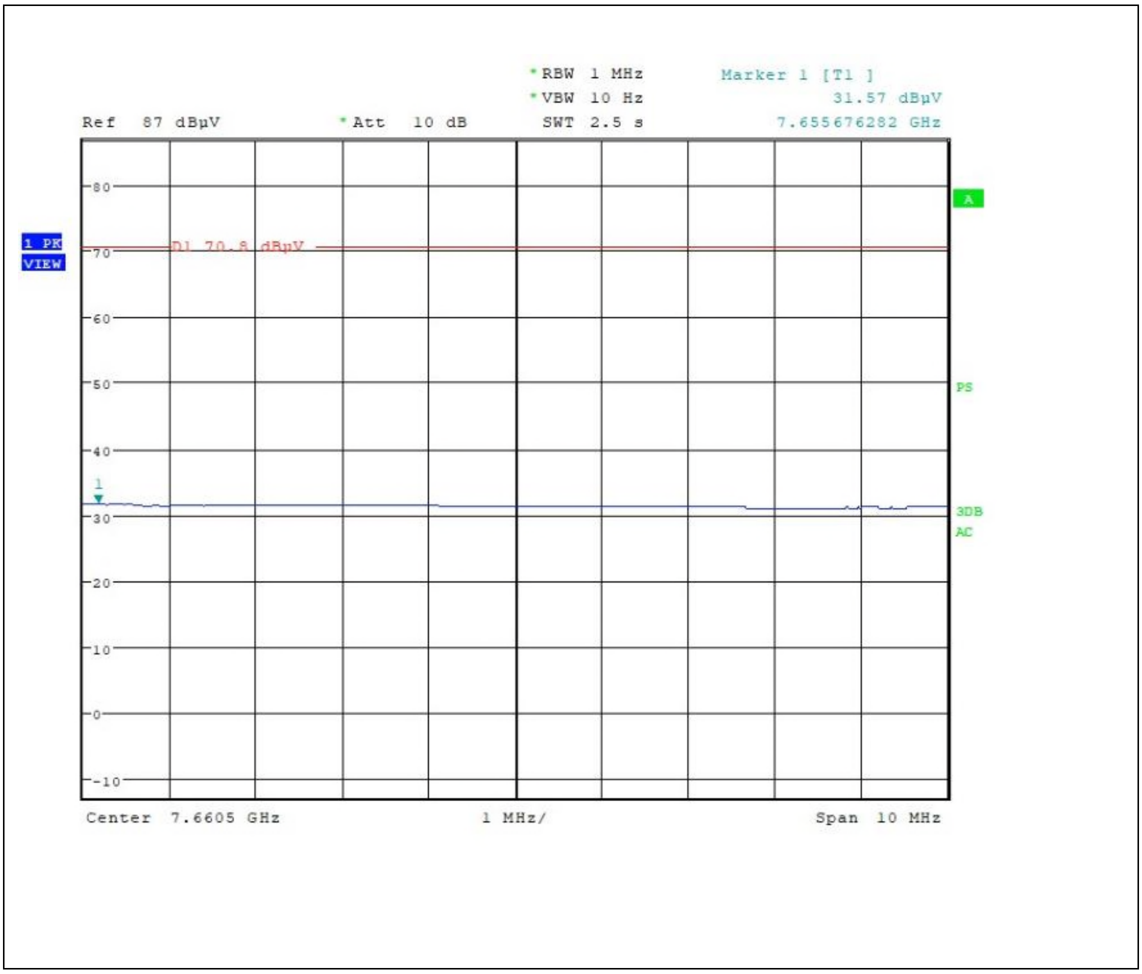
- *Radiated Emissions (Above 1 GHz)*



7393.17 MHz

PLOTS OF EMISSIONS

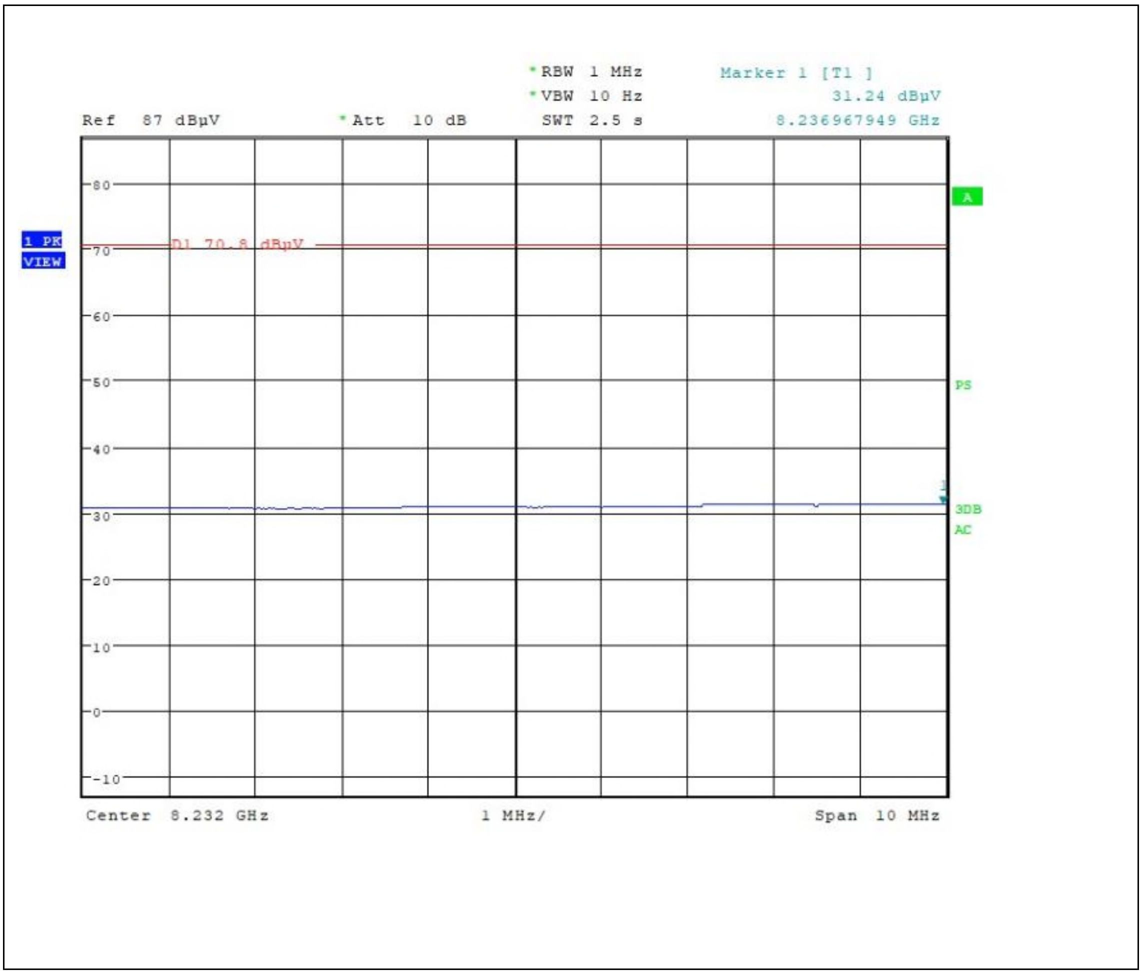
- ***Radiated Emissions (Above 1 GHz)***



7655.67 MHz

PLOTS OF EMISSIONS

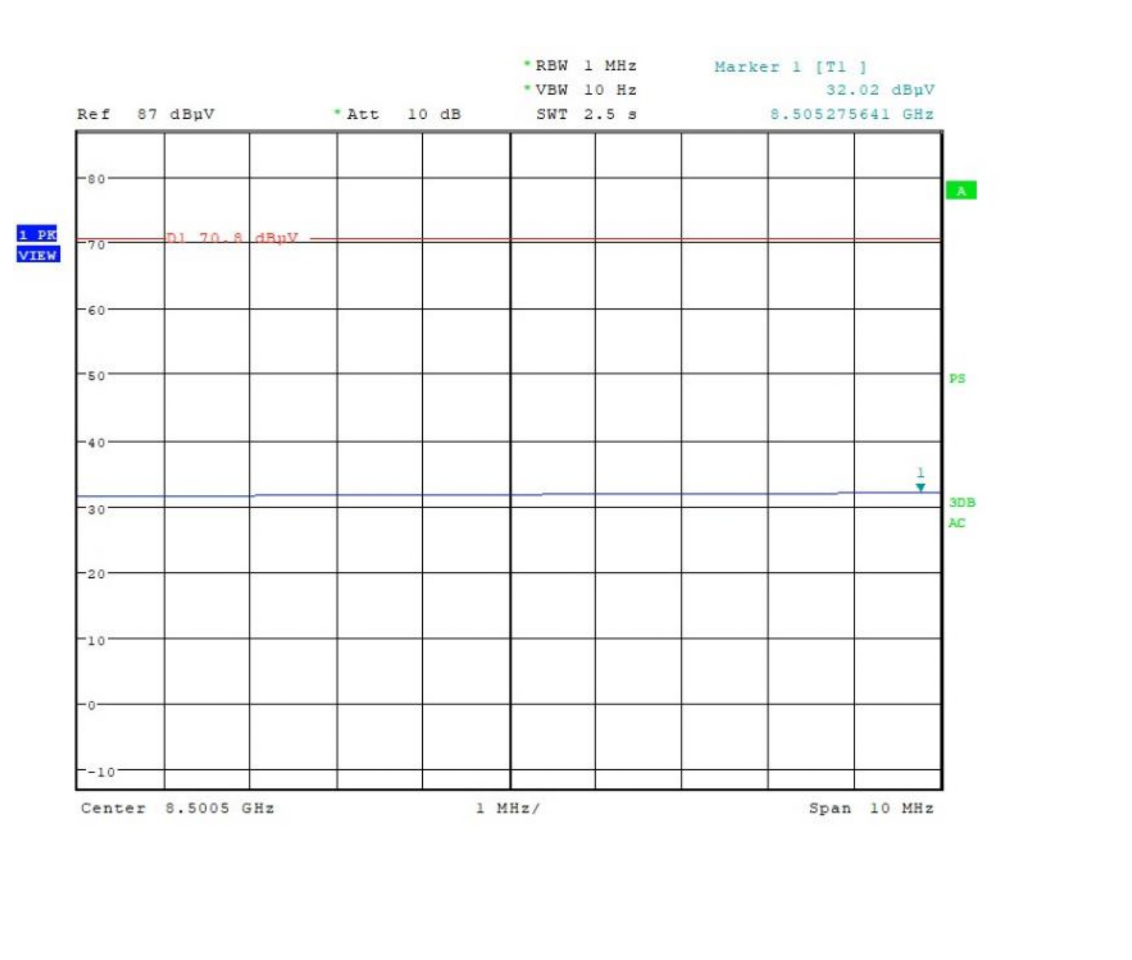
- ***Radiated Emissions (Above 1 GHz)***



8236.96 MHz

PLOTS OF EMISSIONS

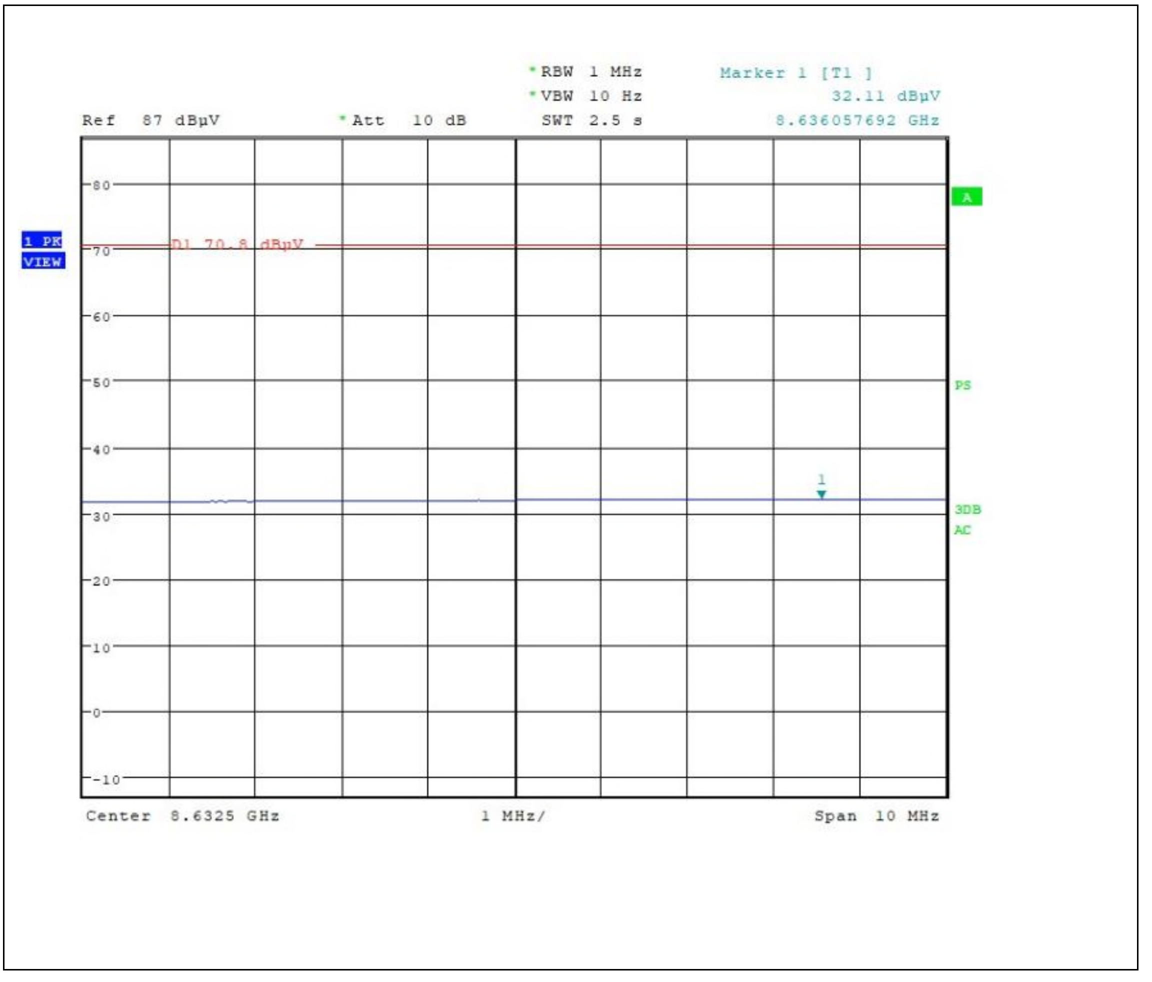
- ***Radiated Emissions (Above 1 GHz)***



8505.27 MHz

PLOTS OF EMISSIONS

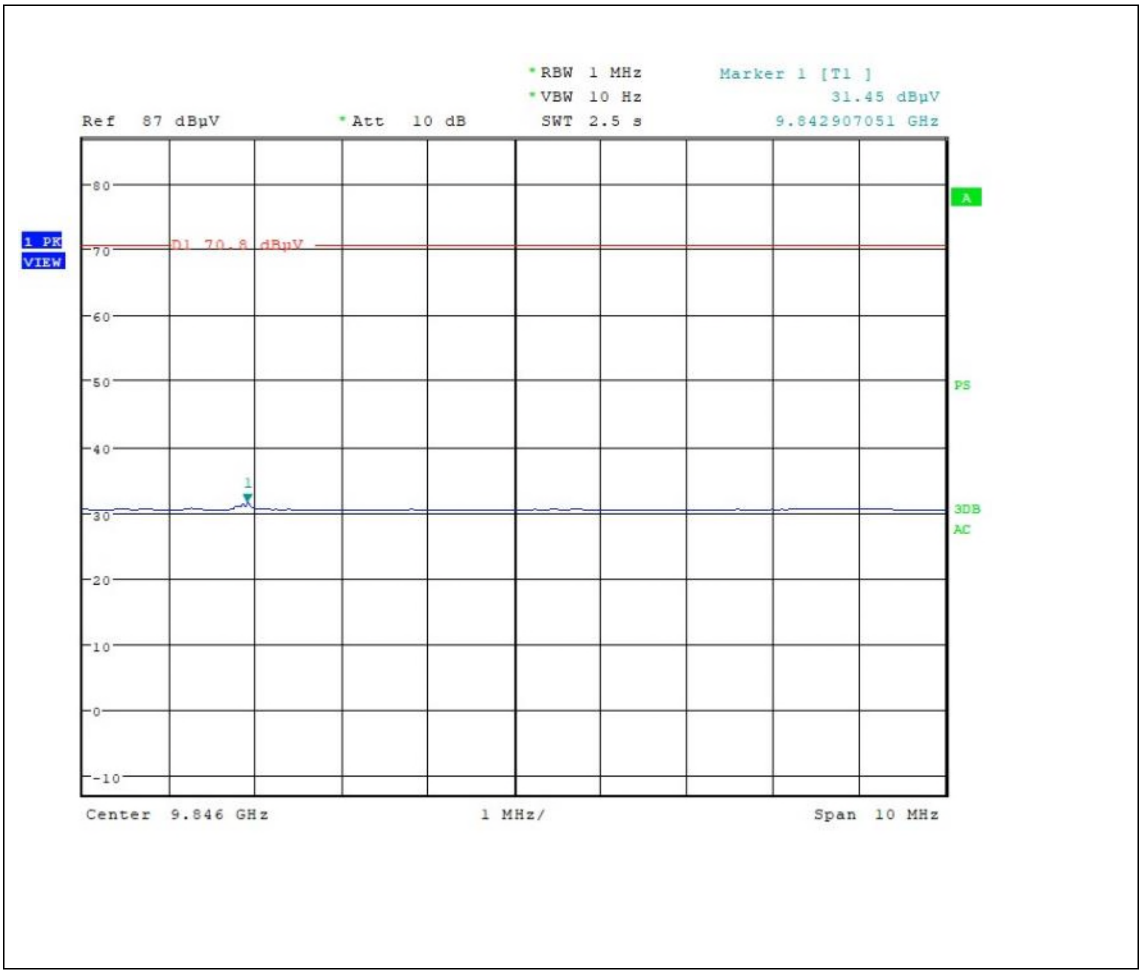
- ***Radiated Emissions (Above 1 GHz)***



8636.05 MHz

PLOTS OF EMISSIONS

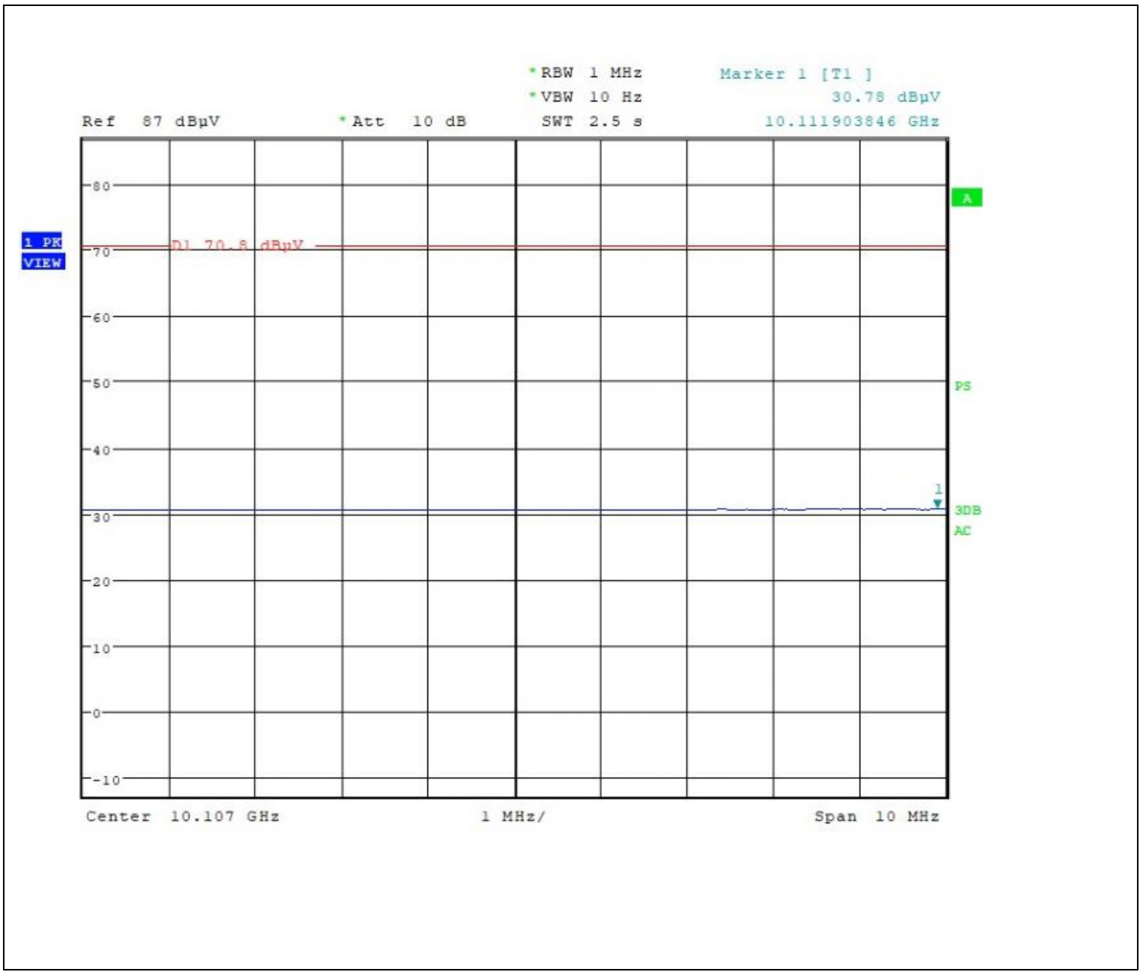
- ***Radiated Emissions (Above 1 GHz)***



9842.90 MHz

PLOTS OF EMISSIONS

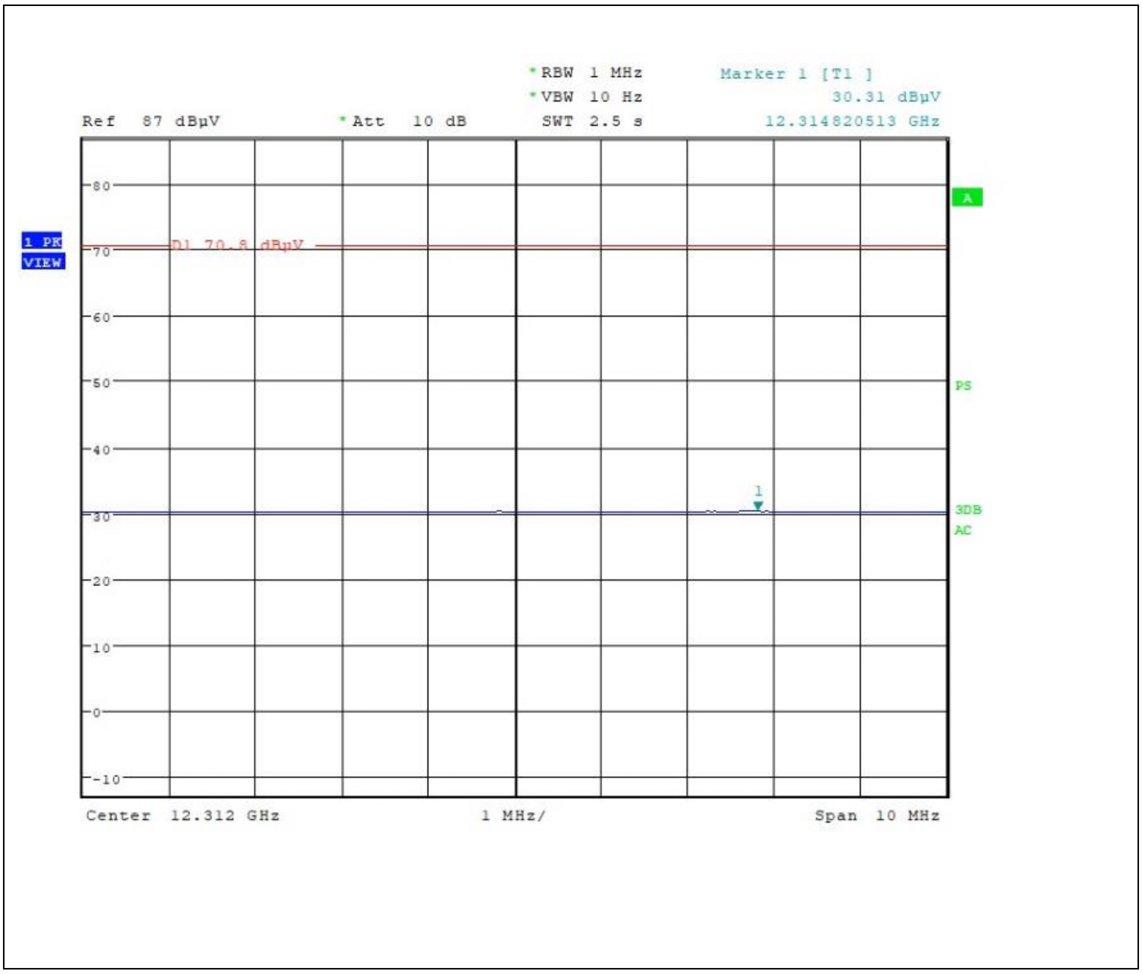
- ***Radiated Emissions (Above 1 GHz)***



10111.90 MHz

PLOTS OF EMISSIONS

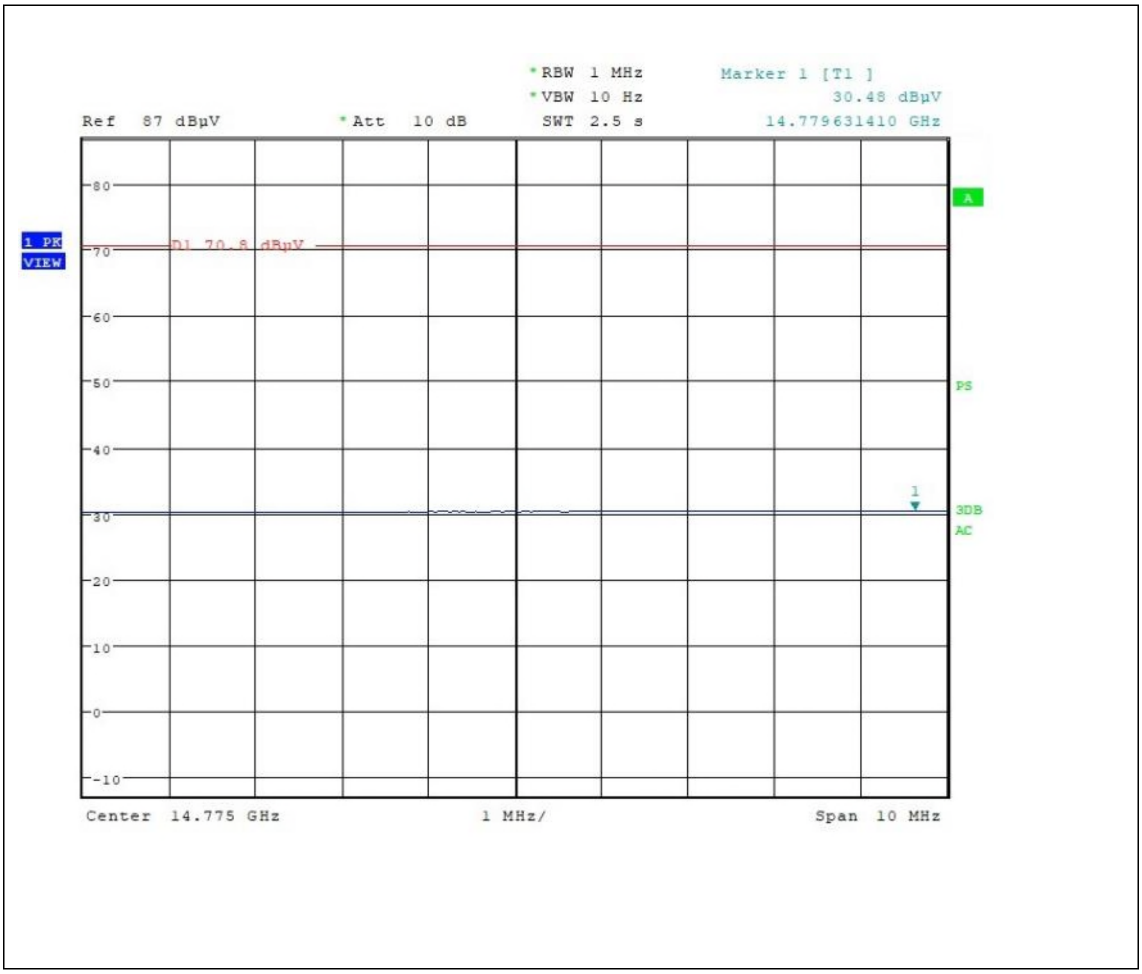
- ***Radiated Emissions (Above 1 GHz)***



12314.82 MHz

PLOTS OF EMISSIONS

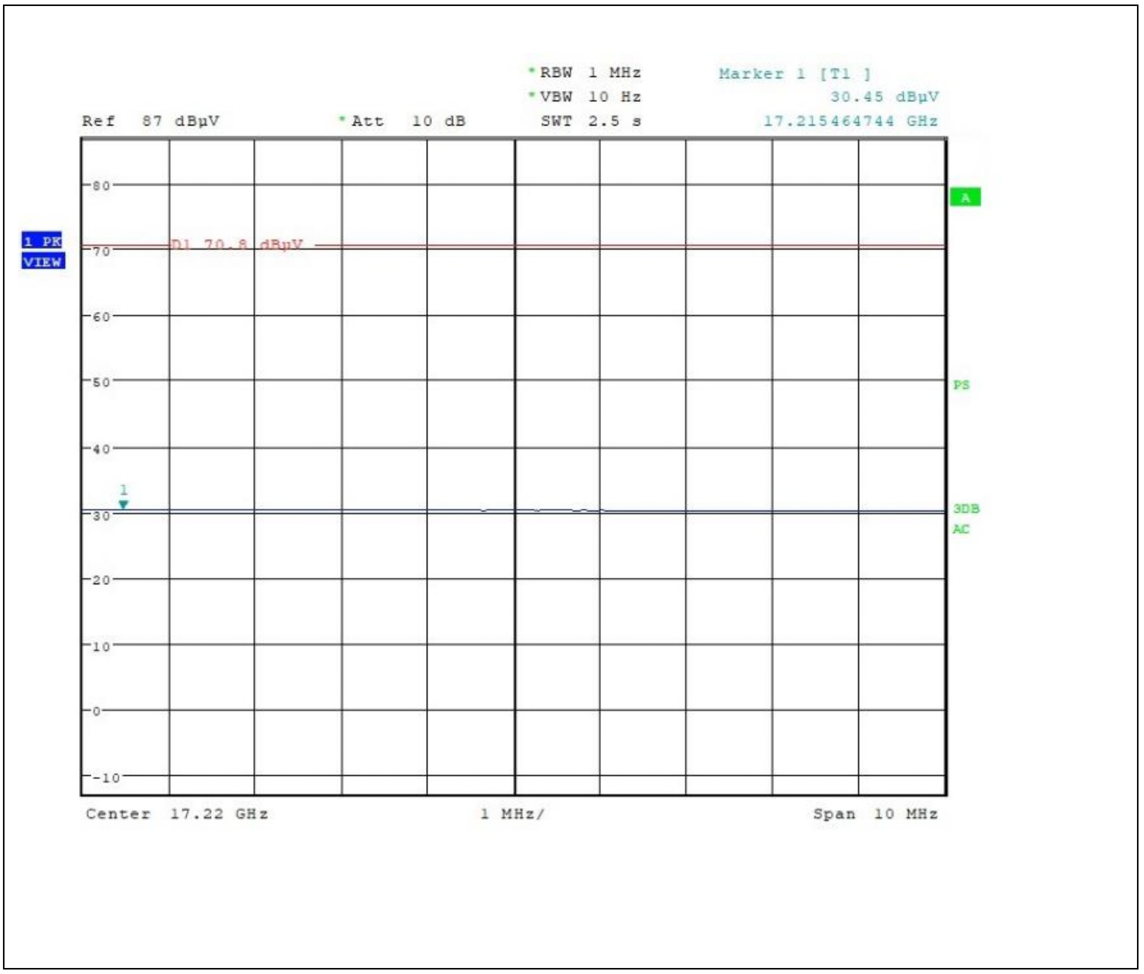
- ***Radiated Emissions (Above 1 GHz)***



14779.63 MHz

PLOTS OF EMISSIONS

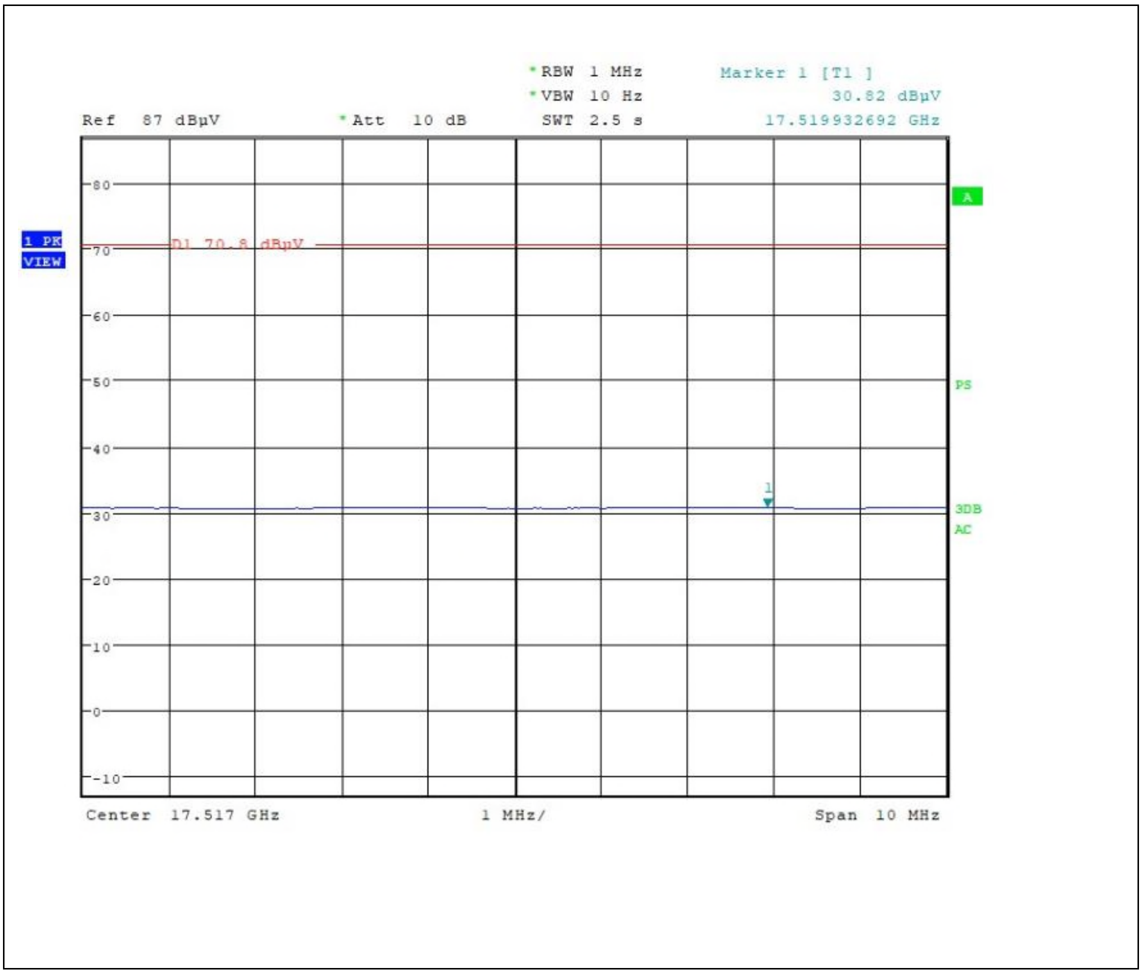
- ***Radiated Emissions (Above 1 GHz)***



17215.46 MHz

PLOTS OF EMISSIONS

- ***Radiated Emissions (Above 1 GHz)***



17519.93 MHz

ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of measurement uncertainty contained in CISPR 16-4-2 with the confidence level of 95 %

1. Conducted Uncertainty Calculation

Source of Uncertainty	X_i	Uncertainty of *Xi*		Coverage factor *k*	*u(Xi)* (dB)	*Ci*	*Ci u(Xi)* (dB)
		Value (dB)	Probability Distribution				
Receiver reading	R_S	± 2.38	normal 1	1.00	2.38	1	2.38
AMN Voltage division factor	L_{AMN}	± 0.15	normal 2	2.00	0.08	1	0.08
Sine wave voltage	dV_{SW}	± 0.17	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	dV_{PA}	± 0.39	normal 2	2.00	0.20	1	0.20
Pulse repetition rate response	dV_{PR}	± 0.39	normal 2	2.00	0.20	1	0.20
Noise floor proximity	dV_{NF}	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.00
AMN VDF frequency interpolation	dV_{FI}	± 0.10	rectangular	$\sqrt{3}$	0.06	1	0.06
AMN Impedance	d_Z	+ 2.60 - 2.70	Triangular	$\sqrt{6}$	1.10	1	1.10
Mismatch : AMN-Receiver	M	± 0.07	U-Shaped	$\sqrt{2}$	0.05	1	0.05
Remark	Using 50 Ω / 50 uH AMN						
Combined Standard Uncertainty	Normal			uc = 1.18 dB			
Expended Uncertainty U	Normal (k = 2)			U = 2.4 dB (CL is 95 %)			

2. Radiation Uncertainty Calculation (Below 1 ㎓)

Source of Uncertainty	Xi	Uncertainty of Xi: Value (dB)	Uncertainty of Xi: Probability Distribution	Coverage factor k	u(Xi) (dB)	Ci	Ci u(Xi) (dB)
Receiver reading	*Ri*	± 0.04	normal 1	1.00	0.04	1	0.04
Sine wave voltage	*dVsw*	± 0.17	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	*dVpa*	± 0.54	normal 2	2.00	0.27	1	0.27
Pulse repetition rate response	*dVpr*	± 0.54	normal 2	2.00	0.27	1	0.27
Noise floor proximity	*dVnf*	± 0.50	normal 2	2.00	0.29	1	0.29
Antenna Factor Calibration	A_F	± 1.30	rectangular	2.00	0.65	1	0.65
Antenna Directivity	A_D	± 0.50	rectangular	$\sqrt{3}$	0.29	1	0.29
Antenna Factor Height Dependence	A_H	± 0.50	rectangular	$\sqrt{3}$	0.29	1	0.29
Antenna Phase Centre Variation	A_P	± 0.20	rectangular	$\sqrt{3}$	0.12	1	0.12
Antenna Factor Frequency Interpolation	A_i	± 0.3	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	S_i	± 4.00	Triangular	$\sqrt{6}$	1.63	1	1.63
Measurement Distance Variation	D_V	± 0.60	rectangular	$\sqrt{3}$	0.35	1	0.35
Antenna Balance	D_{bal}	± 1.00	rectangular	$\sqrt{3}$	0.58	1	0.58
Cross Polarization	D_{Cross}	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Mismatch	*M*	+ 1.32 - 1.57	U-Shaped	$\sqrt{2}$	0.11	1	1.11
EUT Volume Diameter	*Vd*	0.33	Normal 1	1.00	0.33	1	0.33
Combined Standard Uncertainty	Normal			*uc* = 2.36 dB			
Expended Uncertainty U	Normal (*k* = 2)			*U* = 4.8 dB (CL is 95 %)			

3. Radiation Uncertainty Calculation (Above 1 ㎓)

Source of Uncertainty	*Xi*	Uncertainty of *Xi*		Coverage factor *k*	*u(Xi)* (dB)	*Ci*	*Ci u(Xi)* (dB)
		Value (dB)	Probability Distribution				
Receiver reading	*Ri*	0.25	normal 1	1.00	0.25	1	0.25
Preamplifier gain	*Gp*	± 0.23	normal 2	2	0.12	1	0.12
Receiver Sine Wave	*dVsw*	± 0.27	normal 2	2	0.14	1	0.14
Instability of preamp gain	*dGpw*	± 1.2	rectangular	$\sqrt{3}$	0.70	1	0.70
Noise Floor Proximity	*dVnf*	± 0.70	rectangular	$\sqrt{3}$	0.40	1	0.40
Antenna Factor Calibration	*AF*	± 1.50	normal 2	2	0.75	1	0.75
Directivity difference	A_D	± 3.00	rectangular	$\sqrt{3}$	0.87	1	0.87
Phase Centre location	A_P	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Antenna Factor Frequency Interpolation	A_i	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	S_i	± 3.00	Triangular	$\sqrt{6}$	1.22	1	1.22
Effect of setup table material	d_{ANT}	± 1.50	rectangular	$\sqrt{3}$	0.87	1	0.87
Separation distance	d_D	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Cross Polarization	D_{Cross}	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Mismatch (antenna-Preamplifier)	*M*	+ 1.30 - 1.50	U-Shaped	$\sqrt{2}$	1.06	1	1.06
Mismatch (preamplifier-receiver)	*M*	+ 1.20 - 1.40	U-Shaped	$\sqrt{2}$	0.99	1	0.99
Combined Standard Uncertainty	Normal			*uc* = 2.86 dB			
Expended Uncertainty U	Normal (*k* = 2)			*U* = 5.8 dB (CL is 95 %)			

LIST OF TEST EQUIPMENT

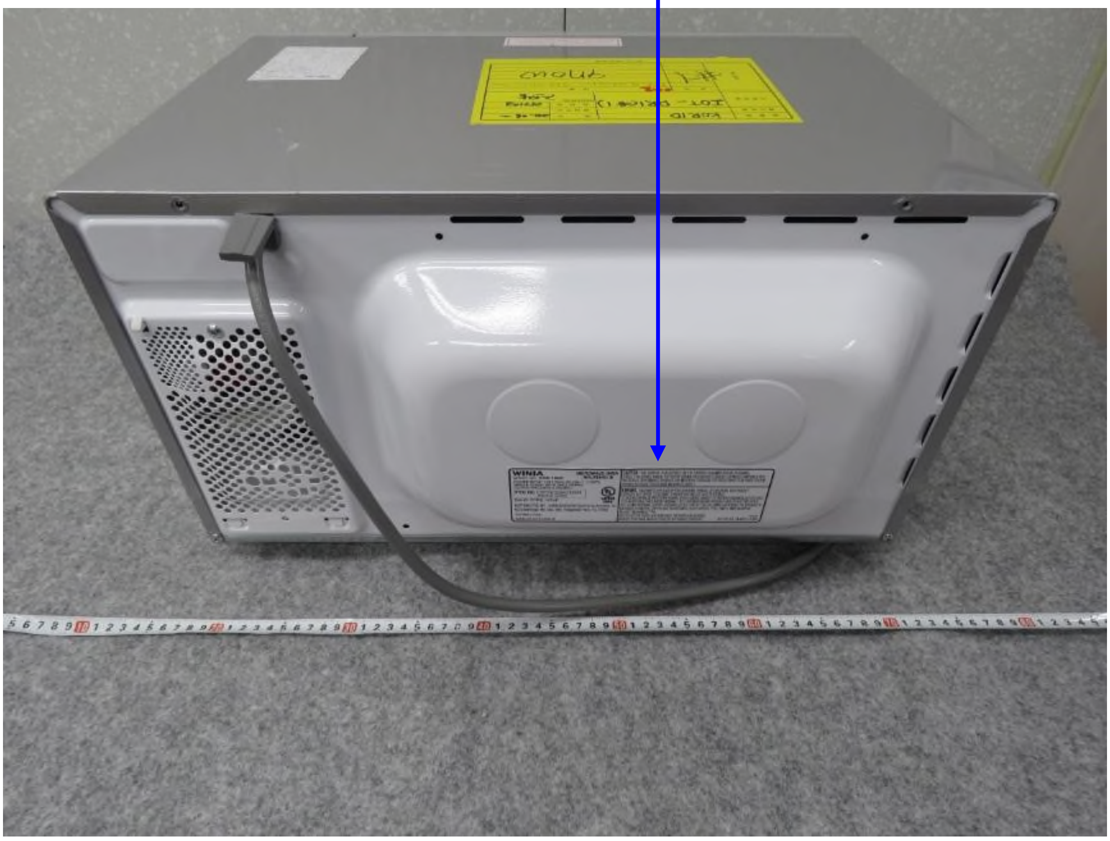
No.	Instrument	Manufacturer	Model	Serial No.	Due to Calibration	Calibration Interval
1	Microwave survey meter	ETS Lindgren	1501	00033549	Jan. 29 2021	2 year
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101041	Apr. 02 2021	1 year
3	Software	ROHDE & SCHWARZ	EMC32	Version 8.53.0	-	-
4	ARTIFICIAL MAINS NETWORK	ROHDE & SCHWARZ	ESH2-Z5	100273	Oct. 11 2020	1 year
5	ATTENUATOR	FAIRVIEW	SA3N5W-10	N/A	Jul. 13 2021	1 year
6	LOOP ANTENNA	ROHDE & SCHWARZ	HFH2-Z2	100279	Feb. 13 2021	2 years
7	EMI Test Receiver	ROHDE & SCHWARZ	ESU 40	100202	Apr. 02 2021	1 year
8	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW8	100994	Apr. 02 2021	1 year
9	Software	ROHDE & SCHWARZ	EMC32	Version 10.10.01	-	-
10	Signal Conditioning Unit	ROHDE & SCHWARZ	SCU 01	10029	Apr. 02 2021	1 year
11	TRILOG Broadband Test Antenna	SCHWARZBECK	VULB 9163	9163-01027	Feb. 07 2022	2 year
12	ATTENUATOR	FAIRVIEW	SA3N5W-06	N/A	Jan. 13 2021	1 year
13	Controller	innco systems GmbH	CO2000-G	CO2000/562/ 23890210/L	N/A	N/A
14	Open Switch and Control Unit	ROHDE & SCHWARZ	OSP-120	100015	N/A	N/A
15	Antenna Mast (Left)	innco systems GmbH	MA4000-EP	N/A	N/A	N/A
16	Turn Table	innco systems GmbH	DT3000-3T	N/A	N/A	N/A
17	Signal Conditioning Unit	ROHDE & SCHWARZ	SCU 01	10030	Apr. 02 2021	1 year
18	Signal Conditioning Unit	Rohde & Schwarz	SCU 18	10065	Apr. 02 2021	1 year
19	DOUBLE RIDGED HORN ANTENNA	SCHWARZBECK	HF907	100197	Aug. 09 2020	1 year
20	SWITCH AND POWER DETECTOR UNIT	ROHDE & SCHWARZ	OSP-120	101766	N/A	N/A
21	TILT ANTENNA MAST	innco systems GmbH	MA4640-XP-EP	N/A	N/A	N/A
22	CONTROLLER	innco systems GmbH	CO3000	CO3000/937/383 30516/L	N/A	N/A
23	Turntable	innco systems GmbH	DT2000-2t	N/A	N/A	N/A
24	WiFi Filter Bank	ROHDE & SCHWARZ	U082	N/A	N/A	N/A

APPENDIX A – SAMPLE LABEL

Labeling Requirements

The sample label shown shall be *permanently affixed* at a conspicuous location on the device and be readily visible to the user at the time of purchase.

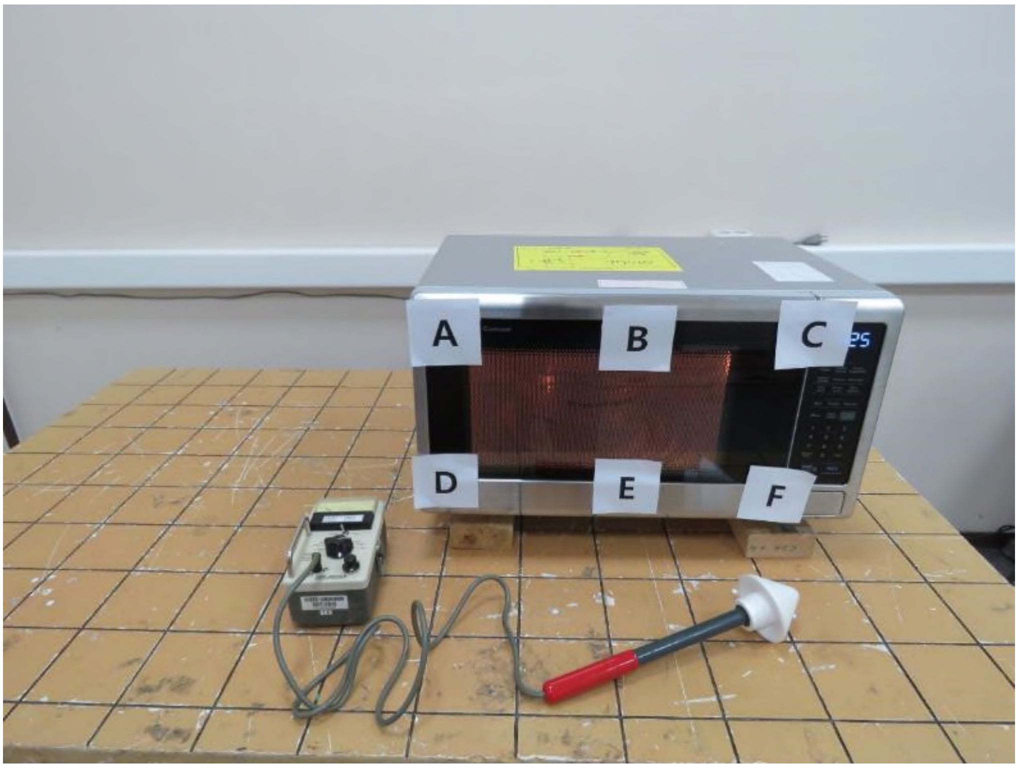
- **FCC ID Location of EUT**



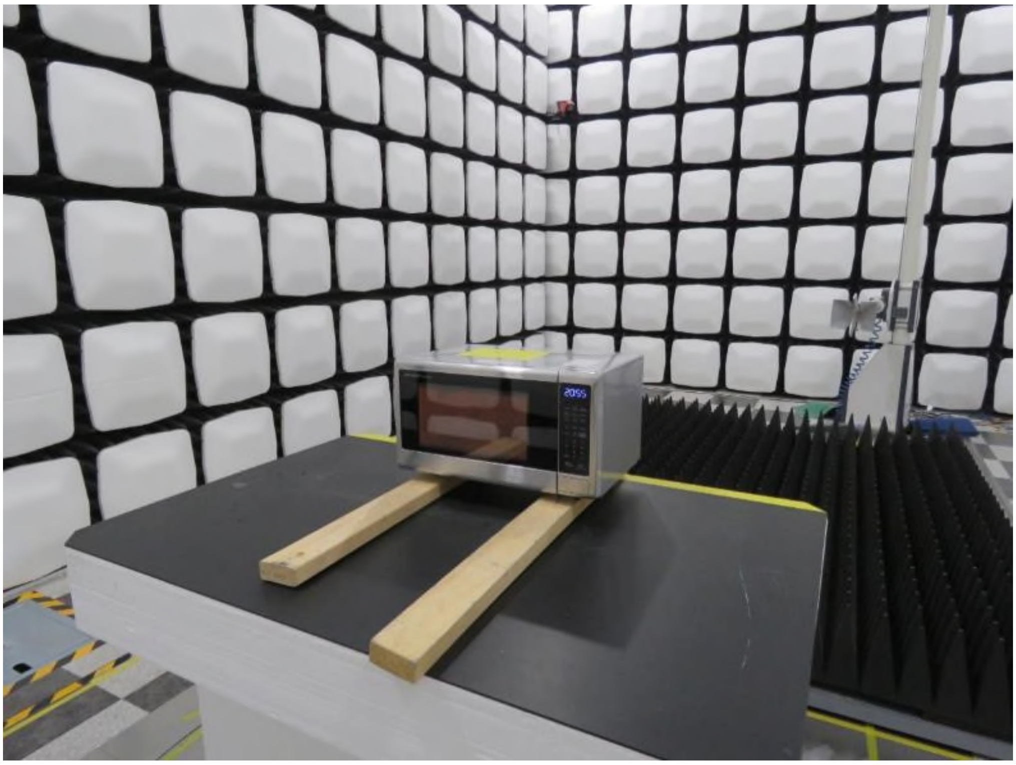
APPENDIX B – PHOTOGRAPHS OF TEST SET-UP

The **Conducted Test Picture** and **Radiated Test Picture** and show the worst-case configuration and cable placement.

- **Radiation hazard Test Picture**

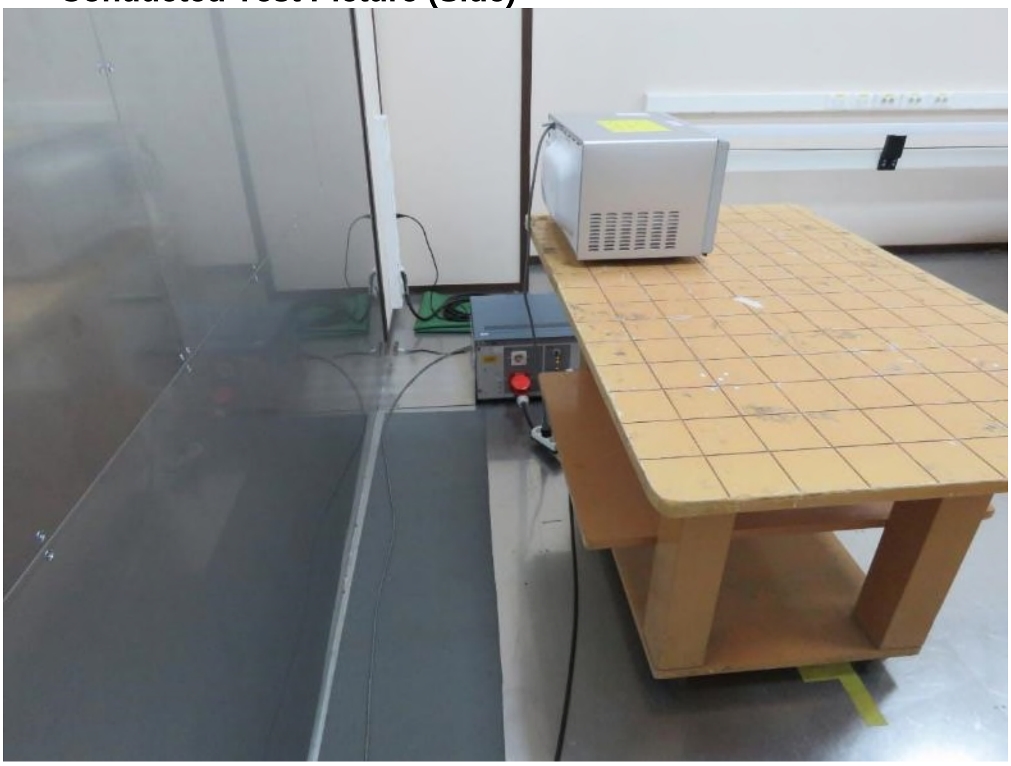


- **Frequency measurement Test Picture**

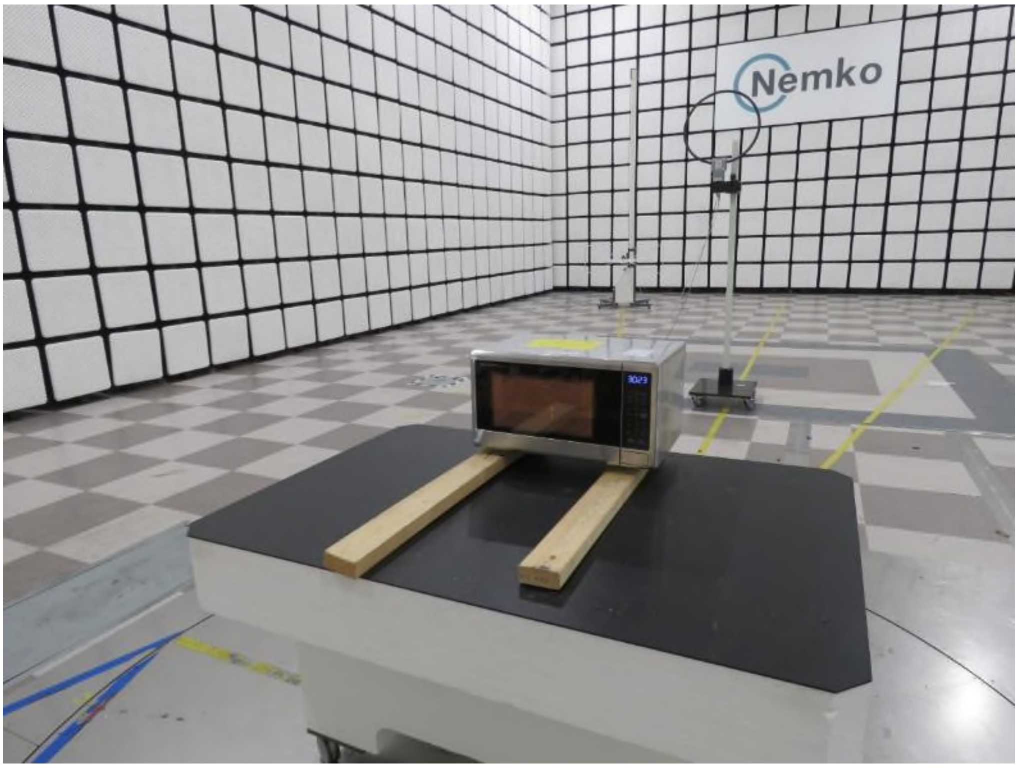


- **Conducted Test Picture (Front)**

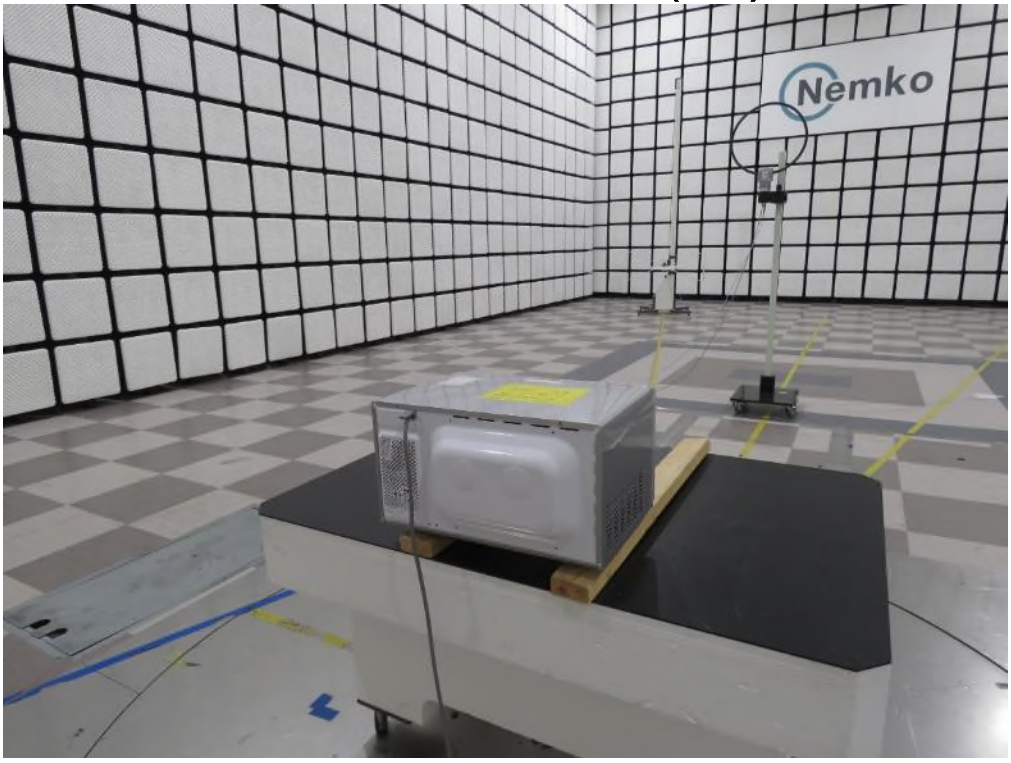
- **Conducted Test Picture (Side)**



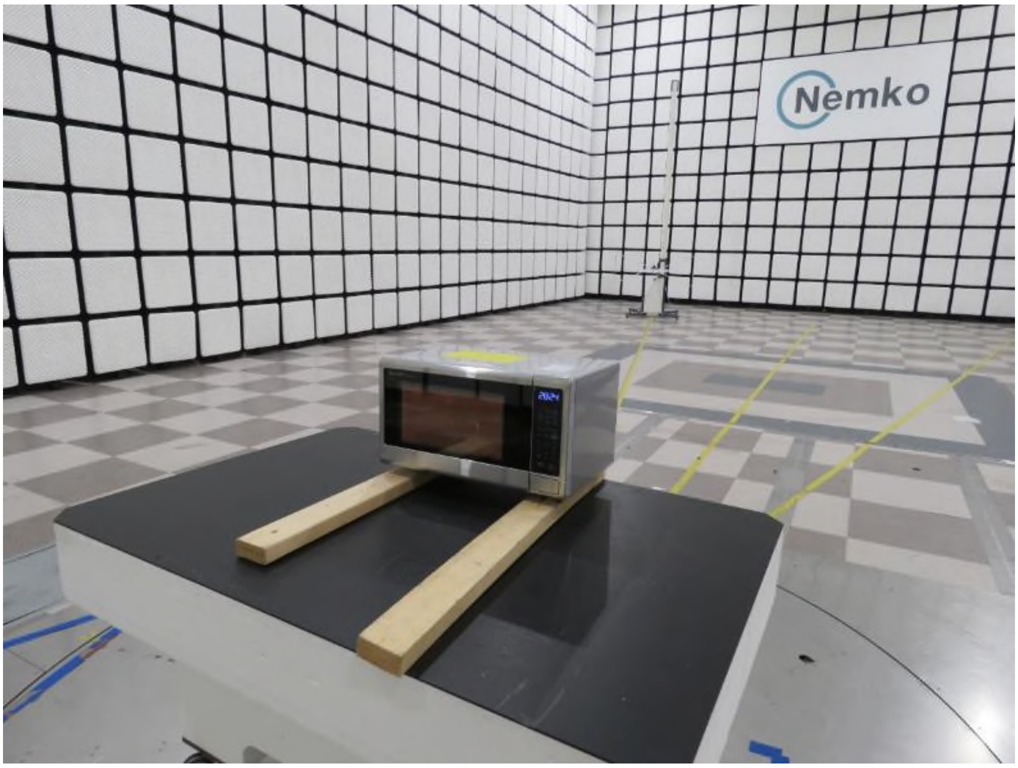
- **Radiated Test Picture : 0.15 ㎒ ~ 30 ㎒ (Front)**



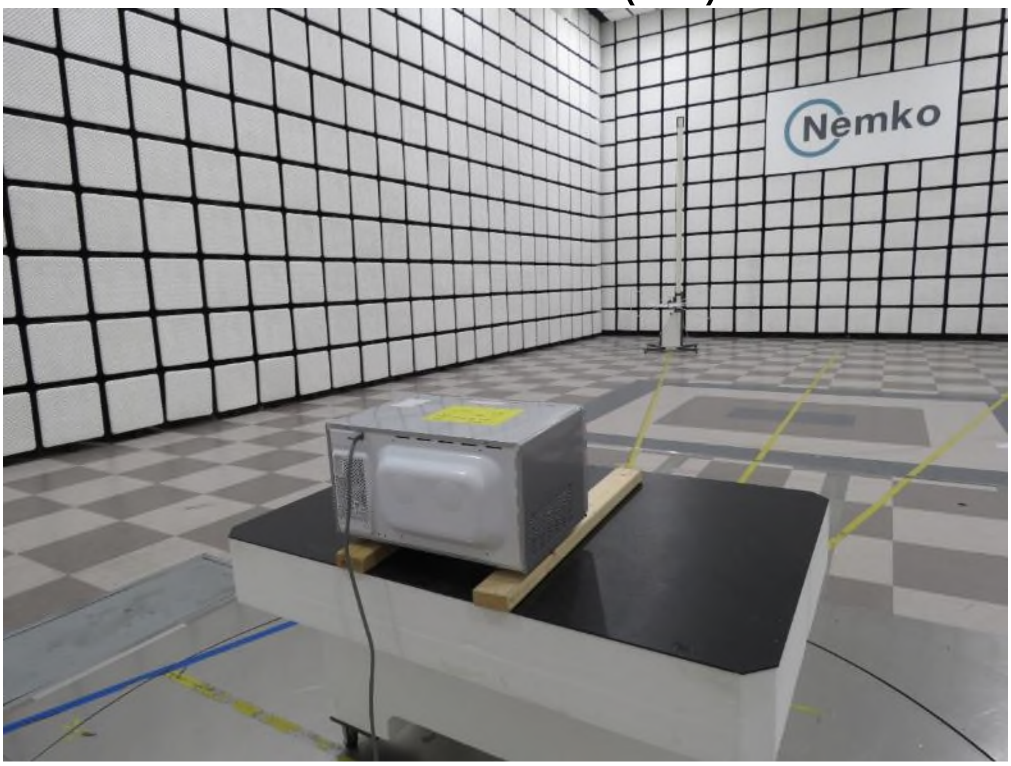
- **Radiated Test Picture : 0.15 ㎒ ~ 30 ㎒ (Rear)**



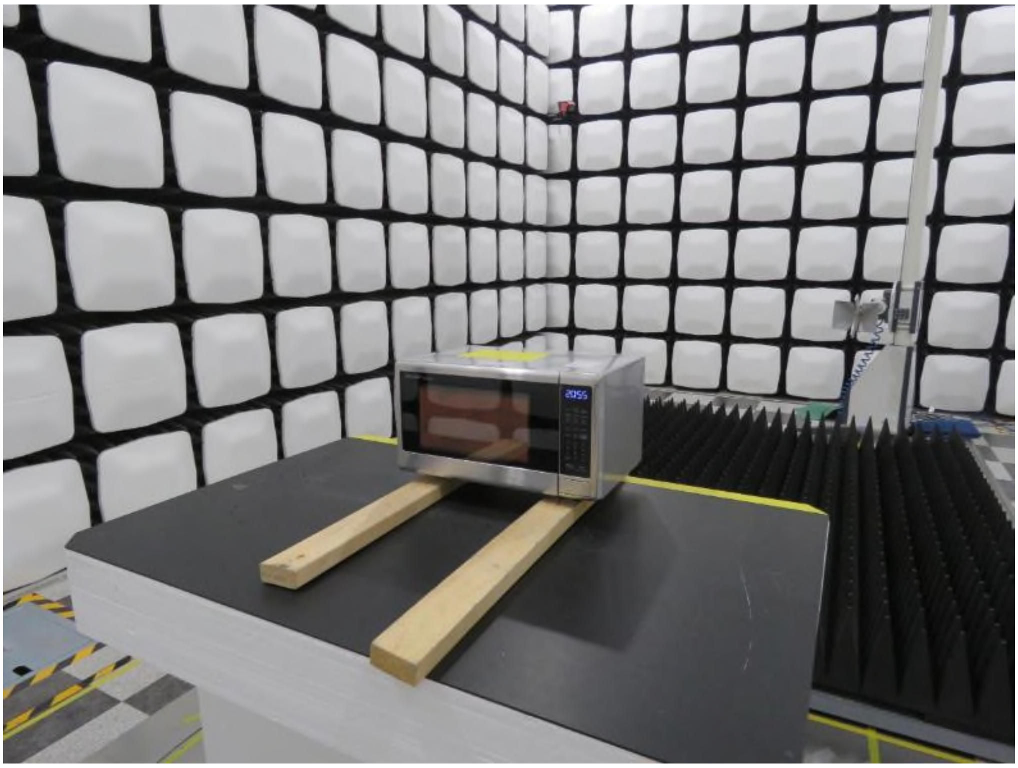
- **Radiated Test Picture : 30 ㎒ ~ 1 ㎓ (Front)**



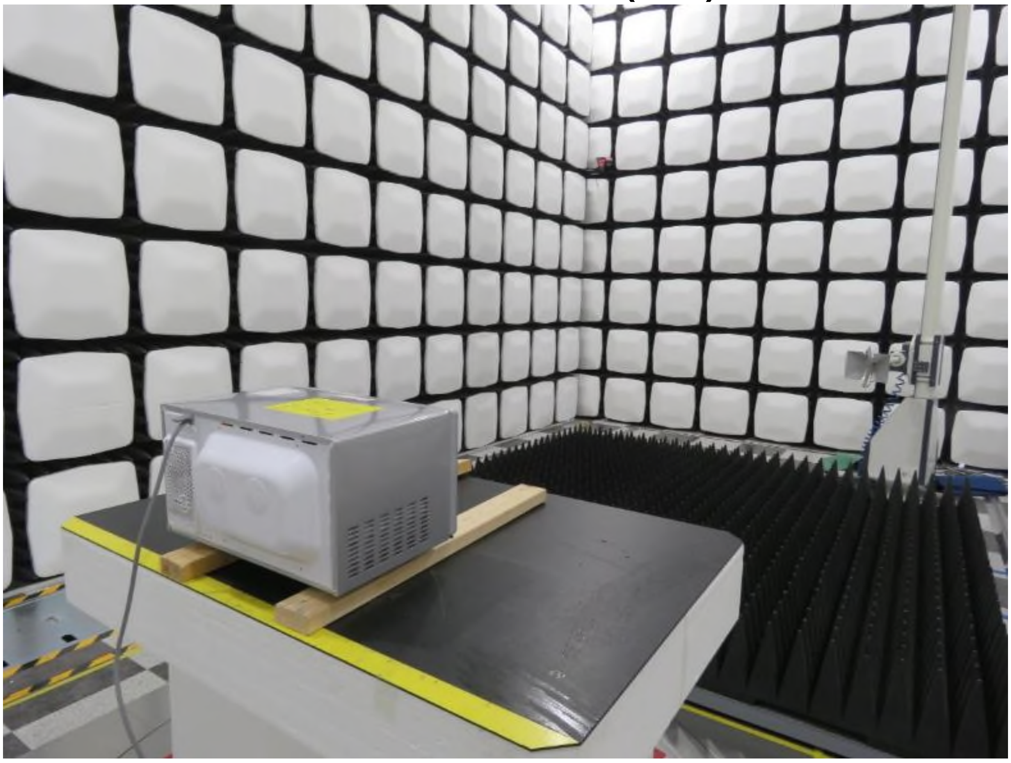
- **Radiated Test Picture : 30 ㎒ ~ 1 ㎓ (Rear)**



- **Radiated Test Picture : 1 ㎓ ~ 18 ㎓ (Front)**



- **Radiated Test Picture : 1 ㎓ ~ 18 ㎓ (Rear)**

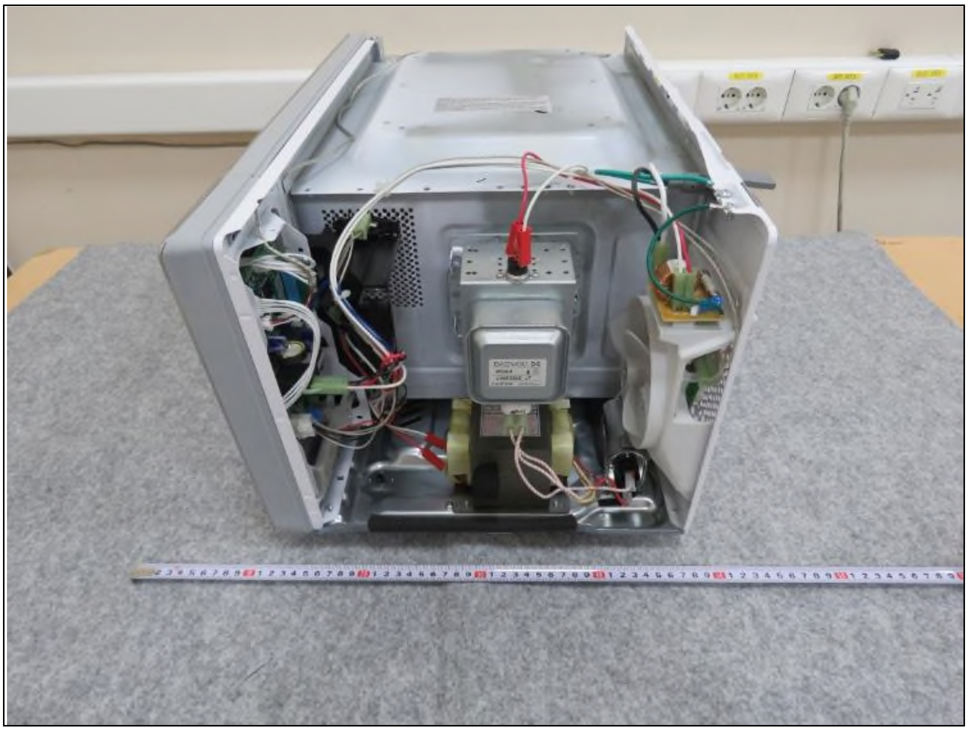


APPENDIX C – EUT PHOTOGRAPHS

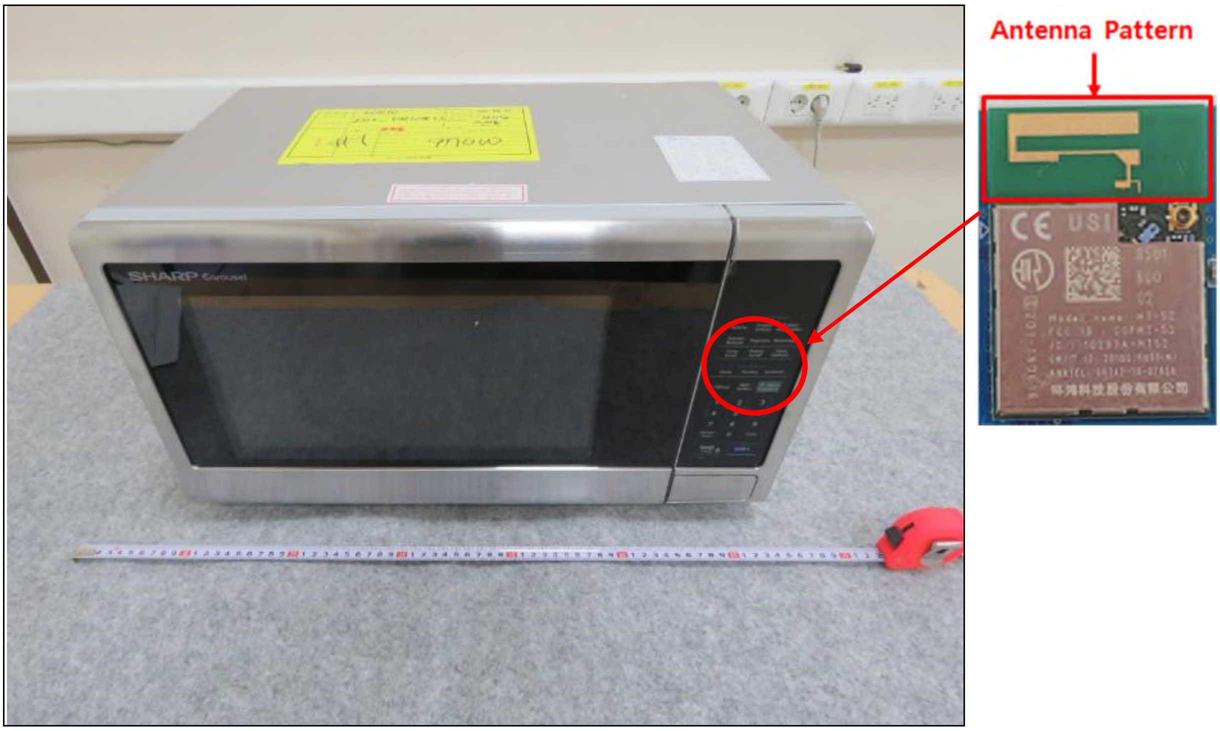
1. Front View of EUT

2. Rear View of EUT

3. Inside View of EUT

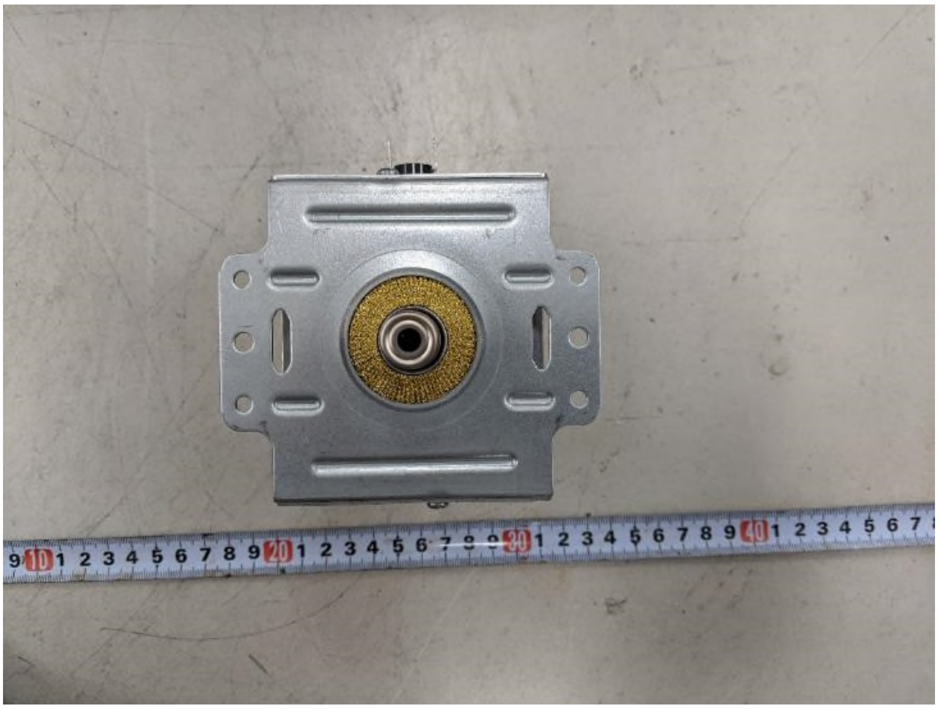


4. Location of WiFi Module & Antenna Pattern

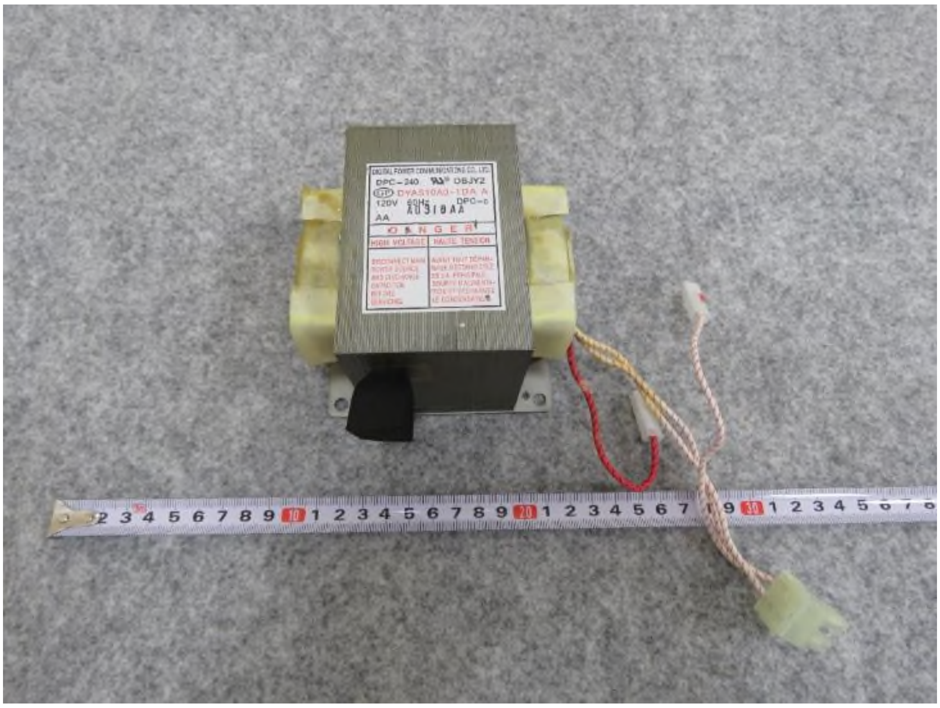


5. Front View of MAGNETRON

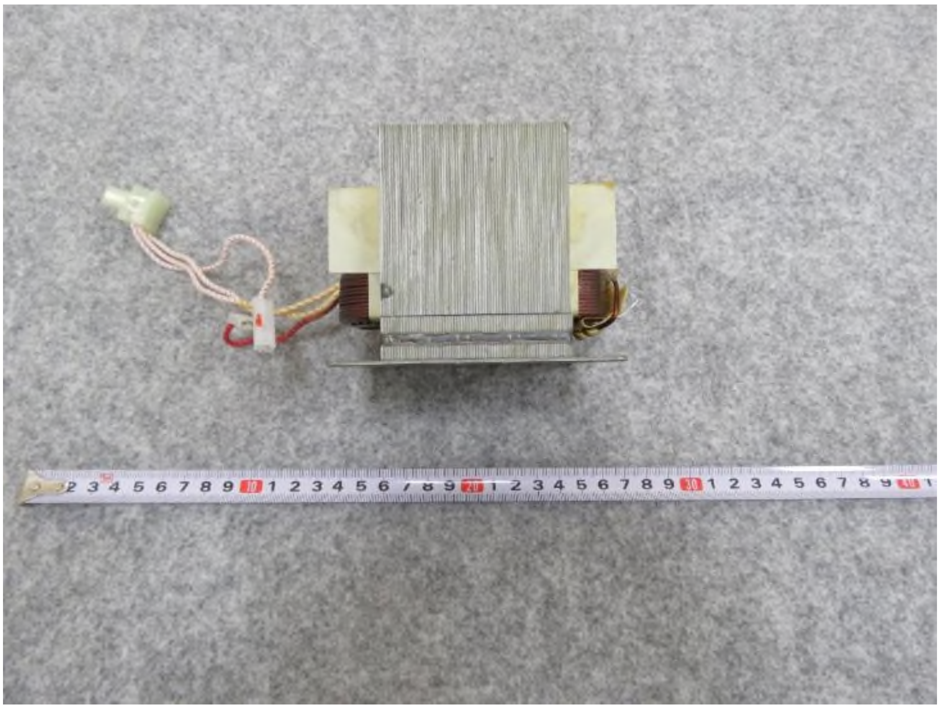
6. Rear View of MAGNETRON



7. Front View of TRANS H.V.

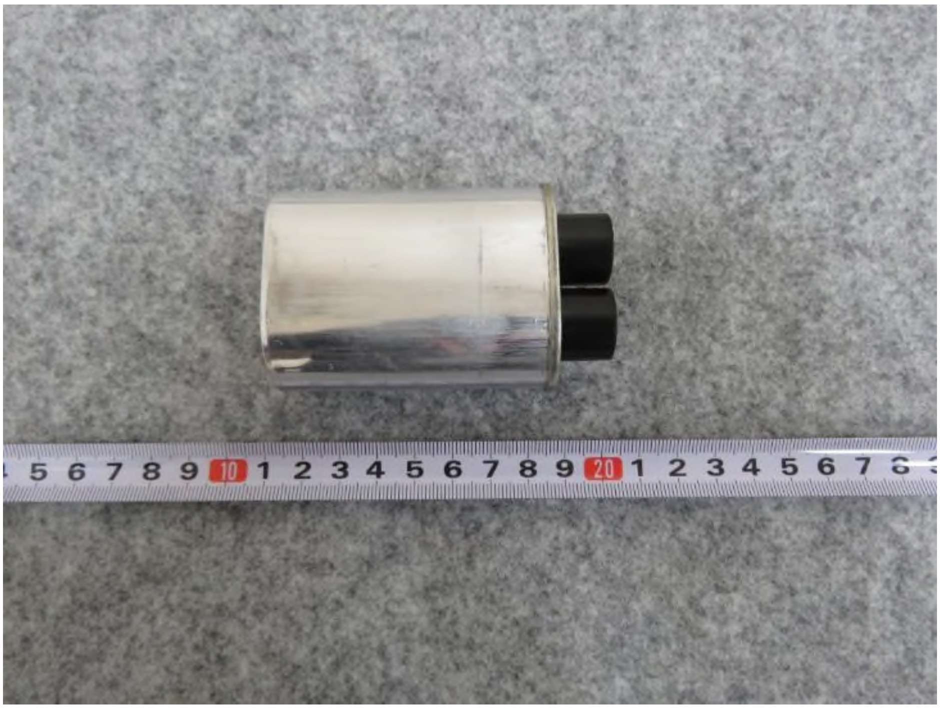


8. Rear View of TRANS H.V.

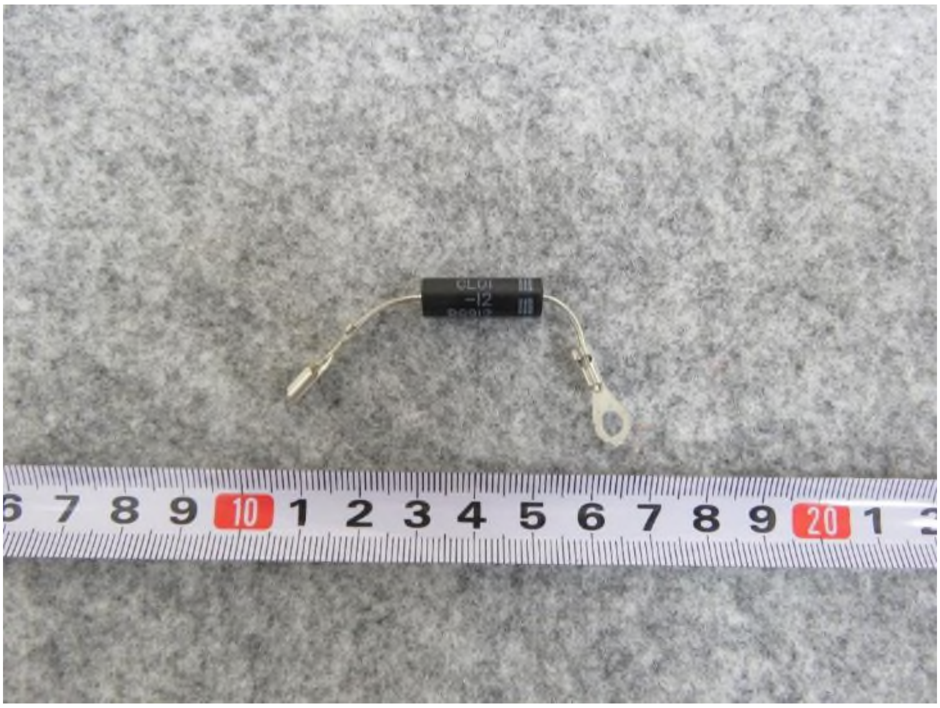


9. Front View of CAPACITOR H.V.

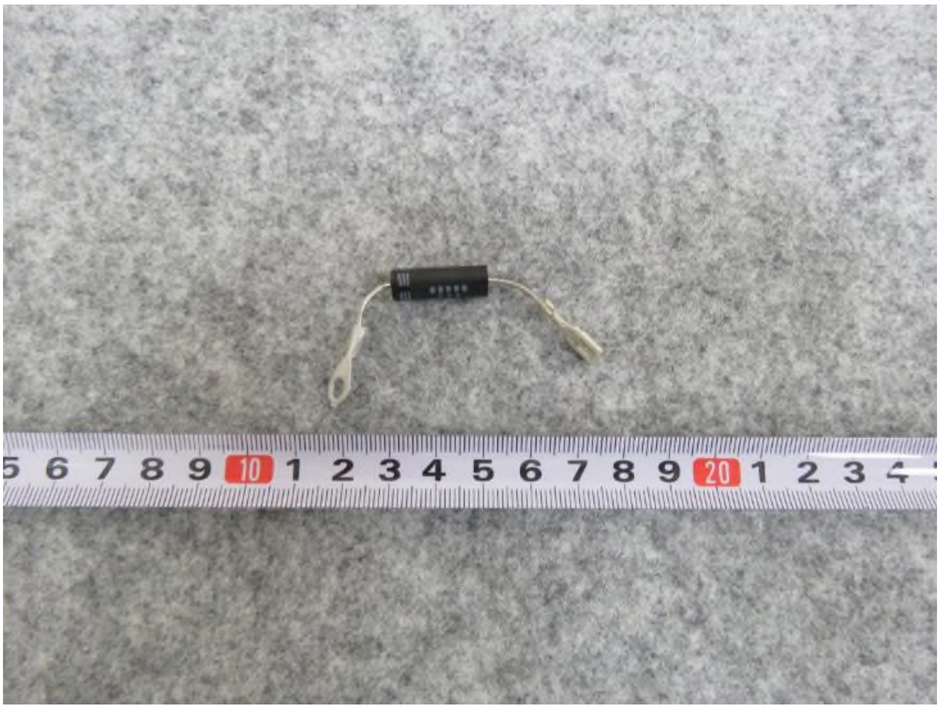
10. Rear View of CAPACITOR H.V.



11. Front View of DIODE H.V.



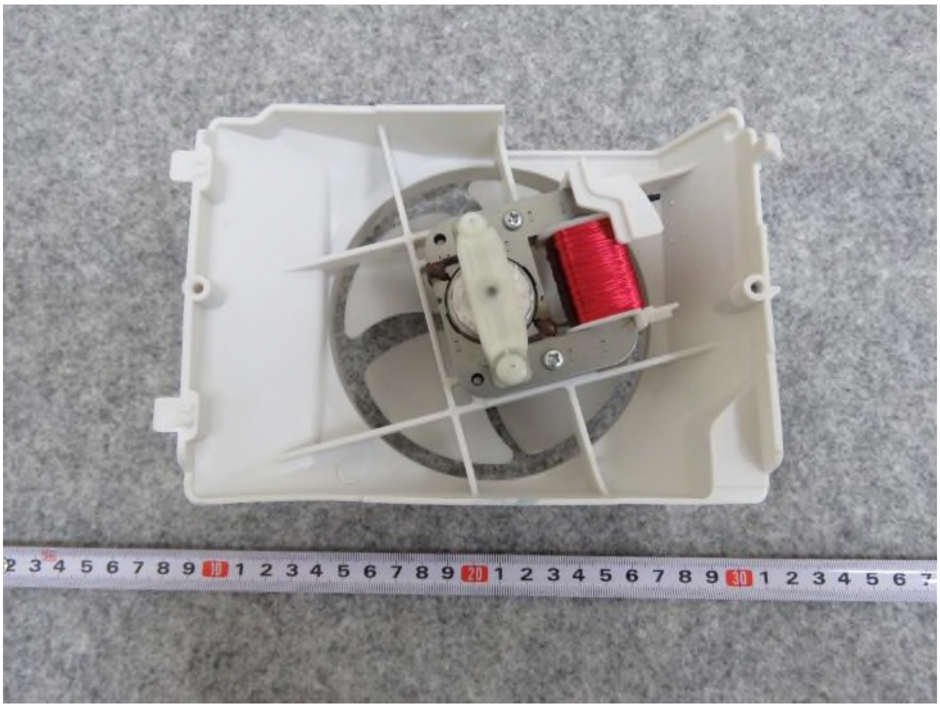
12. Rear View of DIODE H.V.



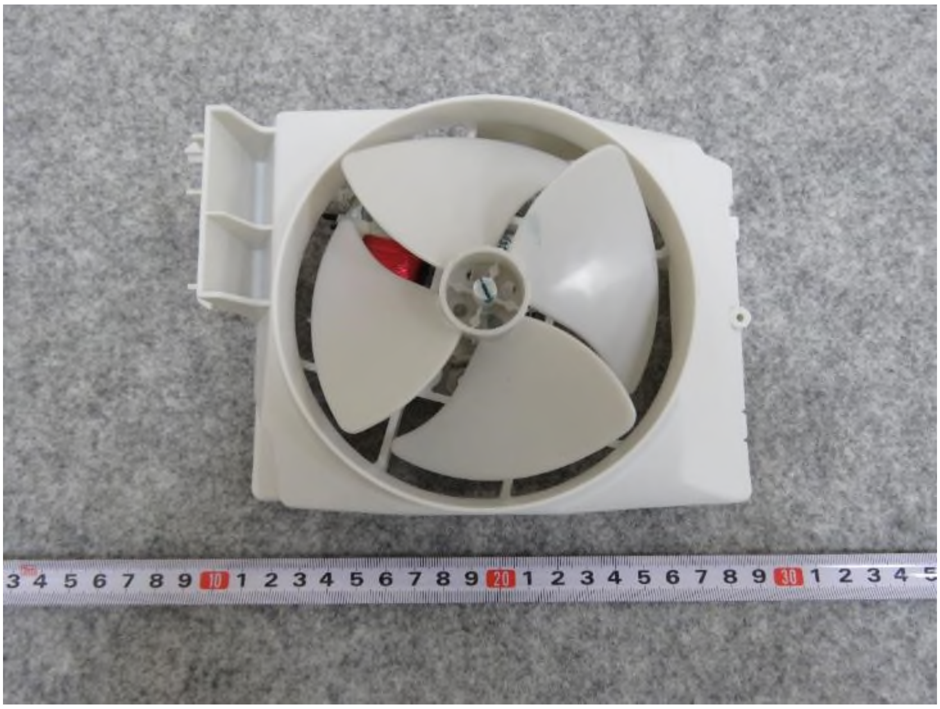
13. Front View of TRAY MOTOR

14. Rear View of TRAY MOTOR

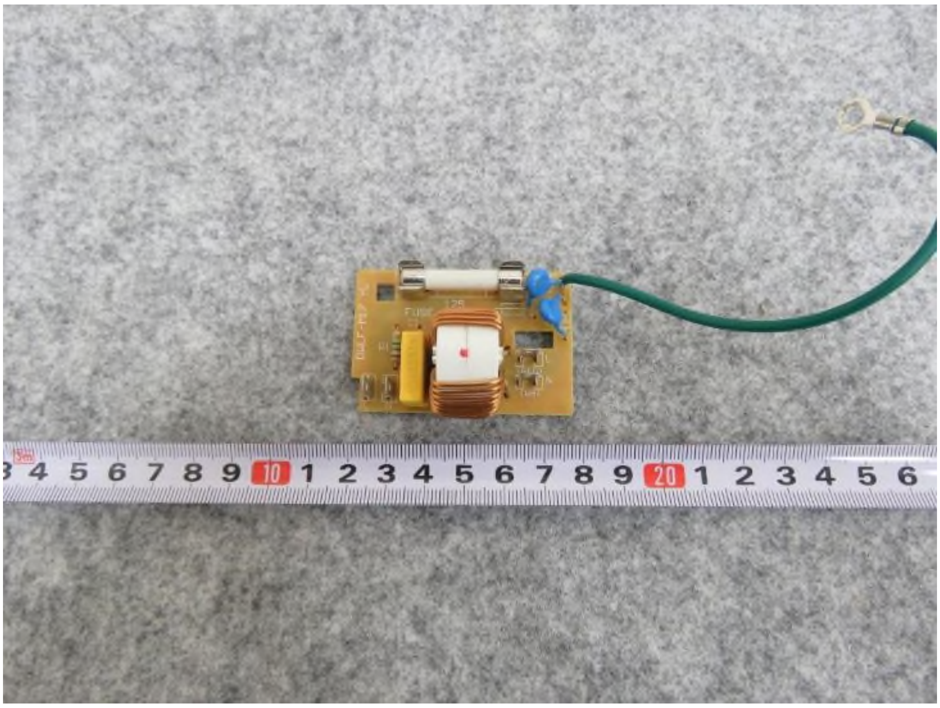
15. Front View of FAN MOTOR



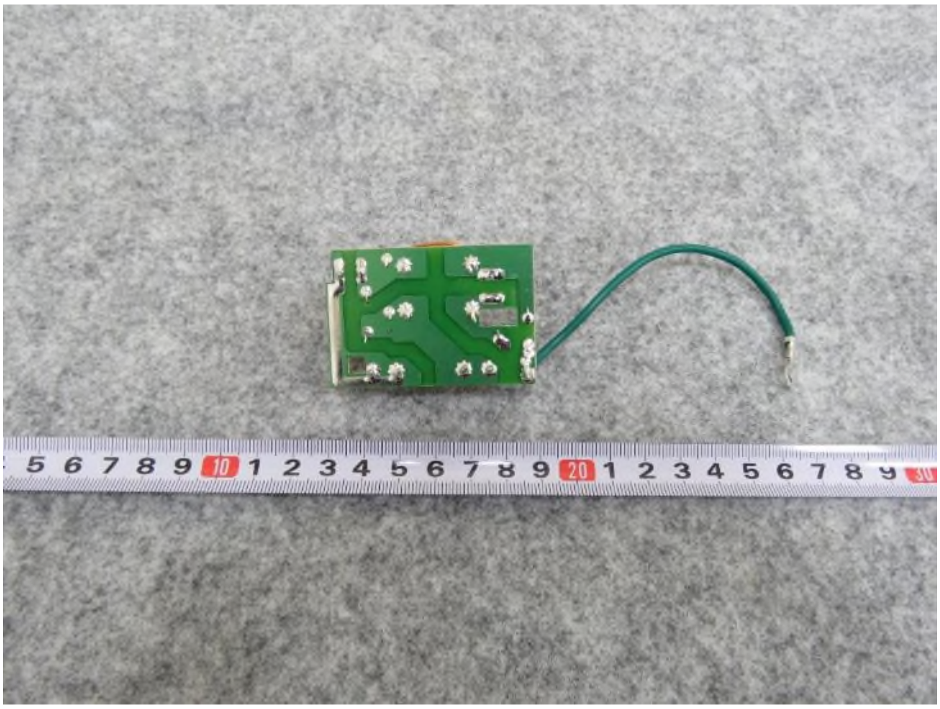
16. Rear View of FAN MOTOR



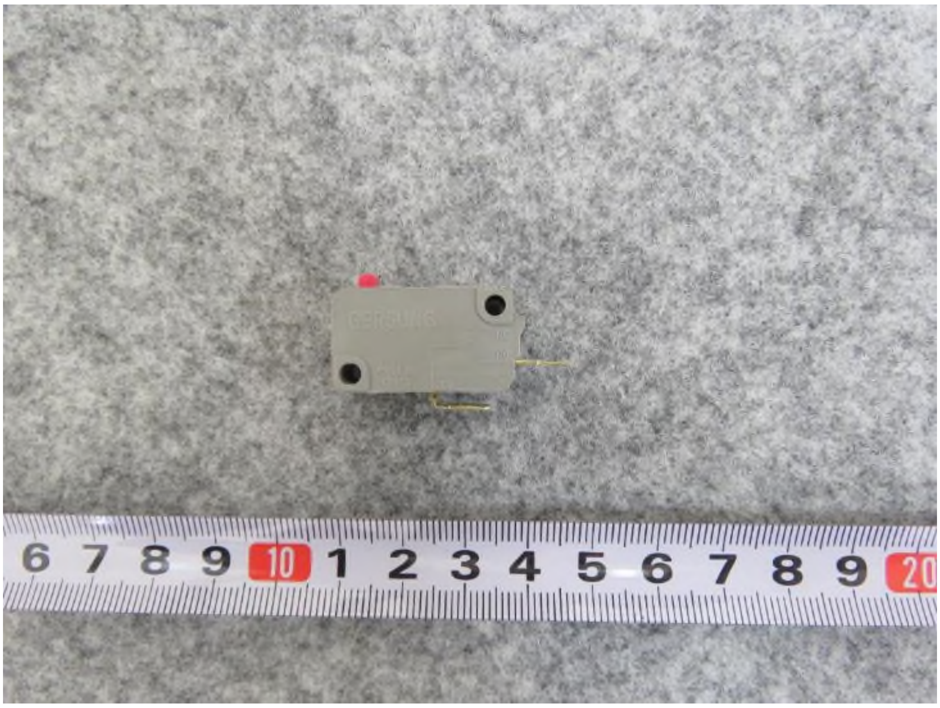
17. Front View of NOISE FILTER



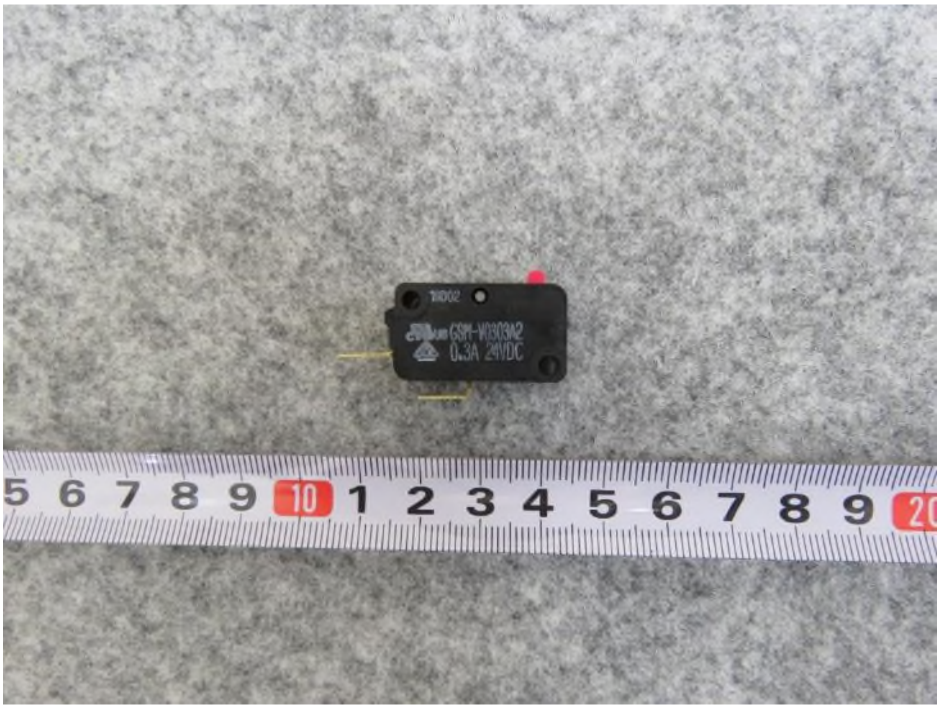
18. Rear View of NOISE FILTER



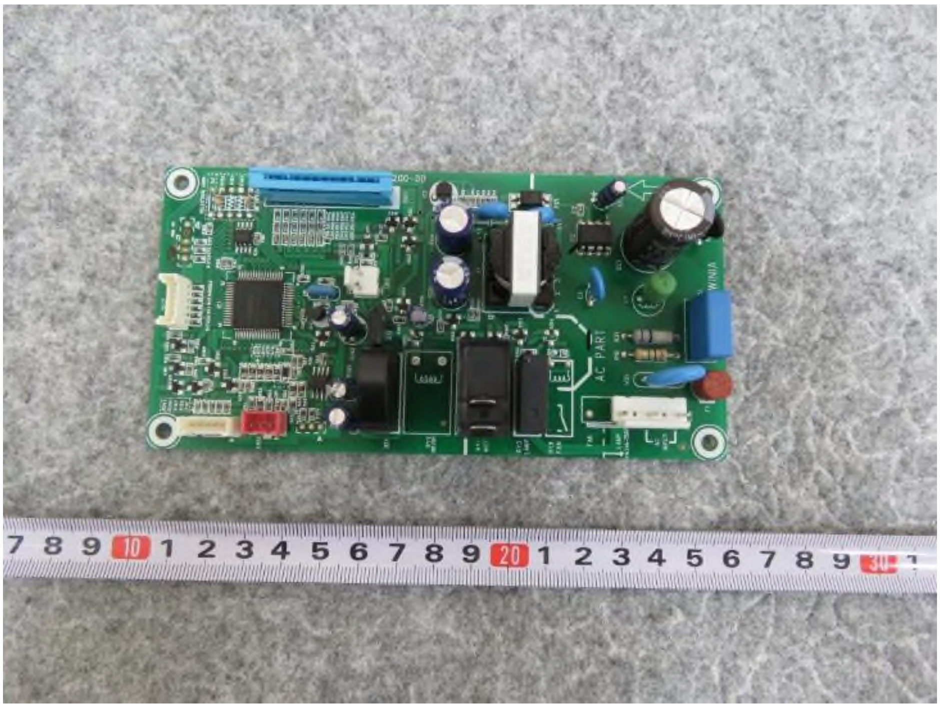
19. Front View of INTERLOCK SWITCH



20. Rear View of INTERLOCK SWITCH



21. Front View of Main PCB (New)



22. Rear View of Main PCB (New)