

Nemko Korea Co., Ltd.

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FCC PART 18 Class II Permissive Change**Applicant :****SAMSUNG ELECTRONICS CO., LTD.****416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si,****Gyeonggi-Do, Korea, 443-742,****Attn : Ms. Jiyea Hong****Dates of Issue : July 19, 2023****Test Report No. : NK-23-E-0655****Test Site : Nemko Korea Co., Ltd.****EMC site, Korea****FCC ID****A3LOTR19M4C****Trade Mark****Contact Person**

SAMSUNG ELECTRONICS CO., LTD.
416 Meatan 3-Dong, Yeongtong-Gu, Suwon-Si,
Gyeonggi-Do, Korea, 443-742
Ms. Jiyea Hong
Telephone No. : + 82 31 8062 9326

Applied Standard :

FCC Part 18 & Part 2

Classification :

Part 18 Consumer Device

EUT Type :

Microwave ovens

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.



July 19, 2023

Tested By : Seungmin Lee
Engineer



July 19, 2023

Reviewed By : Hyunsik Shin
Technical Manager

TABLE OF CONTENTS

SCOPE	3
INTRODUCTION	4
ACCREDITATION AND LISTING	5
EUT INFORMATION	6
DESCRIPTION OF TESTS	7
Radiation Hazard	7
Input Power Measurement	7
Output Power Measurement	7
Frequency Measurements	7
Conducted Emissions	8
Radiated Emissions	9
TEST DATA	10
Radiation Hazard	10
Input Power Measurement	10
Output Power Measurement	10
Frequency measurements	11
Conducted Emissions	13
Radiated Emissions (150 kHz to 30 MHz)	16
Radiated Emissions (30 MHz to 1 GHz)	19
Radiated Emissions (Above 1 GHz)	22
PLOTS OF EMISSIONS	24
ACCURACY OF MEASUREMENT	65
LIST OF TEST EQUIPMENT	68
APPENDIX A – SAMPLE LABEL	69
APPENDIX B – PHOTOGRAPHS OF TEST SET-UP	70
APPENDIX C – EUT PHOTOGRAPHS	75

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 : SAMSUNG ELECTRONICS CO., LTD.

Contact Person : Ms. Jiyea Hong
Tel No.: + 82 31 8062 9326

Manufacturer : SAMSUNG ELECTRONICS CO., LTD.
416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea,
443-742

- FCC ID: A3LOTR19M4C
- Model: ME19CB704112AA
- Trade Mark: 
- EUT Type: Microwave ovens
- Applied Standard: FCC Part 18 & Part 2
- Test Procedure(s): MP-5:1986
- Dates of Test: July 05, 2023 to July 17, 2023
- Place of Tests: Nemko Korea Co., Ltd. EMC Site
- Test Report No.: NK-23-E-0655

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 **Samsung Electronics Co., Ltd.**

FCC ID : **A3LOTR19M4C, Microwave ovens.**

These measurement tests were conducted at **Nemko Korea Co., Ltd. EMC Laboratory.**

The site address is 155, Osan-ro, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 16885 Republic of Korea and 165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, 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).



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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.

ACCREDITATION AND LISTING

Accreditation type		Accreditation number
	CAB Accreditation for DOC	Designation No. KR0026
	KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)	Registration No. KT155
	Canada IC Registered site	Site No. 2040E
	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
	EMC CBTL	TL124
	KCC(RRL)Designated Lab.	Registration No. KR0026

EUT INFORMATION

EUT Information

Intended use	Household
Type of appliance	Over The Range
Model	ME19CB704112AA
Rated voltage & frequency	AC 120 V, 60 Hz Single Phase
Rated power output	1 000 W
Rated power consumption(MW)	1 700 W
Magnetron	OM-75P, manufactured by Samsung

Component List

Item	Model	Manufacturer	Serial Number
MAGNETRON	OM-75P	Samsung	N/A
H.V TRANS	SHV-U1870C	DPC	N/A
H.V CAPACITOR	CH85-210091	Bicai	N/A
FAN MOTOR	SMF-U2070B	Samsung	N/A
INTERLOCK SWITCH	SZM-V16	Starion	N/A
Control	OTR PF1_23	Samsung	N/A

Description of the Changes according to FCC part 2.1043

Report No.	Difference
NK-23-E-0655	CONTROL 1) Add wireless module by FCC certified. 2) New control board

DESCRIPTION OF TESTS

Radiation Hazard

A 700 mL 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 mL water load was placed in the center of the oven and the oven set to maximum power. A 700 mL 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 1 000 mL 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) 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).

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 kHz to 30 MHz 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 kHz. 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.

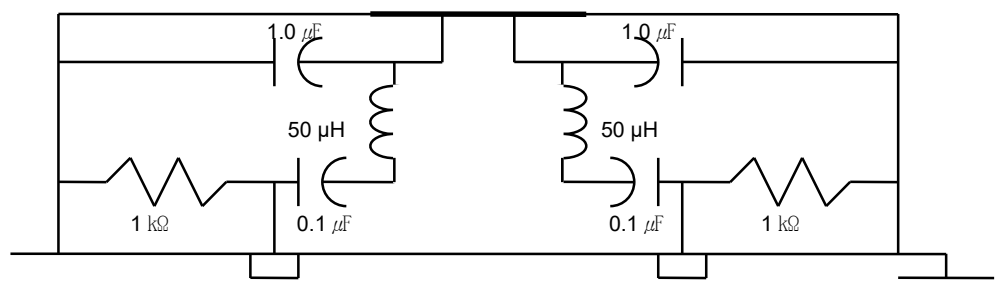


Fig. 2. LISN Schematic Diagram

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 MHz to 30 MHz using Loop Antenna (ROHDE & SCHWARZ/HFH2-Z2) and from 30 MHz to 1 000 MHz using TRILOG Broadband Test Antenna (Schwarzbeck, VULB 9163). 1 GHz to 6 GHz and 6 GHz to 18 GHz, Double Ridged Broadband Horn Antennas (Schwarzbeck, HF907) was used. 18 GHz to 26.5 GHz, Horn Antenna (Q-par Angus, QMS-00238) was used.

The test equipment was placed on a Styrofoam table.

Final Measurements were made indoors at 3 m using Loop Antenna (ROHDE & SCHWARZ/HFH2-Z2) for measurement from 0.15 to 30 MHz with RBW 9 kHz and made indoor at 10 m using TRILOG Broadband Test Antenna (Schwarzbeck, VULB 9163) for measurement from 30 MHz to 1 000 MHz with RBW 120 kHz and made indoors at 3 m using Double Ridged Broadband Horn Antenna (Schwarzbeck, HF907) Horn Antenna (Q-par Angus, QMS-00238) for measurement from 1 GHz to 26.5 GHz with RBW 1 MHz.

The detector function were set to quasi peak mode and the bandwidth of the receiver were set to 9 kHz, 120 kHz and peak mode 1 MHz 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.

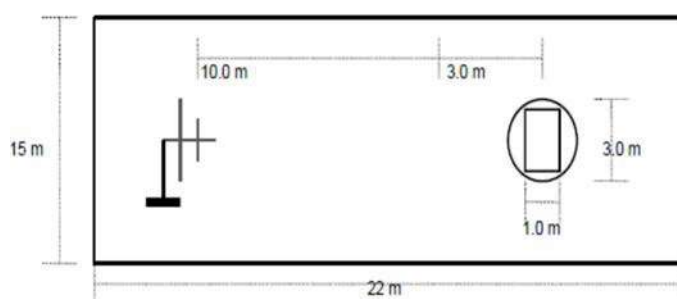


Fig. 3. Dimensions of 10 semi anechoic chamber

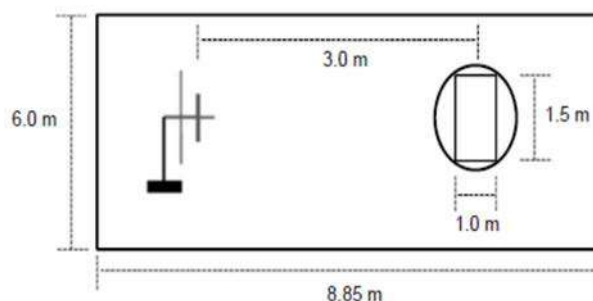


Fig. 4. Dimensions of 3 m full anechoic chamber

TEST DATA

Radiation Hazard

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
A	0.10	1.00
B	0.10	1.00
C	0.05	1.00
D	0.10	1.00
E	0.10	1.00
F	0.05	1.00

Input Power Measurement

Operation mode	P rated (W)	P (W)	dP (%)	Required dP (%)
Power Input	1 700	1 901	1.05	+ 15 %

Output Power Measurement

Quantity of Water [ml]	Mass of the container [g]	Ambient temperature [°C]	Initial temperature [°C]	Final temperature [°C]	Heating time [s]	Power output [W]
1 000	421	21.8	10.0	19.7	42	955

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 (°C)

T₀ is the initial temperature of the water (°C)

T₁ is the final temperature of the water (°C)

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



Tested by : **Seungmin Lee**

TEST DATA

Frequency measurements

► Frequency vs Line Voltage Variation Test

[Room Temperature : 23.6 ± 1.0 °C]

Line Voltage Variation (a.c. V)	*Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
96 (80 %)	H	Lower : 2 433.2	Lower : 2 400 MHz Upper : 2 500 MHz
	H	Upper : 2 471.8	
	V	Lower : 2 433.6	
	V	Upper : 2 471.6	
108 (90 %)	H	Lower : 2 430.2	
	H	Upper : 2 483.6	
	V	Lower : 2 429.6	
	V	Upper : 2 484.8	
120 (100 %)	H	Lower : 2 433.2	
	H	Upper : 2 475.0	
	V	Lower : 2 432.2	
	V	Upper : 2 488.0	
132 (110 %)	H	Lower : 2 435.0	
	H	Upper : 2 475.0	
	V	Lower : 2 435.4	
	V	Upper : 2 476.2	
150 (125 %)	H	Lower : 2 444.0	
	H	Upper : 2 475.6	
	V	Lower : 2 432.0	
	V	Upper : 2 488.8	

NOTE :

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

RESULT : Pass


Tested by : **Seungmin Lee**

TEST DATA

► Frequency vs Load Variation Test

[Room Temperature : 23.6 ± 1.0 °C]

Volume of water (ml)	*)Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
200	H	Lower : 2 431.0	Lower : 2 400 MHz Upper : 2 500 MHz
	H	Upper : 2 476.6	
	V	Lower : 2 433.2	
	V	Upper : 2 490.6	
400	H	Lower : 2 435.8	
	H	Upper : 2 473.2	
	V	Lower : 2 431.6	
	V	Upper : 2 473.4	
600	H	Lower : 2 432.0	
	H	Upper : 2 481.4	
	V	Lower : 2 435.4	
	V	Upper : 2 472.2	
800	H	Lower : 2 432.0	
	H	Upper : 2 481.4	
	V	Lower : 2 429.4	
	V	Upper : 2 486.6	
1 000	H	Lower : 2 433.2	
	H	Upper : 2 475.0	
	V	Lower : 2 432.2	
	V	Upper : 2 488.0	

NOTE :

1. *Pol. H = Horizontal, V = Vertical
2. The water load was varied between 200 ml to 1 000 ml.
3. Frequency was measured by using nominal voltage (a.c. 120 V).
4. ISM Frequency : 2 450 MHz, Tolerance : ± 50 MHz

RESULT : Pass

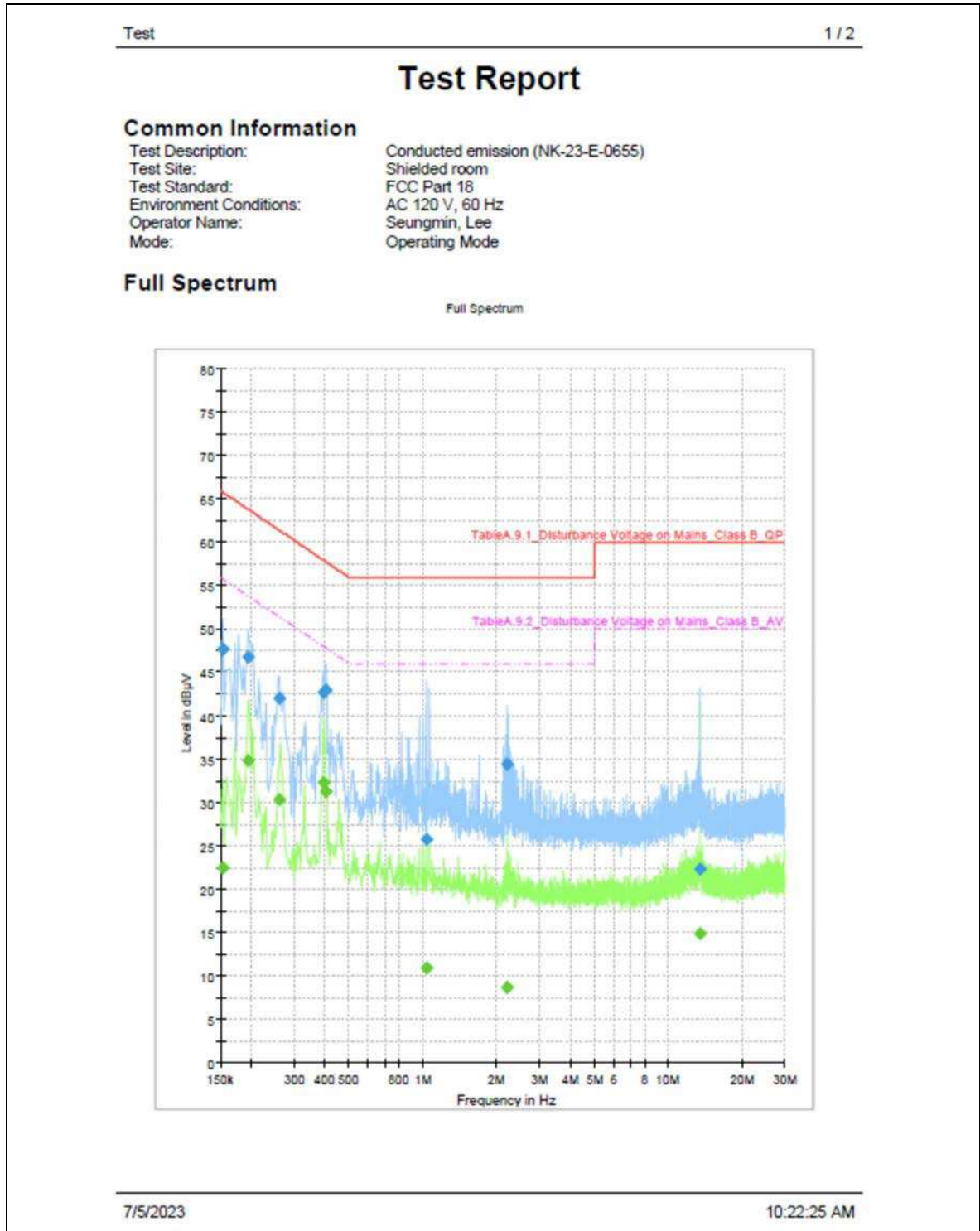

Tested by : **Seungmin Lee**

TEST DATA

Conducted Emissions

FCC ID : A3LOTR19M4C

[Room Temperature : 24.3 ± 1.0 °C]



Test

2 / 2

Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter
0.152985	---	22.49	55.84	33.35	15000.0	9.000	L1	ON
0.152985	47.65	---	65.84	18.18	15000.0	9.000	L1	ON
0.194775	46.78	---	63.83	17.05	15000.0	9.000	N	ON
0.194775	---	34.86	53.83	18.97	15000.0	9.000	N	ON
0.260445	42.02	---	61.42	19.40	15000.0	9.000	N	ON
0.260445	---	30.34	51.42	21.08	15000.0	9.000	N	ON
0.394770	42.74	---	57.96	15.22	15000.0	9.000	N	ON
0.394770	---	32.30	47.96	15.66	15000.0	9.000	N	ON
0.403725	43.02	---	57.78	14.76	15000.0	9.000	N	ON
0.403725	---	31.25	47.78	16.53	15000.0	9.000	N	ON
1.033560	---	10.87	46.00	35.13	15000.0	9.000	L1	ON
1.033560	25.75	---	56.00	30.25	15000.0	9.000	L1	ON
2.215620	---	8.68	46.00	37.32	15000.0	9.000	L1	ON
2.215620	34.48	---	56.00	21.52	15000.0	9.000	L1	ON
13.561605	---	14.88	50.00	35.12	15000.0	9.000	N	ON
13.561605	22.33	---	60.00	37.67	15000.0	9.000	N	ON

(continuation of the "Final_Result" table from column 14 ...)

Frequency (MHz)	Corr. (dB)	Comment
0.152985	9.8	
0.152985	9.8	
0.194775	9.9	
0.194775	9.9	
0.260445	9.7	
0.260445	9.7	
0.394770	9.9	
0.394770	9.9	
0.403725	9.9	
0.403725	9.9	
1.033560	9.8	
1.033560	9.8	
2.215620	9.8	
2.215620	9.8	
13.561605	10.0	
13.561605	10.0	

7/5/2023

10:22:25 AM

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).**



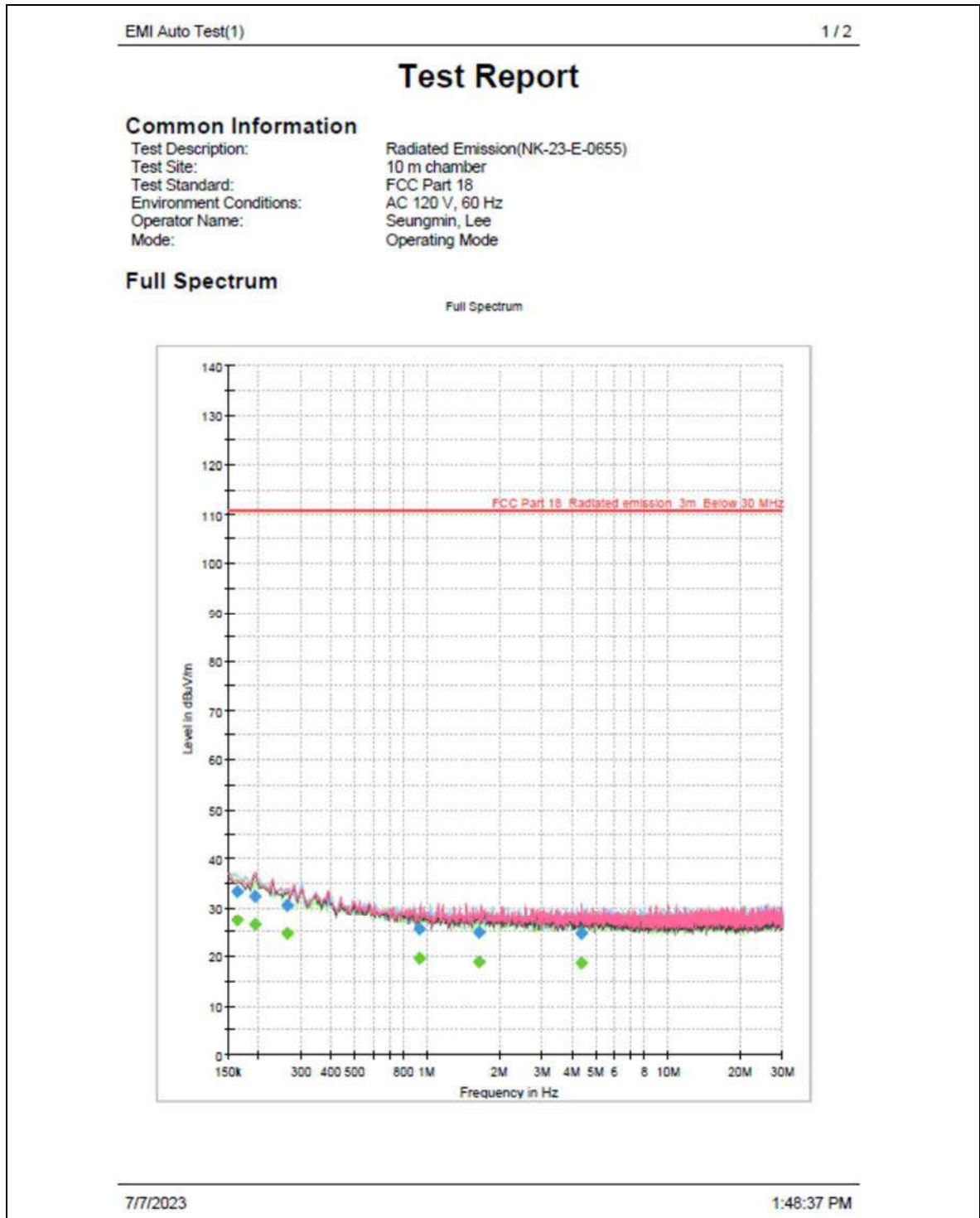
Tested by : **Seungmin Lee**

TEST DATA

Radiated Emissions (150 kHz to 30 MHz)

FCC ID : A3LOTR19M4C

[Room Temperature : 22.1 ± 1.0 °C]



EMI Auto Test(1)

2 / 2

Final Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
0.162000	—	27.36	110.76	83.40	15000.0	9.000	0.0	V
0.162000	33.39	—	110.76	77.37	15000.0	9.000	0.0	V
0.192015	—	26.42	110.76	84.34	15000.0	9.000	0.0	V
0.192015	32.38	—	110.76	78.38	15000.0	9.000	0.0	V
0.262640	—	24.62	110.76	86.14	15000.0	9.000	0.0	H
0.262640	30.58	—	110.76	80.18	15000.0	9.000	0.0	H
0.930757	25.61	—	110.76	85.15	15000.0	9.000	0.0	V
0.930757	—	19.59	110.76	91.17	15000.0	9.000	0.0	V
1.645397	24.88	—	110.76	85.88	15000.0	9.000	0.0	V
1.645397	—	18.93	110.76	91.83	15000.0	9.000	0.0	V
4.374338	—	18.66	110.76	92.10	15000.0	9.000	0.0	V
4.374338	24.63	—	110.76	86.13	15000.0	9.000	0.0	V

(continuation of the "Final_Result" table from column 14 ...)

Frequency (MHz)	Azimuth (deg)	Corr. (dB/m)	Comment
0.162000	303.0	-30.8	
0.162000	303.0	-30.8	
0.192015	67.0	-30.8	
0.192015	67.0	-30.8	
0.262640	105.0	-30.8	
0.262640	105.0	-30.8	
0.930757	23.0	-30.8	
0.930757	23.0	-30.8	
1.645397	217.0	-30.7	
1.645397	217.0	-30.7	
4.374338	133.0	-30.4	
4.374338	133.0	-30.4	

7/7/2023

1:48:37 PM

<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 : $40 * \log (300 / 3) = 80 \text{ dBuV/m}$
4. The limit at 300 meters is $20 * \log (25 * \text{SQRT} (\text{RF Power} / 500))$
5. All other emissions were measured while a 700 $\text{m}\ell$ load was placed in the center of the oven.
6. The limit for consumer device is on the FCC Part section 18.305.



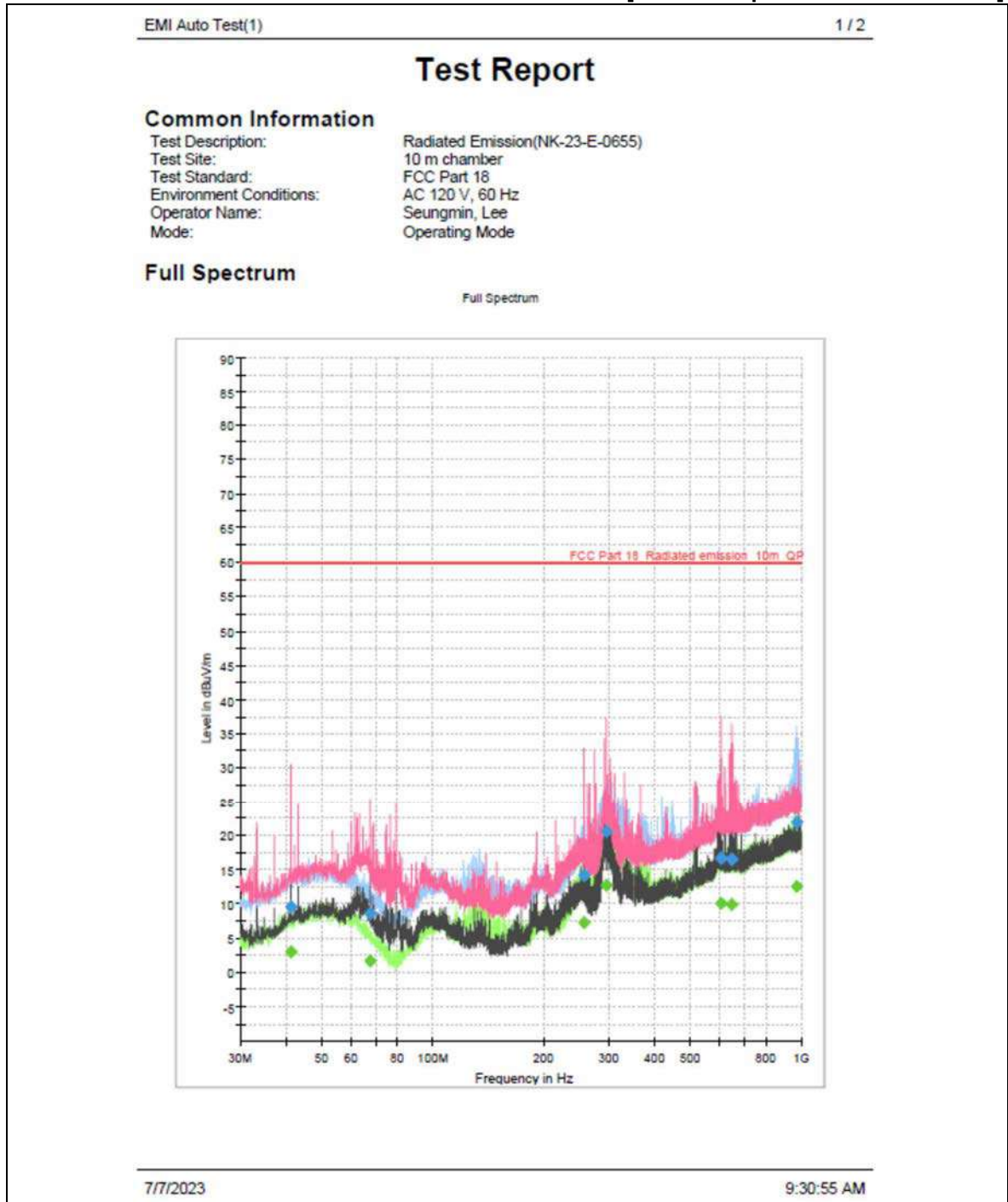
Tested by : **Seungmin Lee**

TEST DATA

Radiated Emissions (30 MHz to 1 GHz)

FCC ID : A3LOTR19M4C

[Room Temperature : 22.1 ± 1.0 °C]



EMI Auto Test(1)

2 / 2

Final Result

Frequency (MHz)	QuasiPeak (dBuV/m)	CAverage (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
41.208889	—	2.94	60.26	57.32	15000.0	120.000	200.0	V
41.208889	9.60	—	60.26	50.66	15000.0	120.000	200.0	V
67.614444	—	1.63	60.26	58.63	15000.0	120.000	200.0	V
67.614444	8.63	—	60.26	51.63	15000.0	120.000	200.0	V
257.842222	—	7.25	60.26	53.01	15000.0	120.000	100.0	V
257.842222	14.19	—	60.26	46.07	15000.0	120.000	100.0	V
296.803889	—	12.62	60.26	47.64	15000.0	120.000	100.0	V
296.803889	20.48	—	60.26	39.78	15000.0	120.000	100.0	V
604.347778	16.59	—	60.26	43.67	15000.0	120.000	200.0	V
604.347778	—	9.96	60.26	50.30	15000.0	120.000	200.0	V
646.812222	16.45	—	60.26	43.81	15000.0	120.000	300.0	V
646.812222	—	9.82	60.26	50.44	15000.0	120.000	300.0	V
967.558889	21.89	—	60.26	38.37	15000.0	120.000	200.0	H
967.558889	—	12.44	60.26	47.82	15000.0	120.000	200.0	H

(continuation of the "Final_Result" table from column 14 ...)

Frequency (MHz)	Azimuth (deg)	Corr. (dB/m)	Comment
41.208889	4.0	-30.7	
41.208889	4.0	-30.7	
67.614444	51.0	-32.4	
67.614444	51.0	-32.4	
257.842222	17.0	-28.5	
257.842222	17.0	-28.5	
296.803889	17.0	-27.3	
296.803889	17.0	-27.3	
604.347778	19.0	-19.5	
604.347778	19.0	-19.5	
646.812222	190.0	-19.4	
646.812222	190.0	-19.4	
967.558889	48.0	-14.8	
967.558889	48.0	-14.8	

7/7/2023

9:30:55 AM

<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 : $20 * \log (300/10) \doteq 29.5 \text{ dB } \mu\text{N/m}$
4. The limit at 300 meters is $20 * \log (25 * \text{SQRT} (\text{RF Power}/500))$
5. All other emissions were measured while a 700 *ml* 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 : **Seungmin Lee**

TEST DATA

Radiated Emissions (Above 1 GHz)

FCC ID : A3LOTR19M4C

[Room Temperature : 23.6 ± 1.0 °C]

Frequency (MHz)	Pol* (H/V)	Antenna Heights (cm)	Turntable Angles (°)	Reading Level (dBμV)	Total Loss** (dB)	Result at 3 m		K	Results at 300 m	Limits at 300 m
						(dBμV/m)	(μV/m)		(μV/m)	(μV/m)
2380	V	200	45	38.55	0.1	38.65	85.61	0.0060	0.52	34.55
3970	V	100	45	33.51	9.1	42.61	135.05	0.0093	1.26	34.55
4582	H	300	90	33.89	11.2	45.09	179.68	0.0100	1.80	34.55
4936	H	100	0	54.50	12	66.5	2113.49	0.0100	21.13	34.55
5511	V	300	315	30.84	12	42.84	138.68	0.0100	1.39	34.55
6342	V	400	45	33.08	12.5	45.58	190.11	0.0100	1.90	34.55
6990	H	200	0	30.88	14.1	44.98	177.42	0.0100	1.77	34.55
7392	V	200	0	51.54	14.7	66.24	2051.16	0.0100	20.51	34.55
7964	V	200	45	29.02	15.6	44.62	170.22	0.0100	1.70	34.55
8450	H	400	90	29.90	16.5	46.4	208.93	0.0100	2.09	34.55
9049	V	300	225	30.00	17.1	47.1	226.46	0.0100	2.26	34.55
9881	H	300	0	40.71	17.6	58.31	823.19	0.0100	8.23	34.55
10335	H	200	0	30.35	17.7	48.05	252.64	0.0100	2.53	34.55
10750	V	200	315	27.85	17.8	45.65	191.65	0.0100	1.92	34.55
12346	H	300	0	28.36	20.1	48.46	264.85	0.0100	2.65	34.55
12768	H	400	0	26.74	20.5	47.24	230.14	0.0100	2.30	34.55
12942	H	300	45	27.13	20.8	47.93	249.17	0.0100	2.49	34.55
14799	V	300	270	26.52	23.1	49.62	302.69	0.0100	3.03	34.55
15258	V	200	315	29.50	23.5	53	446.68	0.0100	4.47	34.55
17280	V	300	270	27.18	25.4	52.58	425.60	0.0100	4.26	34.55
17815	V	300	45	28.56	26.2	54.76	547.02	0.0100	5.47	34.55

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. Where K is given by :

Frequency	K
1830 MHz	.0046
2745 MHz	.0070
3660 MHz	.0090
4575 MHz and above	.0100

For frequencies between those given in the table, the value of K is determined by linear interpolation.

5. The limit at 300 meters is $25 * \text{SQRT}(\text{RF Power}/500)$
6. Load for measurement of radiation on second and third harmonic : Two loads, one of 700 ml and the other of 300 ml, 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.
7. The test was performed at peak detector mode with average.
8. The limit for consumer device is on the FCC Part section 18.305.



Tested by : Seungmin Lee

PLOTS OF EMISSIONS

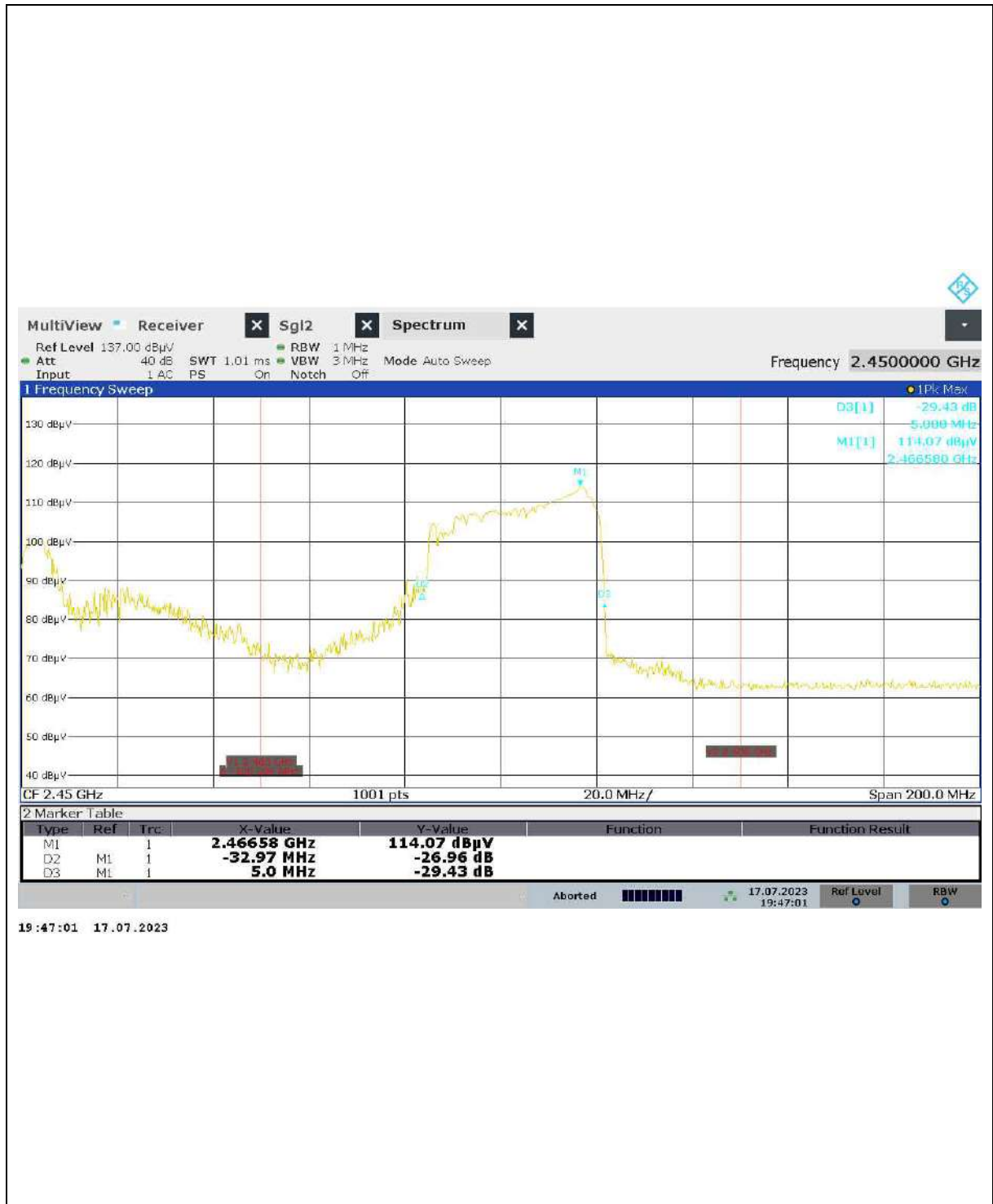
• Frequency vs Line Voltage Variation Test



Horizontal (96 V, 1 000 mℓ)

PLOTS OF EMISSIONS

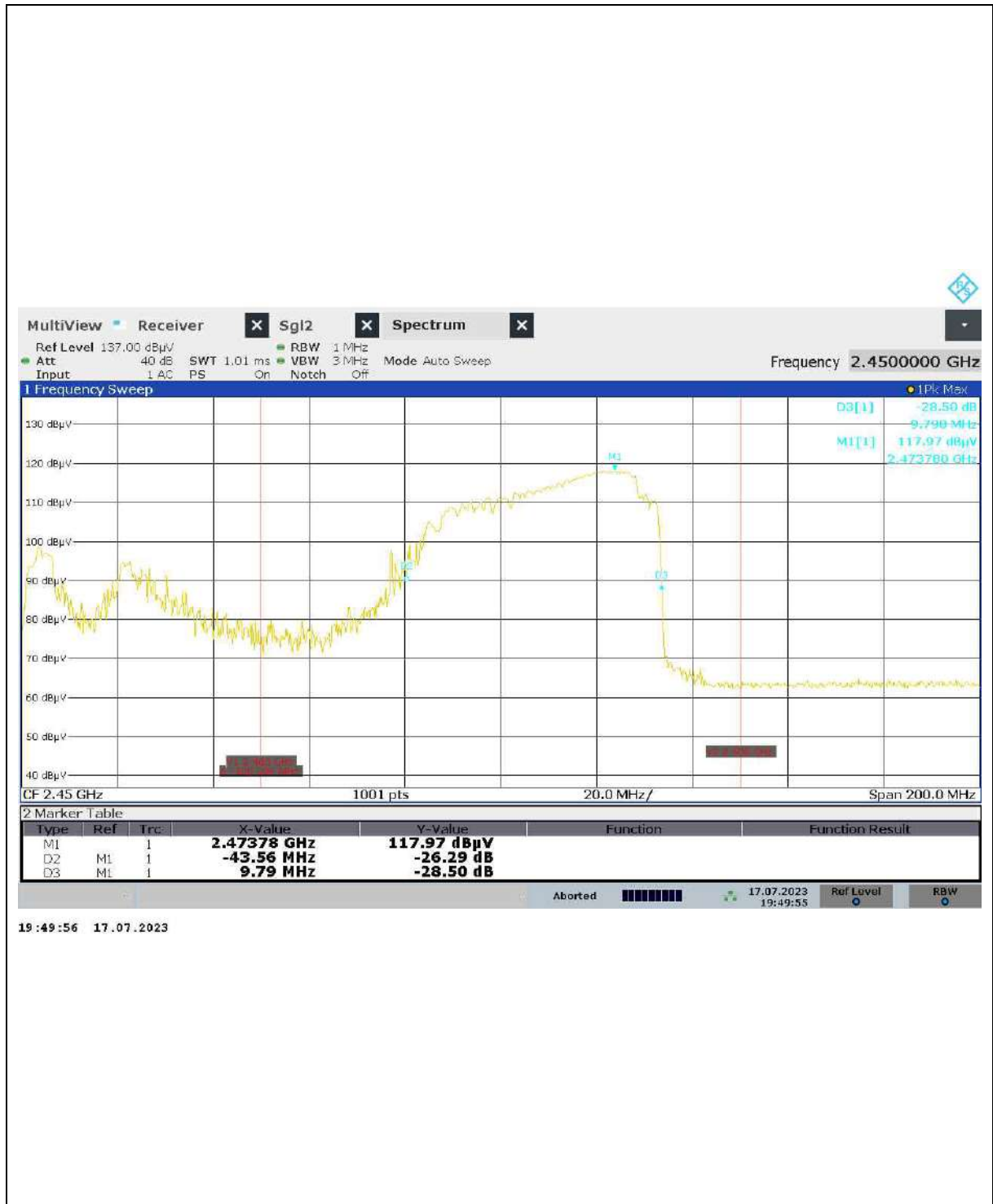
Frequency vs Line Voltage Variation Test



Vertical (96 V, 1 000 mV)

PLOTS OF EMISSIONS

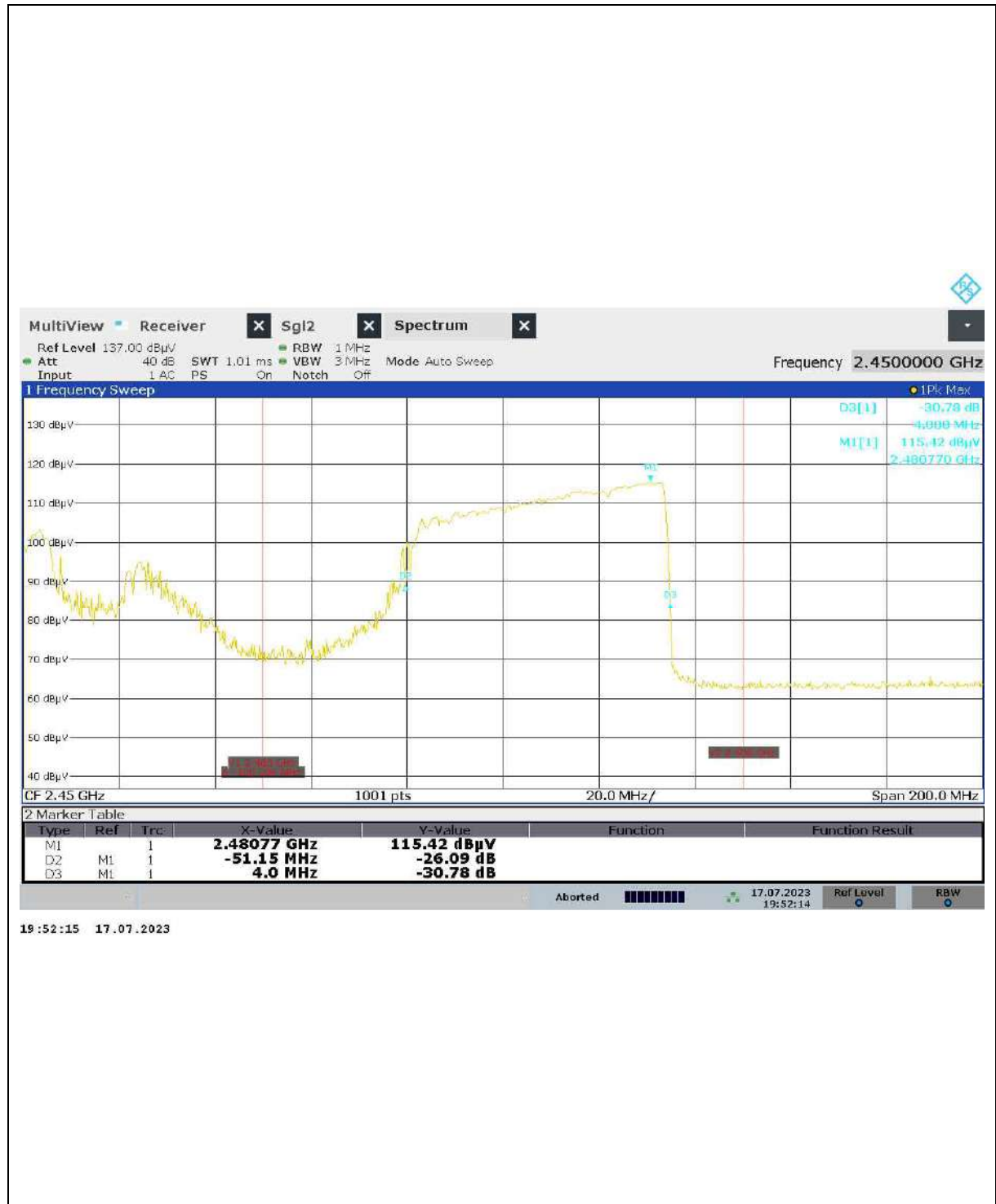
Frequency vs Line Voltage Variation Test



Horizontal (108 V, 1 000 mℓ)

PLOTS OF EMISSIONS

Frequency vs Line Voltage Variation Test



Vertical (108 V, 1 000 mℓ)

PLOTS OF EMISSIONS

Frequency vs Line Voltage Variation Test



Horizontal (120 V, 1 000 mℓ)

PLOTS OF EMISSIONS

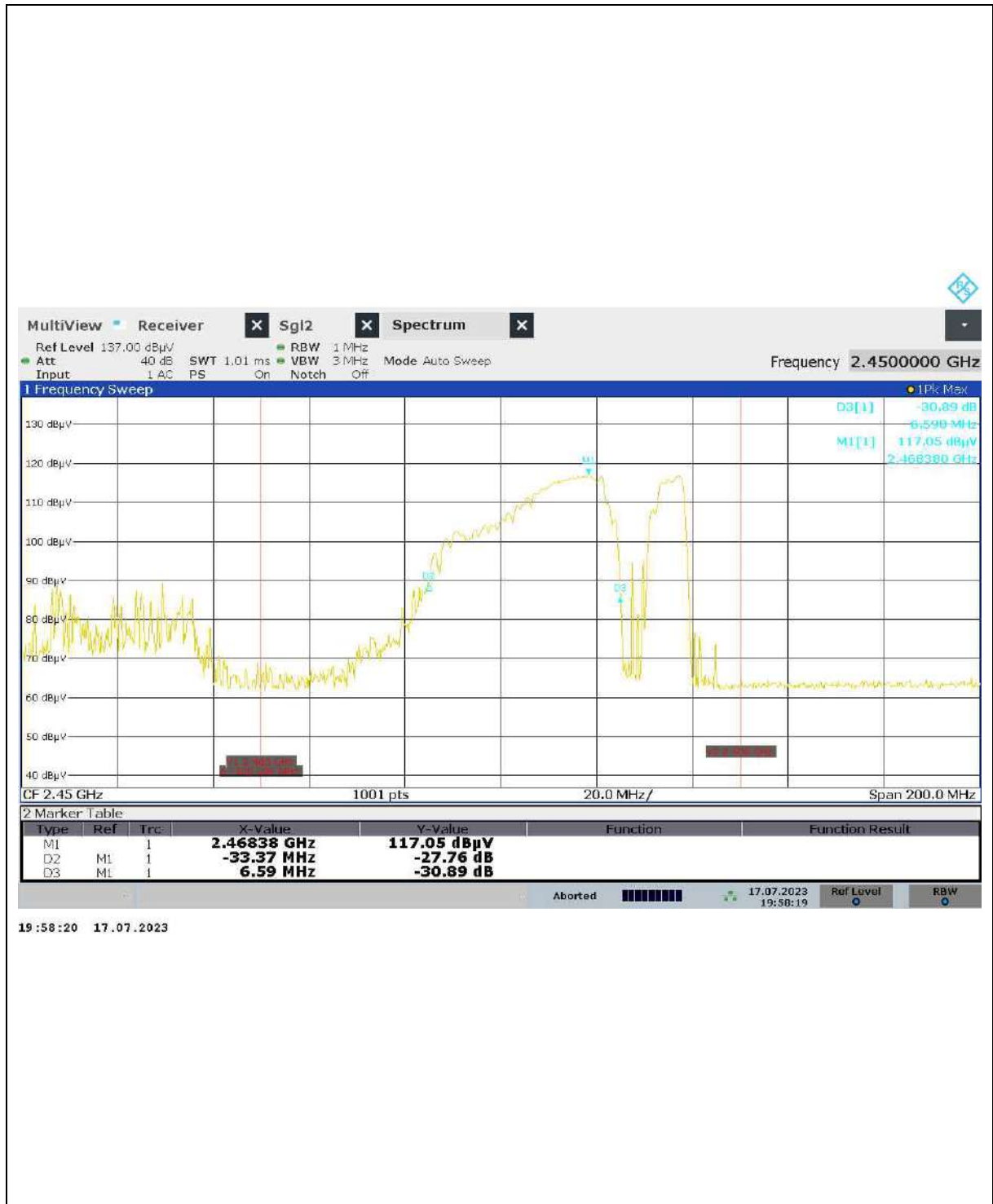
Frequency vs Line Voltage Variation Test



Vertical (120 V, 1 000 mℓ)

PLOTS OF EMISSIONS

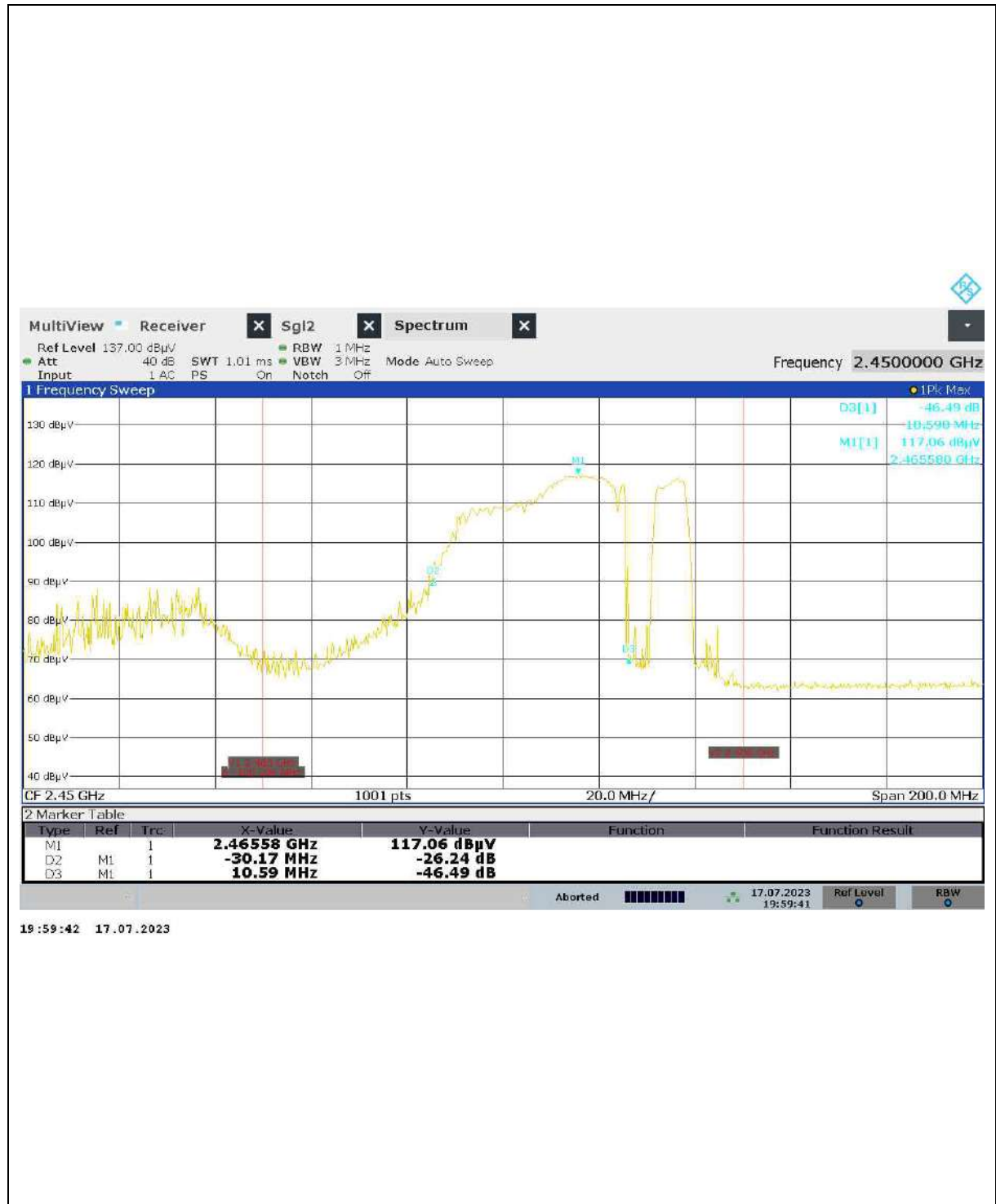
Frequency vs Line Voltage Variation Test



Horizontal (132 V, 1 000 mℓ)

PLOTS OF EMISSIONS

Frequency vs Line Voltage Variation Test



Vertical (132 V, 1 000 mℓ)

PLOTS OF EMISSIONS

Frequency vs Line Voltage Variation Test



Horizontal (150 V, 1 000 mℓ)

PLOTS OF EMISSIONS

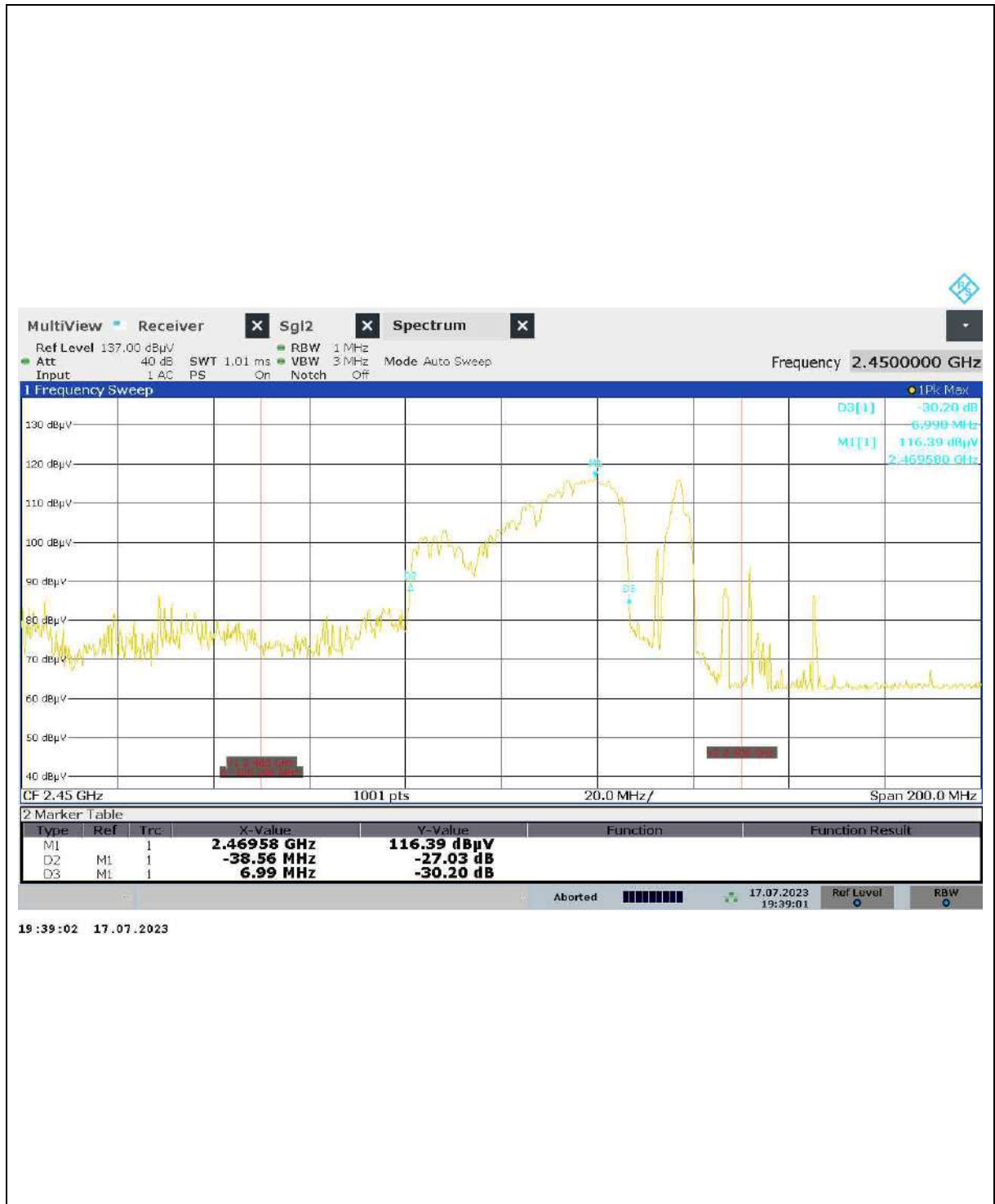
Frequency vs Line Voltage Variation Test



Vertical (150 V, 1 000 mV)

PLOTS OF EMISSIONS

Frequency vs Load Variation Test



Horizontal (120 V, 200 mV)

PLOTS OF EMISSIONS

Frequency vs Load Variation Test



Vertical (120 V, 200 mV)

PLOTS OF EMISSIONS

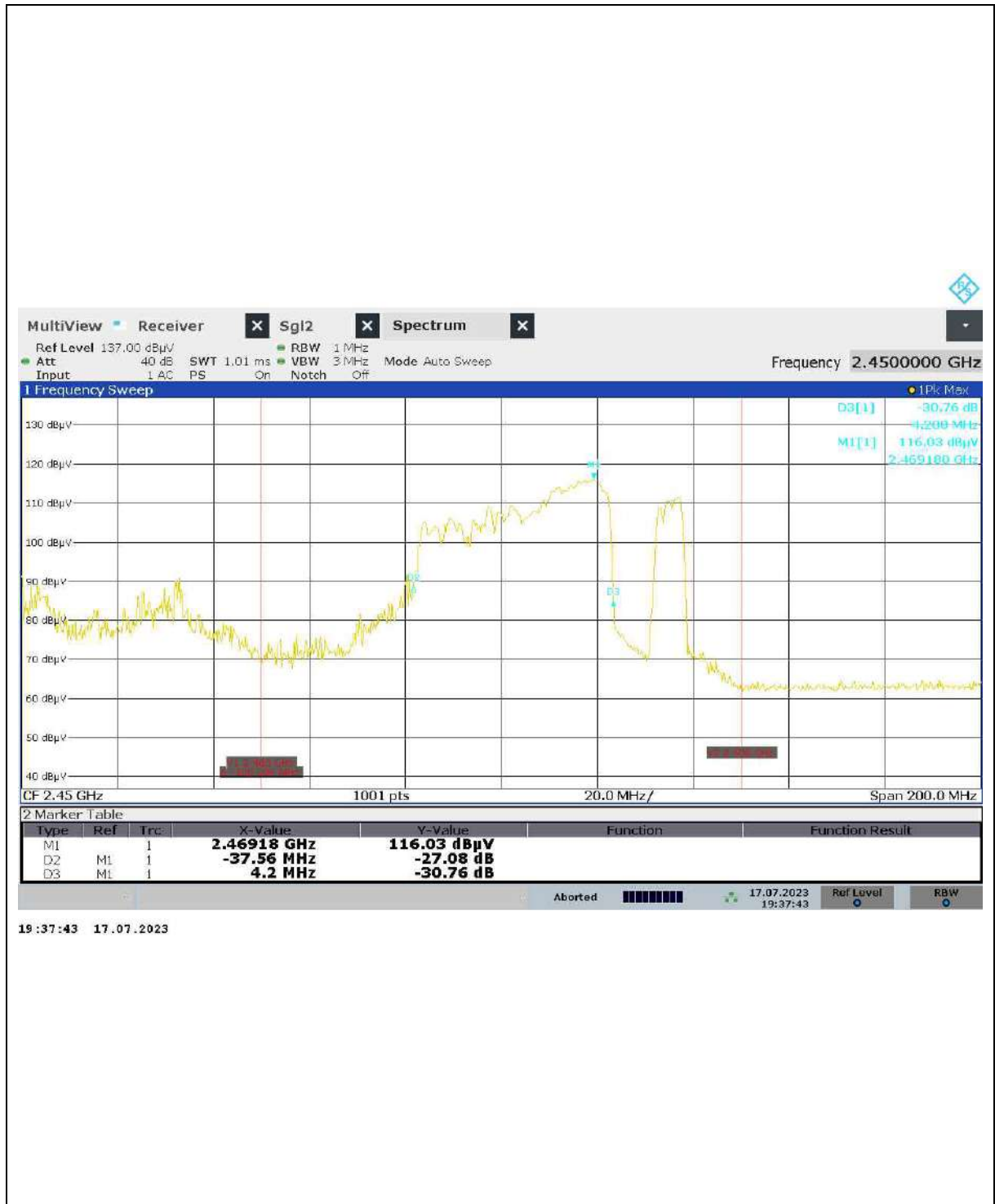
Frequency vs Load Variation Test



Horizontal (120 V, 400 mℓ)

PLOTS OF EMISSIONS

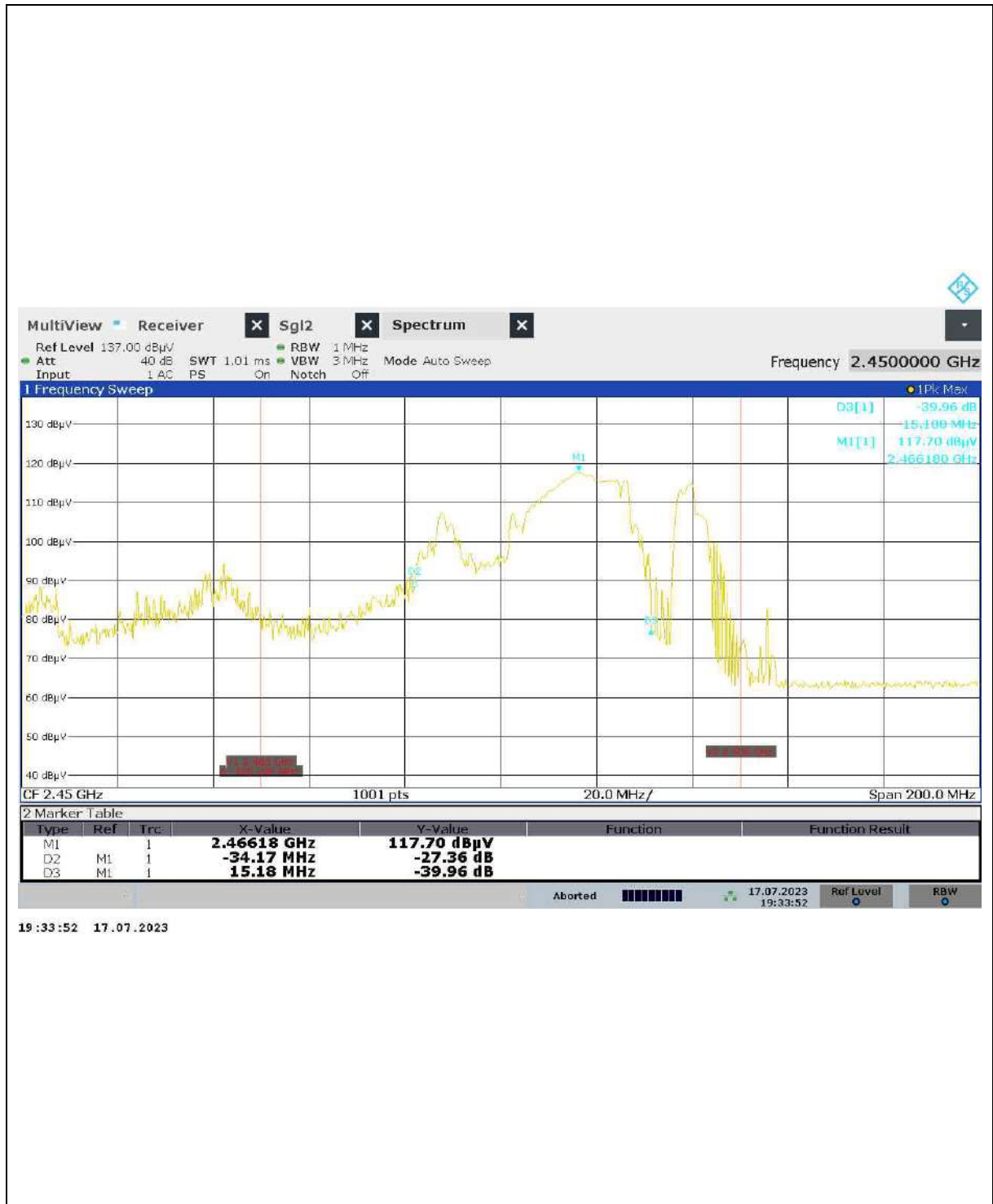
Frequency vs Load Variation Test



Vertical (120 V, 400 ml)

PLOTS OF EMISSIONS

Frequency vs Load Variation Test



Horizontal (120 V, 600 mℓ)

PLOTS OF EMISSIONS

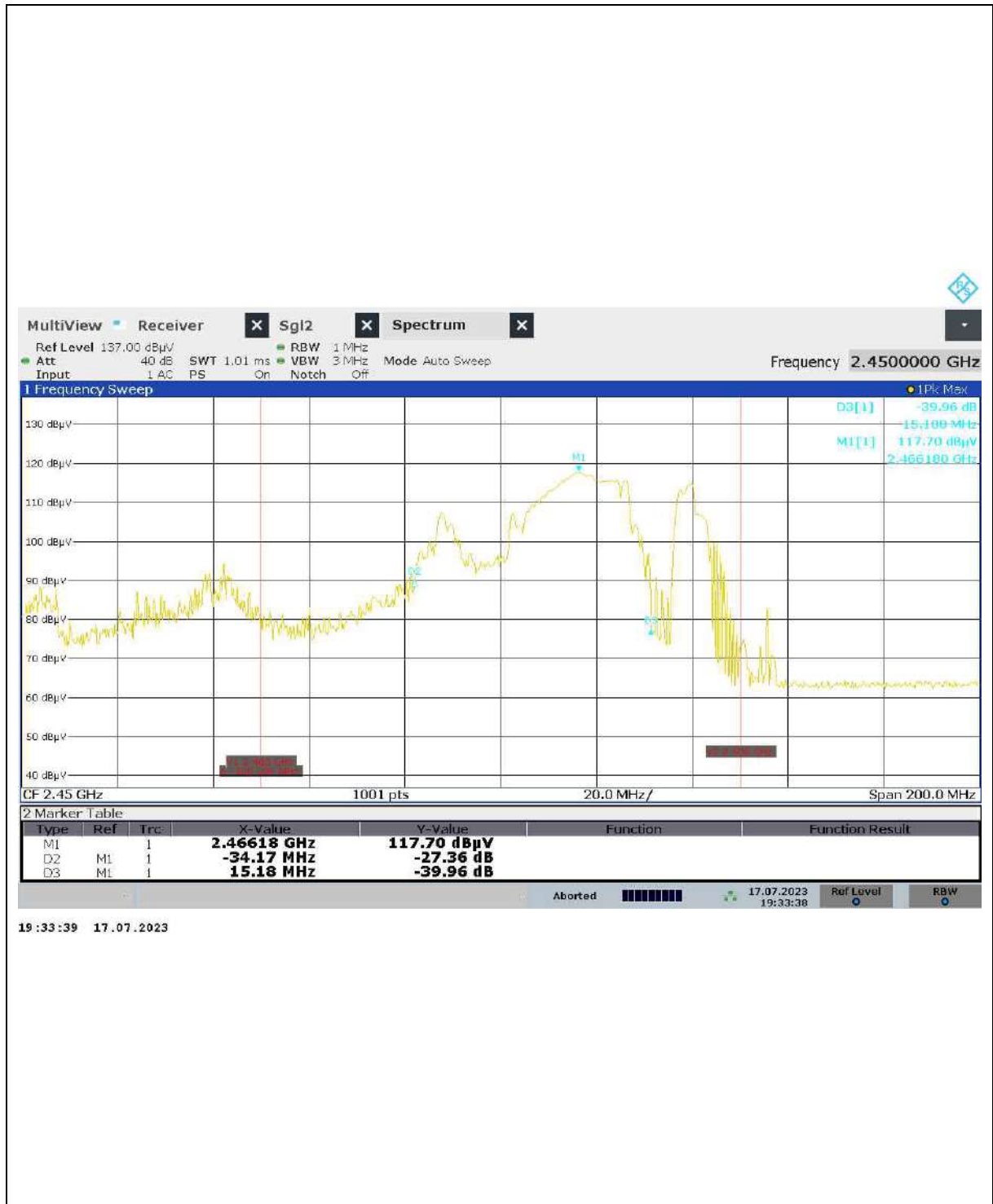
Frequency vs Load Variation Test



Vertical (120 V, 600 mV)

PLOTS OF EMISSIONS

Frequency vs Load Variation Test



Horizontal (120 V, 800 mℓ)

PLOTS OF EMISSIONS

Frequency vs Load Variation Test



Vertical (120 V, 800 ml)

PLOTS OF EMISSIONS

Frequency vs Load Variation Test



Horizontal (120 V, 1 000 mℓ)

PLOTS OF EMISSIONS

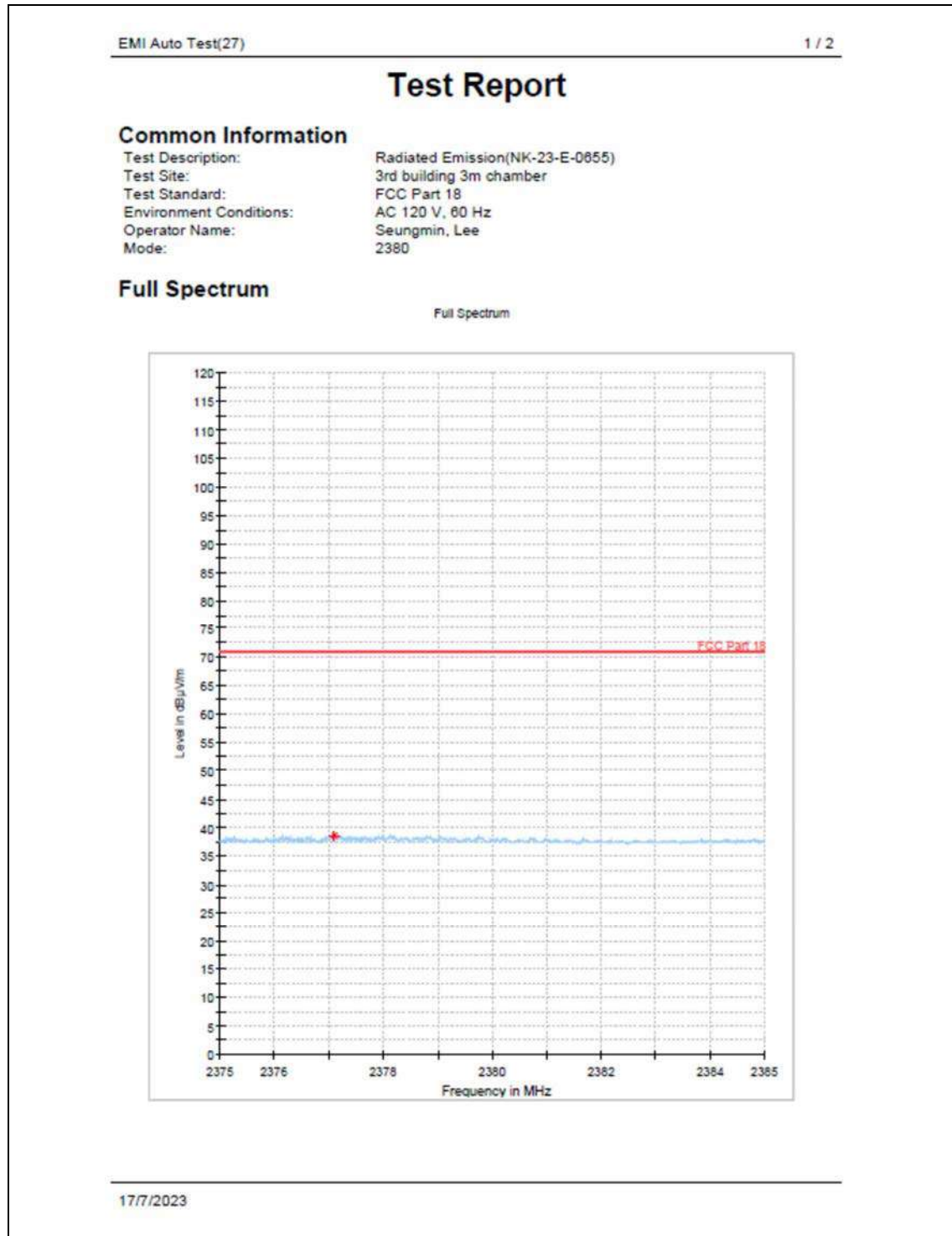
Frequency vs Load Variation Test



Vertical (120 V, 1 000 mℓ)

PLOTS OF EMISSIONS

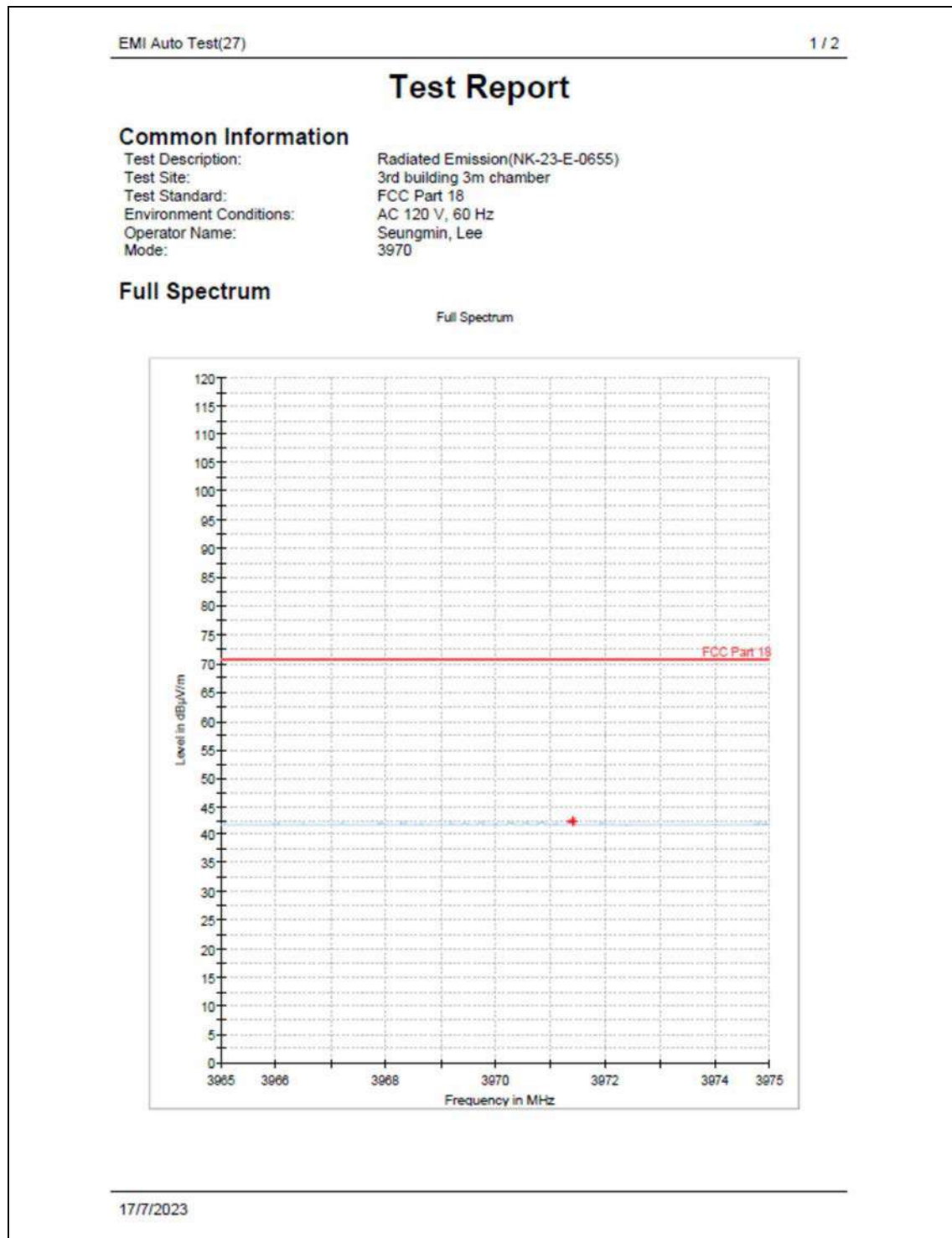
- Radiated Emissions (Above 1 GHz)**



2 377.10 MHz

PLOTS OF EMISSIONS

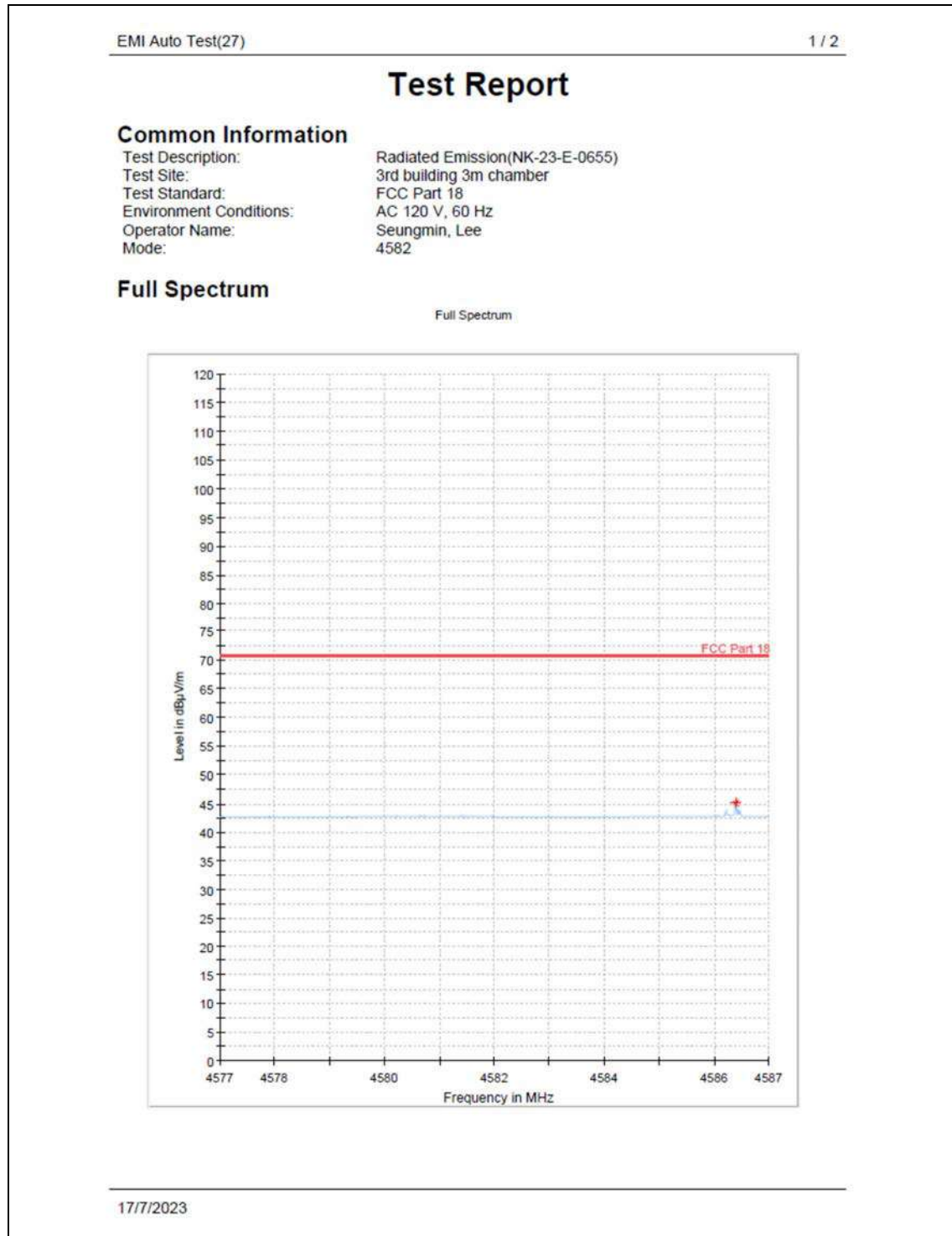
- Radiated Emissions (Above 1 GHz)



3 971.39 MHz

PLOTS OF EMISSIONS

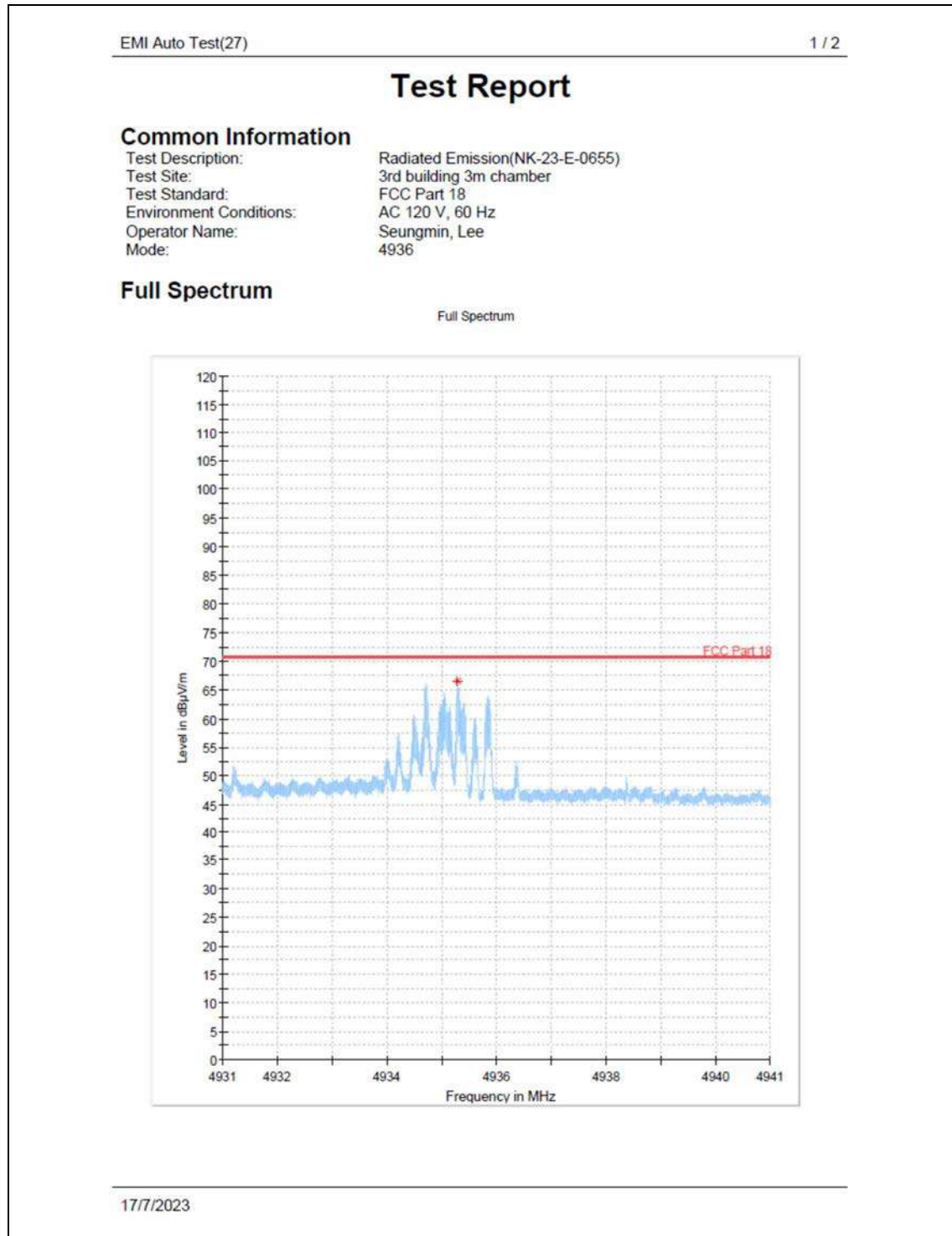
Radiated Emissions (Above 1 GHz)



4 586.39 MHz

PLOTS OF EMISSIONS

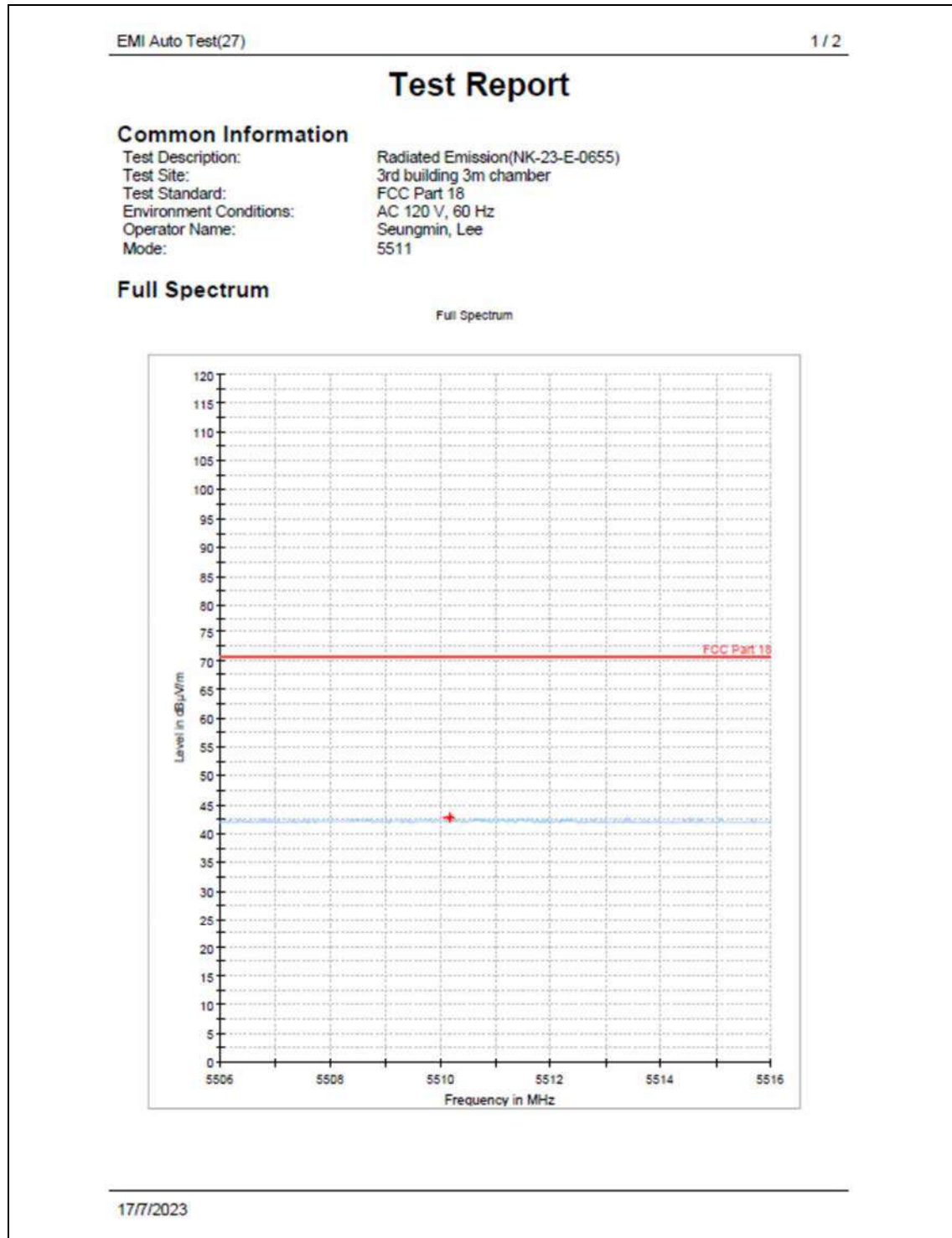
Radiated Emissions (Above 1 GHz)



4 935.29 MHz

PLOTS OF EMISSIONS

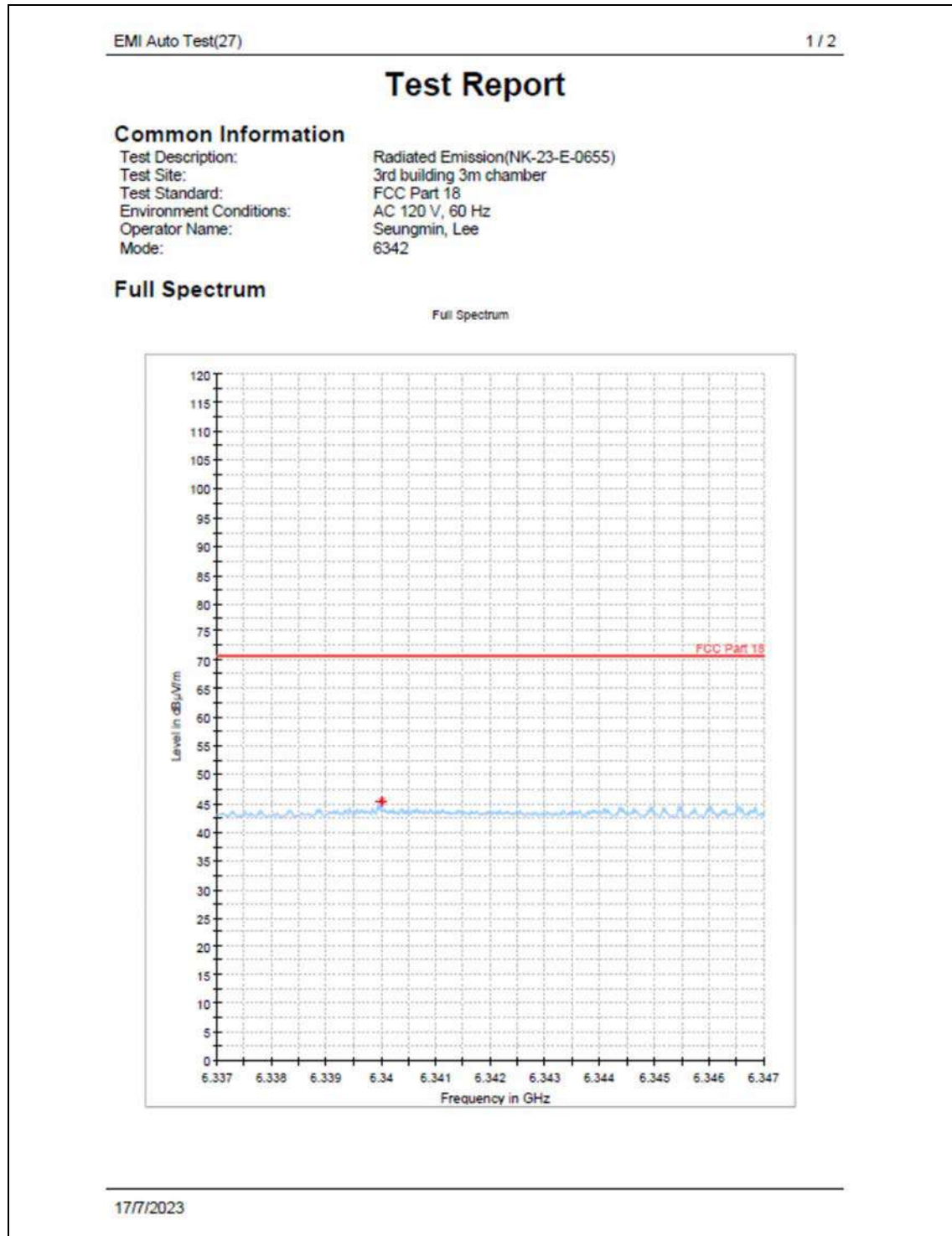
Radiated Emissions (Above 1 GHz)



5 510.15 MHz

PLOTS OF EMISSIONS

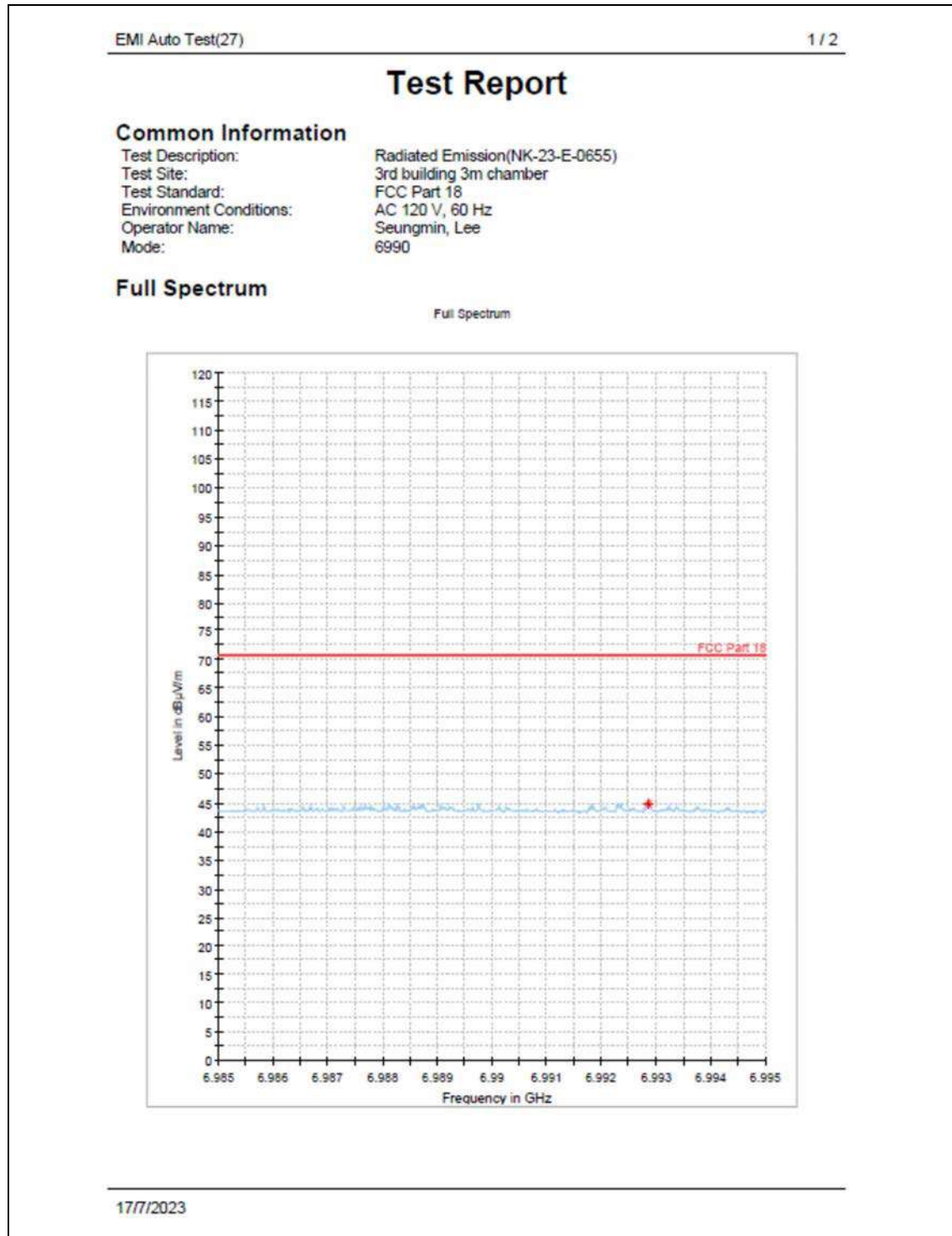
- Radiated Emissions (Above 1 GHz)



6 340 MHz

PLOTS OF EMISSIONS

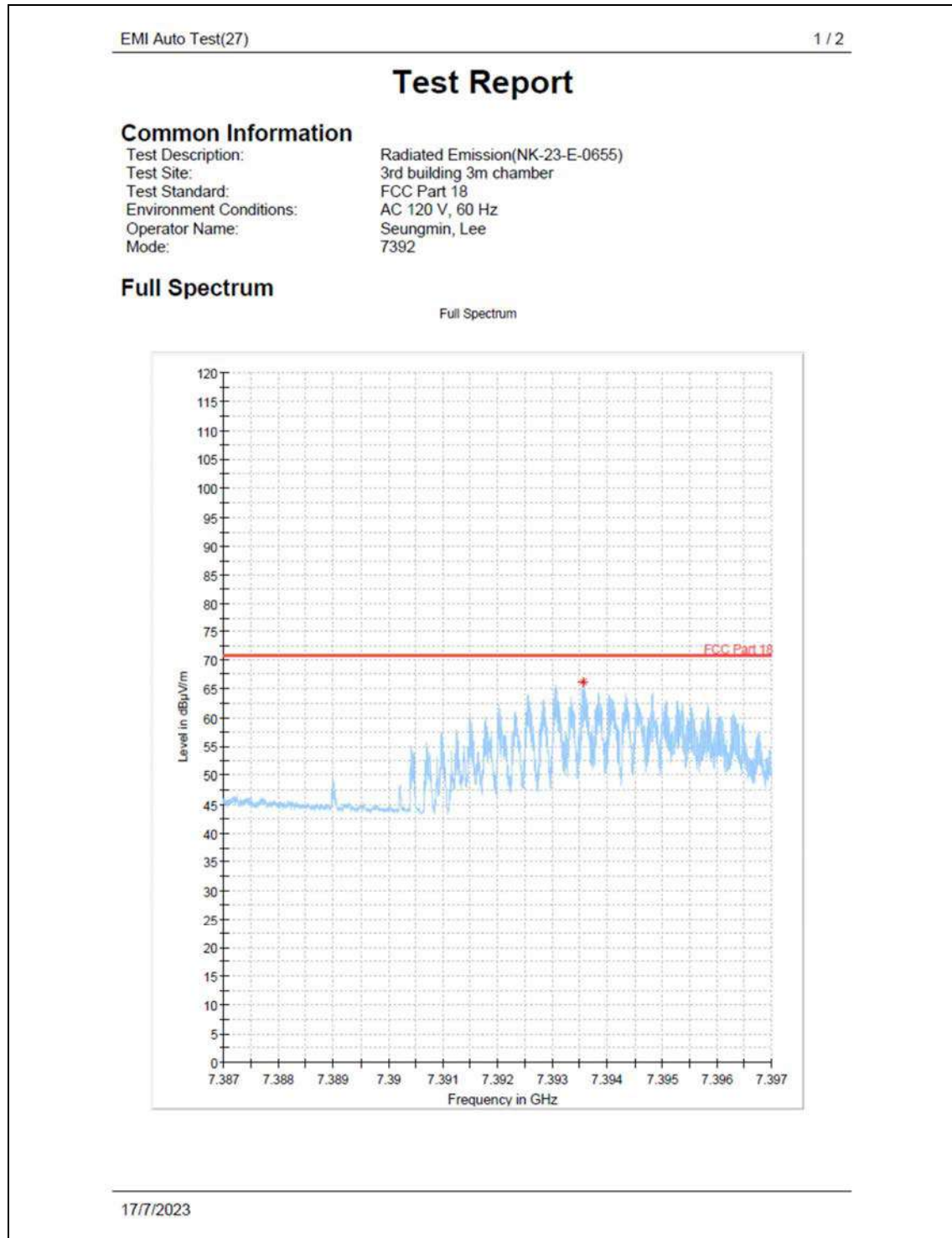
Radiated Emissions (Above 1 GHz)



6 992.86 MHz

PLOTS OF EMISSIONS

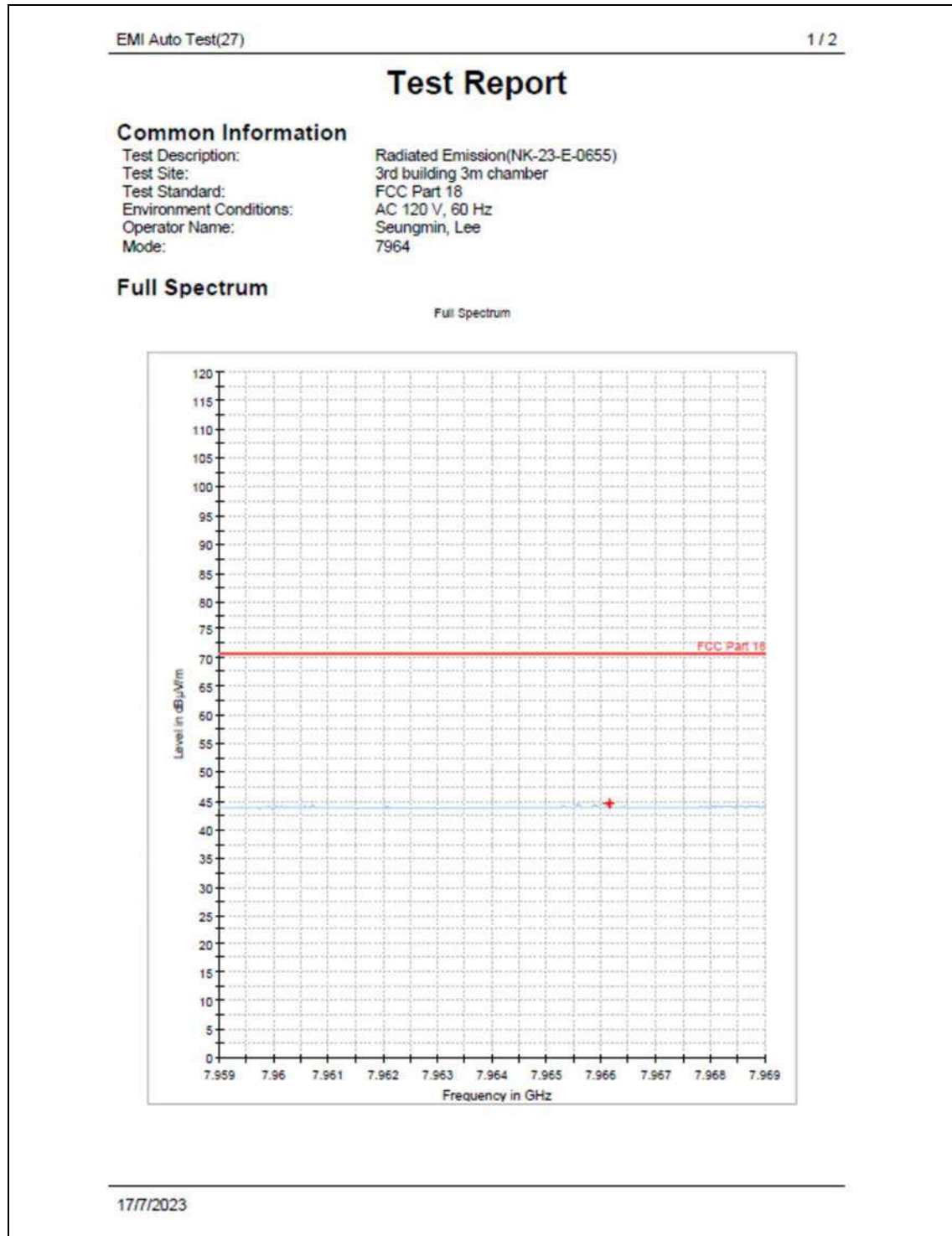
Radiated Emissions (Above 1 GHz)



7 393.55 MHz

PLOTS OF EMISSIONS

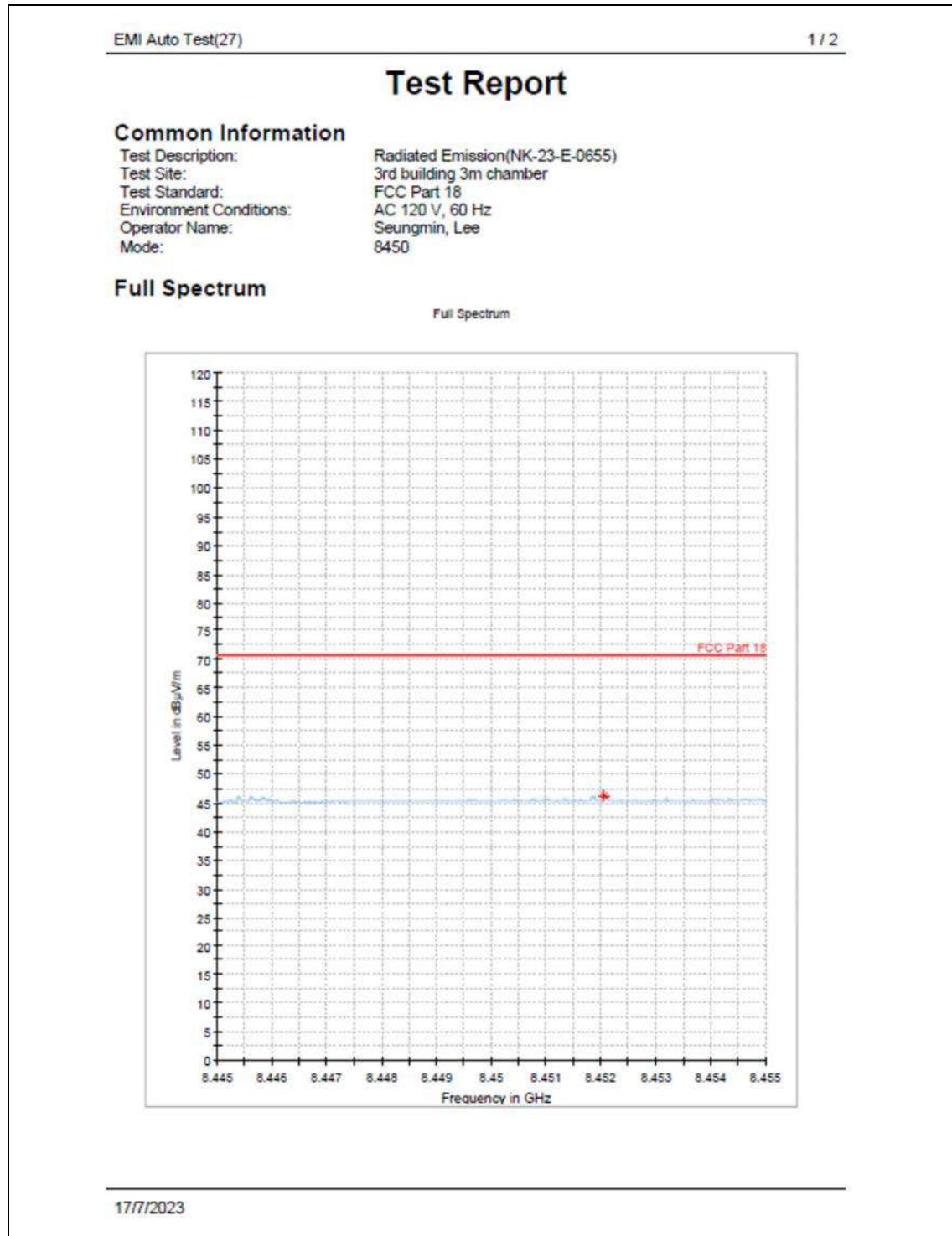
Radiated Emissions (Above 1 GHz)



7 966.13 MHz

PLOTS OF EMISSIONS

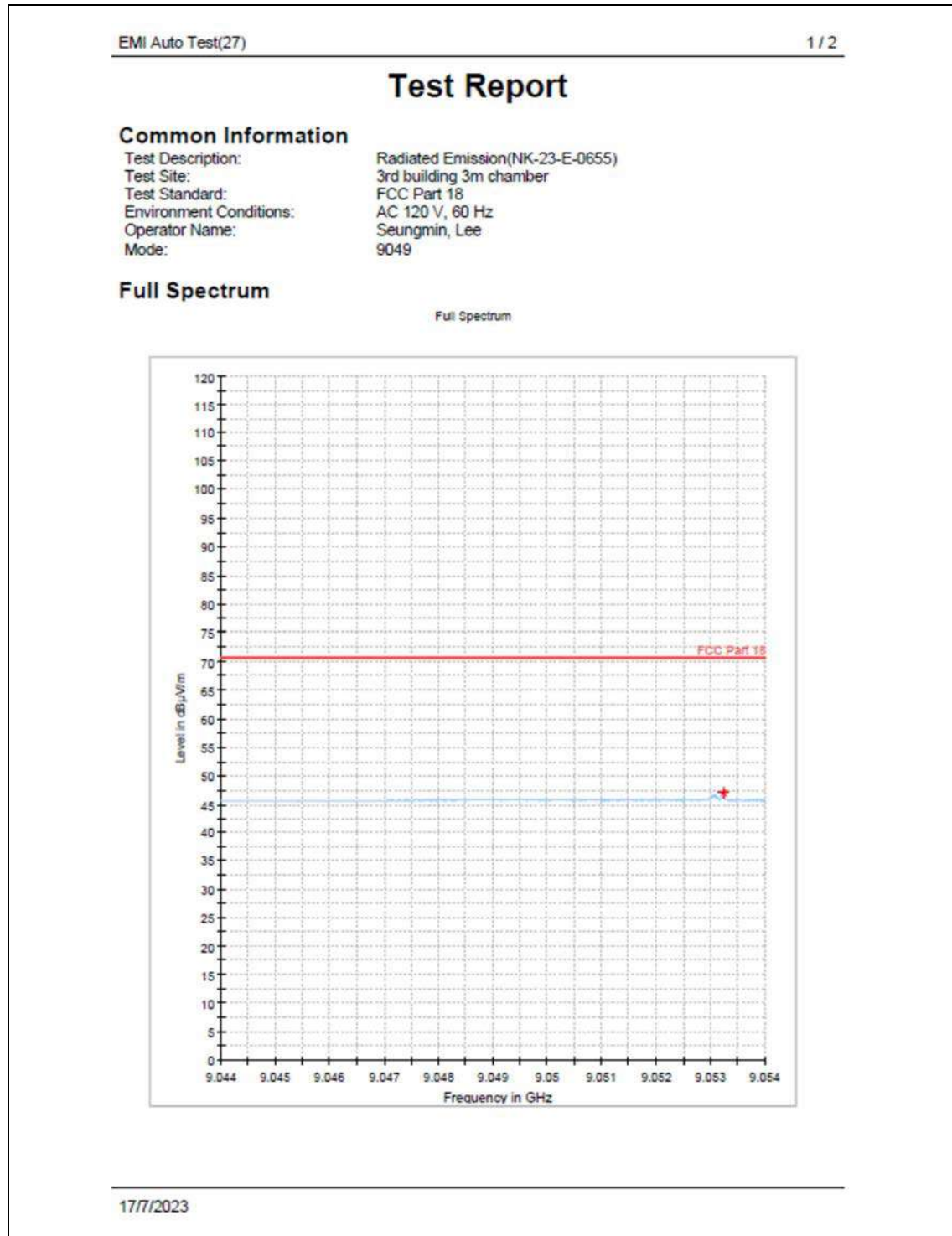
Radiated Emissions (Above 1 GHz)



8 452.06 MHz

PLOTS OF EMISSIONS

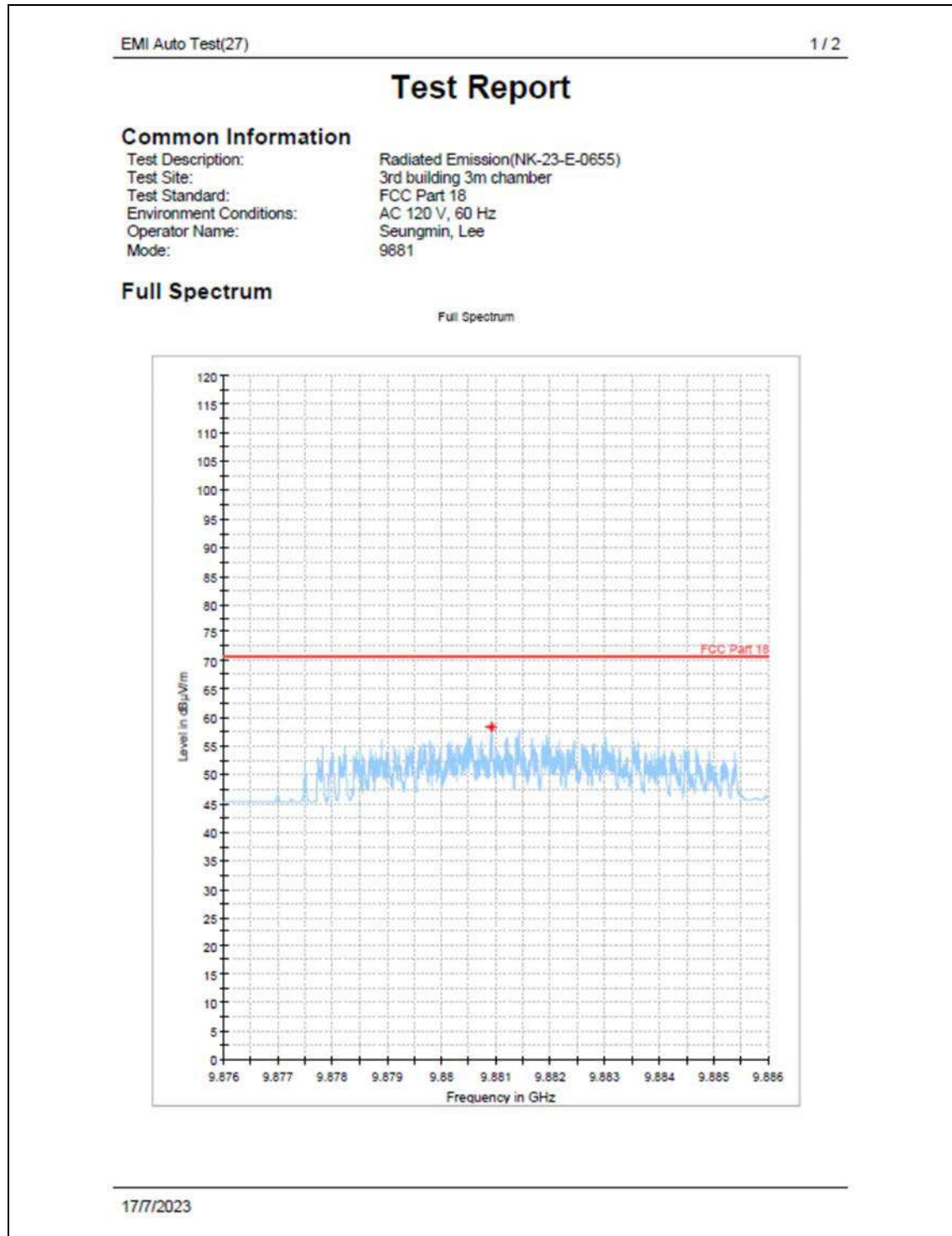
Radiated Emissions (Above 1 GHz)



9 053.24 MHz

PLOTS OF EMISSIONS

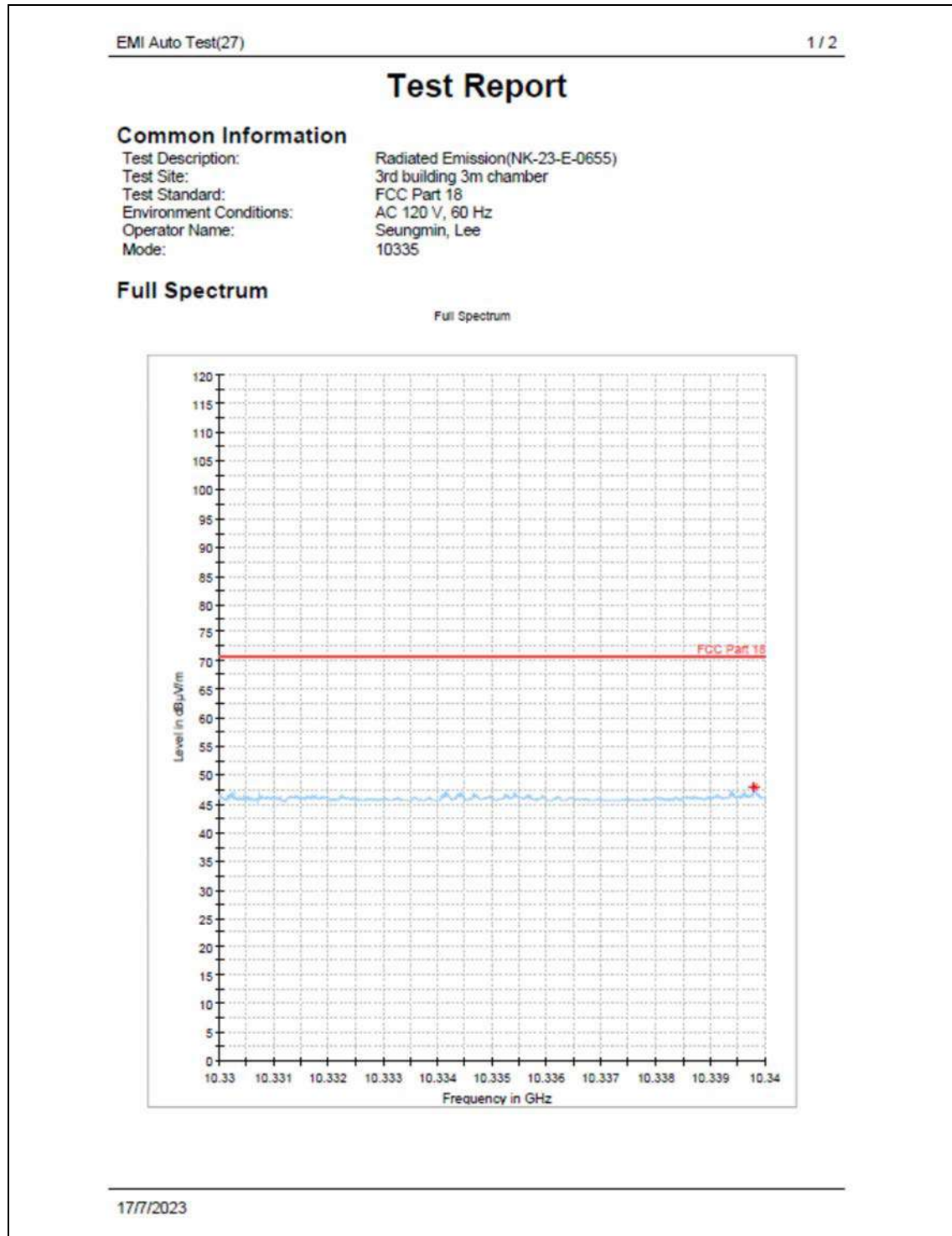
Radiated Emissions (Above 1 GHz)



9 880.92 MHz

PLOTS OF EMISSIONS

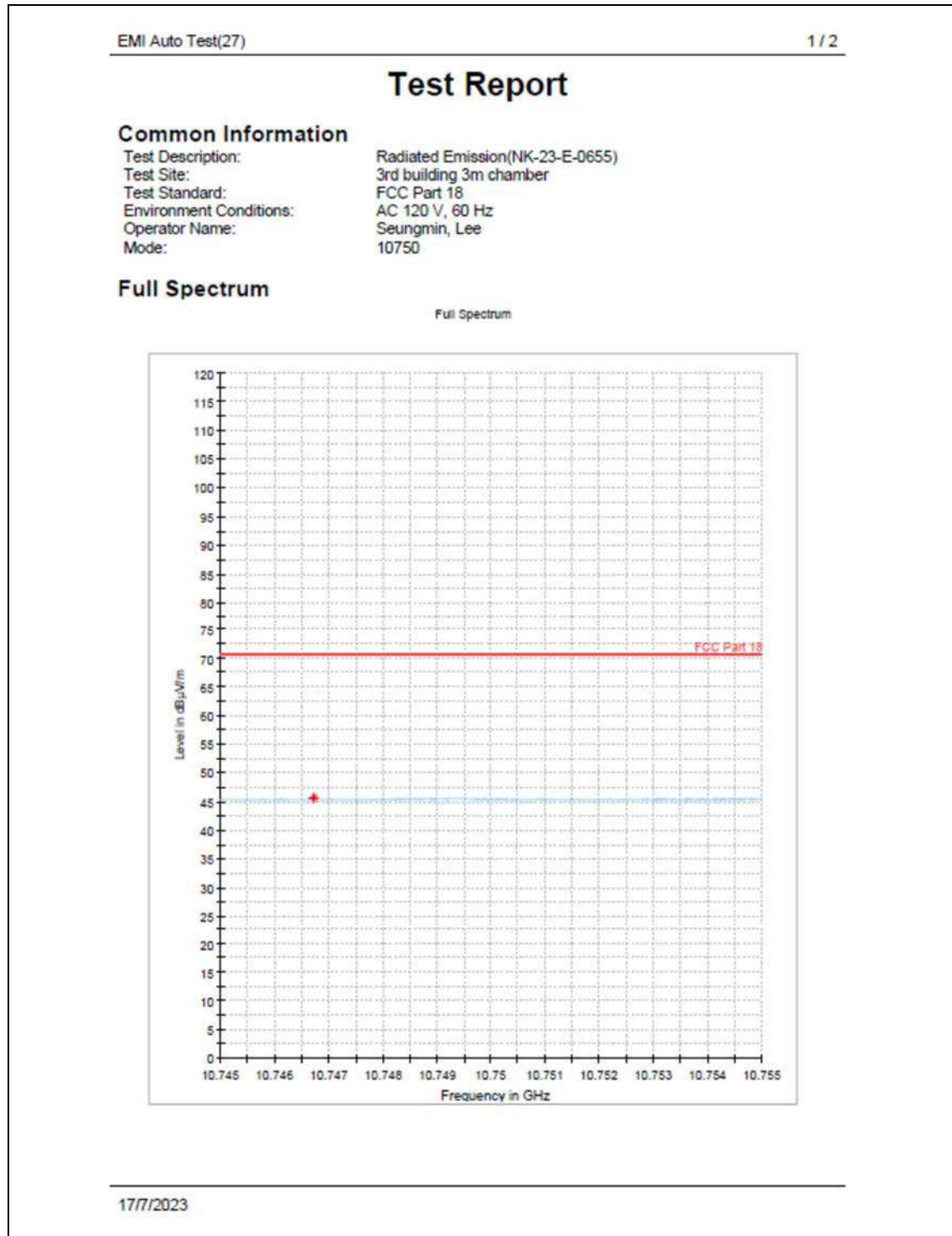
Radiated Emissions (Above 1 GHz)



10 339.81 MHz

PLOTS OF EMISSIONS

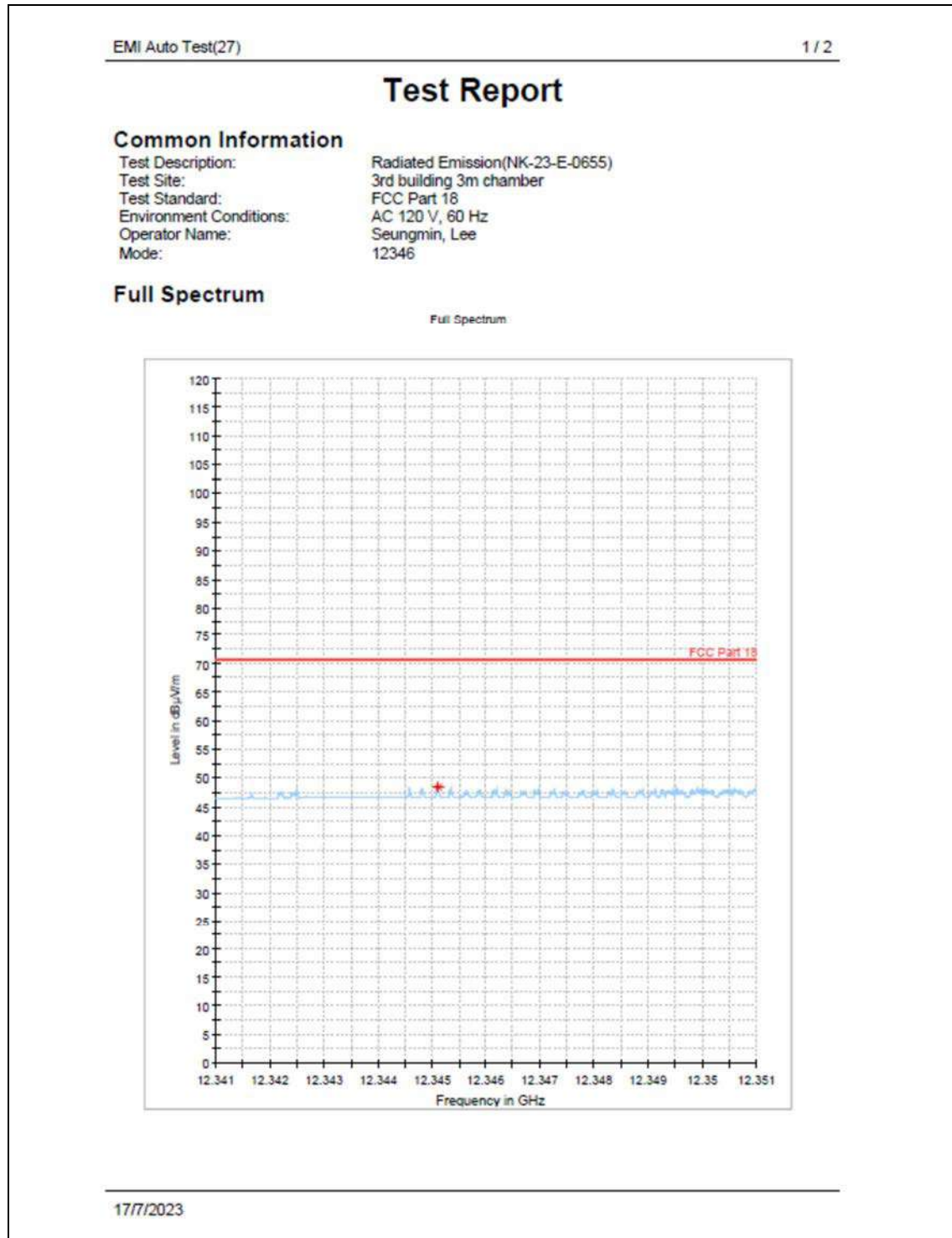
Radiated Emissions (Above 1 GHz)



10 746.72 MHz

PLOTS OF EMISSIONS

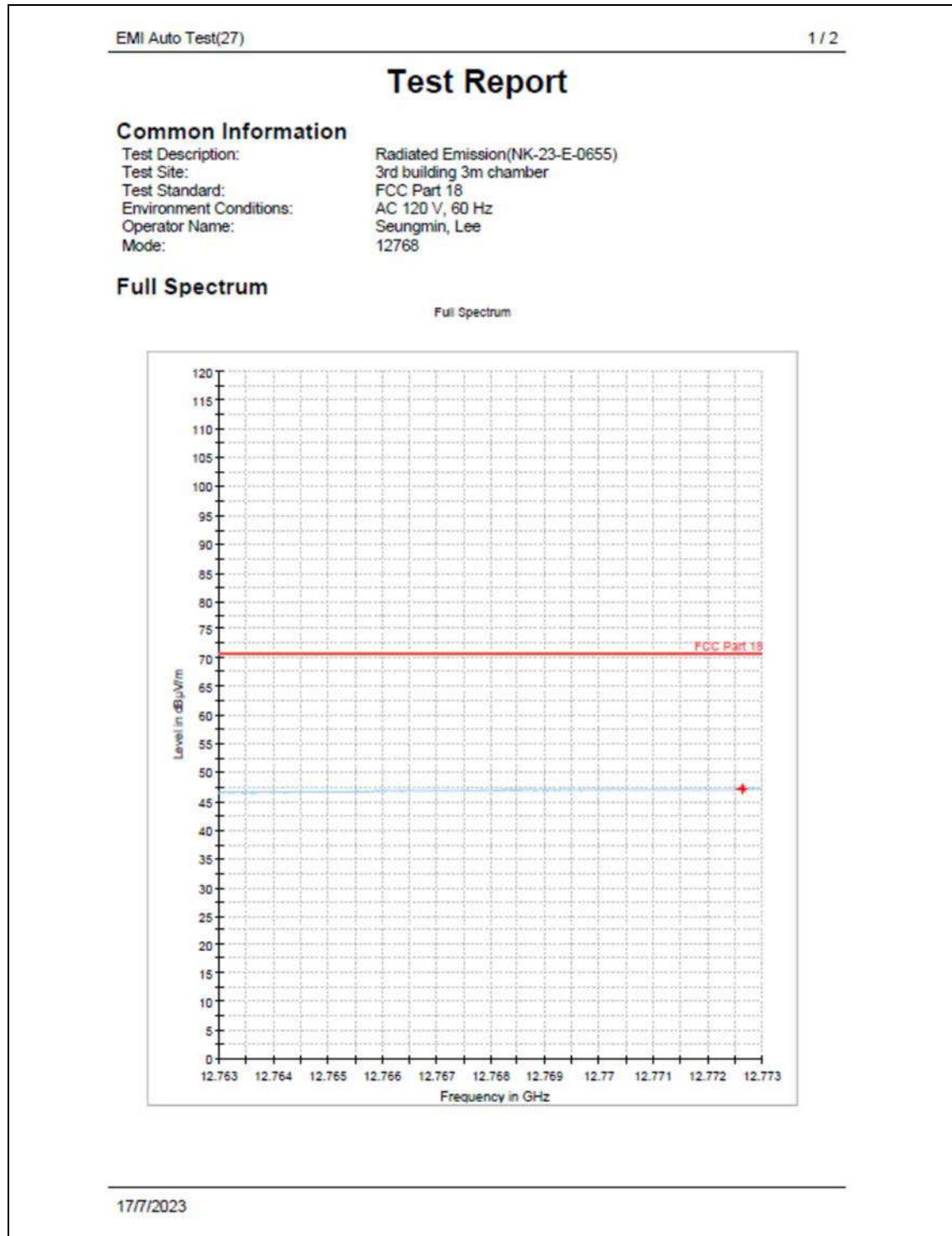
Radiated Emissions (Above 1 GHz)



12 345.11 MHz

PLOTS OF EMISSIONS

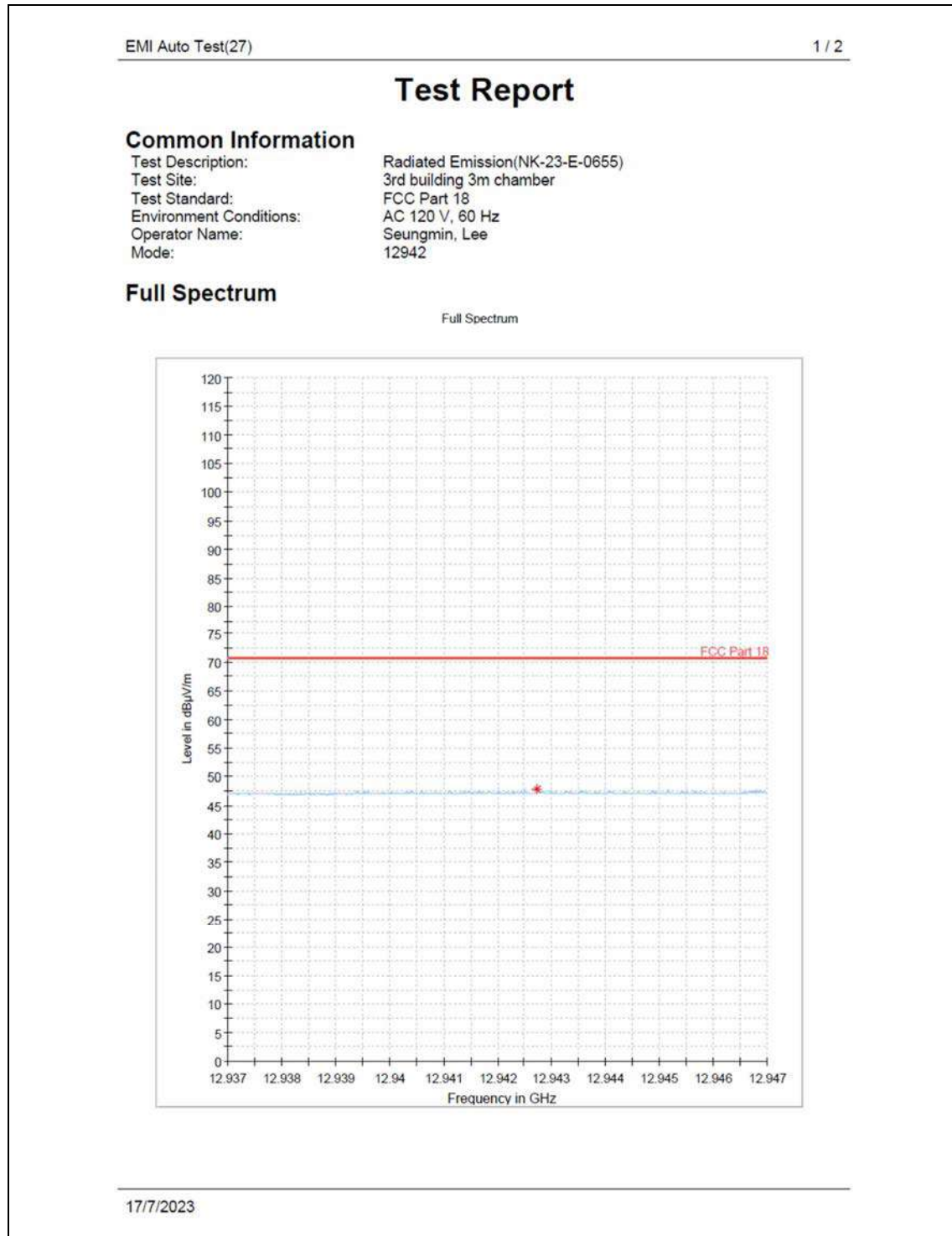
Radiated Emissions (Above 1 GHz)



12 772.63 MHz

PLOTS OF EMISSIONS

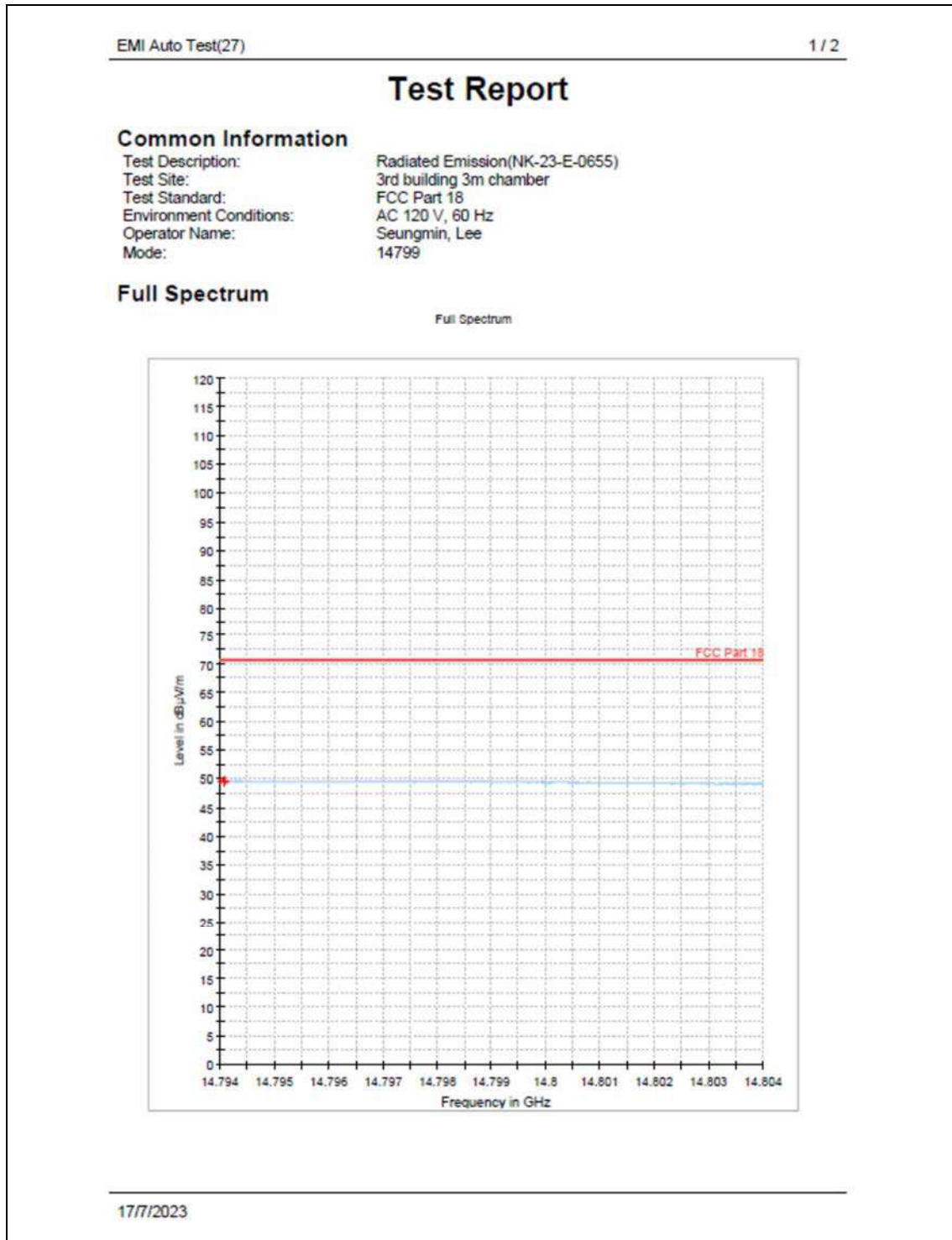
• Radiated Emissions (Above 1 GHz)



12 942.73 MHz

PLOTS OF EMISSIONS

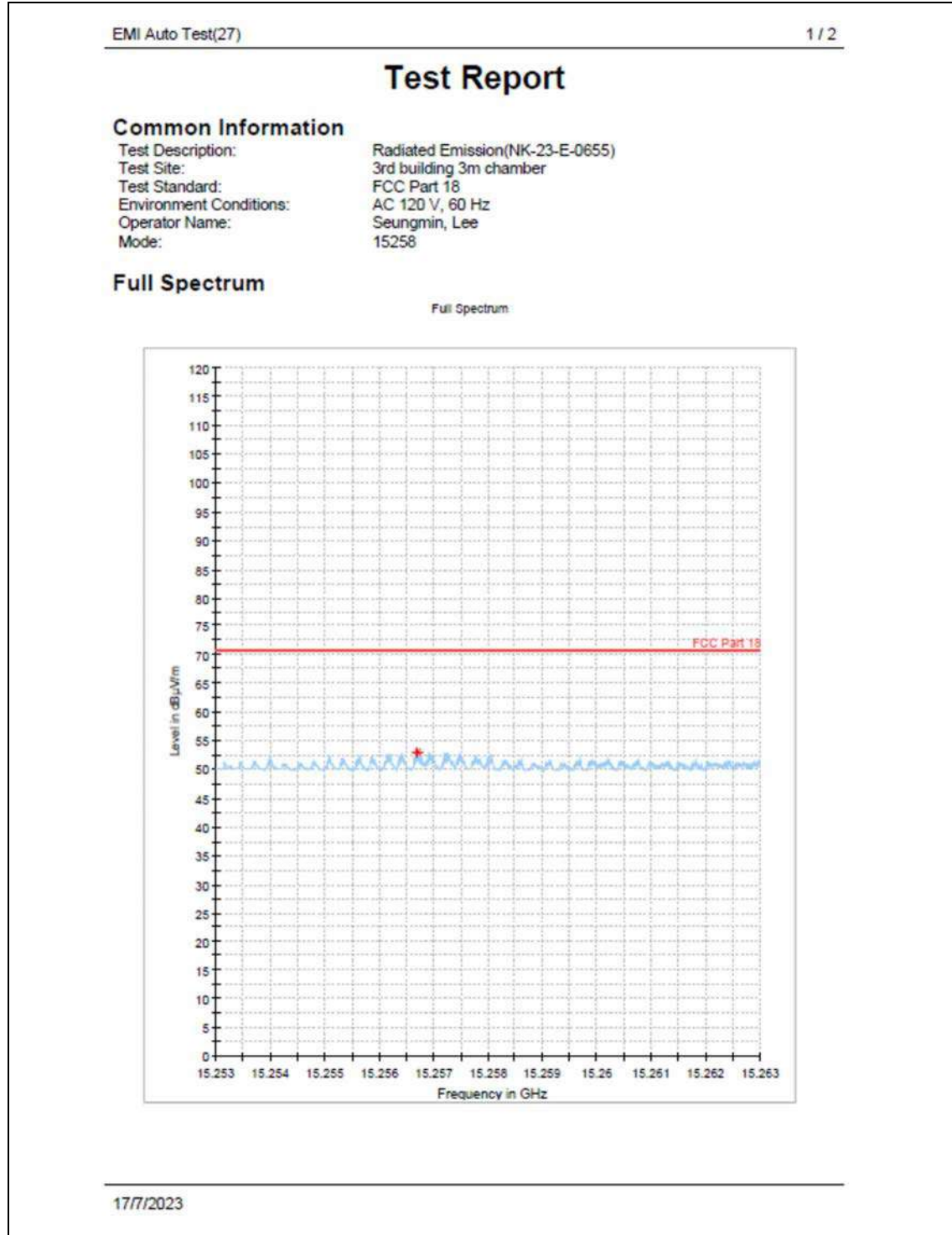
Radiated Emissions (Above 1 GHz)



14 794.06 MHz

PLOTS OF EMISSIONS

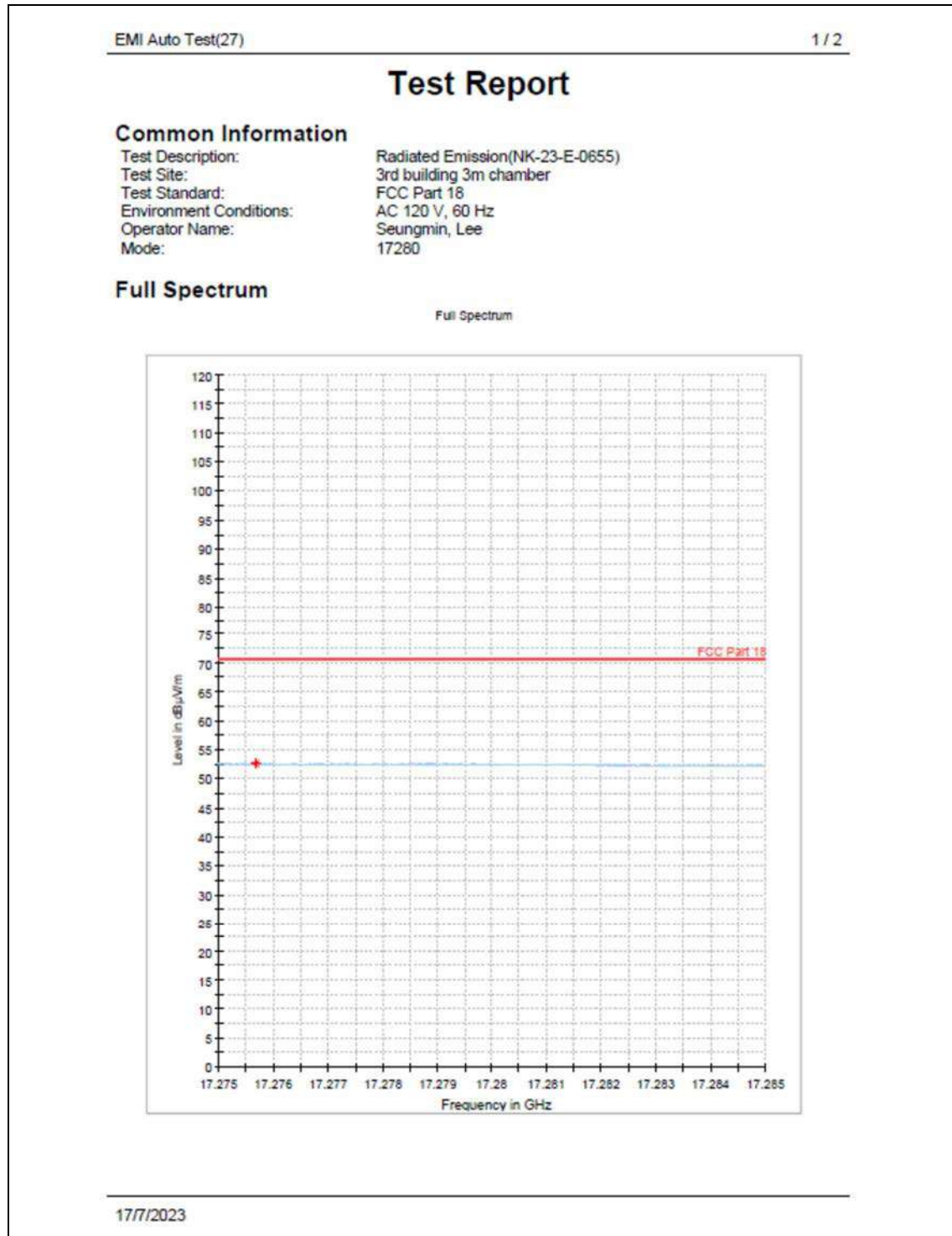
Radiated Emissions (Above 1 GHz)



15 256.69 MHz

PLOTS OF EMISSIONS

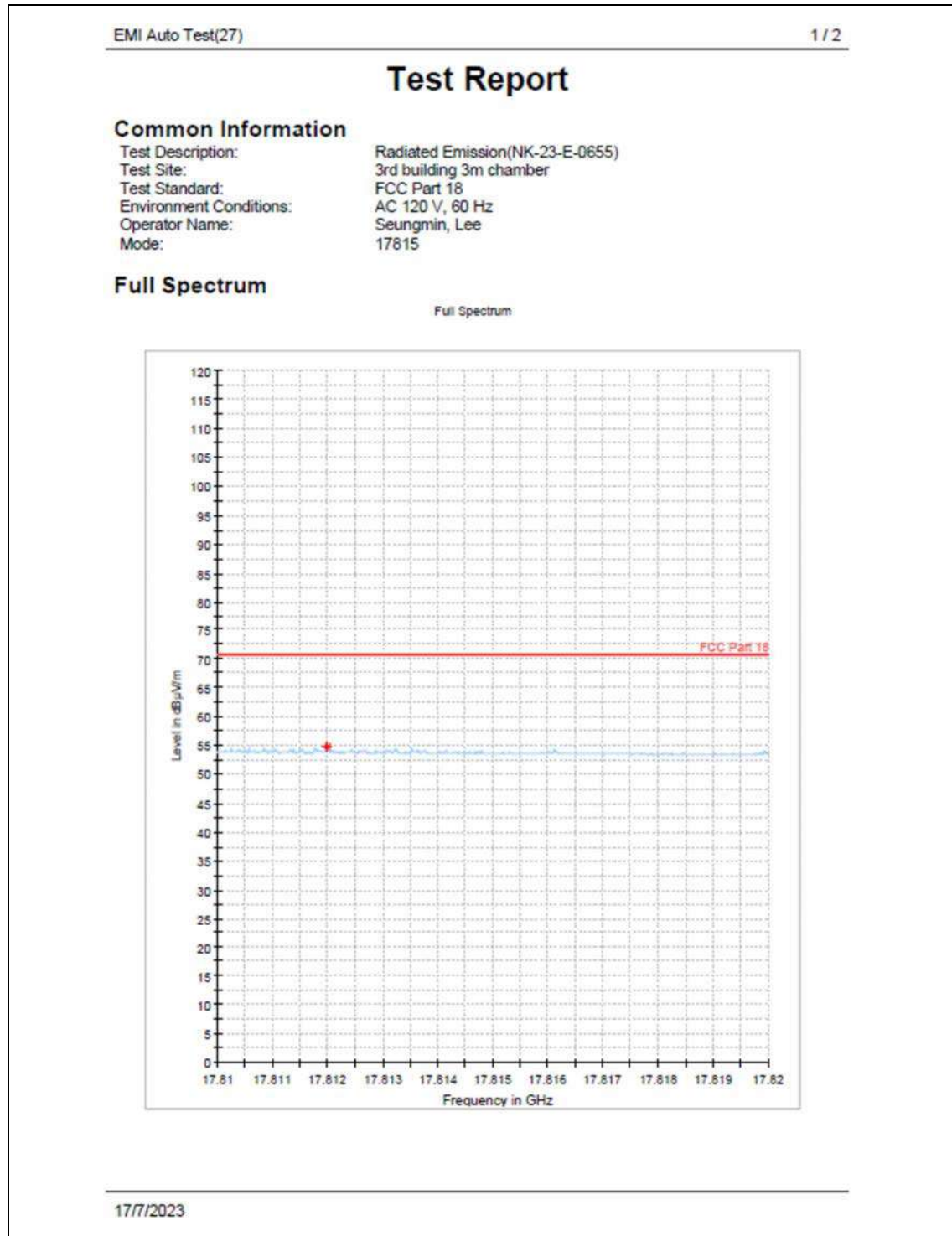
Radiated Emissions (Above 1 GHz)



17 275.66 MHz

PLOTS OF EMISSIONS

- Radiated Emissions (Above 1 GHz)**



17 811.99 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	Xi	Uncertainty of Xi		Coverage factor k	u(Xi) (dB)	Ci	Ci u(Xi) (dB)
		Value (dB)	Probability Distribution				
Receiver reading	R _i	± 0.01	normal 1	1.00	0.01	1	0.01
AMN Voltage division factor	L _{AMN}	± 0.16	normal 2	2.00	0.08	1	0.08
Sine wave voltage	dV _{SW}	± 0.18	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	dV _{PA}	± 0.70	normal 2	2.00	0.35	1	0.35
Pulse repetition rate response	dV _{PR}	± 0.70	normal 2	2.00	0.35	1	0.35
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
Combined Standard Uncertainty	Normal			u _c = 1.22 dB			
Expended Uncertainty U	Normal (k = 2)			U = 2.44 dB (CL is 95 %)			

2. Radiation Uncertainty Calculation (Below 1 GHz)

Source of Uncertainty	X _i	Uncertainty of X _i		Coverage factor k	u(X _i) (dB)	C _i	C _i u(X _i) (dB)
		Value (dB)	Probability Distribution				
Receiver reading	R _i	± 0.08	normal 1	1.00	0.08	1	0.08
Sine wave voltage	dV _{sw}	± 0.18	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	dV _{pa}	± 0.58	normal 2	2.00	0.29	1	0.29
Pulse repetition rate response	dV _{pr}	± 0.35	normal 2	2.00	0.18	1	0.18
Noise floor proximity	dV _{nf}	± 0.50	normal 2	2.00	0.29	1	0.29
Antenna Factor Calibration	A _F	± 1.30	normal 2	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	± 1.00	rectangular	$\sqrt{3}$	0.58	1	0.58
Antenna Phase Centre Variation	A _P	± 0.06	rectangular	$\sqrt{3}$	0.03	1	0.03
Antenna Factor Frequency Interpolation	A _i	± 0.30	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	± 0.10	rectangular	$\sqrt{3}$	0.06	1	0.06
Antenna Balance	D _{bal}	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Cross Polarisation	D _{Cross}	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Mismatch	M	+ 0.89 - 1.00	U-Shaped	$\sqrt{2}$	0.70	1	0.70
Combined Standard Uncertainty	Normal			u _c = 2.19 dB			
Expanded Uncertainty U	Normal (k = 2)			U = 4.38 dB (CL is 95 %)			

3. Radiation Uncertainty Calculation (Above 1 GHz)

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	± 0.26	normal 1	1	0.26	1	0.26
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	± 1.40	normal 2	2	0.70	1	0.70
Directivity difference	Ad	± 3.00	rectangular	$\sqrt{3}$	0.87	1	0.87
Phase Centre location	AP	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Antenna Factor Frequency Interpolation	Ai	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	Si	± 3.00	triangular	$\sqrt{6}$	1.22	1	1.22
Effect of setup table material	dANT	± 1.50	rectangular	$\sqrt{3}$	0.87	1	0.87
Separation distance	dB	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Cross Polarization	DCross	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Mismatch (antenna-Preamplifier)	M	+ 0.89 - 1.00	U-Shaped	$\sqrt{2}$	0.70	1	0.70
Mismatch (preamplifier-receiver)	M	+ 1.32 - 1.56	U-Shaped	$\sqrt{2}$	1.10	1	1.10
Combined Standard Uncertainty	Normal			uc = 2.51 dB			
Expanded Uncertainty U	Normal (k = 2)			U = 5.02 dB (CL is 95 %)			

LIST OF TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Due Date	Calibration Interval
1	EMI TEST RECEIVER	Rohde & Schwarz	ESR3	102930	2024.07.03	1 year
2	Software	Rohde & Schwarz	EMC32	Version 11.50	-	-
3	TWO-LINE V-NETWORK	Rohde & Schwarz	ENV216	102829	2024.07.04	1 year
4	Microwave survey meter	ETS Lindgren	HI-1801	0003549	2024.01.10	1 year
5	EMI TEST RECEIVER	Rohde & Schwarz	ESW8	100994	2024.03.30	1 year
6	TRILOG Broadband Test Antenna	SCHWARZBECK	VULB 9163	01432	2025.06.16	2 years
7	ATTENUATOR	FAIRVIEW	SA3N5W-06	N/A	2023.10.18	1 year
8	AMPLIFIER	Sonoma Instrument	315	420127	2024.07.03	1 year
9	Open Switch and Control Unit	Rohde & Schwarz	OSP230	101830	-	-
10	TILT ANTENNA MAST	innco systems GmbH	MA4640/800-XP-EP	N/A	-	-
11	Turntable	innco systems GmbH	DT3000-3t	N/A	-	-
12	CONTROLLER	innco systems GmbH	CO3000	CO3000/1373/52220621/P	-	-
13	LOOP ANTENNA	Rohde & Schwarz	HFH2-Z2	100279	2024.03.21	1 year
14	EMI TEST RECEIVER	Rohde & Schwarz	ESW44	103091	2024.03.29	1 year
15	CONTROLLER	innco systems GmbH	CO3000	CO3000/937/38330516/L	-	-
16	TILT ANTENNA MAST	innco systems GmbH	MA4640-XP-EP	N/A	-	-
17	Turntable	innco systems GmbH	DT2000-2t	N/A	-	-
18	SWITCH AND POWER DETECTOR UNIT	Rohde & Schwarz	OSP120	101766	-	-
19	WiFi Filter Bank	Rohde & Schwarz	U082	N/A	-	-
20	DOUBLE RIDGED HORN ANTENNA	Rohde & Schwarz	HF907	100197	2024.01.14	1 year
21	Band Reject	Wainwright Instruments GmbH	WRCJV8-2350-2400-2500-2550-40SS	2	-	-
22	Software	Rohde & Schwarz	EMC32	Version 10.10.01	-	-
23	Multimeter	FLUKE Corporation	FLUKE-101	58980136WS	2024.01.09	1 year

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



Contains Transmitter Module FCC ID : A3LCCAR210R, IC : 649E-CCAR210R

FCC ID : A3LCBAP210A, IC : 649E-CBAP210A

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.



DG68-00952B-00

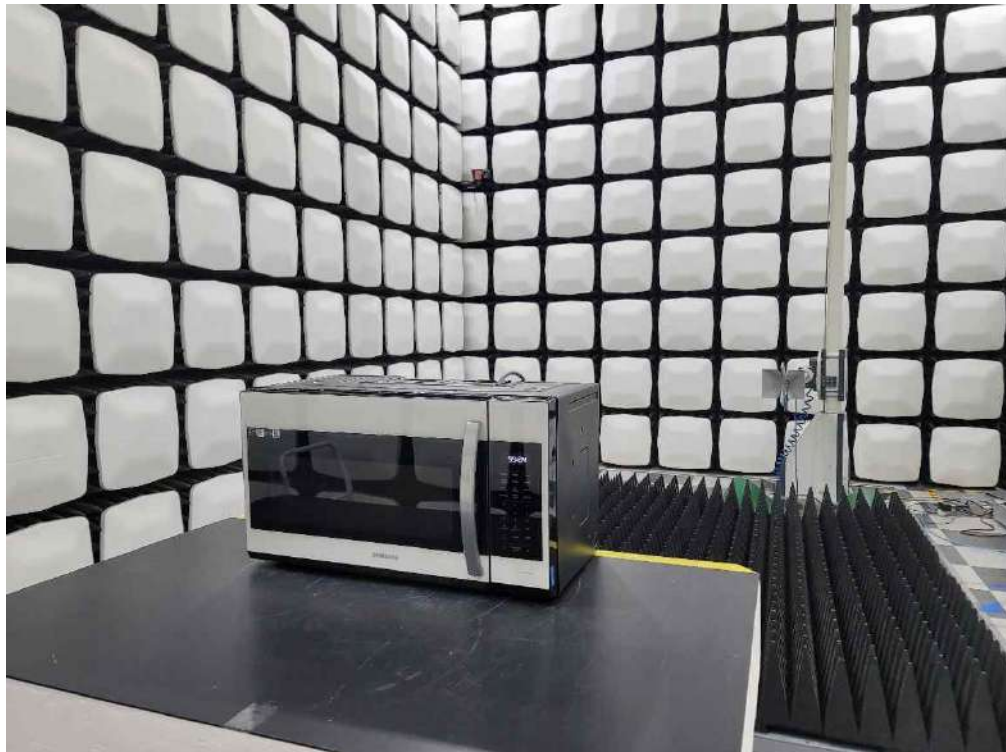
APPENDIX B – PHOTOGRAPHS OF TEST SET-UP

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

- **Radiation hazard Test Picture**



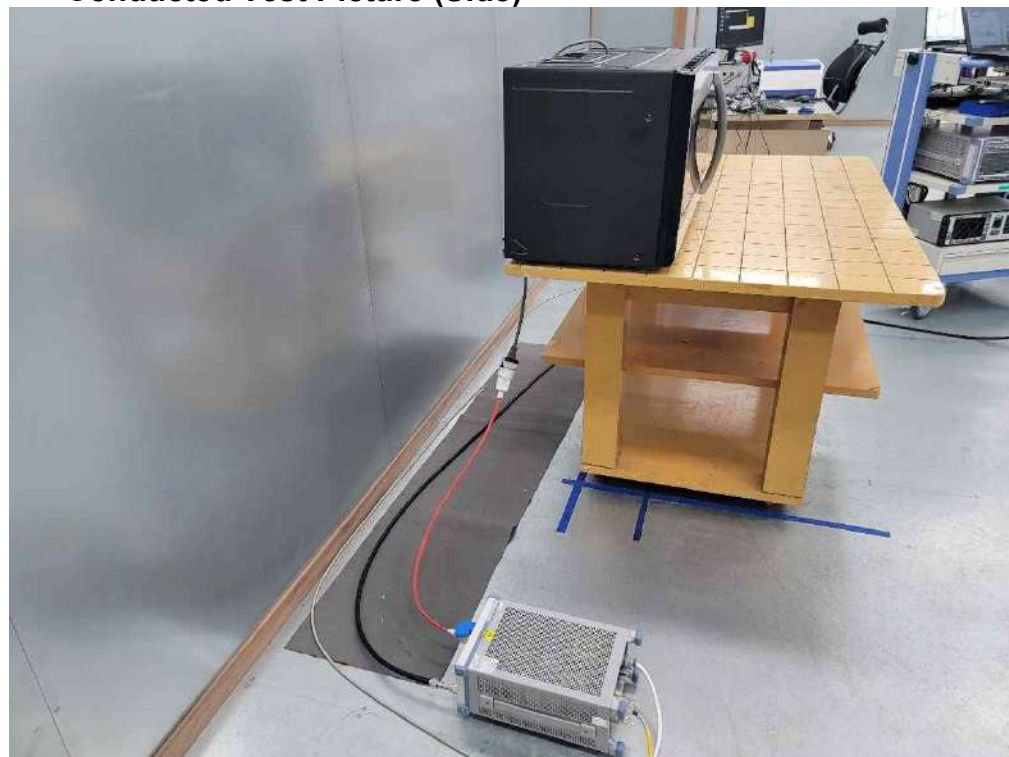
- **Frequency measurement Test Picture**



- **Conducted Test Picture (Front)**



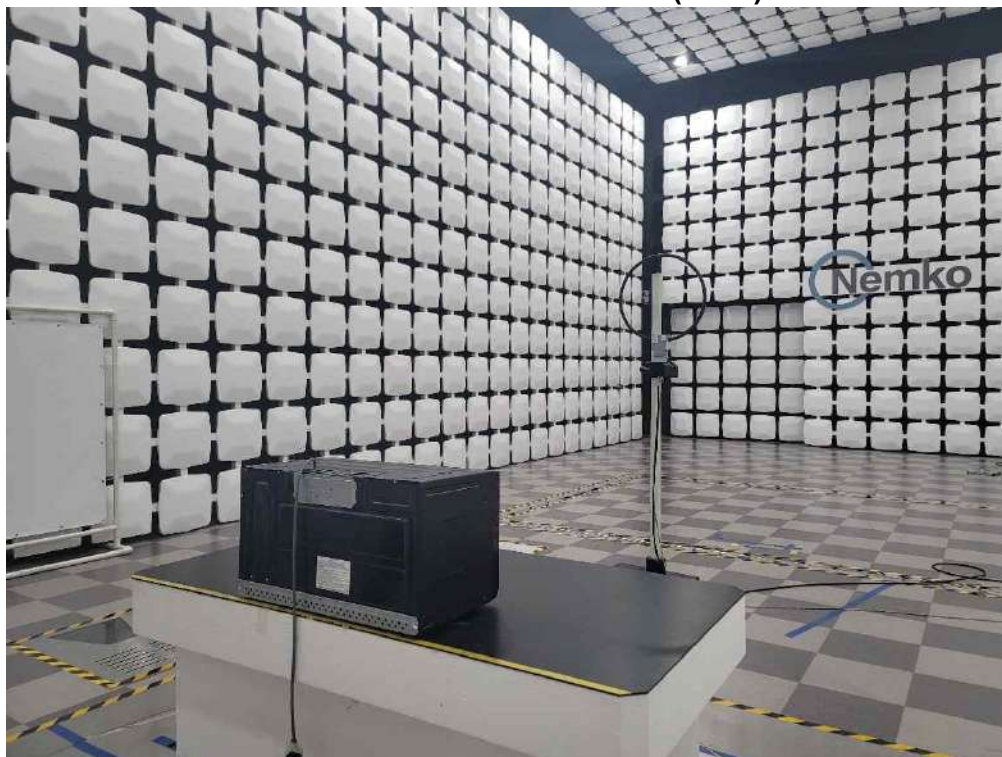
- **Conducted Test Picture (Side)**



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



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



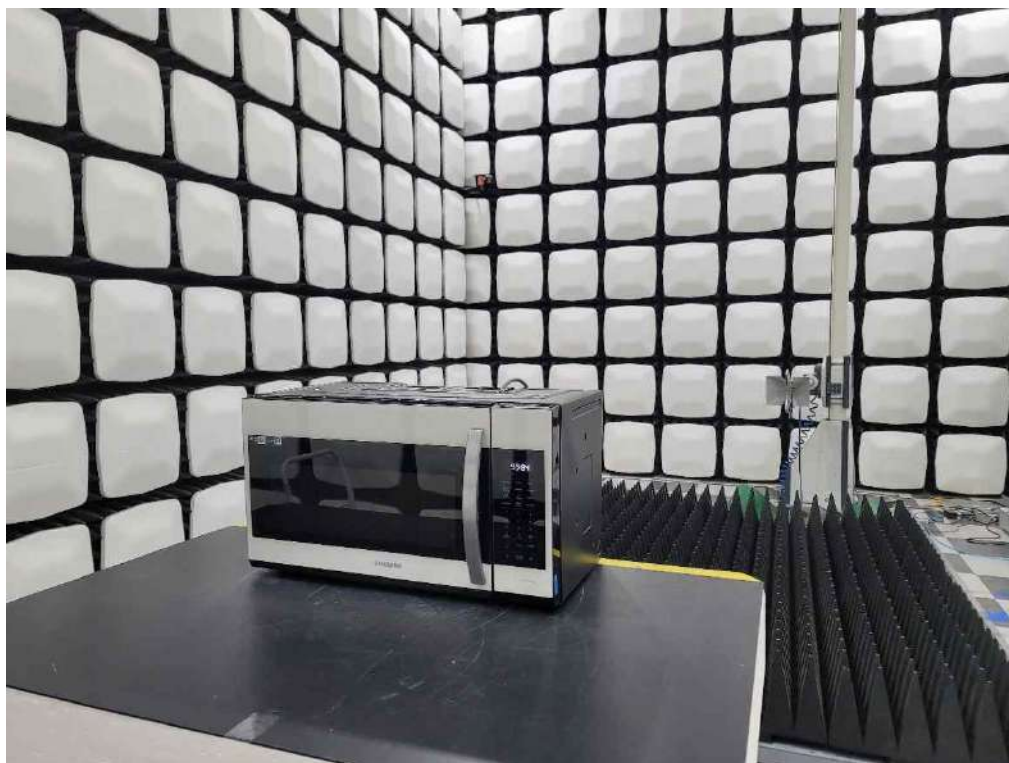
- Radiated Test Picture : 30 MHz ~ 1 GHz (Front)



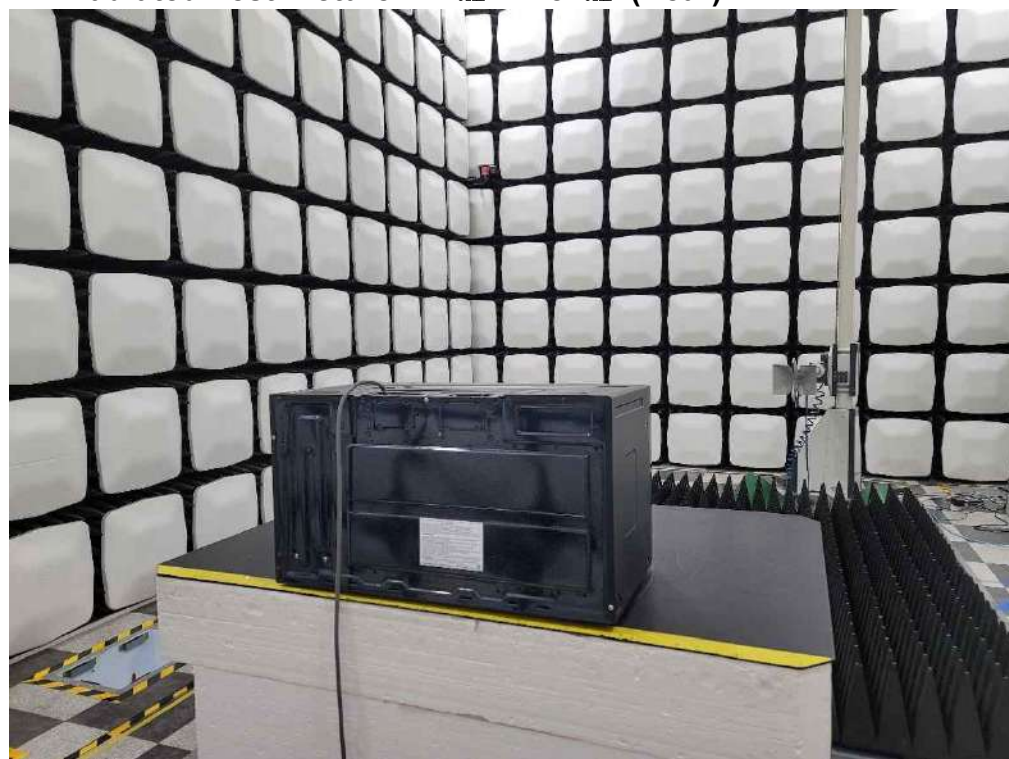
- Radiated Test Picture : 30 MHz ~ 1 GHz (Rear)



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



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



APPENDIX C – EUT PHOTOGRAPHS

Front View of EUT 1



Front View of EUT 2



Rear View of EUT



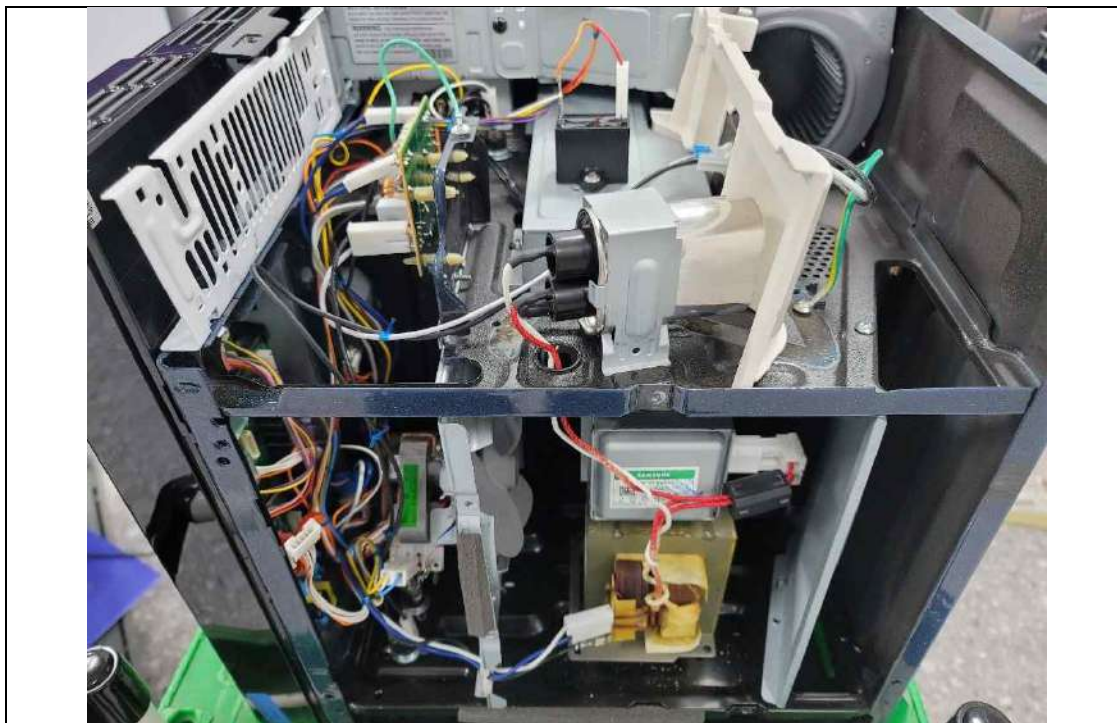
Left View of EUT



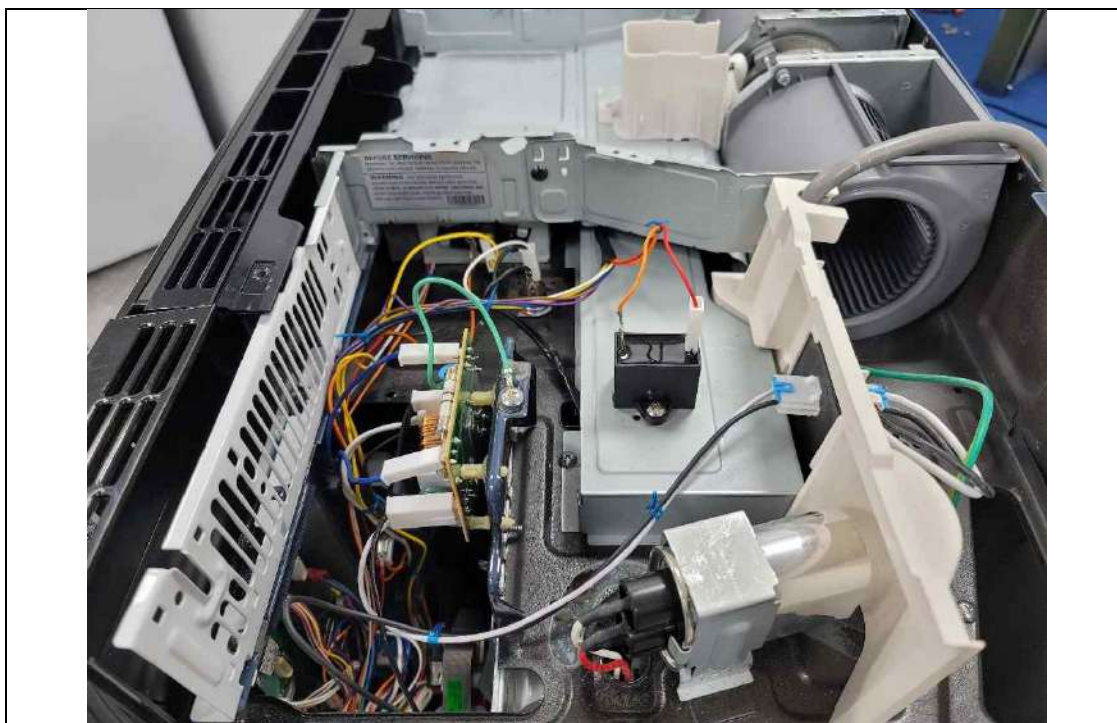
Right View of EUT



Inside View of EUT 1



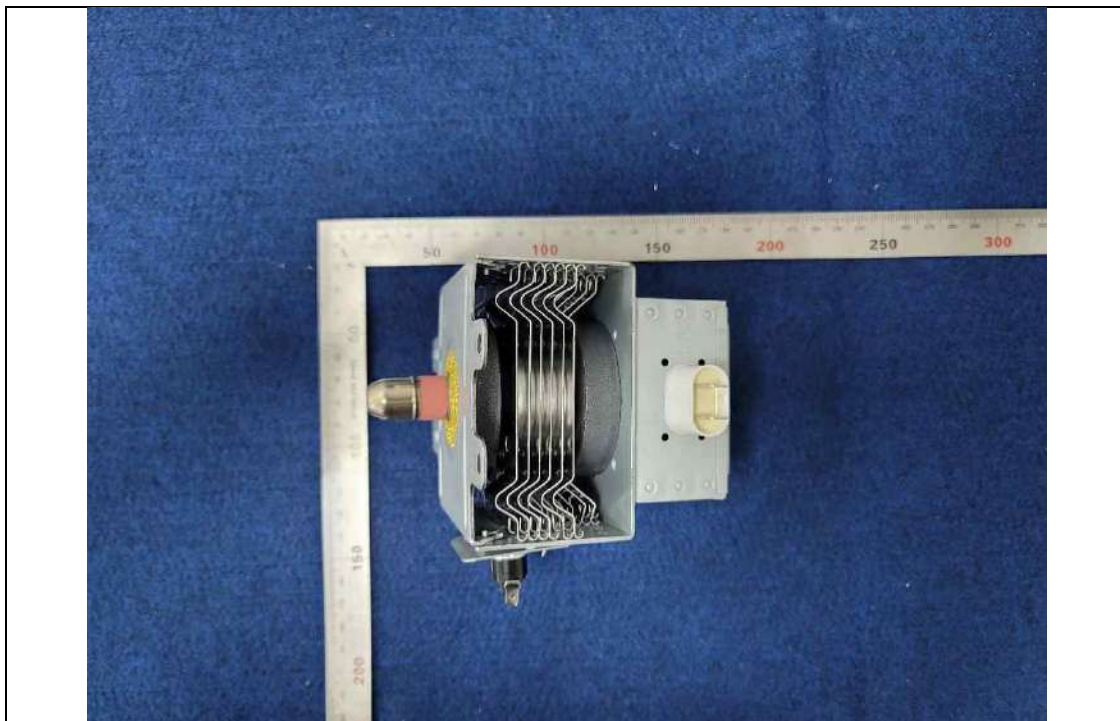
Inside View of EUT 2



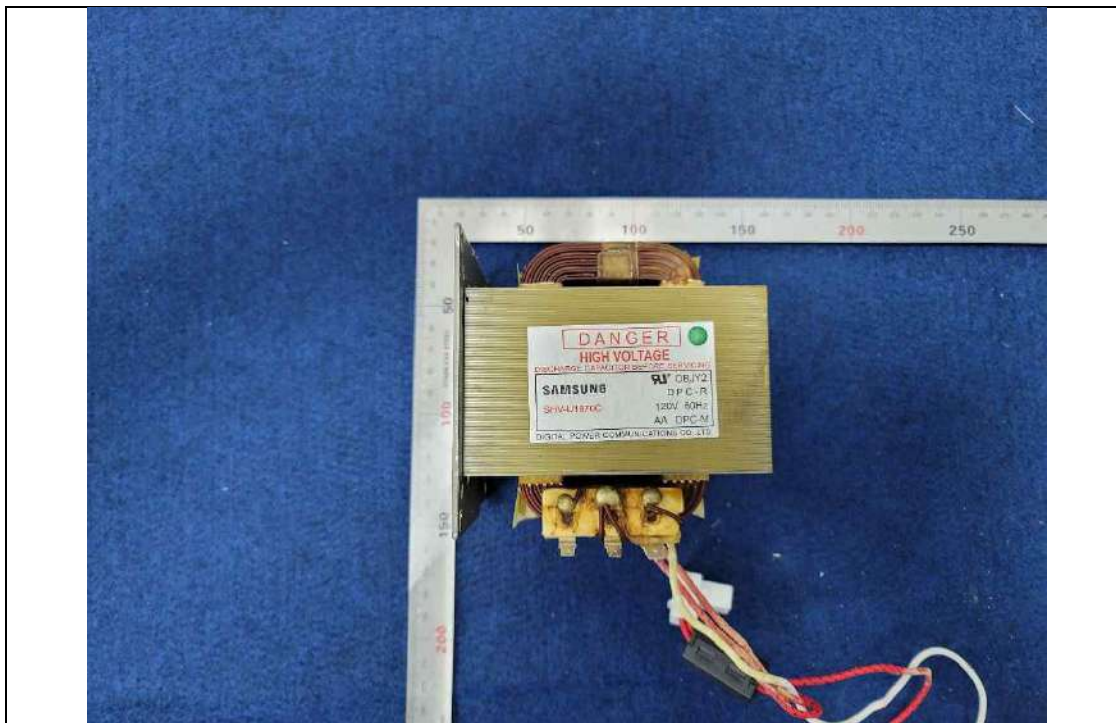
Front View of MAGNETRON



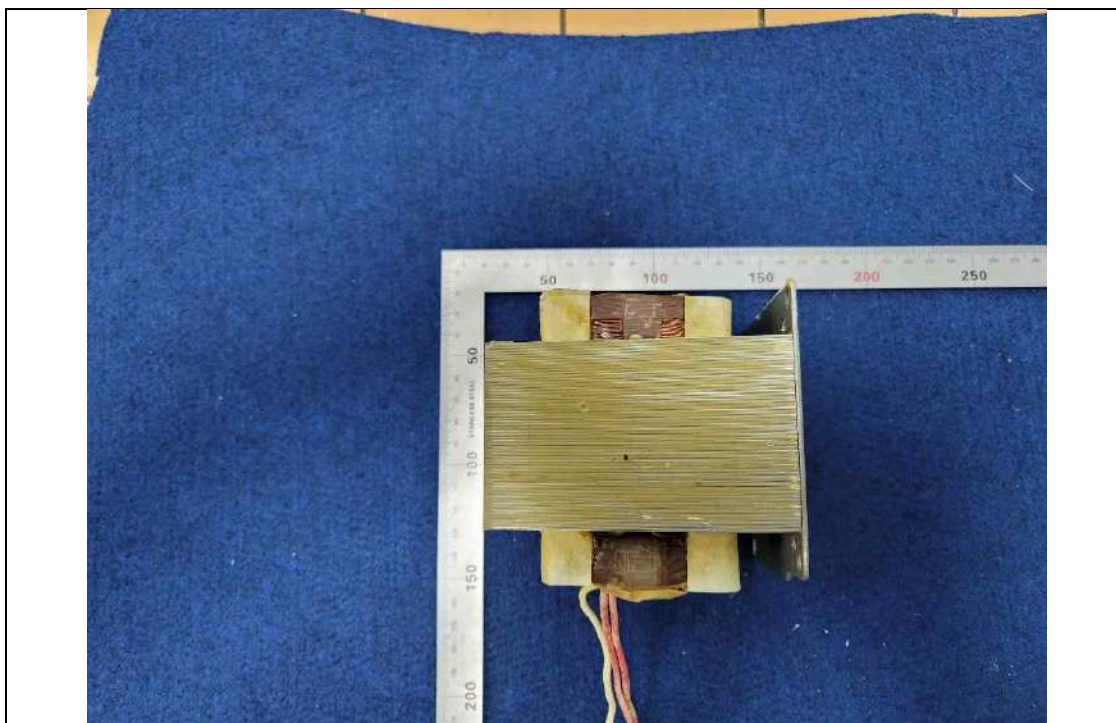
Rear View of MAGNETRON



Front View of H.V TRANS



Rear View of H.V TRANS



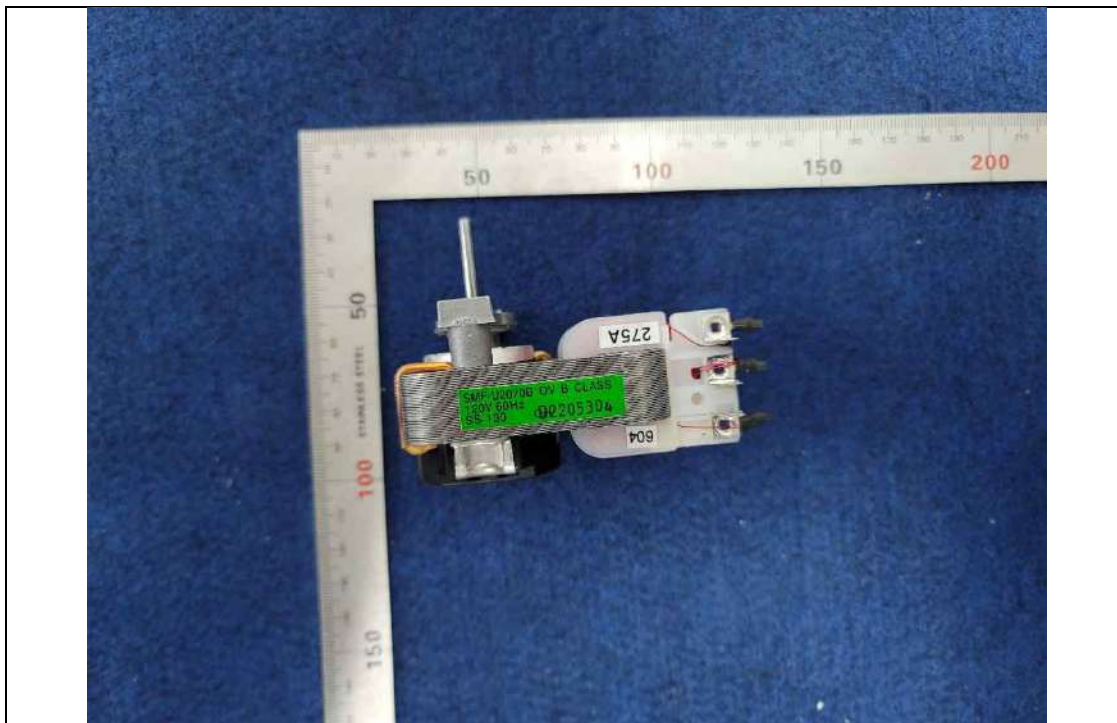
Front View of H.V CAPACITOR



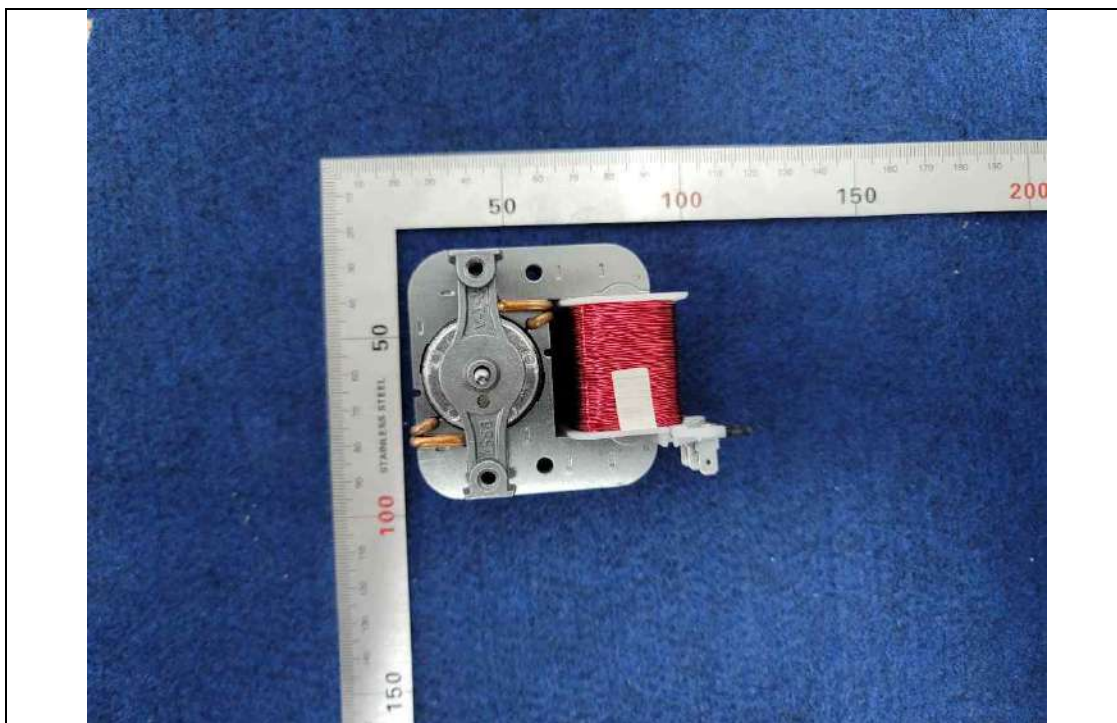
Rear View of H.V CAPACITOR



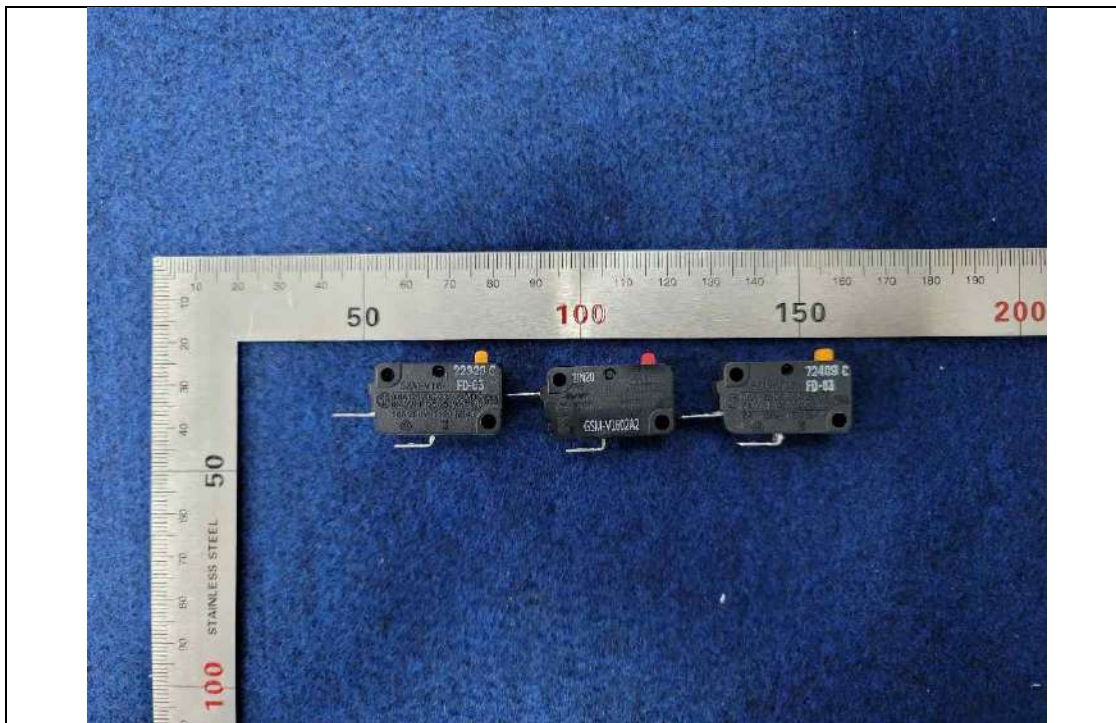
Front View of FAN MOTOR



Rear View of FAN MOTOR



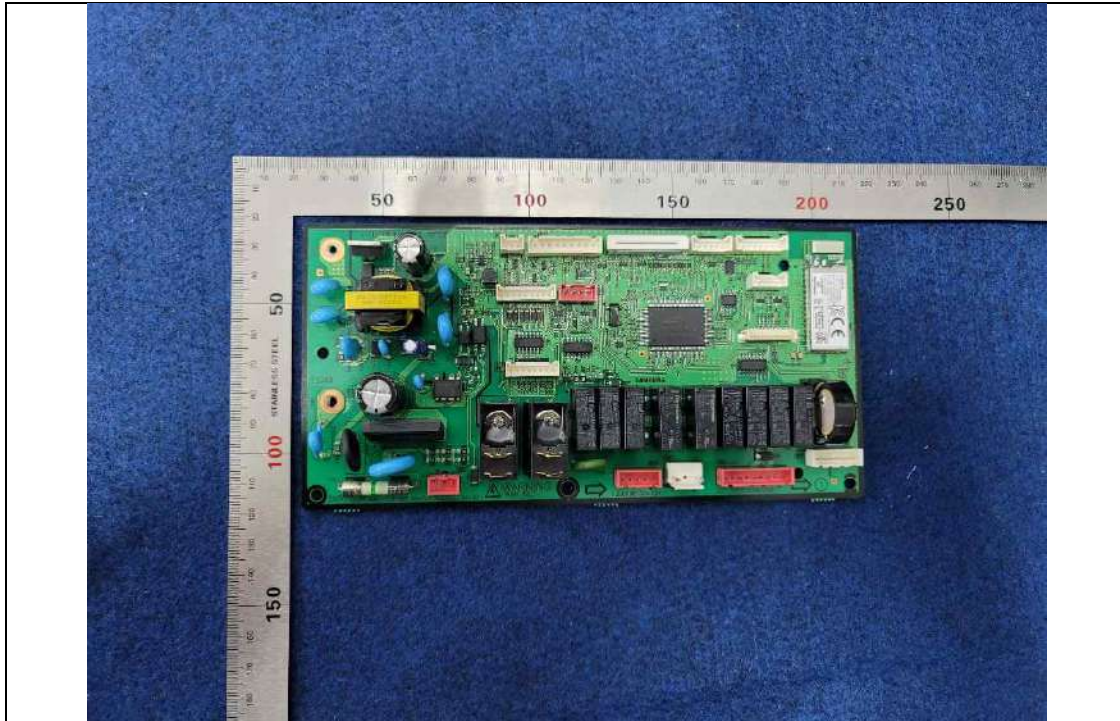
Front View of INTERLOCK SWITCH



Rear View of INTERLOCK SWITCH



Front View of Control



Rear View of Control

