

## 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 :

Samsung Electronics Co., Ltd.  
Kitchen solution Business Team , 129,  
Samsung-ro Yeongtong-gu, Suwon-si,  
Gyeonggi-do, 443-742 Korea, Republic of  
Attn : Mr. Gilryeong Koh

Dates of Issue : July 07, 2021  
Test Report No. : NK-21-E-0514  
Test Site : Nemko Korea Co., Ltd.  
EMC site, Korea

FCC ID

**A3LME6000A**

Trade Mark



Contact Person

Samsung Electronics Co., Ltd.  
Kitchen solution Business Team , 129, Samsung-ro  
Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742  
Korea, Republic of  
Mr. Gilryeong Koh  
Telephone No. : + 82 31 200 6849

Applied Standard : FCC Part 18 & Part 2  
Classification : Consumer ISM equipment  
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 07, 2021

Tested By : Jeamin Kim  
Engineer



July 07, 2021

Reviewed By : Taegyun Kim  
Technical Manager

# TABLE OF CONTENTS

<b>SCOPE</b>	3
<b>INTRODUCTION</b>	4
<b>ACCREDITATION AND LISTING</b>	5
<b>EUT INFORMATION</b>	6
<b>DESCRIPTION OF TESTS</b>	7
Radiation Hazard	7
Input Power Measurement	7
Output Power Measurement	7
Frequency Measurements	7
Conducted Emissions	8
Radiated Emissions	9
<b>TEST DATA</b>	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	23
<b>ACCURACY OF MEASUREMENT</b>	52
<b>LIST OF TEST EQUIPMENT</b>	55
<b>APPENDIX A – SAMPLE LABEL</b>	56
<b>APPENDIX B – PHOTOGRAPHS OF TEST SET-UP</b>	57
<b>APPENDIX C – EUT PHOTOGRAPHS</b>	63

## 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 :** Mr. Gilryeong Koh  
Tel No.: + 82 31 200 6849

**Manufacturer :** Samsung Electronics Co., Ltd.  
Kitchen solution Business Team , 129,  
Samsung-ro Yeongtong-gu, Suwon-si,  
Gyeonggi-do, 443-742 Korea, Republic of

- FCC ID: A3LME6000A
- Model: ME11A7710DS
- Trade Mark: 
- EUT Type: Microwave ovens
- Applied Standard: FCC Part 18 & Part 2
- Test Procedure(s): MP-5:1986
- Dates of Test: June 16, 2021 to June 22, 2021
- Place of Tests: Nemko Korea Co., Ltd. EMC Site
- Test Report No.: NK-21-E-0514

## 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 : **A3LME6000A, Microwave ovens.**

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  
Fax) + 82 31 322 2332

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	Microwave ovens
Model	ME11A7710DS
Rated voltage & frequency	a.c. 120 V, 60 Hz Single Phase
Rated power output	1 100 W
Rated power consumption(MW)	1 650 W
Magnetron	2M303J, manufactured by Toshiba

### Component List

Item	Model	Manufacturer	Serial Number
MAGNETRON	2M303J	Toshiba	N/A
H.V TRANS	SHV-U1870E	DPC	N/A
H.V CAPACITOR	CH85-21095	Bicai	N/A
FAN MOTOR	SMF-U2070C	Ohsung	N/A
INTERLOCK SWITCH	GSM-V1603A2	Gersung	N/A
PCB	ME6000A_MAIN	Samsung	N/A

### Description of the Changes according to FCC part 2.1043

Report No.	Difference
N/A	N/A

## ***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 (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 (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 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.

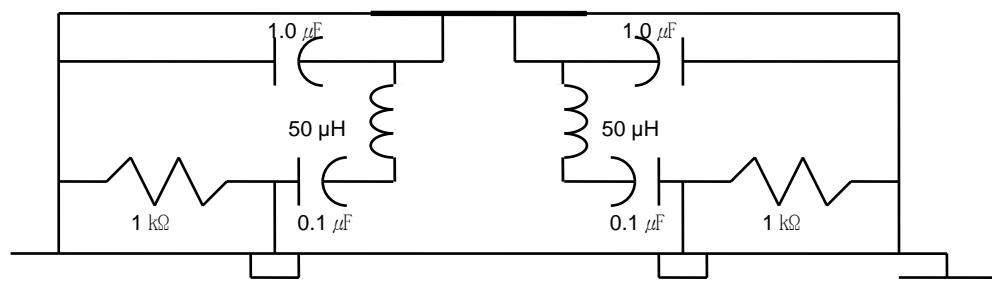


Fig. 2. LISN Schematic Diagram



## 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.

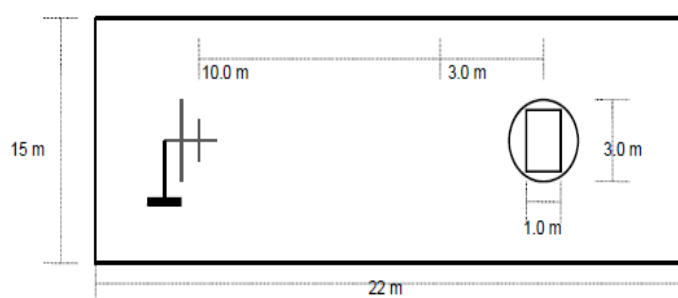


Fig. 3. Dimensions of 10 semi anechoic chamber

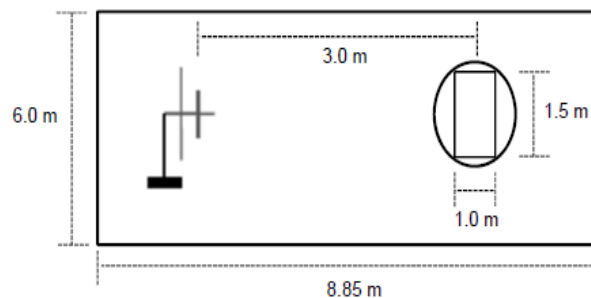


Fig. 4. Dimensions of 3 m full anechoic chamber

## TEST DATA

### Radiation Hazard

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
A	0.10	1.00
B	0.05	1.00
C	0.05	1.00
D	0.05	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	1 650	1 680	1.78	+ 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	400	19.4	10.0	20.1	38	1 117

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)

$T_0$  is the initial temperature of the water (°C)

$T_1$  is the final temperature of the water (°C)

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



Tested by : Jeamin Kim

## TEST DATA

### Frequency measurements

#### ► Frequency vs Line Voltage Variation Test

[Room Temperature : 25.7 ± 1.0 °C]

Line Voltage Variation (a.c. V)	*Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
96 (80 %)	H	Lower : 2 402.1	Lower : 2 400 MHz Upper : 2 500 MHz
	H	Upper : 2 468.5	
	V	Lower : 2 419.6	
	V	Upper : 2 467.1	
108 (90 %)	H	Lower : 2 407.6	
	H	Upper : 2 471.6	
	V	Lower : 2 406.3	
	V	Upper : 2 473.6	
120 (100 %)	H	Lower : 2 404.8	
	H	Upper : 2 469.7	
	V	Lower : 2 409.2	
	V	Upper : 2 471.1	
132 (110 %)	H	Lower : 2 414.6	
	H	Upper : 2 466.0	
	V	Lower : 2 408.1	
	V	Upper : 2 470.9	
150 (125 %)	H	Lower : 2 414.9	
	H	Upper : 2 464.8	
	V	Lower : 2 411.0	
	V	Upper : 2 470.4	

#### 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 : Jeamin Kim

# TEST DATA

## ► Frequency vs Load Variation Test

[Room Temperature : 25.7 ± 1.0 °C]

Volume of water (ml)	*)Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
200	H	Lower : 2 401.3	Lower : 2 400 MHz Upper : 2 500 MHz
	H	Upper : 2 472.0	
	V	Lower : 2 406.1	
	V	Upper : 2 469.2	
400	H	Lower : 2 400.4	
	H	Upper : 2 472.2	
	V	Lower : 2 411.5	
	V	Upper : 2 469.0	
600	H	Lower : 2 401.2	
	H	Upper : 2 471.7	
	V	Lower : 2 412.3	
	V	Upper : 2 469.7	
800	H	Lower : 2 401.7	
	H	Upper : 2 492.8	
	V	Lower : 2 412.2	
	V	Upper : 2 468.5	
1 000	H	Lower : 2 406.9	
	H	Upper : 2 491.9	
	V	Lower : 2 409.7	
	V	Upper : 2 468.0	

### 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 : Jeamin Kim

# TEST DATA

## Conducted Emissions

FCC ID : A3LME6000A

[Room Temperature : 21.6 ± 1.0 °C]

EMI Auto Test(4)

1 / 2

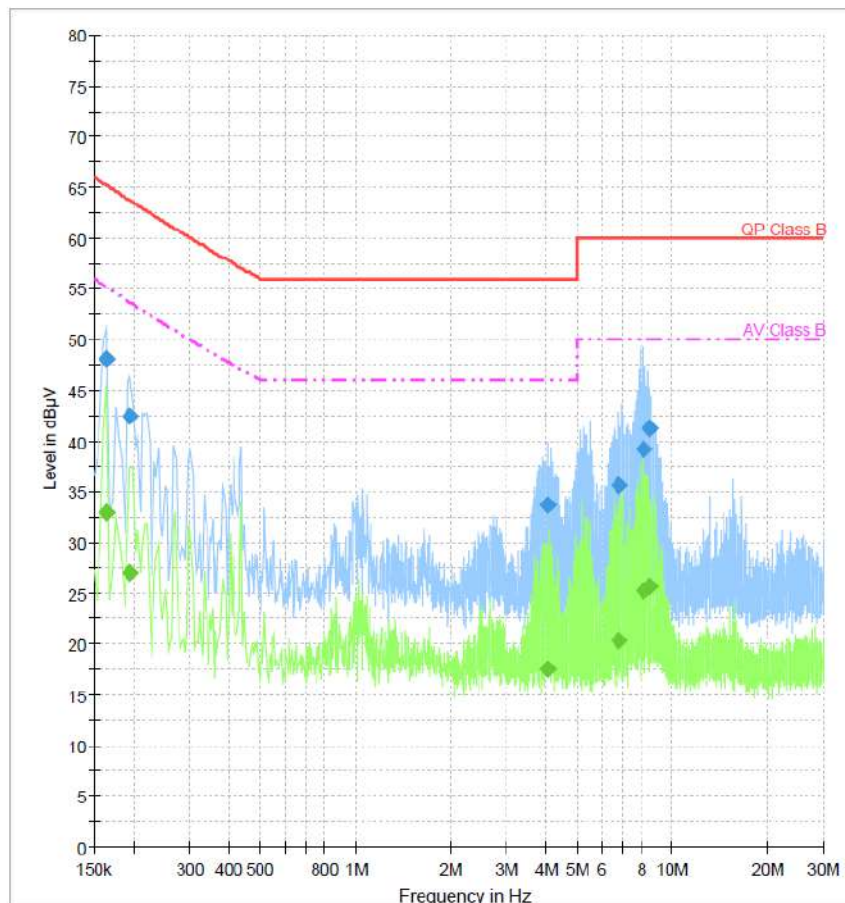
## Test Report

### Common Information

Test Description:	Conducted emission (NK-21-E-0514)
Test Site:	3rd building shielded room
Test Standard:	FCC Part 18
Environment Conditions:	a.c. 120 V, 60 Hz
Operator Name:	Jeamin, Kim

### 2.EMI Auto Test\_4-Line Voltage LISN

2.EMI Auto Test\_4-Line Voltage LISN



6/22/2021

EMI Auto Test(4)

2 / 2

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.164925	48.1	15000.0	9.000	GND	L1	10.7	17.0	65.2	
0.194775	42.4	15000.0	9.000	GND	L1	10.7	21.3	63.7	
4.060350	33.7	15000.0	9.000	GND	N	10.9	22.3	56.0	
6.772969	35.7	15000.0	9.000	GND	L1	10.9	24.3	60.0	
8.175919	39.2	15000.0	9.000	GND	L1	10.9	20.8	60.0	
8.470688	41.3	15000.0	9.000	GND	L1	10.9	18.7	60.0	

### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.164925	33.0	15000.0	9.000	GND	N	10.8	22.2	55.1	
0.194775	27.0	15000.0	9.000	GND	N	10.8	26.6	53.7	
4.060350	17.5	15000.0	9.000	GND	N	10.9	28.5	46.0	
6.772969	20.3	15000.0	9.000	GND	L1	10.9	29.7	50.0	
8.175919	25.3	15000.0	9.000	GND	L1	10.9	24.7	50.0	
8.470688	25.6	15000.0	9.000	GND	L1	10.9	24.4	50.0	

6/22/2021

**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).*

A handwritten signature in blue ink, appearing to read '김제민' (Kim Jeamin).

---

Tested by : **Jeamin Kim**

# TEST DATA

## Radiated Emissions (150 kHz to 30 MHz)

FCC ID : A3LME6000A

[Room Temperature : 25.2 ± 1.0 °C]

Test

1 / 2

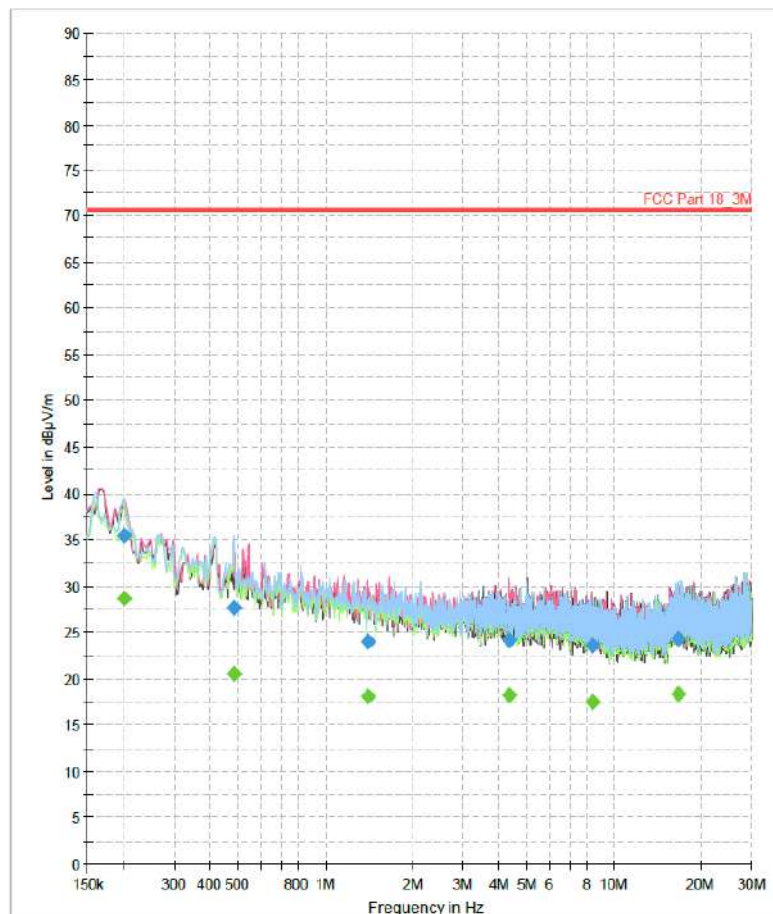
## Test Report

### Common Information

Test Description :	Radiated Emission(NK-21-E-0514)
Test Site :	3rd Building 10 m Chamber
Test Standard :	FCC Part 18
Environment Conditions :	a.c. 120 V, 60 Hz
Operator Name :	Jeamin, Kim

### Full Spectrum

Full Spectrum



8/16/2021



Test

2 / 2

### Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
0.200745	35.41	---	71.45	36.04	15000.0	9.000	0.0	H
0.200745	---	28.71	71.45	42.74	15000.0	9.000	0.0	H
0.481335	---	20.49	71.45	50.96	15000.0	9.000	0.0	H
0.481335	27.60	---	71.45	43.85	15000.0	9.000	0.0	H
1.406685	---	18.14	71.45	53.31	15000.0	9.000	0.0	V
1.406685	24.04	---	71.45	47.41	15000.0	9.000	0.0	V
4.323030	24.19	---	71.45	47.26	15000.0	9.000	0.0	V
4.323030	---	18.20	71.45	53.25	15000.0	9.000	0.0	V
8.427405	---	17.58	71.45	53.87	15000.0	9.000	0.0	V
8.427405	23.55	---	71.45	47.90	15000.0	9.000	0.0	V
16.794360	24.38	---	71.45	47.07	15000.0	9.000	0.0	H
16.794360	---	18.43	71.45	53.02	15000.0	9.000	0.0	H

(continuation of the "Final\_Result" table from column 14 ...)

Frequency (MHz)	Azimuth (deg)	Corr. (dB/m)	Comment
0.200745	180.0	-22.8	
0.200745	180.0	-22.8	
0.481335	16.0	-23.0	
0.481335	16.0	-23.0	
1.406685	172.0	-22.7	
1.406685	172.0	-22.7	
4.323030	18.0	-22.3	
4.323030	18.0	-22.3	
8.427405	152.0	-22.2	
8.427405	152.0	-22.2	
16.794360	103.0	-21.7	
16.794360	103.0	-21.7	

6/16/2021

&lt;Radiated Measurements at 3 meters &gt;

**NOTES:**

1. \*Pol. H = Horizontal V = Vertical
2. \*\*AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. Distance Correction factor :  $20 * \log (300 / 3) = 40 \text{ dBuV/m}$
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.



---

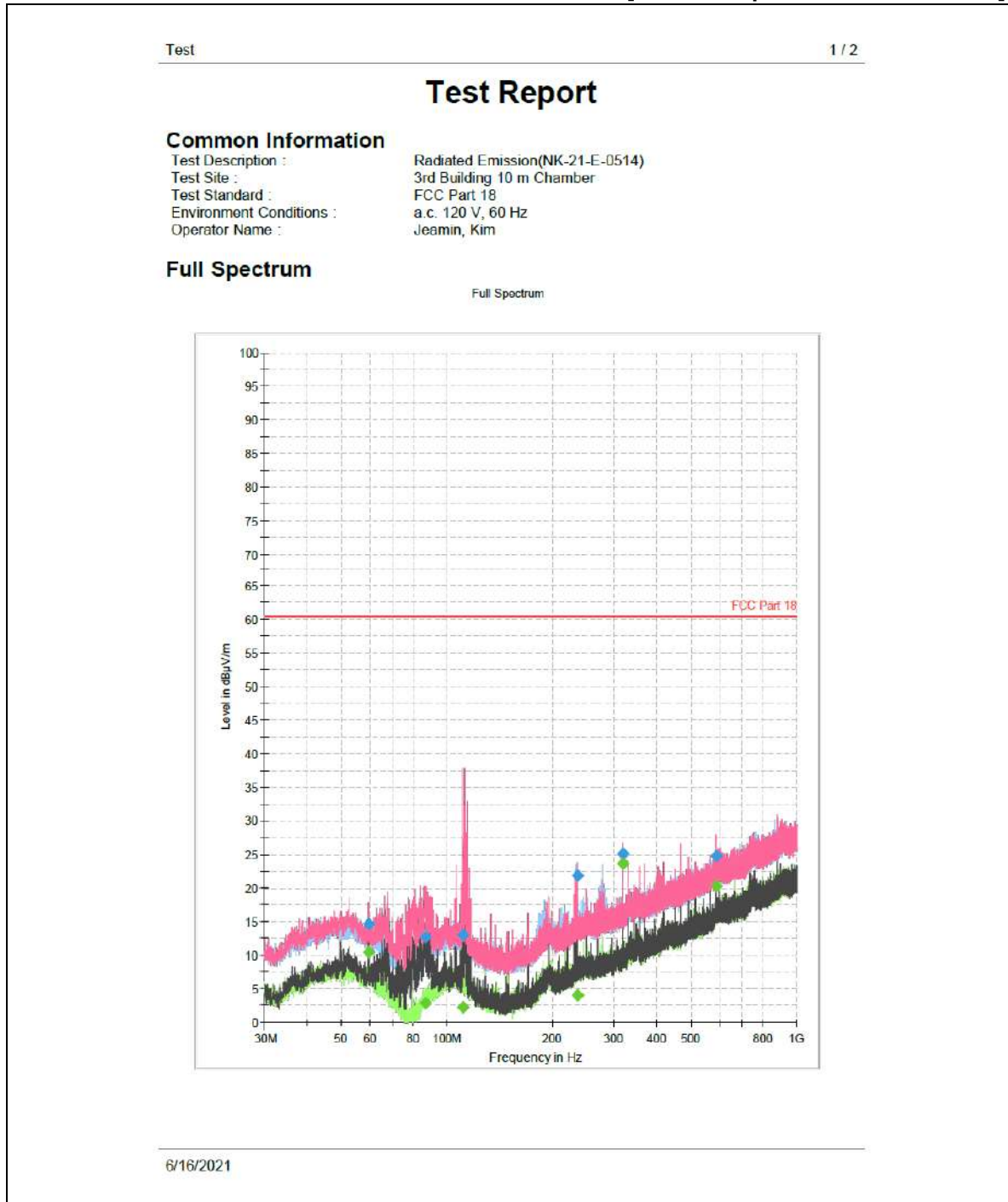
Tested by : **Jeamin Kim**

# TEST DATA

## Radiated Emissions (30 MHz to 1 GHz)

FCC ID : A3LME6000A

[Room Temperature :  $25.2 \pm 1.0$  °C]



Test

2 / 2

### Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
59.633500	---	10.51	60.99	50.48	15000.0	120.000	300.0	V
59.633500	14.56	---	60.99	46.43	15000.0	120.000	300.0	V
86.502500	---	2.83	60.99	58.16	15000.0	120.000	200.0	V
86.502500	12.66	---	60.99	48.33	15000.0	120.000	200.0	V
110.704000	13.08	---	60.99	47.91	15000.0	120.000	100.0	V
110.704000	---	2.28	60.99	58.71	15000.0	120.000	100.0	V
235.979500	---	4.01	60.99	56.98	15000.0	120.000	100.0	V
235.979500	21.94	---	60.99	39.05	15000.0	120.000	100.0	V
319.108500	---	23.57	60.99	37.42	15000.0	120.000	300.0	V
319.108500	25.14	---	60.99	35.85	15000.0	120.000	300.0	V
589.059500	---	20.26	60.99	40.73	15000.0	120.000	400.0	V
589.059500	24.76	---	60.99	36.23	15000.0	120.000	400.0	V

(continuation of the "Final\_Result" table from column 14 ...)

Frequency (MHz)	Azimuth (deg)	Corr. (dB/m)	Comment
59.633500	298.0	-21.3	
59.633500	298.0	-21.3	
86.502500	273.0	-24.7	
86.502500	273.0	-24.7	
110.704000	116.0	-21.7	
110.704000	116.0	-21.7	
235.979500	99.0	-18.8	
235.979500	99.0	-18.8	
319.108500	239.0	-15.9	
319.108500	239.0	-15.9	
589.059500	155.0	-7.1	
589.059500	155.0	-7.1	

6/16/2021

&lt;Radiated Measurements at 10 meters&gt;

**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  $\text{m}\ell$  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 : Jeamin Kim

# TEST DATA

## Radiated Emissions (Above 1 GHz)

FCC ID : A3LME6000A

[Room Temperature : 22.1 ± 1.6 °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 (μV/m)	Limits at 300 m (μV/m)
						(dBμV/m)	(μV/m)			
2173	H	100	120	65.78	-8.5	57.28	731.14	0.0055	4.02	37.37
2766	V	200	0	67.79	-6.2	61.59	1200.88	0.0070	8.46	37.37
4952	H	100	0	61.68	2.3	63.98	1581.25	0.0100	15.81	37.37
7415	H	400	270	55.27	5.6	60.87	1105.35	0.0100	11.05	37.37
8626	V	400	0	29.23	6.3	35.53	59.77	0.0100	0.60	37.37
9872	H	400	270	29.22	6.9	36.12	63.97	0.0100	0.64	37.37
12330	V	200	210	43.65	8.4	52.05	400.41	0.0100	4.00	37.37
14802	H	400	270	44.21	12.3	56.51	669.11	0.0100	6.69	37.37
17268	V	200	210	31.19	14.6	45.79	194.76	0.0100	1.95	37.37

&lt;Radiated Measurements at 3 meters&gt;

### NOTES:

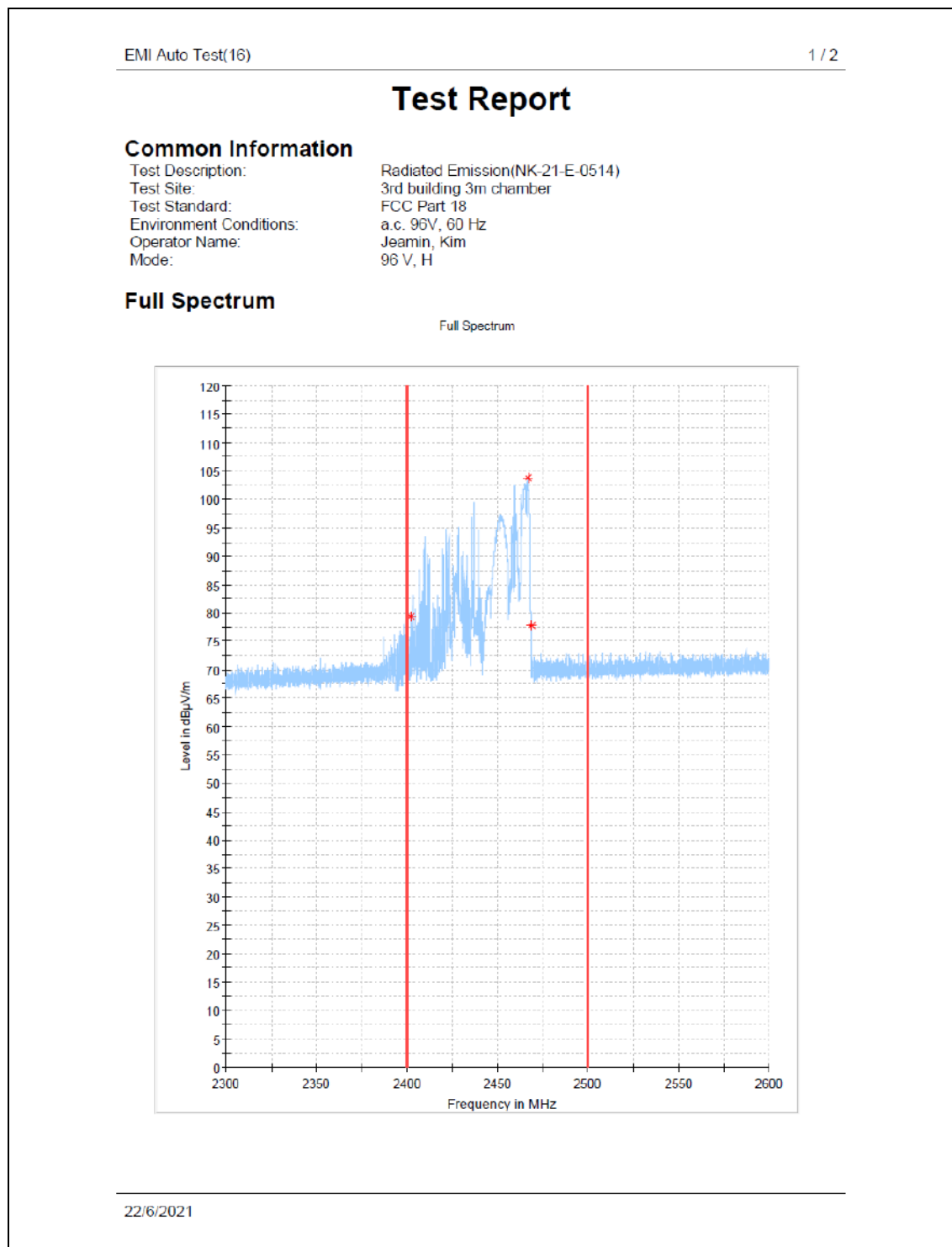
- \* Pol. H=Horizontal V=Vertical
- \*\* Total Loss = Antenna Factor + Cables Loss + Amplifier + HPF (High Pass Filter)
- Field Strength (at 300 m) (μV/m) =  $K * 10^{[Fieldstrength\ at\ 3\ m\ (dB\mu V/m) / 20]}$
- The limit at 300 meters is  $25 * \sqrt{RF\ Power/500}$
- Load for measurement of radiation 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.
- The test was performed at peak detector mode with average.
- The limit for consumer device is on the FCC Part section 18.305.



Tested by : Jeamin Kim

# PLOTS OF EMISSIONS

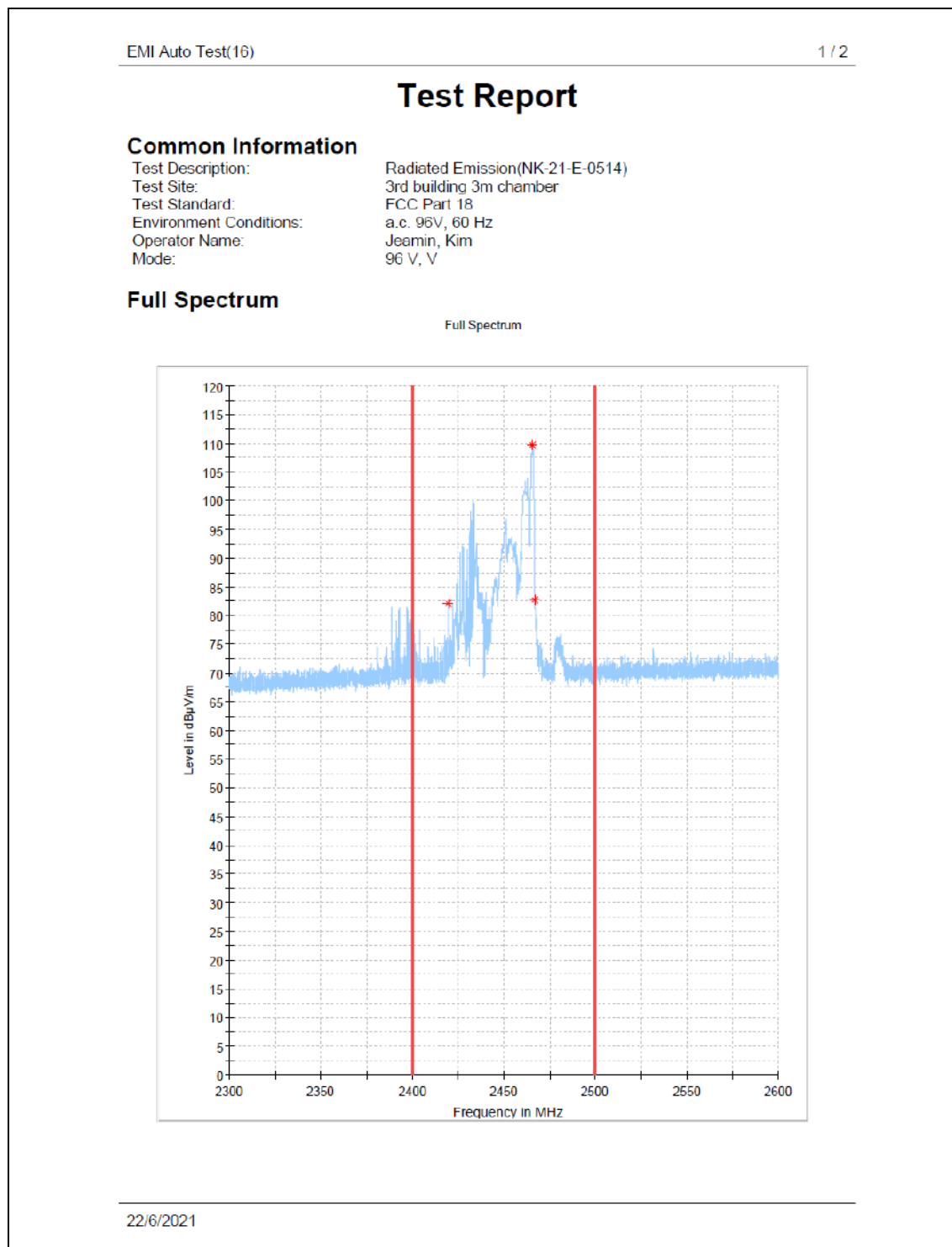
## • Frequency vs Line Voltage Variation Test



Horizontal (96 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

## • Frequency vs Line Voltage Variation Test

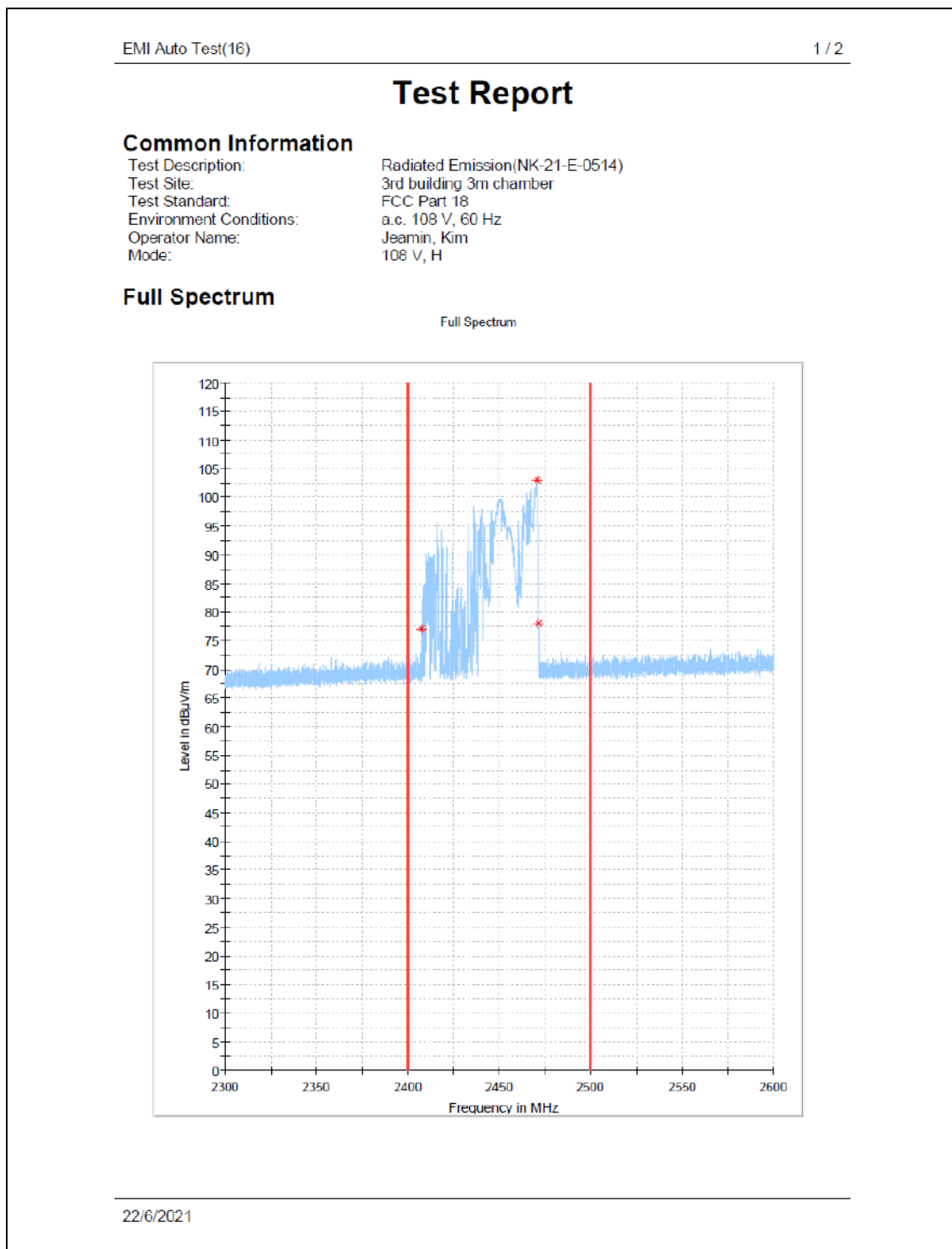


Vertical (96 V, 1 000 mℓ)



# PLOTS OF EMISSIONS

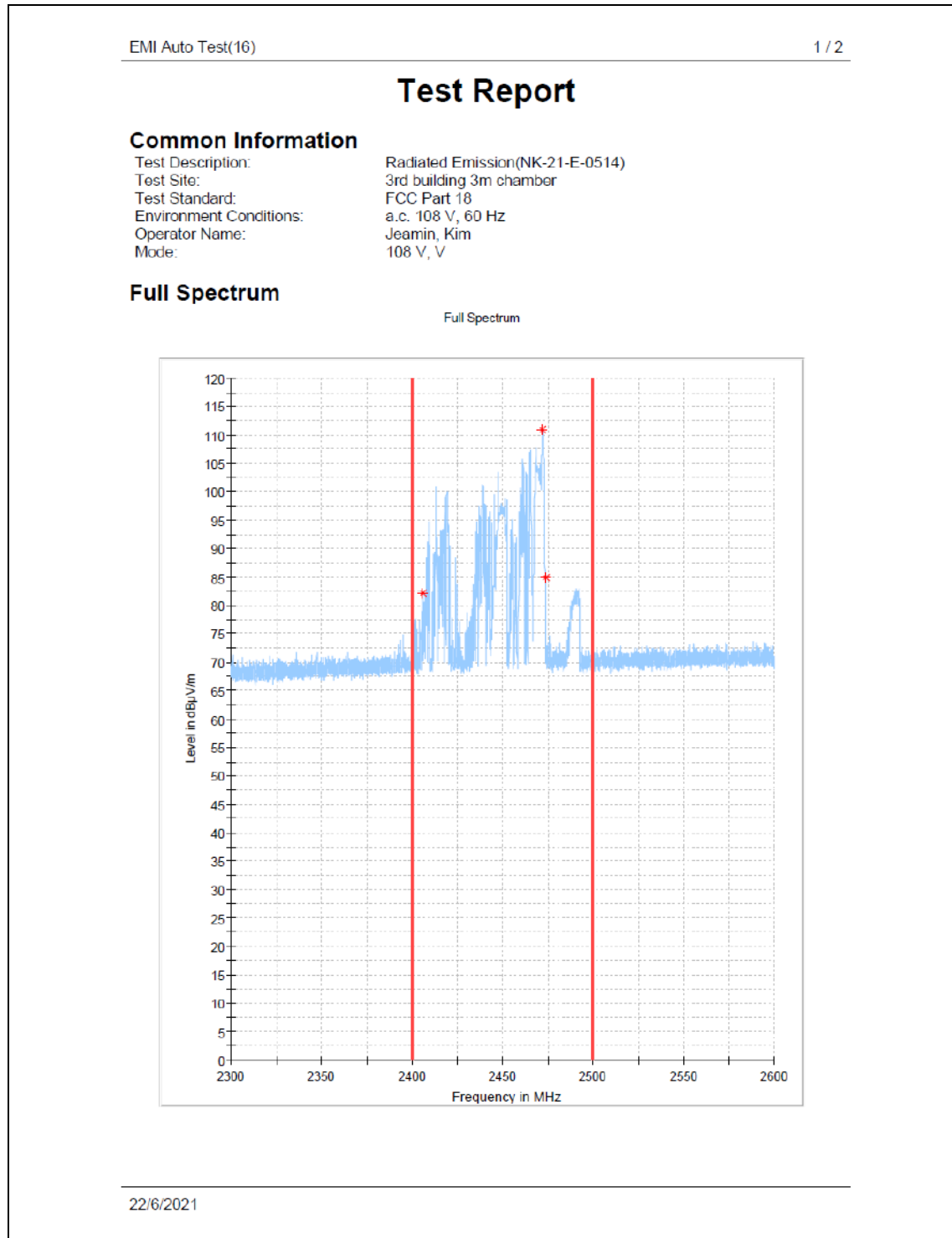
## • Frequency vs Line Voltage Variation Test



Horizontal (108 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

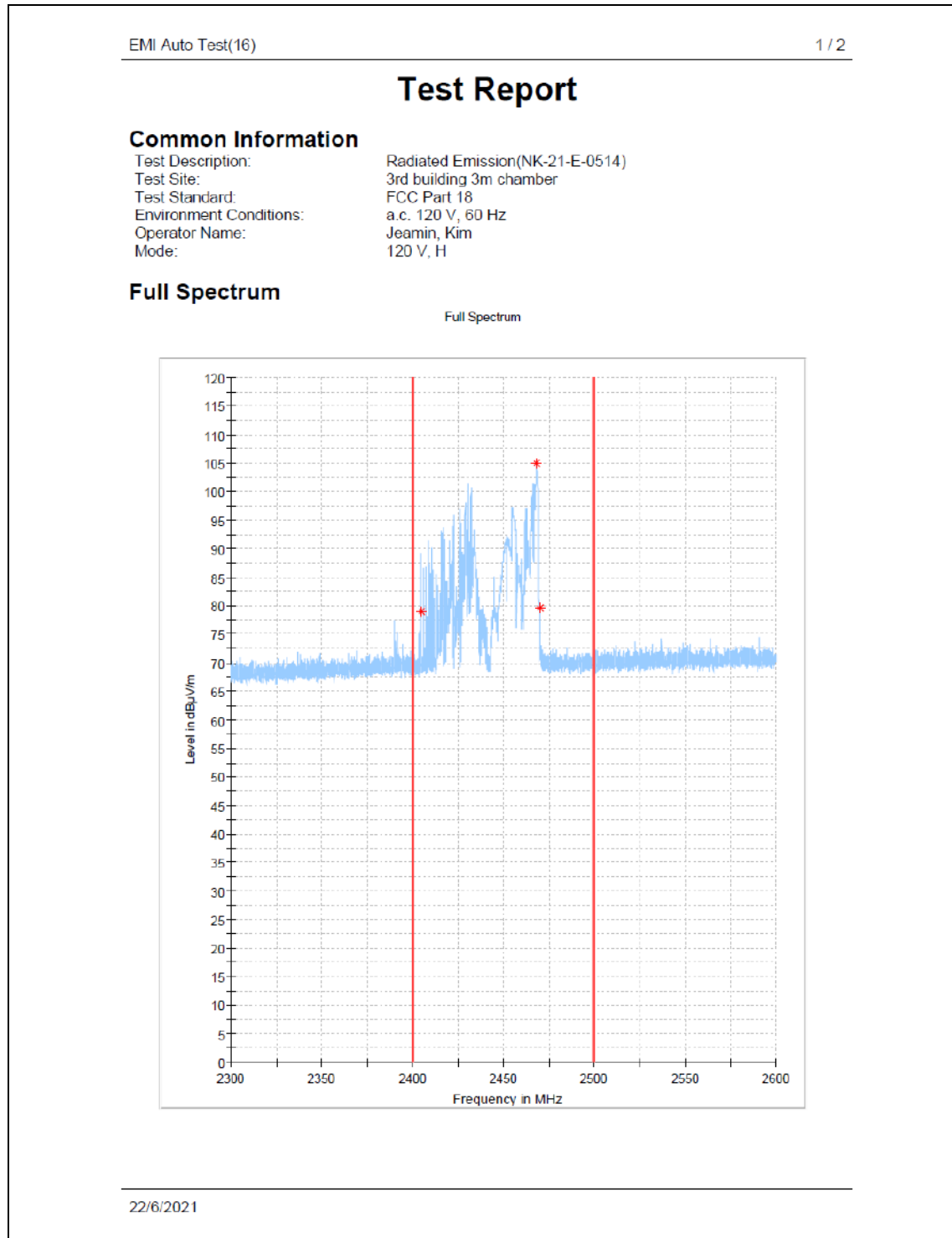
## • Frequency vs Line Voltage Variation Test



Vertical (108 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

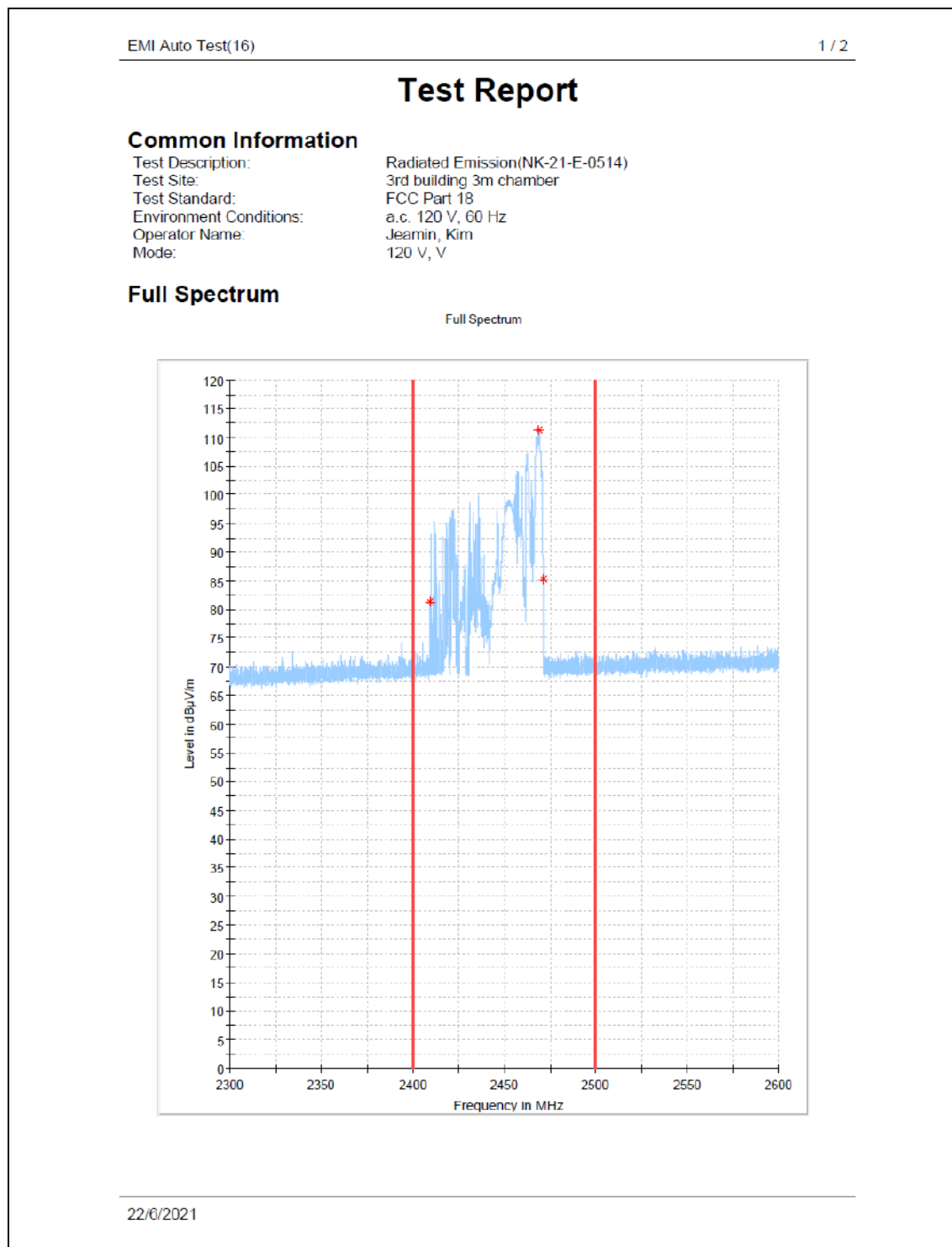
## • Frequency vs Line Voltage Variation Test



Horizontal (120 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

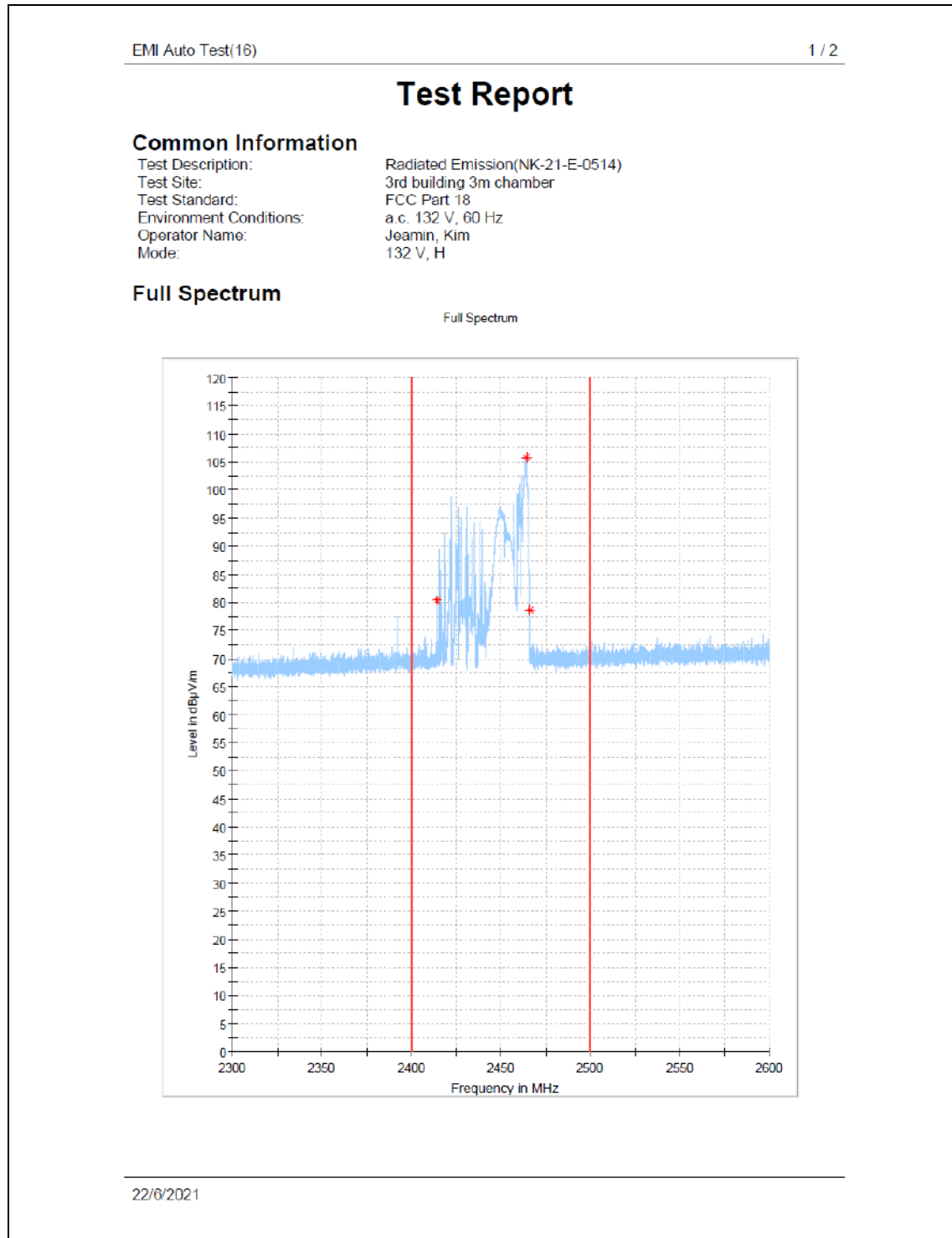
## • Frequency vs Line Voltage Variation Test



Vertical (120 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

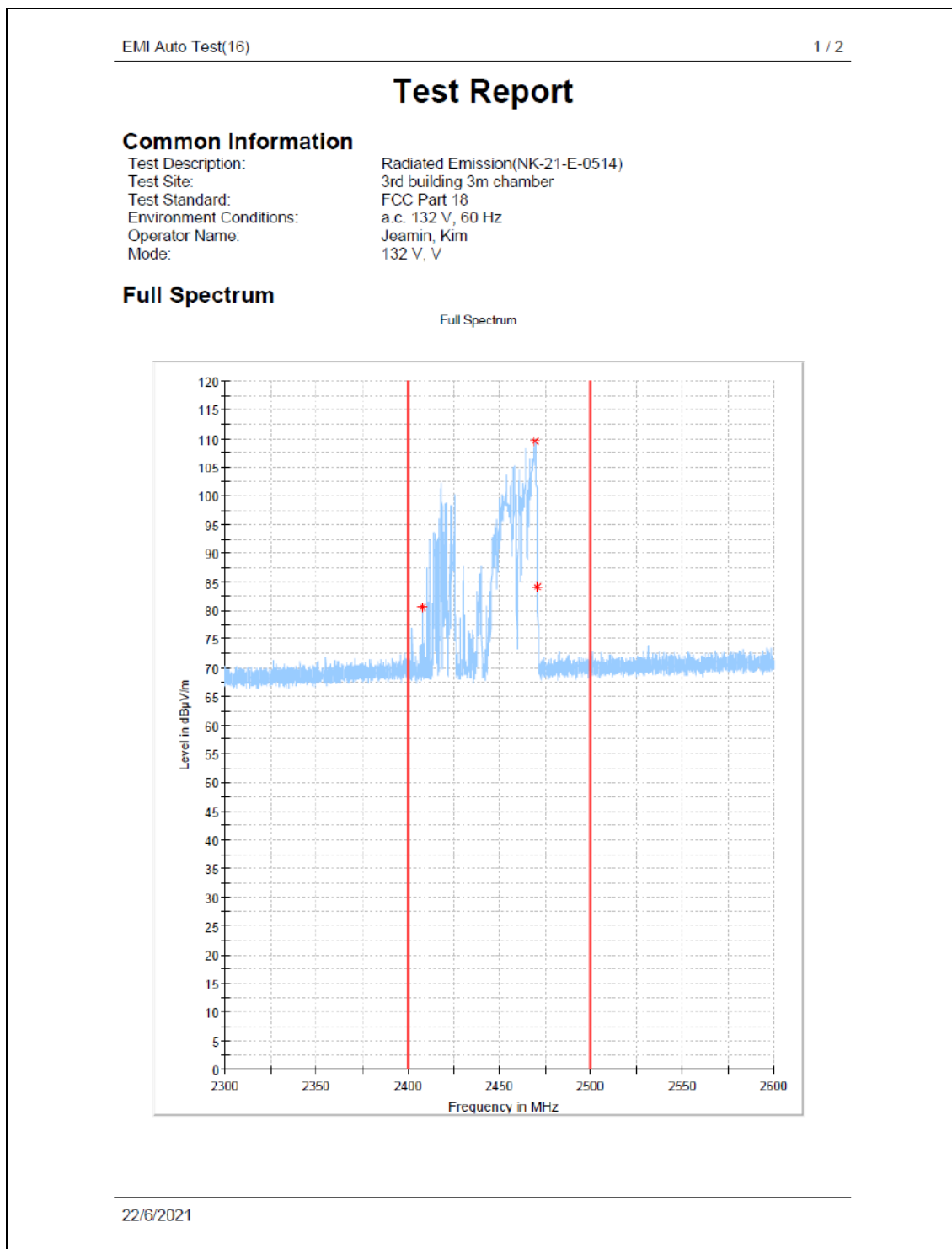
## • Frequency vs Line Voltage Variation Test



Horizontal (132 V, 1 000 ml)

# PLOTS OF EMISSIONS

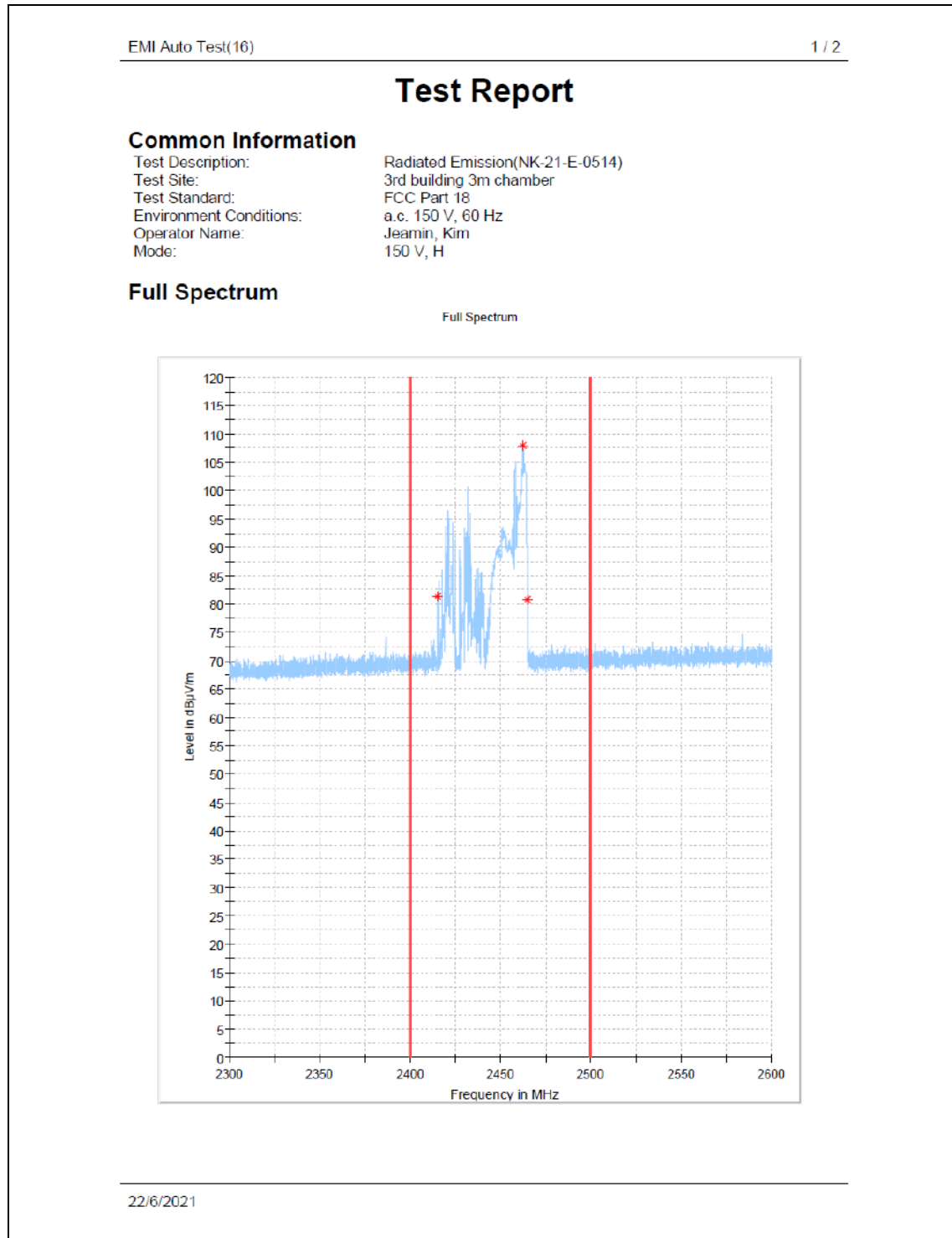
## • Frequency vs Line Voltage Variation Test



Vertical (132 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

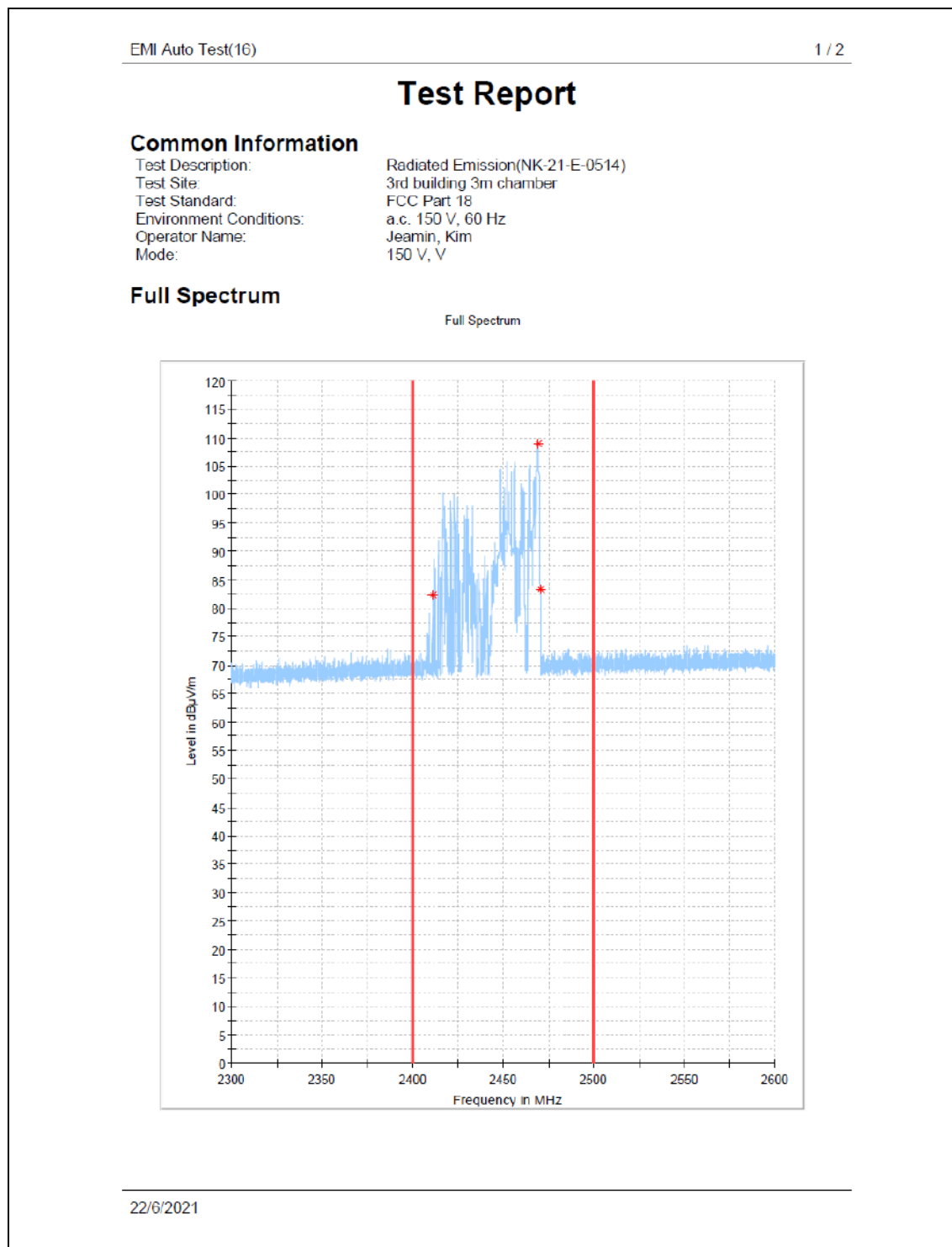
## • Frequency vs Line Voltage Variation Test



Horizontal (150 V, 1 000 mℓ)

# PLOTS OF EMISSIONS

## • Frequency vs Line Voltage Variation Test

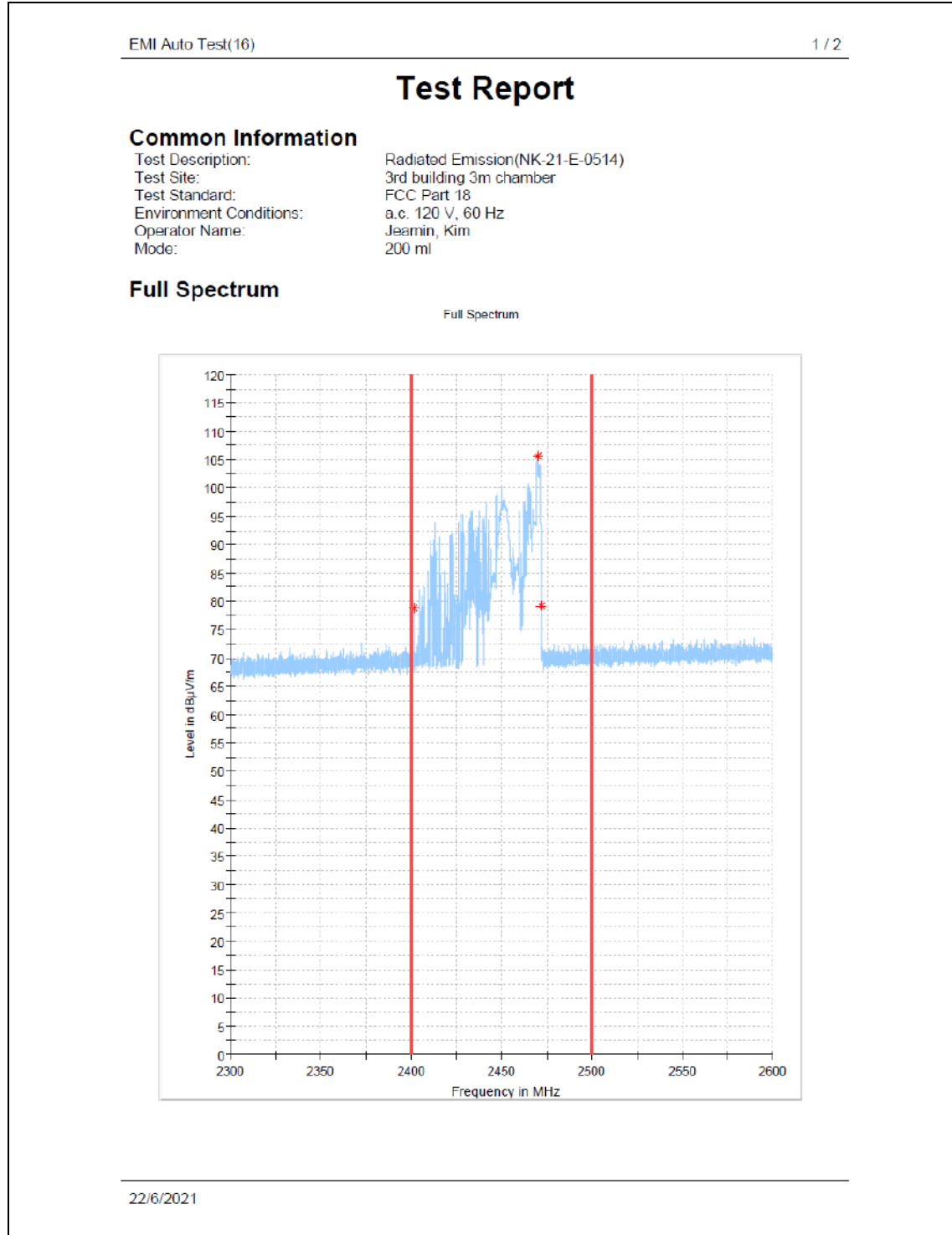


Vertical (150 V, 1 000 mℓ)



# PLOTS OF EMISSIONS

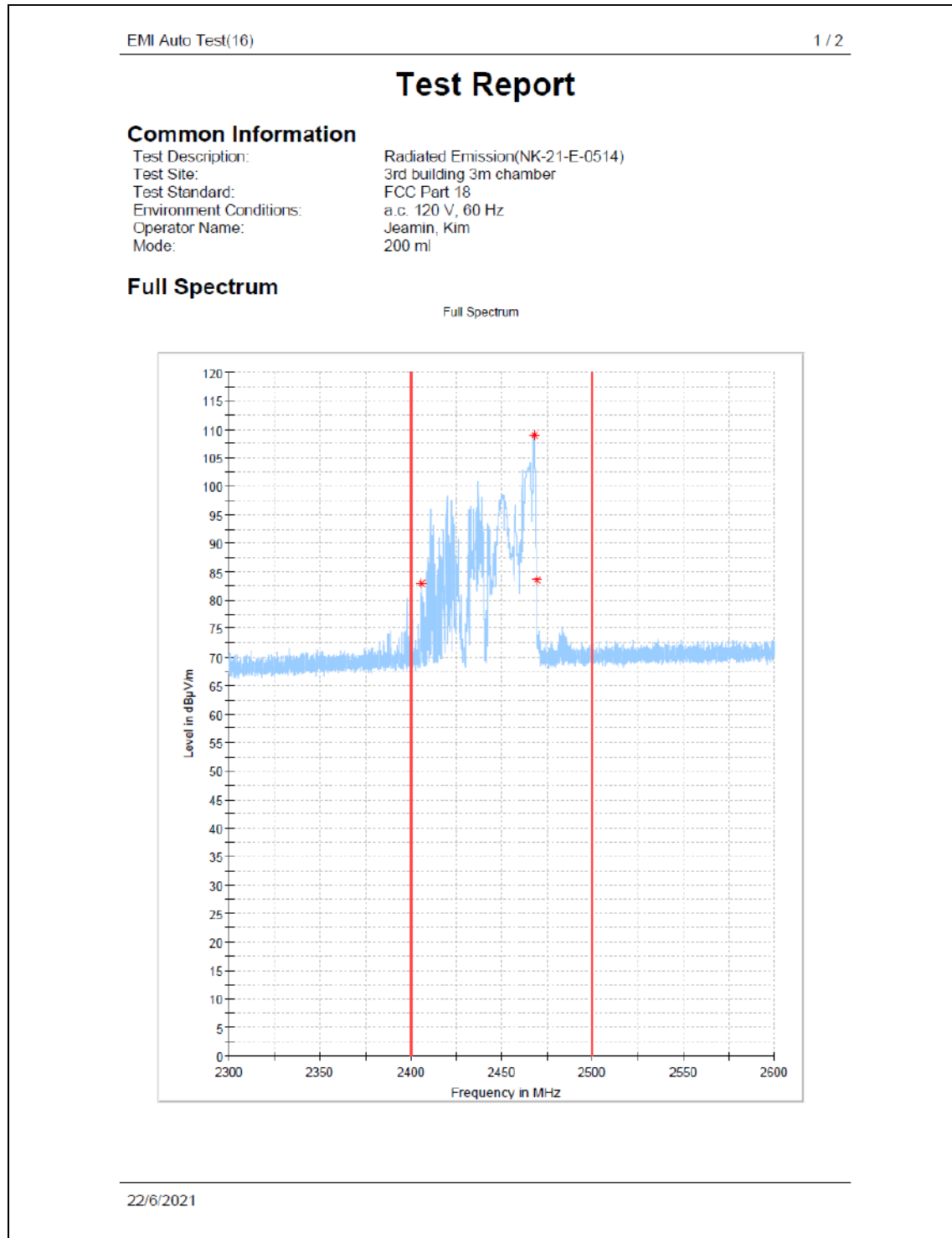
## • Frequency vs Load Variation Test



Horizontal (120 V, 200 ml)

# PLOTS OF EMISSIONS

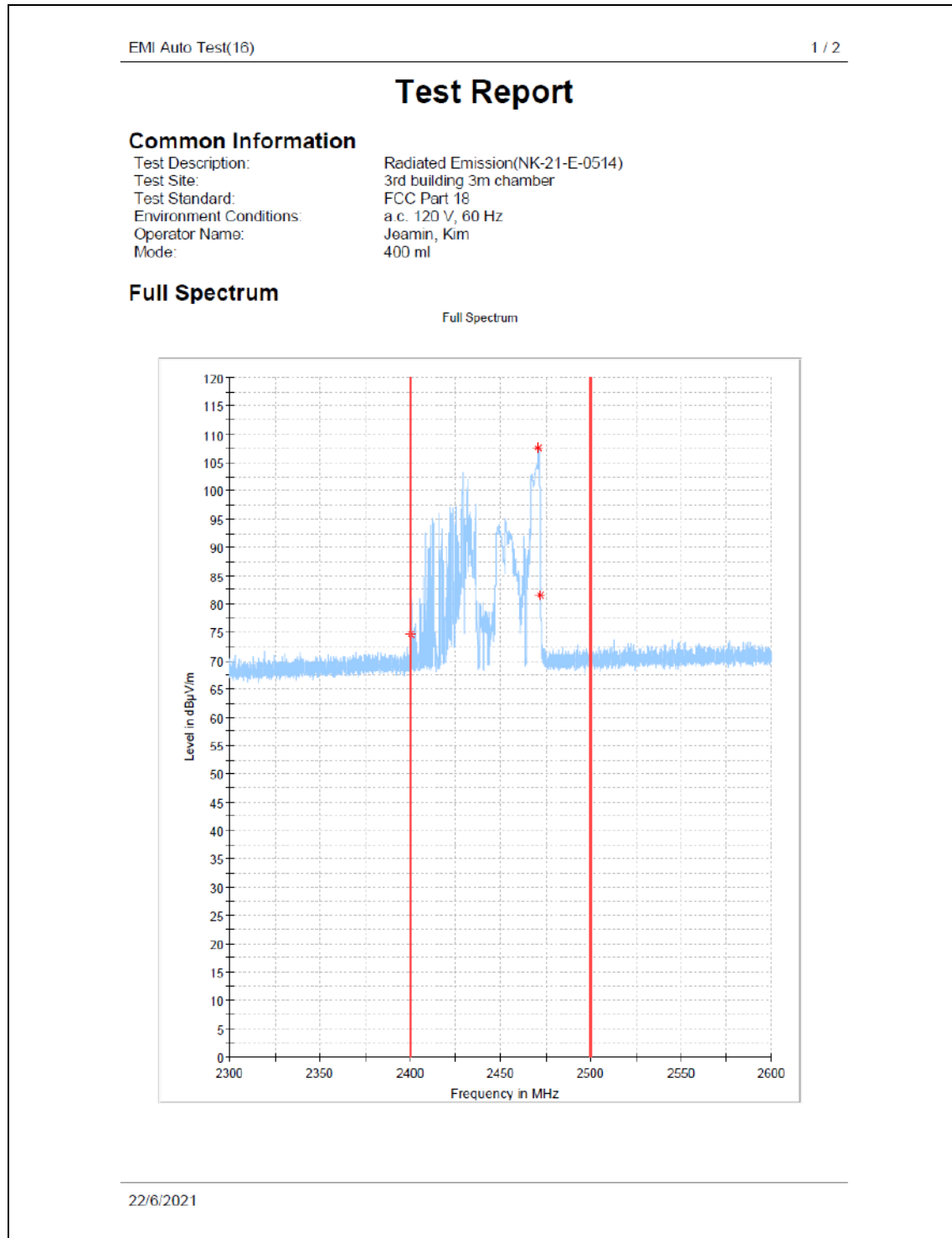
## • Frequency vs Load Variation Test



Vertical (120 V, 200 ml)

# PLOTS OF EMISSIONS

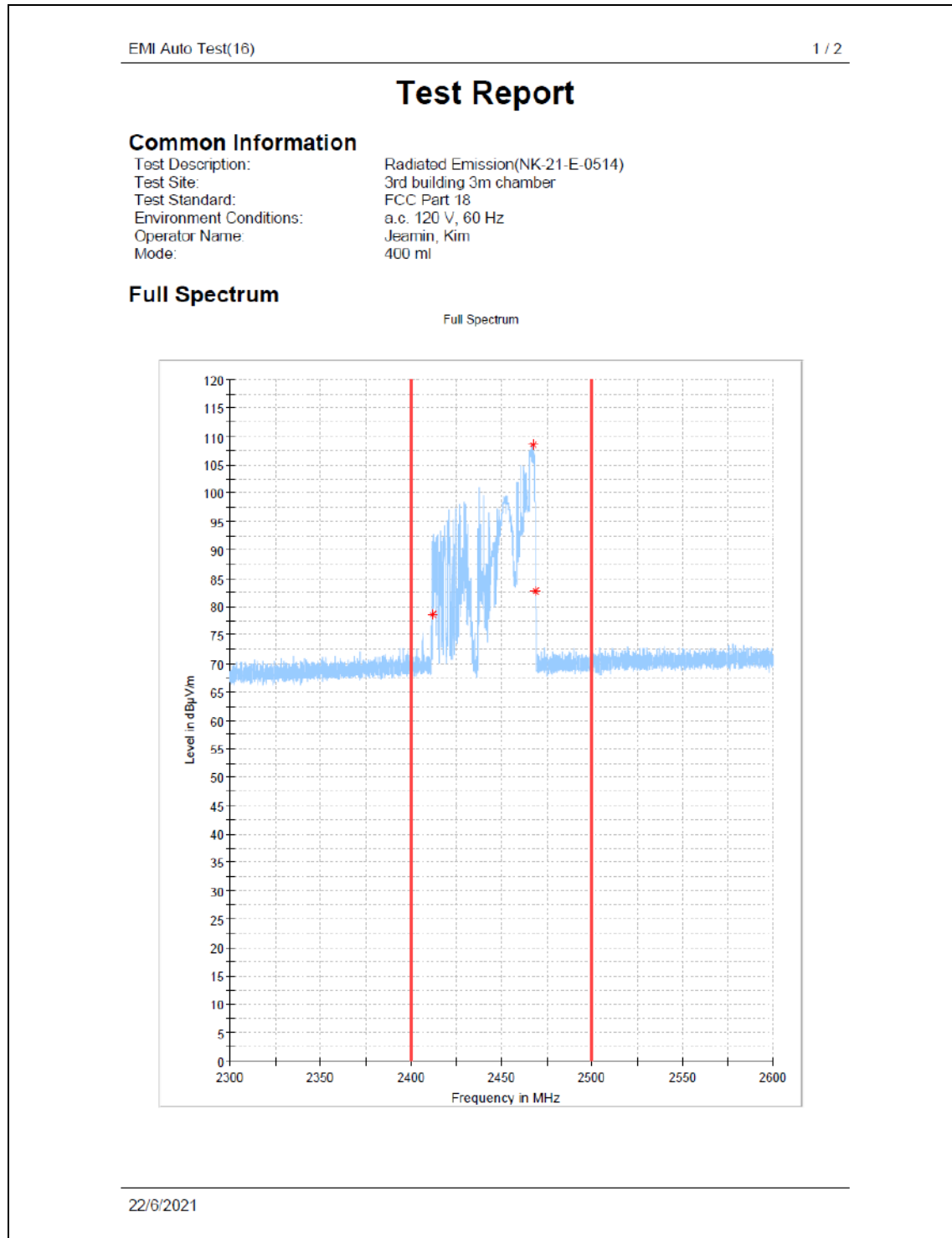
## • Frequency vs Load Variation Test



Horizontal (120 V, 400 ml)

# PLOTS OF EMISSIONS

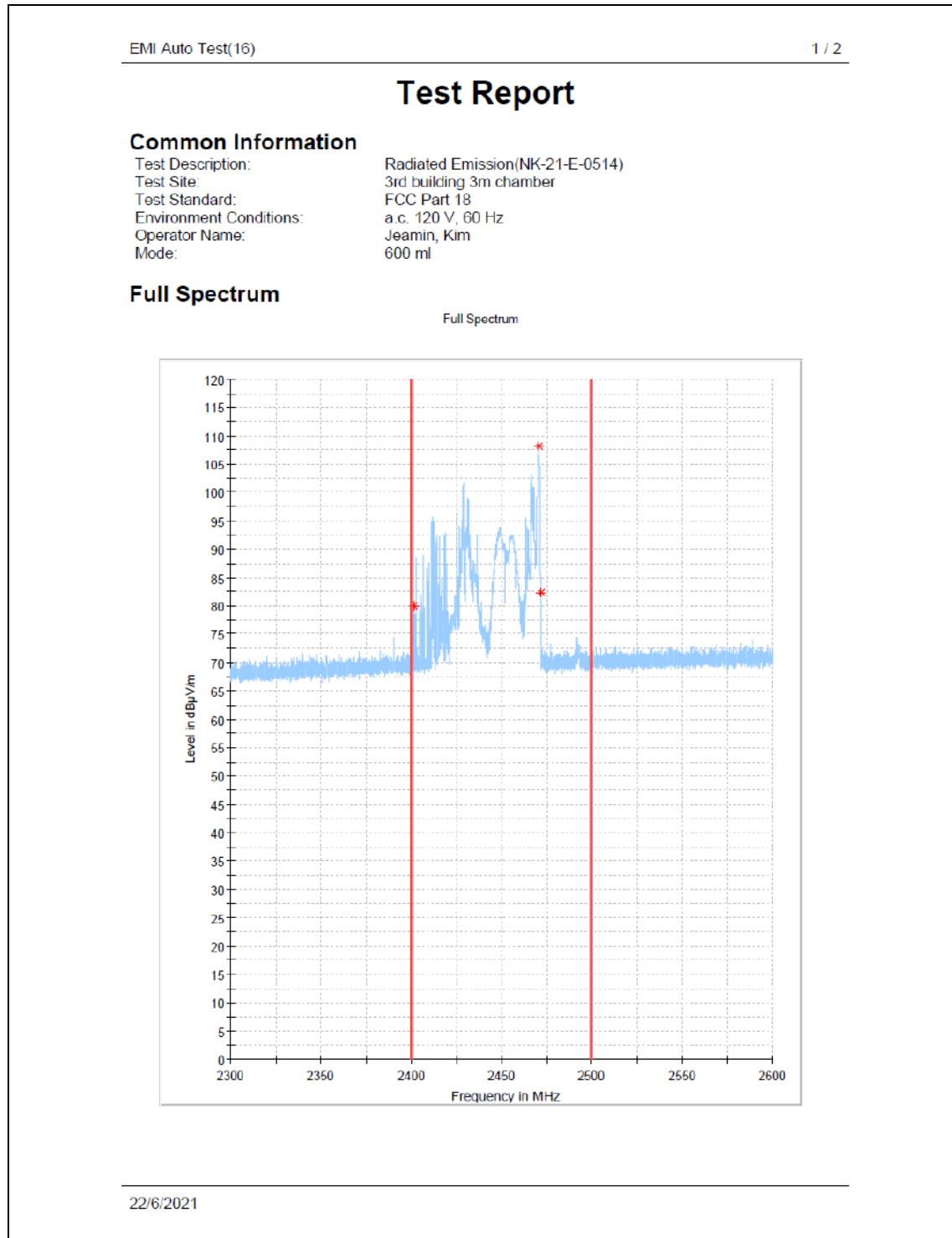
## • Frequency vs Load Variation Test



Vertical (120 V, 400 ml)

# PLOTS OF EMISSIONS

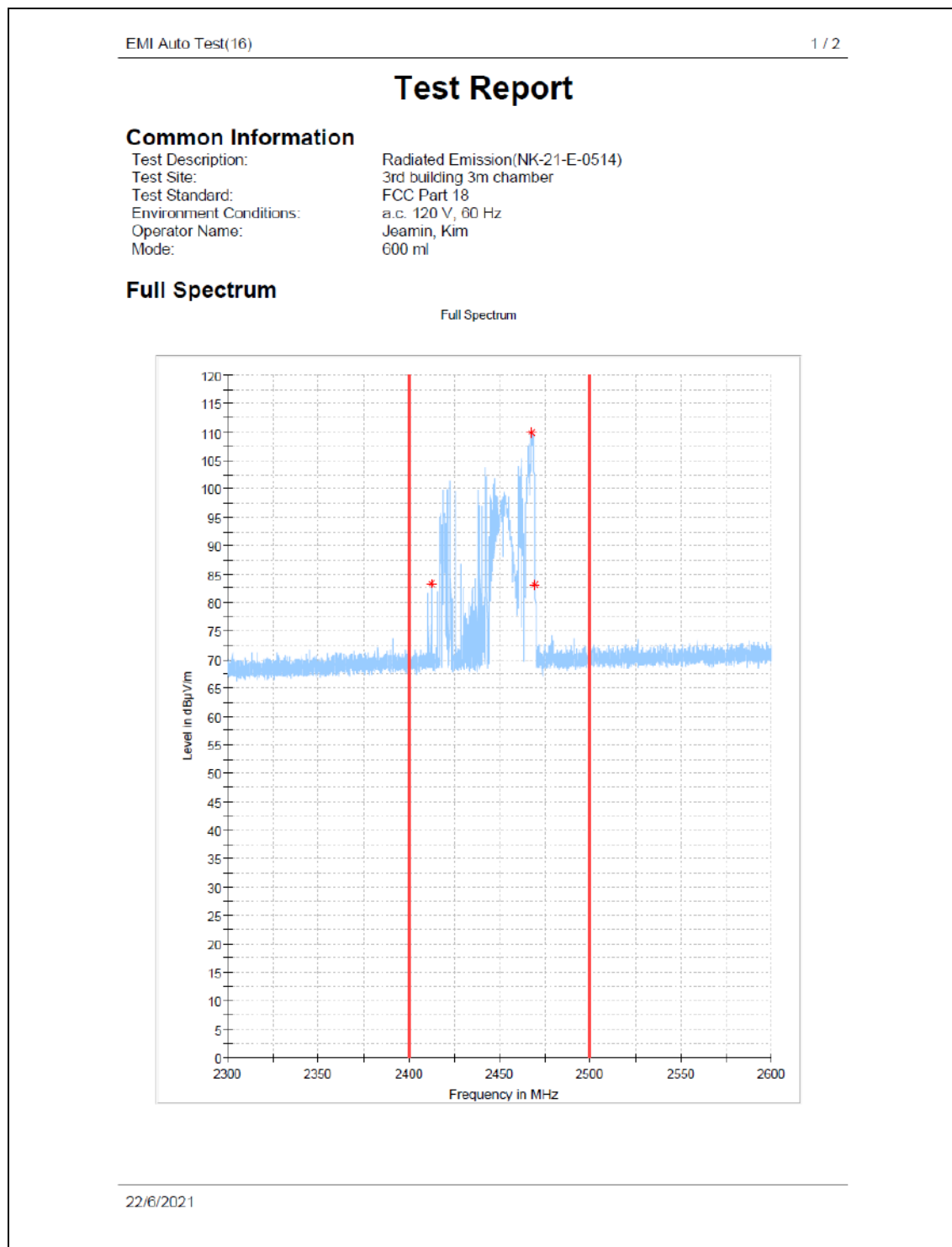
## • Frequency vs Load Variation Test



Horizontal (120 V, 600 ml)

# PLOTS OF EMISSIONS

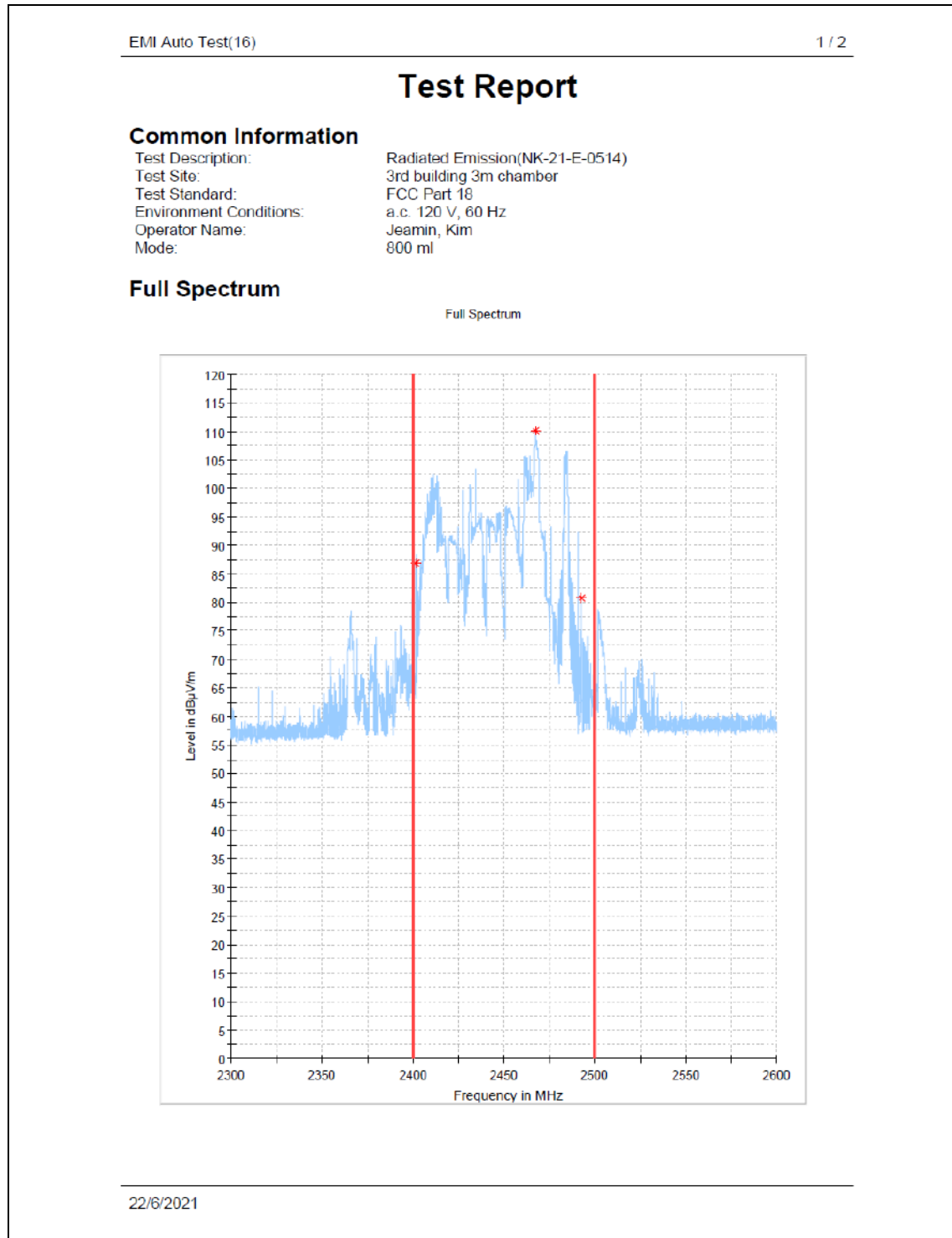
## • Frequency vs Load Variation Test



Vertical (120 V, 600 ml)

# PLOTS OF EMISSIONS

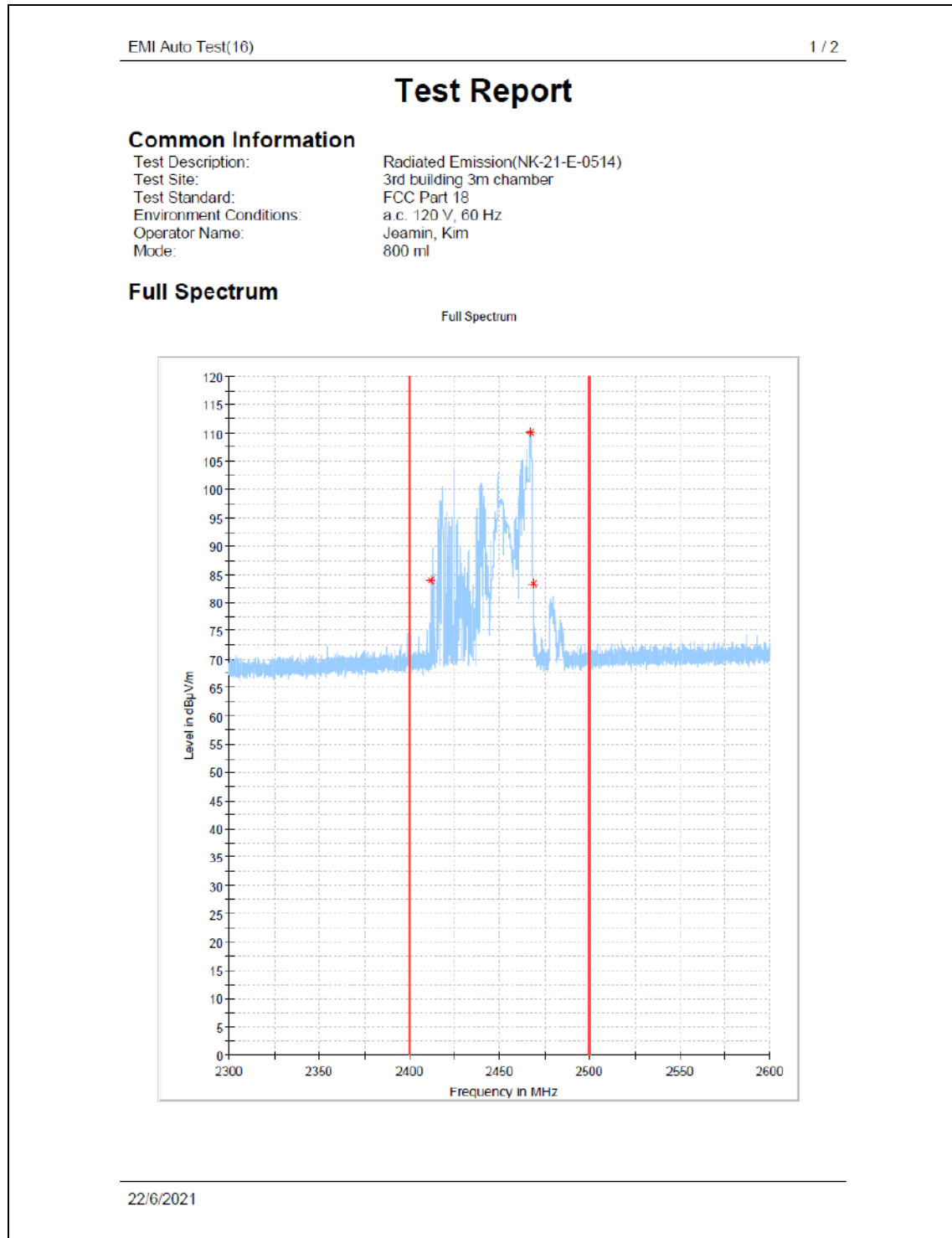
## • Frequency vs Load Variation Test



Horizontal (120 V, 800 ml)

# PLOTS OF EMISSIONS

## • Frequency vs Load Variation Test

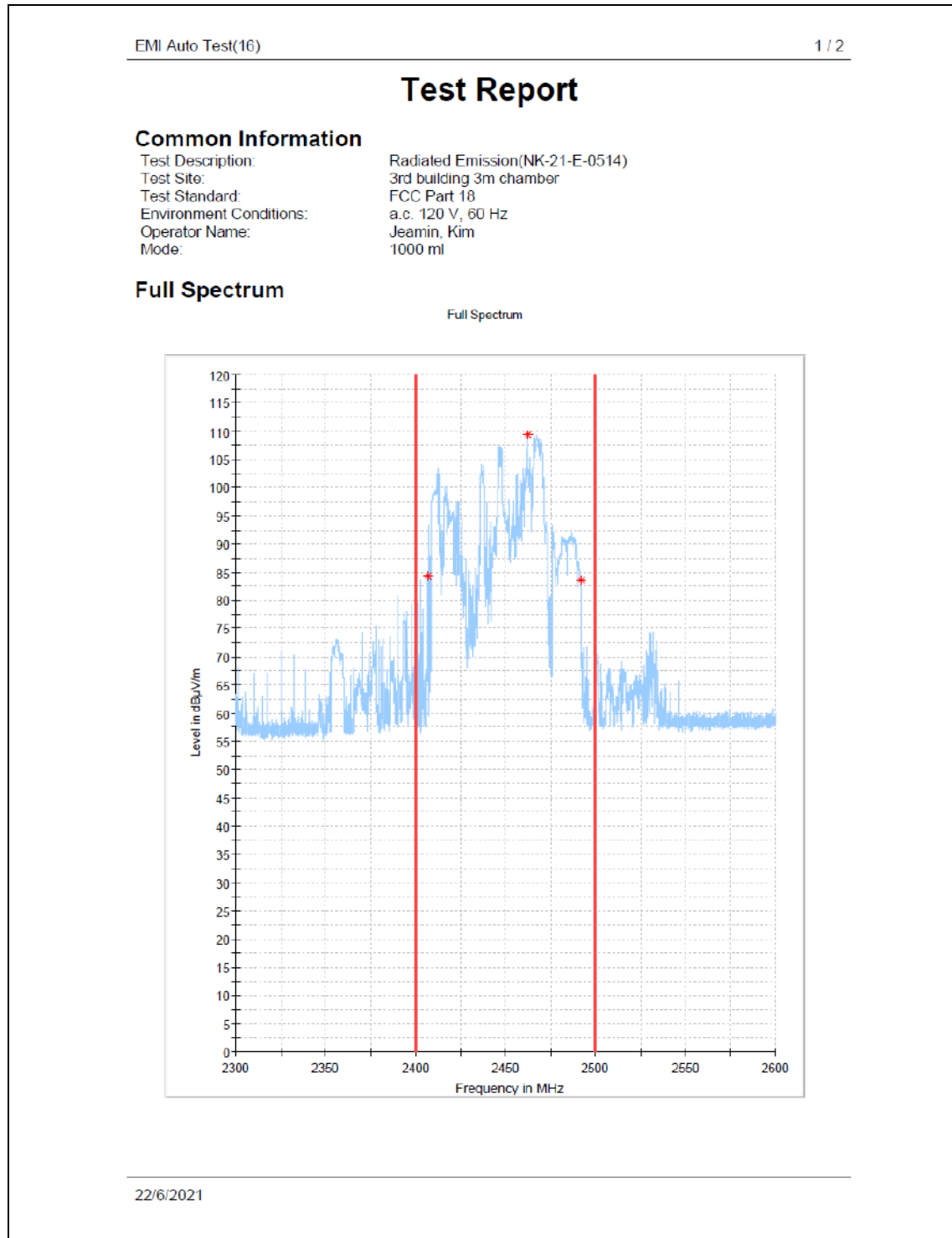


Vertical (120 V, 800 ml)



# PLOTS OF EMISSIONS

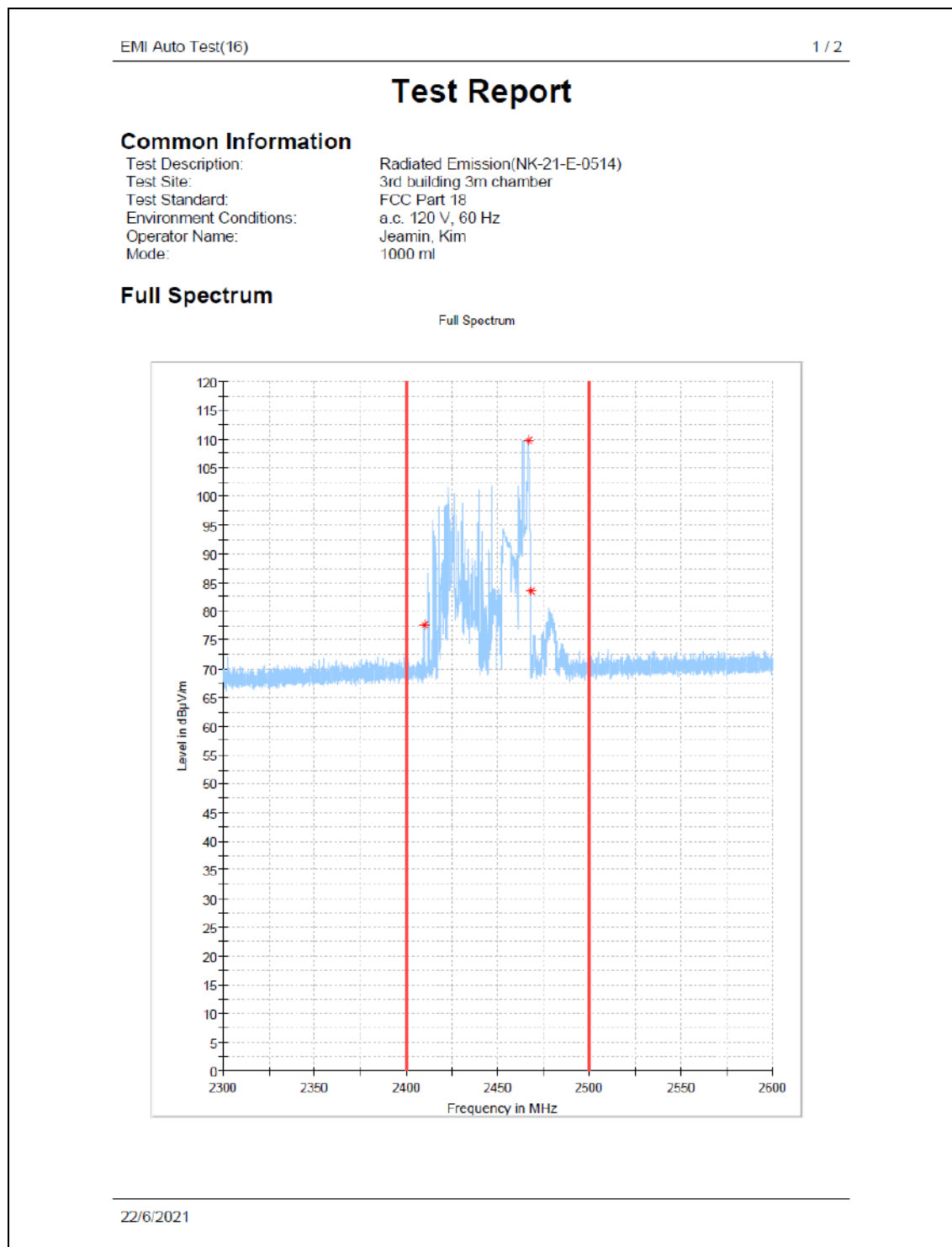
## • Frequency vs Load Variation Test



Horizontal (120 V, 1 000 ml)

# PLOTS OF EMISSIONS

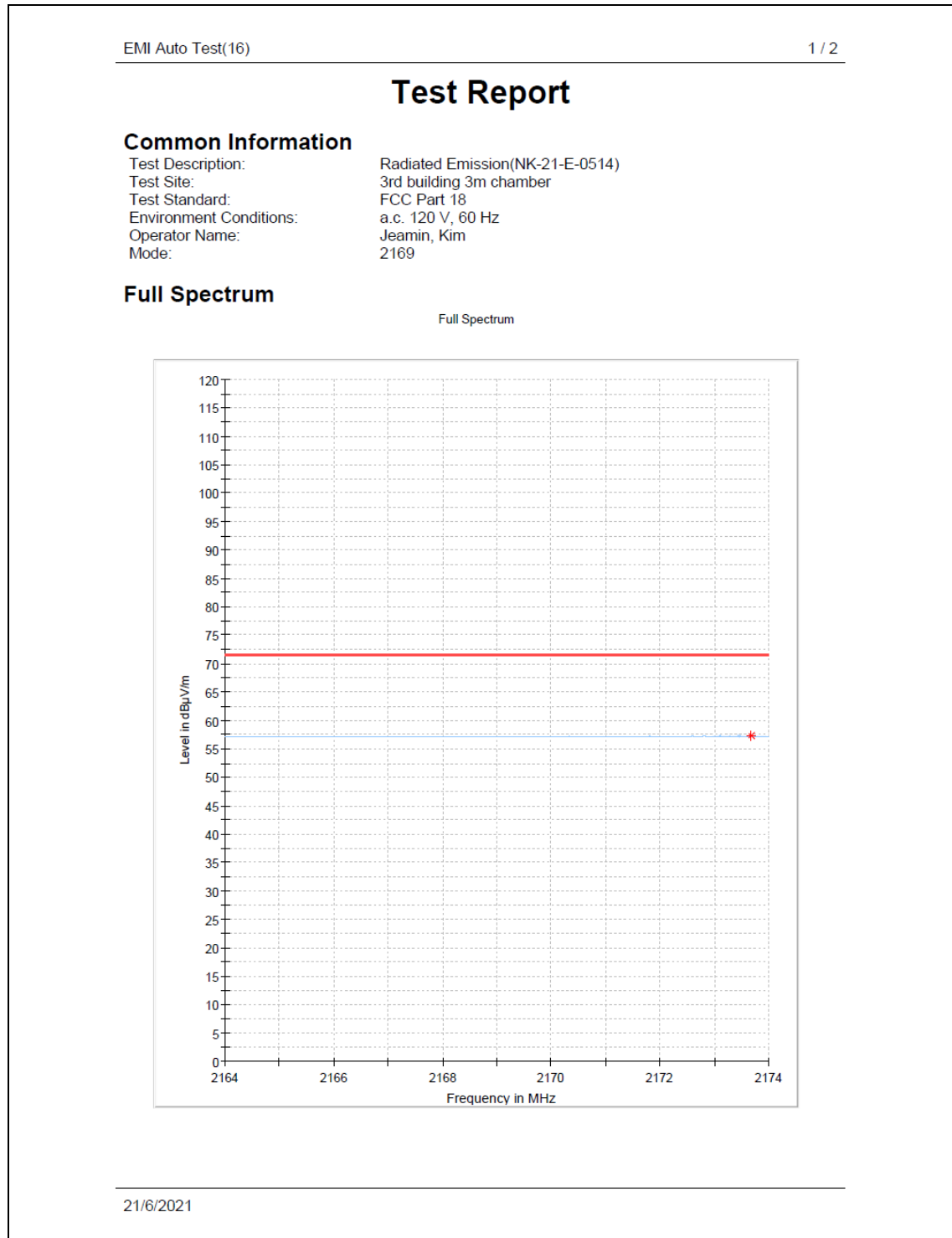
## • Frequency vs Load Variation Test



Vertical (120 V, 1 000 ml)

# PLOTS OF EMISSIONS

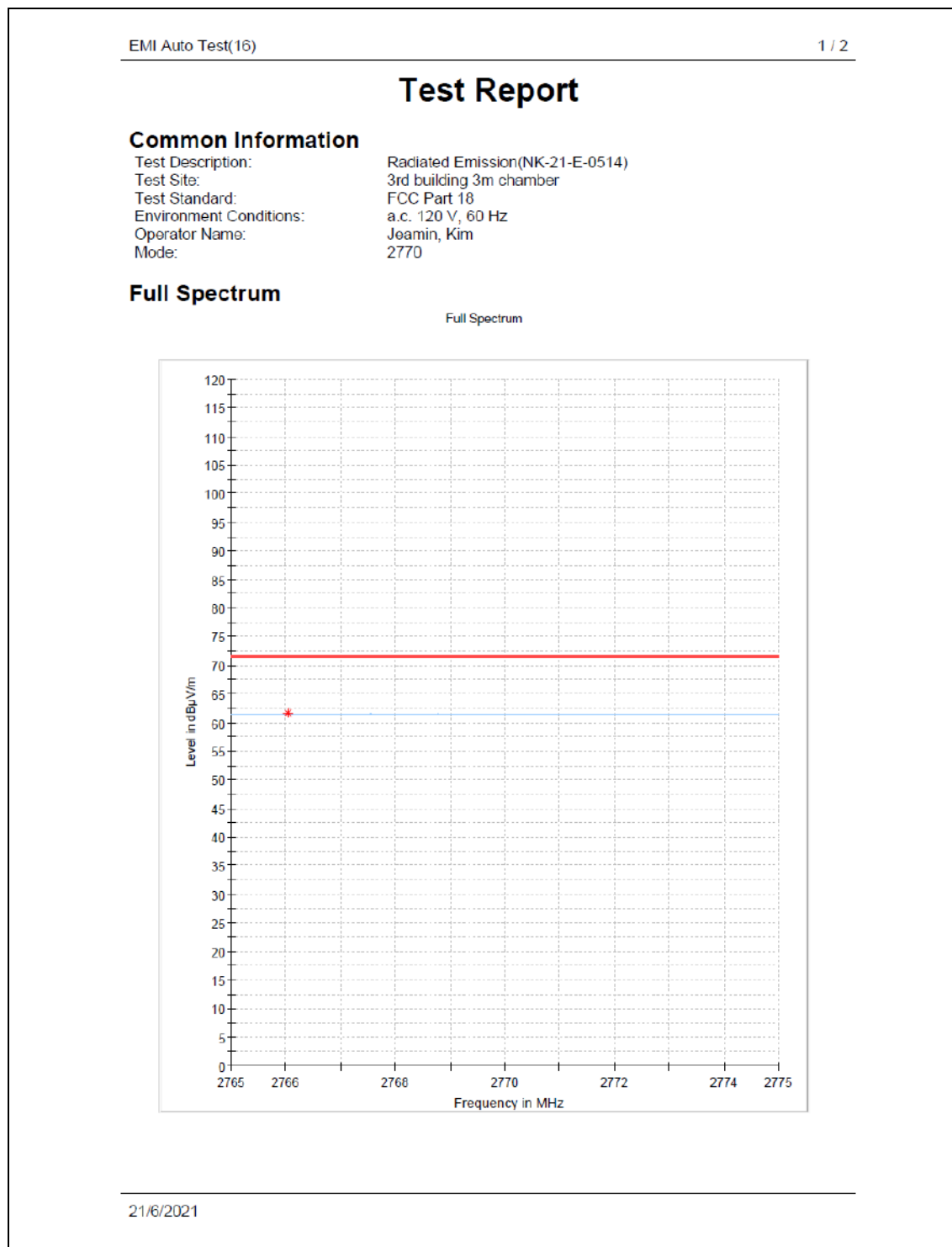
## Radiated Emissions (Above 1 GHz)



2 173.66 MHz

# PLOTS OF EMISSIONS

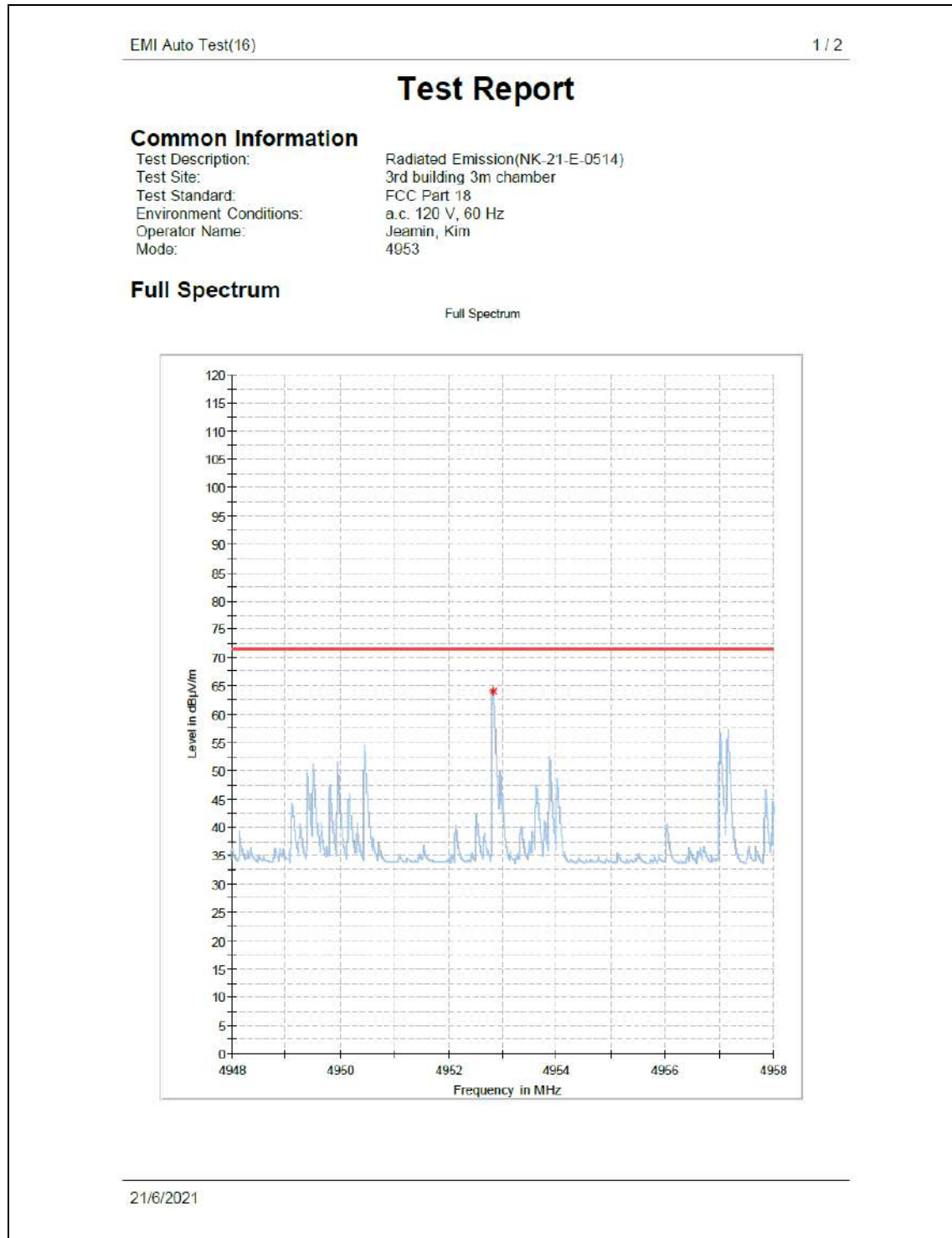
## Radiated Emissions (Above 1 GHz)



2 766.04 MHz

# PLOTS OF EMISSIONS

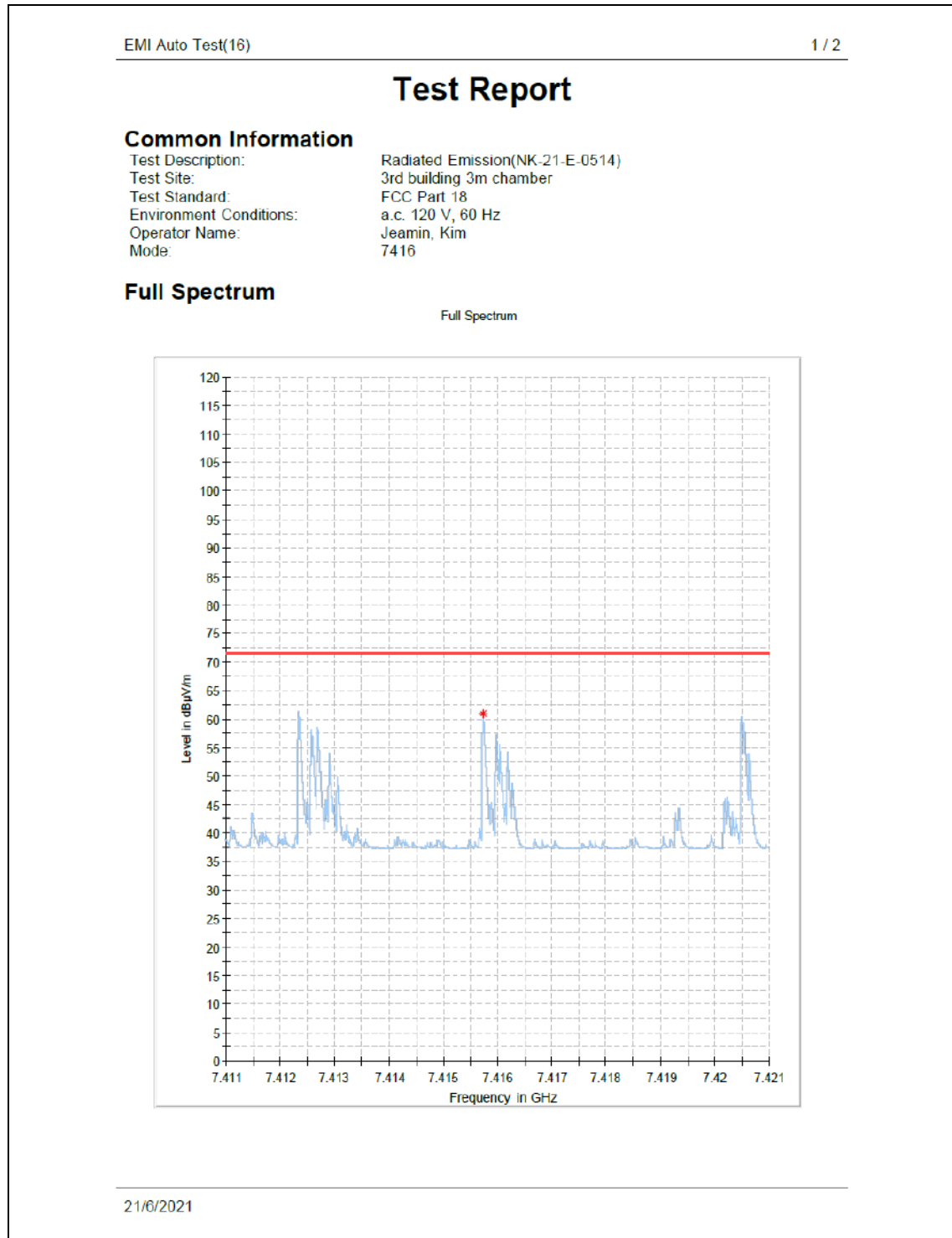
## Radiated Emissions (Above 1 GHz)



4 952.82 MHz

# PLOTS OF EMISSIONS

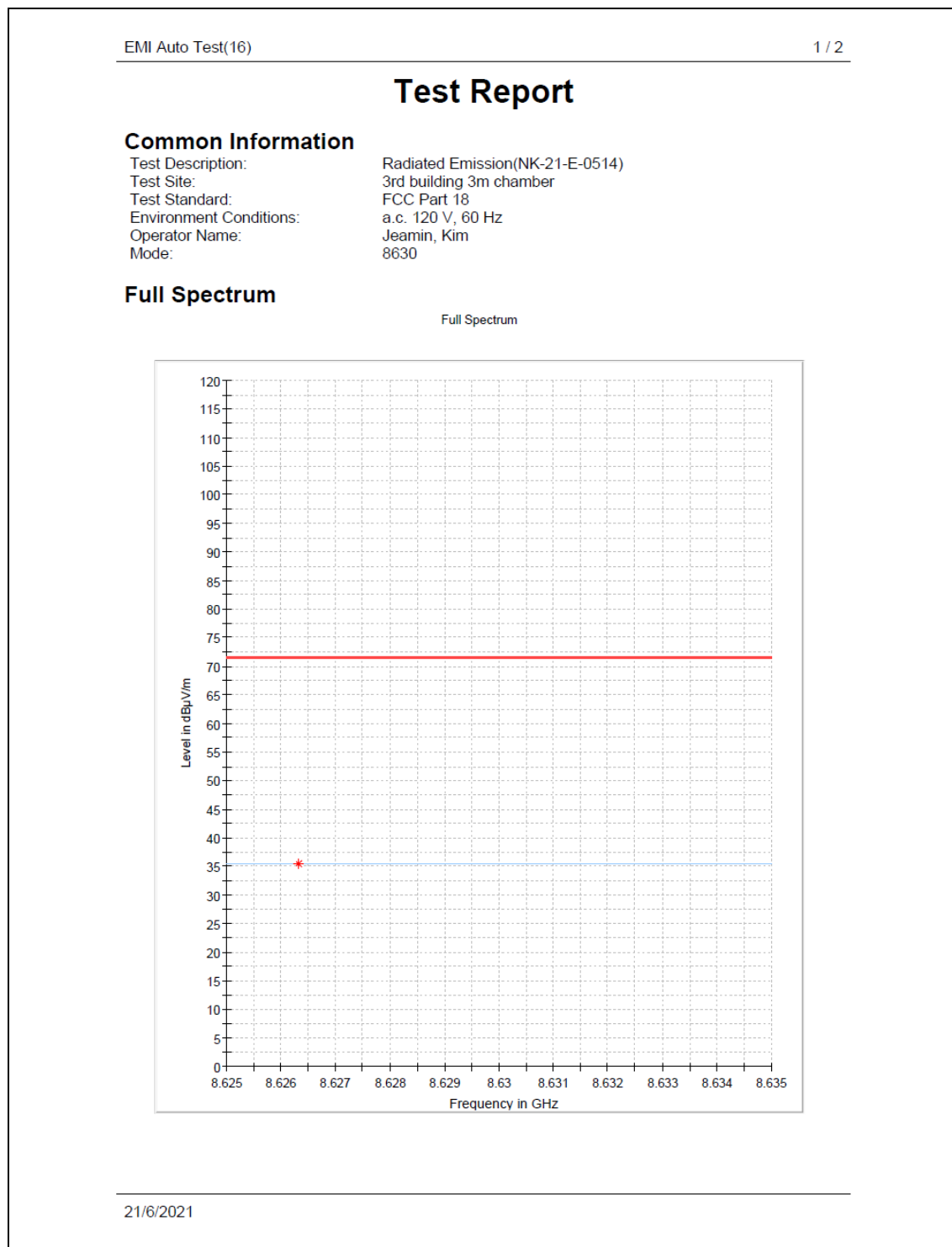
## Radiated Emissions (Above 1 GHz)



7 415.74 MHz

# PLOTS OF EMISSIONS

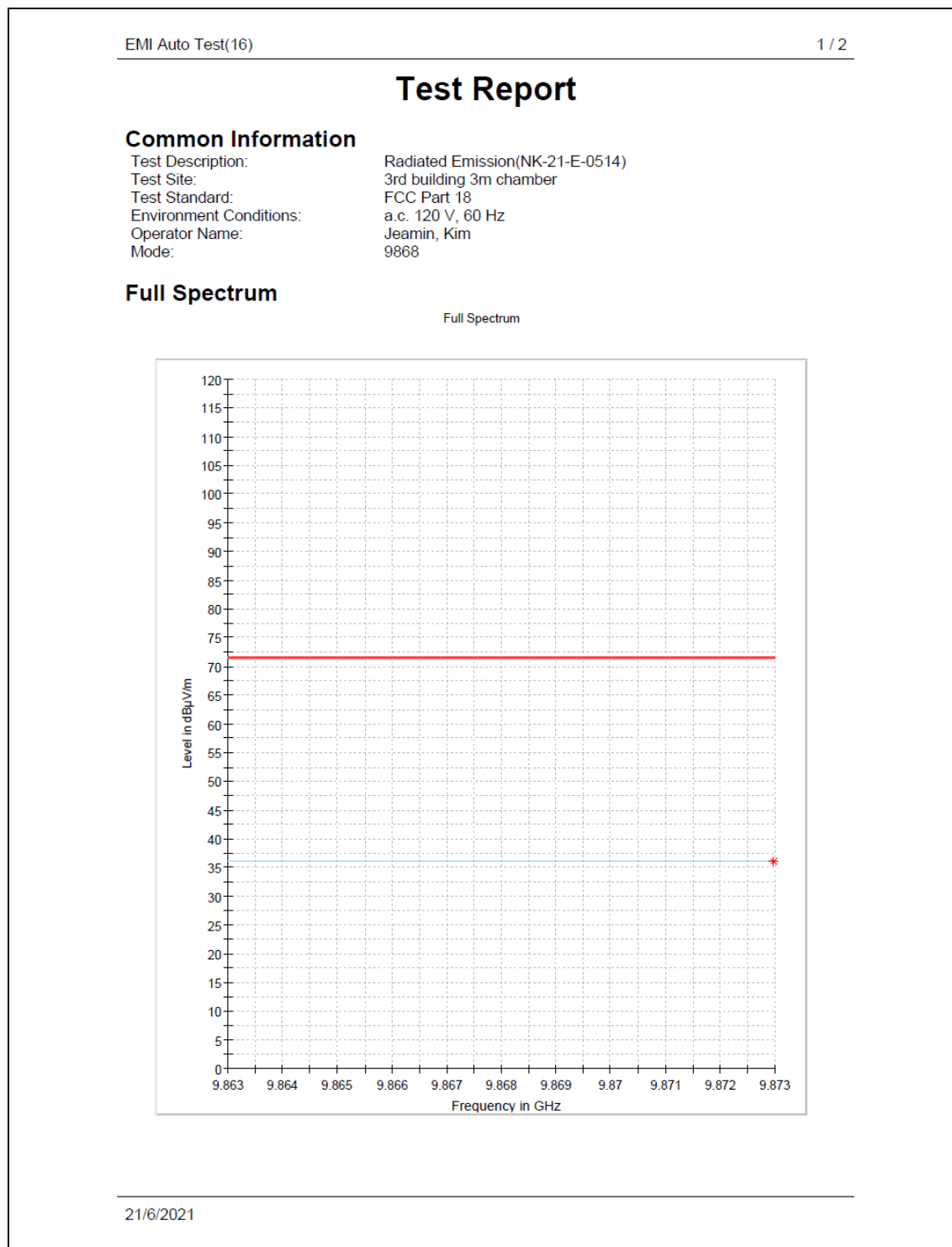
## Radiated Emissions (Above 1 GHz)



**8 626.32 MHz**

# PLOTS OF EMISSIONS

## Radiated Emissions (Above 1 GHz)

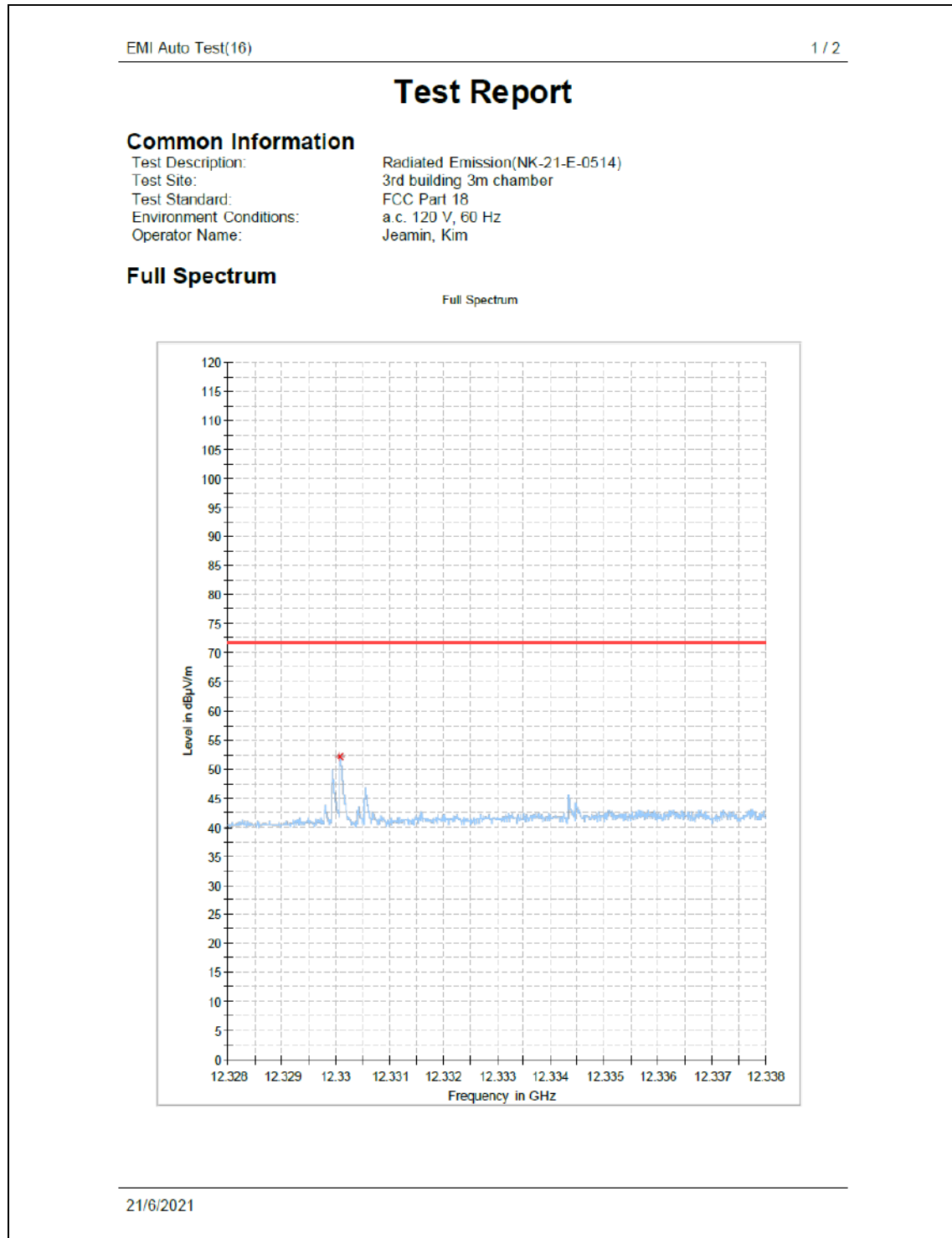


9 872.98 MHz



# PLOTS OF EMISSIONS

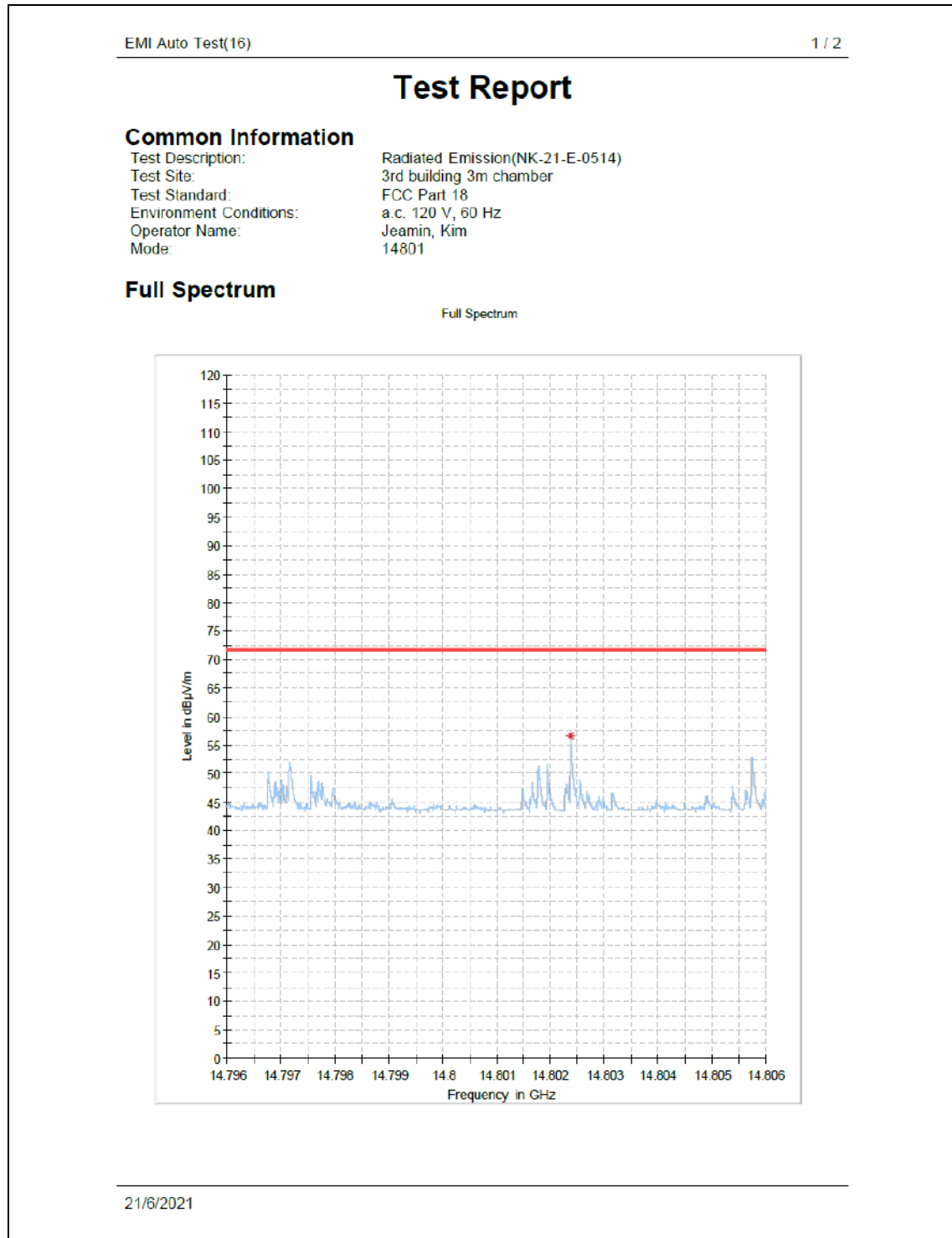
## Radiated Emissions (Above 1 GHz)



12 330.10 MHz

# PLOTS OF EMISSIONS

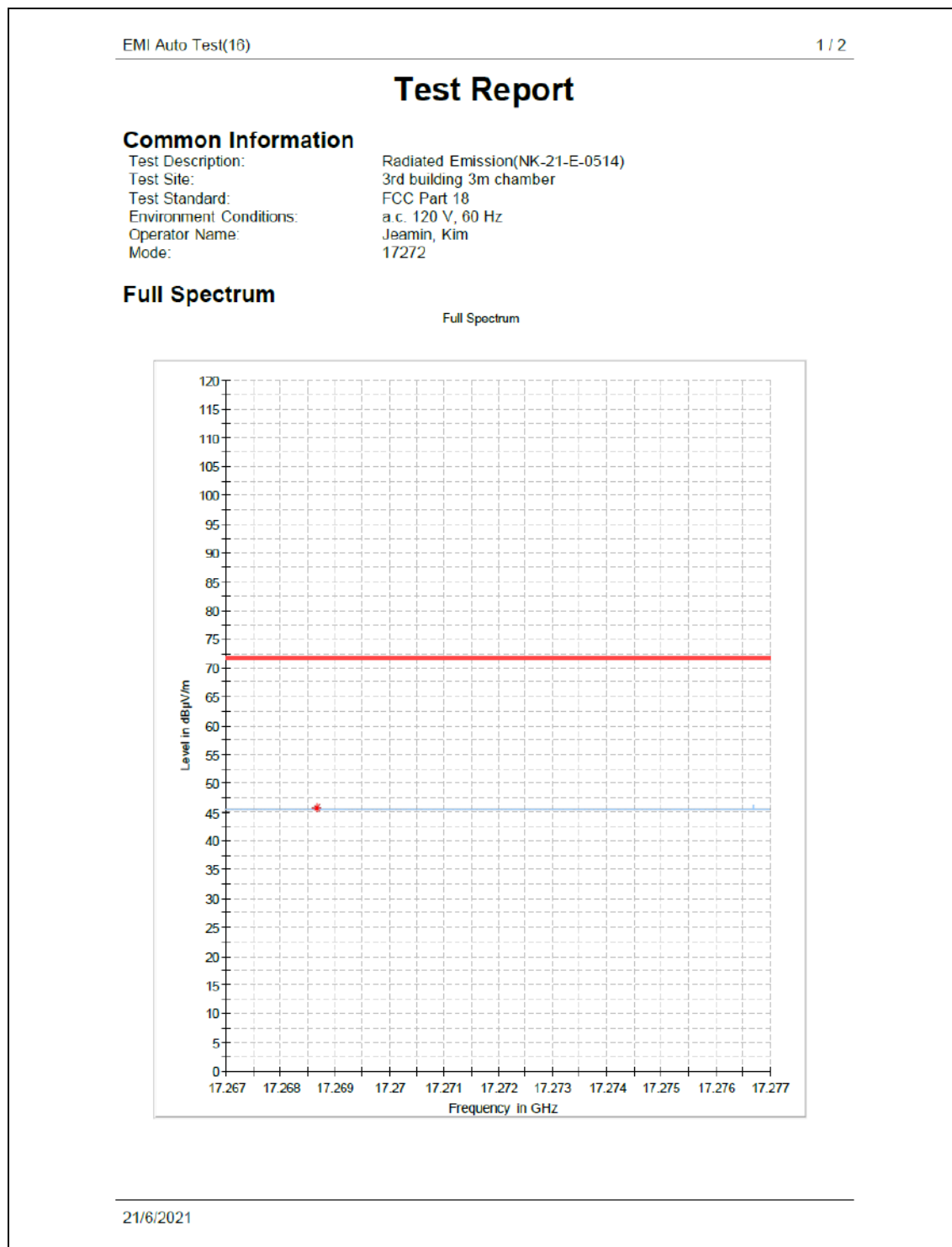
## Radiated Emissions (Above 1 GHz)



14 802.38 MHz

# PLOTS OF EMISSIONS

## Radiated Emissions (Above 1 GHz)



17 268.66 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 $X_i$		Coverage factor $k$	$u(X_i)$ (dB)	$C_i$	$C_i u(X_i)$ (dB)
		Value (dB)	Probability Distribution				
Receiver reading	$R_s$	$\pm 0.31$	normal 1	1.00	0.31	1	0.31
AMN Voltage division factor	$L_{AMN}$	$\pm 0.15$	normal 2	2.00	0.08	1	0.08
Sine wave voltage	$dV_{SW}$	$\pm 0.17$	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	$dV_{PA}$	$\pm 0.39$	normal 2	2.00	0.20	1	0.20
Pulse repetition rate response	$dV_{PR}$	$\pm 0.39$	normal 2	2.00	0.20	1	0.20
Noise floor proximity	$dV_{NF}$	$\pm 0.00$	rectangular	$\sqrt{3}$	0.00	1	0.00
AMN VDF frequency interpolation	$dV_{FI}$	$\pm 0.10$	rectangular	$\sqrt{3}$	0.06	1	0.06
AMN Impedance	$dz$	+ 2.60 - 2.70	Triangular	$\sqrt{6}$	1.10	1	1.10
Mismatch : AMN-Receiver	$M$	$\pm 0.07$	U-Shaped	$\sqrt{2}$	0.05	1	0.05
Remark	Using 50 $\Omega$ / 50 uH AMN						
Combined Standard Uncertainty	Normal			$u_c = 1.18$ dB			
Expanded Uncertainty U	Normal ( $k = 2$ )			$U = 2.4$ 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	$R_i$	$\pm 0.41$	normal 1	1.00	0.41	1	0.41
Sine wave voltage	$dV_{sw}$	$\pm 0.17$	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	$dV_{pa}$	$\pm 0.54$	normal 2	2.00	0.27	1	0.27
Pulse repetition rate response	$dV_{pr}$	$\pm 0.54$	normal 2	2.00	0.27	1	0.27
Noise floor proximity	$dV_{nf}$	$\pm 0.50$	normal 2	2.00	0.29	1	0.29
Antenna Factor Calibration	$A_F$	$\pm 1.30$	rectangular	2.00	0.65	1	0.65
Antenna Directivity	$A_D$	$\pm 0.50$	rectangular	$\sqrt{3}$	0.29	1	0.29
Antenna Factor Height Dependence	$A_H$	$\pm 0.50$	rectangular	$\sqrt{3}$	0.29	1	0.29
Antenna Phase Centre Variation	$A_P$	$\pm 0.20$	rectangular	$\sqrt{3}$	0.12	1	0.12
Antenna Factor Frequency Interpolation	$A_i$	$\pm 0.3$	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	$S_i$	$\pm 4.00$	triangular	$\sqrt{6}$	1.63	1	1.63
Measurement Distance Variation	$D_V$	$\pm 0.60$	rectangular	$\sqrt{3}$	0.35	1	0.35
Antenna Balance	$D_{bal}$	$\pm 1.00$	rectangular	$\sqrt{3}$	0.58	1	0.58
Cross Polarization	$D_{Cross}$	$\pm 0.90$	rectangular	$\sqrt{3}$	0.52	1	0.52
Mismatch	$M$	+ 0.89 - 1.00	U-Shaped	$\sqrt{2}$	0.70	1	0.70
EUT Volume Diameter	$V_d$	0.33	normal 1	1.00	0.33	1	0.33
Combined Standard Uncertainty	Normal			$u_c = 2.24$ dB			
Expanded Uncertainty U	Normal ( $k = 2$ )			$U = 4.48$ dB (CL is 95 %)			

### 3. Radiation Uncertainty Calculation (Above 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	$R_i$	0.25	normal 1	1.00	0.25	1	0.25
Preamplifier gain	$G_p$	$\pm 0.23$	normal 2	2	0.12	1	0.12
Receiver Sine Wave	$dV_{sw}$	$\pm 0.27$	normal 2	2	0.14	1	0.14
Instability of preamp gain	$dG_{pw}$	$\pm 1.2$	rectangular	$\sqrt{3}$	0.70	1	0.70
Noise Floor Proximity	$dV_{nf}$	$\pm 0.70$	rectangular	$\sqrt{3}$	0.40	1	0.40
Antenna Factor Calibration	$AF$	$\pm 1.40$	normal 2	2	0.70	1	0.70
Directivity difference	$A_D$	$\pm 3.00$	rectangular	$\sqrt{3}$	0.87	1	0.87
Phase Centre location	$A_P$	$\pm 0.30$	rectangular	$\sqrt{3}$	0.17	1	0.17
Antenna Factor Frequency Interpolation	$A_i$	$\pm 0.30$	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	$S_i$	$\pm 3.00$	triangular	$\sqrt{6}$	1.22	1	1.22
Effect of setup table material	$d_{ANT}$	$\pm 1.50$	rectangular	$\sqrt{3}$	0.87	1	0.87
Separation distance	$d_D$	$\pm 0.30$	rectangular	$\sqrt{3}$	0.17	1	0.17
Cross Polarization	$D_{Cross}$	$\pm 0.90$	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

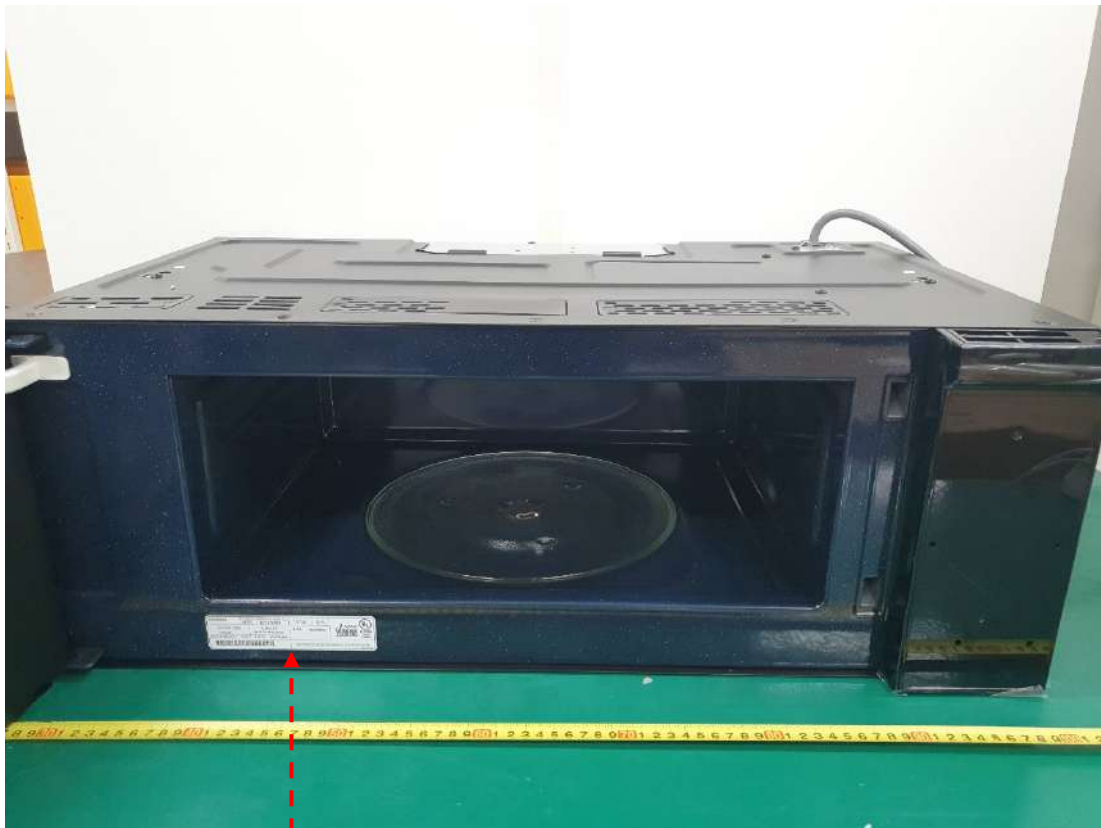
No.	Instrument	Manufacturer	Model	Serial No.	Due to Calibration	Calibration Interval
1	Microwave survey meter	ETS Lindgren	1501	0003549	2021.01.15	2 years
2	EMI Test Receiver	Rohde & Schwarz	ESCI	101041	2021.04.05	1 year
3	Software	Rohde & Schwarz	EMC32	Version 8.53.0	-	-
4	TWO-LINE VNETWORK	Rohde & Schwarz	ENV216	101156	2021.04.05	1 year
5	LOOP ANTENNA	ROHDE & SCHWARZ	HFH2-Z2	100279	2021.02.25	1 year
6	EMI TEST RECEIVER	Rohde & Schwarz	ESU 40	100202	2021.04.05	1 year
7	EMI TEST RECEIVER	Rohde & Schwarz	ESW8	100994	2021.04.06	1 year
8	Software	Rohde & Schwarz	EMC32	EMC32V10.60.15	-	-
9	Signal Conditioning Unit	Rohde & Schwarz	SCU 01	10030	2021.04.06	1 year
10	TRILOG Broadband Test Antenna	SCHWARZBECK	VULB 9163	9163-01027	2021.05.03	2 years
11	ATTENUATOR	FAIRVIEW	SA3N5W-06	N/A	2021.01.11	1 year
12	CONTROLLER	innco systems GmbH	CO2000-G	CO2000/562/23890210/L	-	-
13	OPEN SWITCH AND CONTROL UNIT	Rohde & Schwarz	OSP-120	100015	-	-
14	ANTENNA MAST (LEFT)	innco systems GmbH	MA4000-EP	N/A	-	-
15	Turn Table	innco systems GmbH	DT3000-3T	N/A	-	-
16	Signal Conditioning Unit	Rohde & Schwarz	SCU 18	10065	2021.04.06	1 year
17	DOUBLE RIDGED HORN ANTENNA	Rohde & Schwarz	HF907	102585	2020.07.16	1 year
18	OPEN SWITCH AND CONTROL UNIT	Rohde & Schwarz	OSP-120	101766	-	-
19	TILT ANTENNA MAST	innco systems GmbH	MA4640-XP-EP	N/A	-	-
20	CONTROLLER	innco systems GmbH	CO3000	CO3000/937/38330516/L	-	-
21	Turntable	innco systems GmbH	DT2000-2t	N/A	-	-
22	WiFi Filter Bank	ROHDE & SCHWARZ	U082	N/A	-	-
23	Signal Conditioning Unit	ROHDE & SCHWARZ	SCU-26D	1984522	2021.04.06	1 year
24	Horn Antenna	Q-par Angus	QMS-00225	17637	2020.09.22	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



<b>SAMSUNG</b>		HOUSEHOLD MICROWAVE OVEN MODEL ME11A7710DS		120 Vac	60Hz	 
MANUFACTURED APRIL-2021		SERIAL No. 0BQL7WZN400001Z		1.65 kW MICROWAVE		
MADE IN MALAYSIA	SEMA	FCC ID : A3LME6000A				
						THIS PRODUCT COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J. <small>DE68-03721A-04</small>



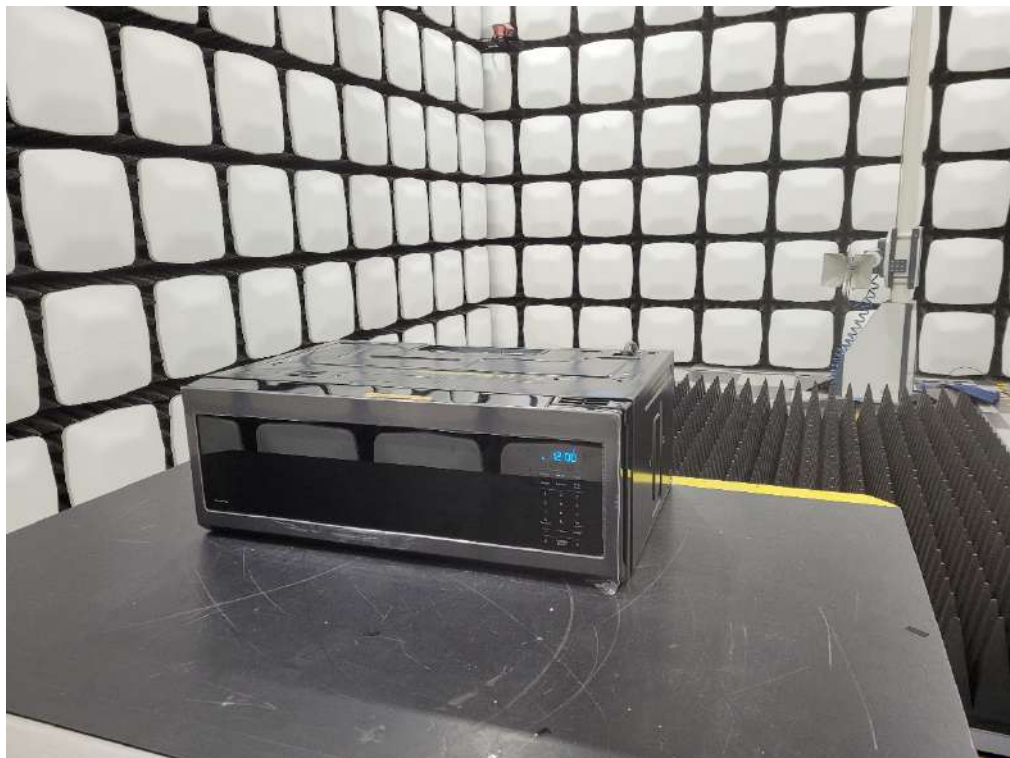
## APPENDIX B – PHOTOGRAPHS OF TEST SET-UP

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

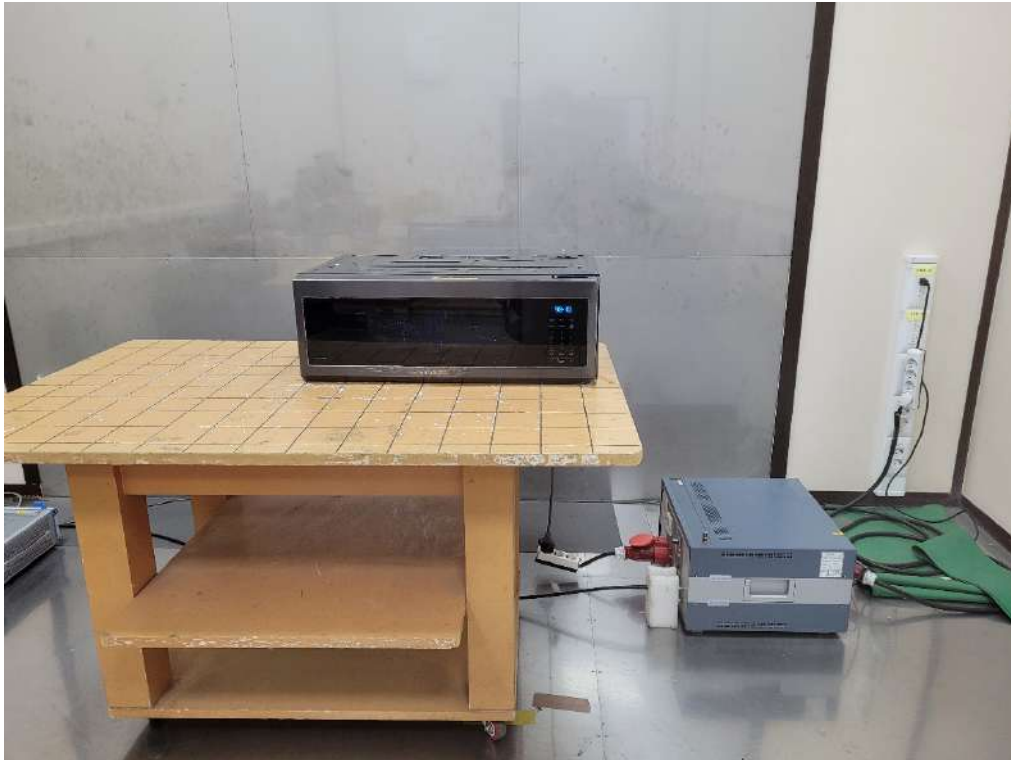
- **Radiation hazard Test Picture**



- **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)





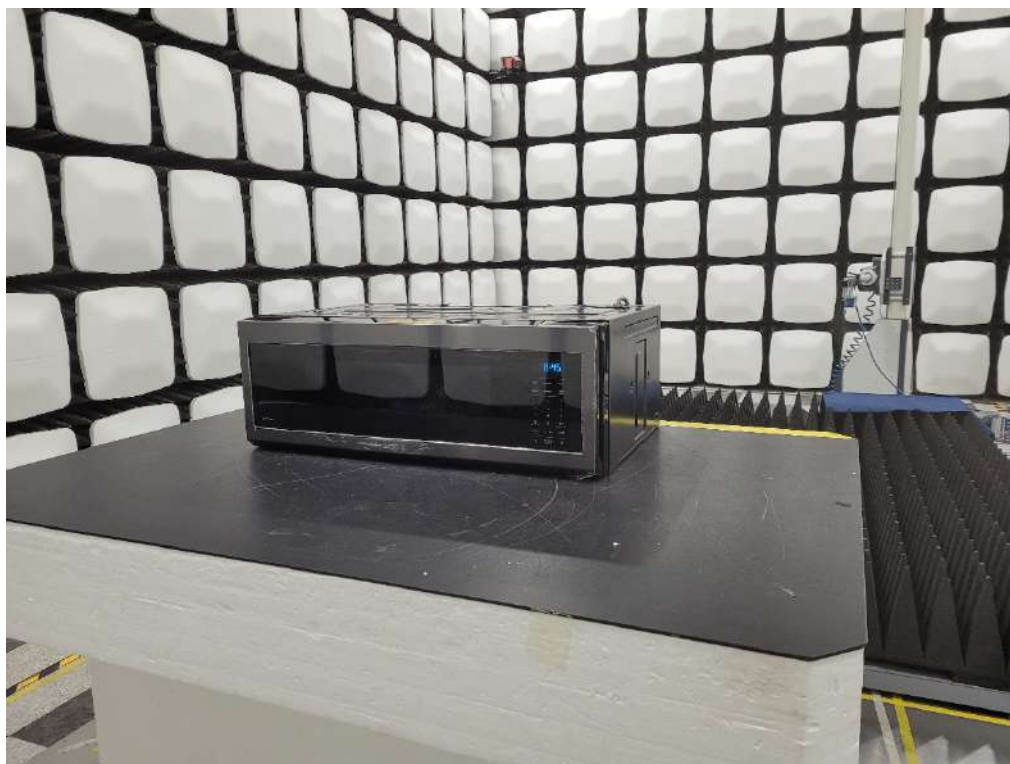
● Radiated Test Picture : 1 GHz ~ 18 GHz (Front)



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



- Radiated Test Picture : 18 GHz ~ 26.5 GHz (Front)



- Radiated Test Picture : 18 GHz ~ 26.5 GHz (Rear)



## **APPENDIX C – EUT PHOTOGRAPHS**

---

**Front View of EUT**



**Rear View of EUT**





**Left View of EUT**

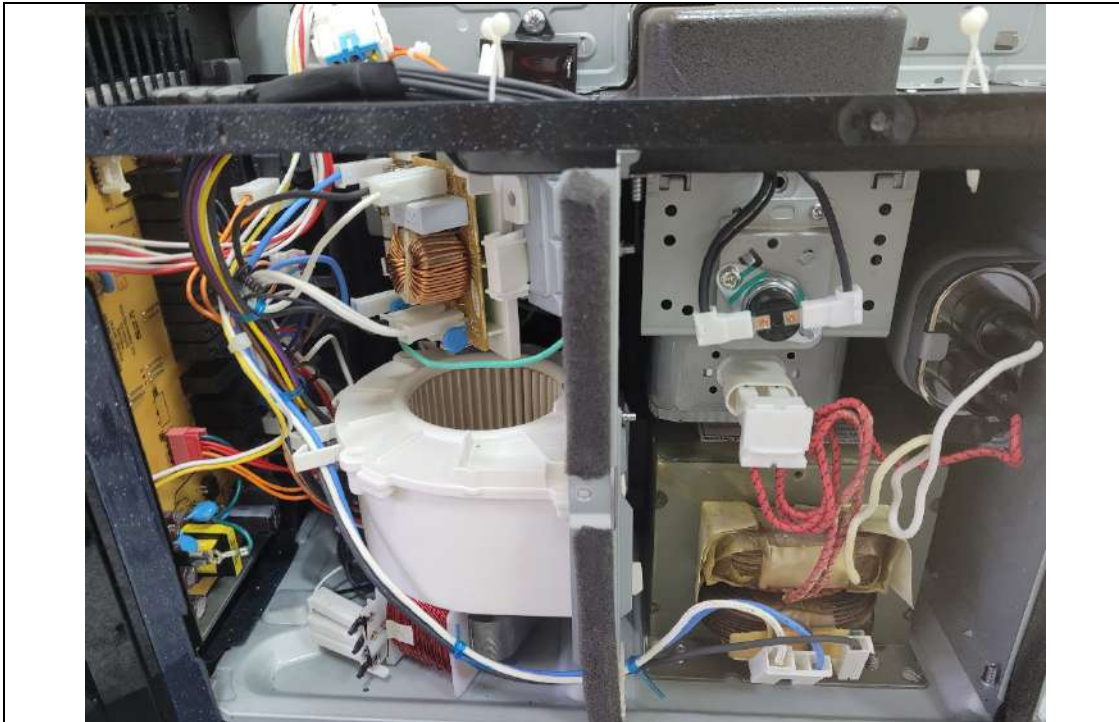


**Right View of EUT**

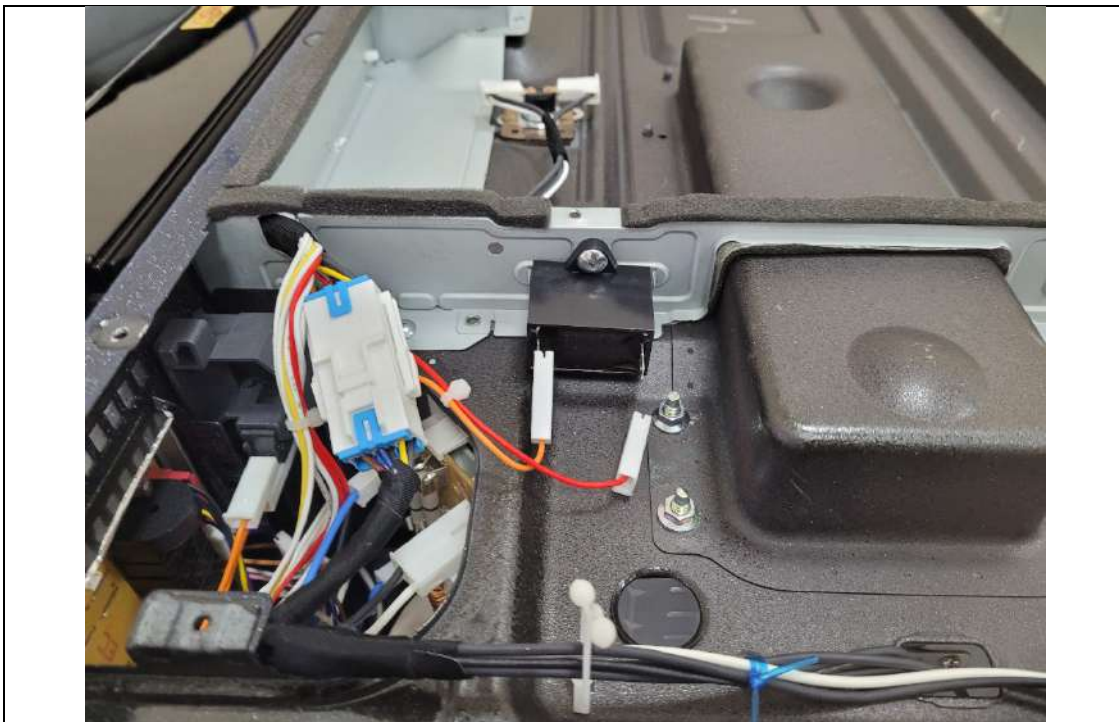




**Inside View of EUT 1**



**Inside View of EUT 2**



### View of MAGNETRON



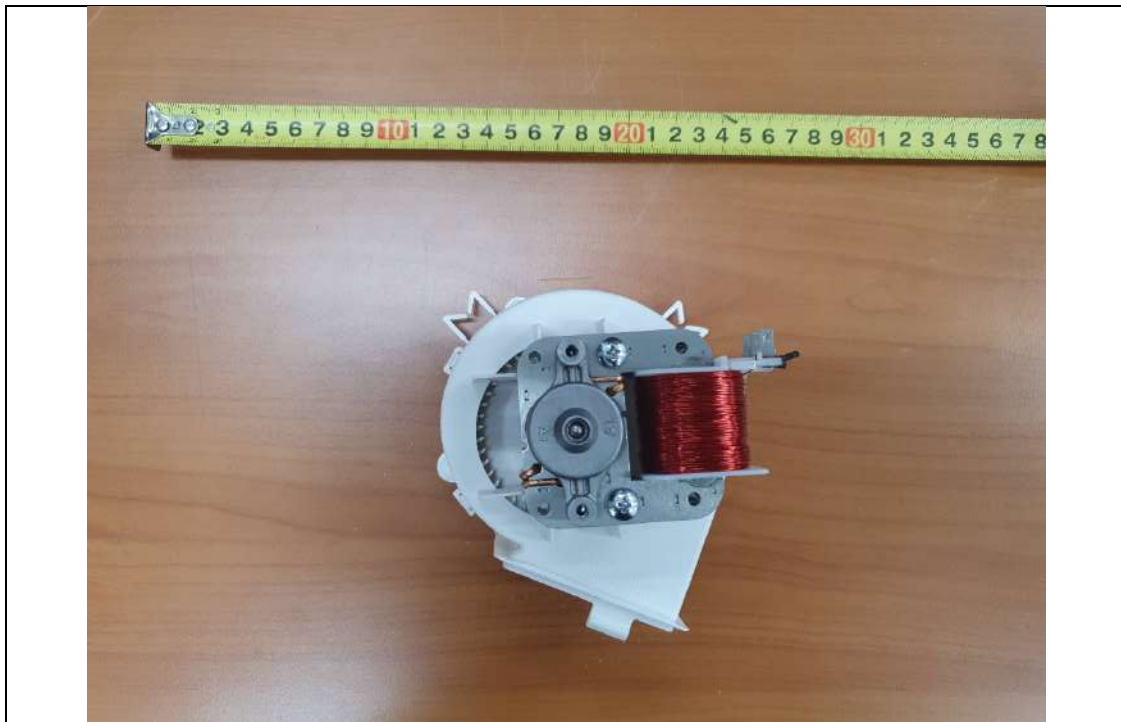
### View of H.V TRANS



**View of H.V CAPACITOR**



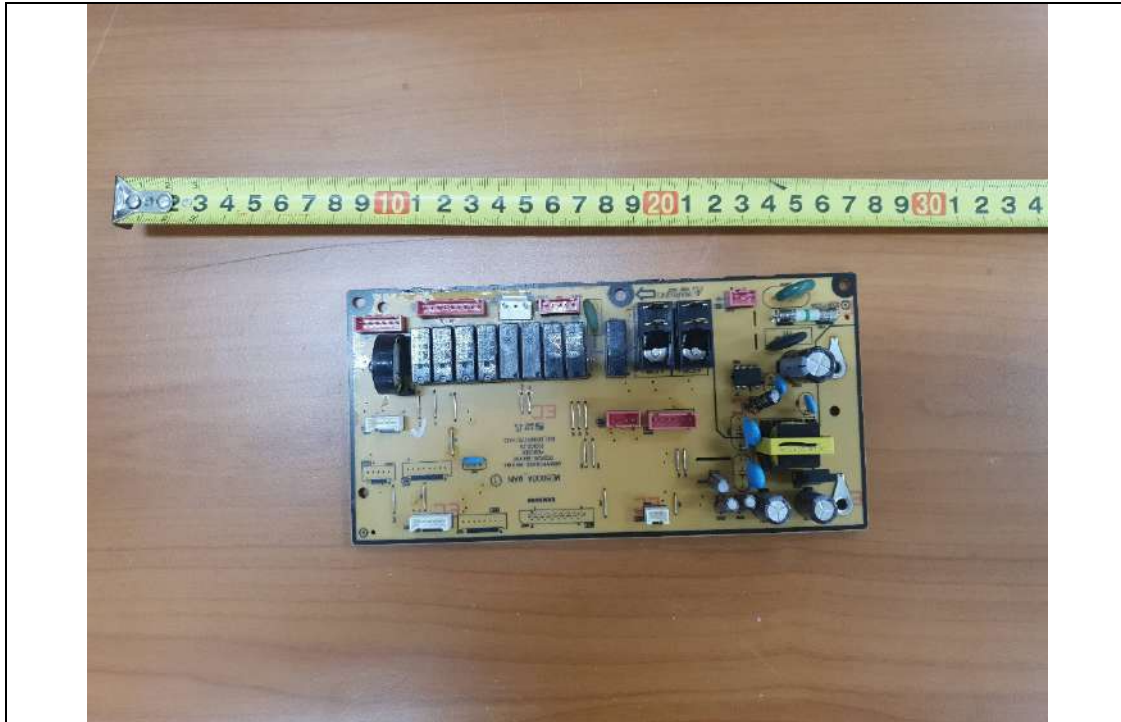
**View of FAN MOTOR**





**View of INTERLOCK SWITCH**

### Front View of PCB



### Rear View of PCB

