Nemko Korea Co., Ltd.

300-2, Osan-Ri, Mohyun-Myun, Cheoin-Gu, Yongin-City, Gyeonggi-Do, KOREA
TEL:+ 82 31 322 2333 FAX:+ 82 31 322 2332

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant :
Daewoo Electronics Corporation
M/W oven R&D center
412-2, Cheongcheon2-Dong, Bupyeong-Gu,
Incheon, 403-032, KOREA
Attn : Mr. Seongok, Kim

Dates of Issue : October 20, 2010
Test Report No. : NK-10-E-786
Test Site : Nemko Korea Co., Ltd.
EMC site, Korea

FCC ID	*C5F7NF9GMO900N*
Brand Name	*DAEWOO*
Contact Person	Daewoo Electronics Corporation M/W oven R&D center 412-2, Cheongcheon2-Dong, Bupyeong-Gu, Incheon, 403-032, KOREA Mr. Seongok, Kim Telephone No. : + 82 32 510 7919

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

The device bearing the brand name 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.

Oct 20. 2010
Tested By : K. W. Kim
Engineer

Oct. 20. 2010
Reviewed By : H. H. Kim
Manager & Chief Engineer

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.

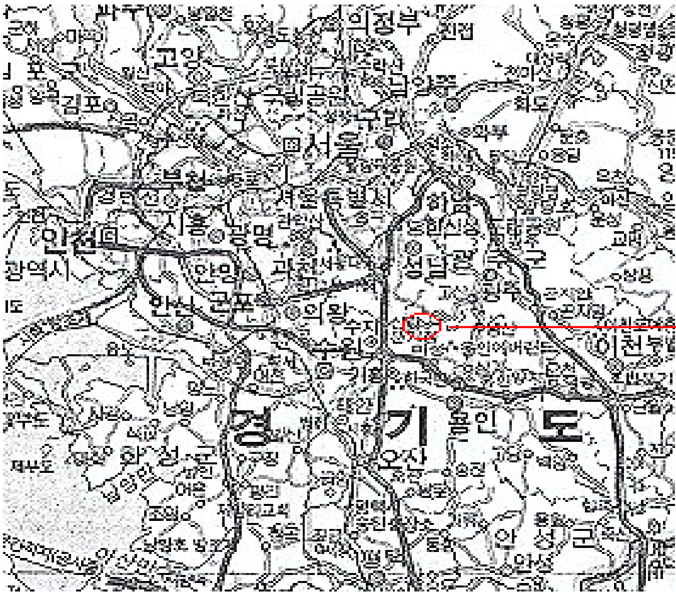
Responsible Party :	Daewoo Electronics Corporation
Contact Person :	Mr. Seongok, Kim Tel No.: + 82 32 510 7919
Manufacturer :	Daewoo Electronics Corporation M/W oven R&D center 412-2, Cheongcheon2-Dong, Bupyeong-Gu, Incheon, 403-032, KOREA
Factory :	Daewoo Microwave Oven Co., Ltd. Delta, Dagang, District, Tianjin, China

- FCC ID: C5F7NF9GMO900N
- Model: KOR-9G2B
- Brand Name: DAEWOO
- EUT Type: Microwave Oven
- Applied Standard: FCC Part 18 & Part 2
- Test Procedure(s): MP-5:1986
- Dates of Test: September 30, 2010 to October 15, 2010
- Place of Tests: Nemko Korea Co., Ltd. EMC Site
- Test Report No.: NK-10-E-786

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 **Daewoo Electronics Corporation.**
FCC ID : **C5F7NF9GMO900N , Microwave Oven.**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory***.
The site address is 300-2, Osan-Ri, Mohyun-Myun, Cheoin-Gu, Yongin-City, Gyeonggi-Do, 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 (18miles) south-southeast from central Seoul.
It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.
The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003



Nemko Korea Co., Ltd.
OPEN AREA TEST SITE
300-2, Osan-Ri, Mohyun-Myun,
Cheoin-Gu, Yongin-City
Gyeonggi-Do,KOREA 449-852
Tel) +82-31-322-2333

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

Electric Rating :	a.c. 120 V , 60 Hz
Clock :	4 MHz
Magnetron Type :	RM228 (Daewoo)
Operating Frequency :	2.45 GHz

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

The EUT was placed on a wooden table 0.8 m at 1 m distance Horn antenna.
A 700ml 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 1000 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 120 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 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 meter 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 0.4 m height is placed 0.4 m away from the vertical wall and 1.5 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) is bonded to the shielded room.
The EUT is powered from the Rohde & Schwarz LISN.
Power to the LISN is 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 DC 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 LISN,
All interconnecting cables more than 1 meter were shortened by non inductive bundling (serpentine fashion) to a 1 meter 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 20 msec sweep time.
The frequency producing the maximum level was re-examined using the EMI test receiver. (Rohde & Schwarz ESCS30).
The detector function were set to CISPR quasi-peak mode & 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 EME reported was calibrated using the R&S signal generator.

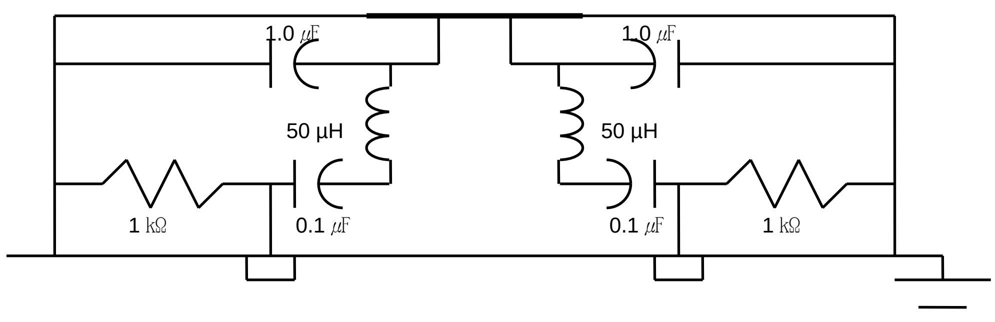


Fig. 2. LISN Schematic Diagram

DESCRIPTION OF TESTS

Radiated Emissions

Preliminary measurement were made indoors at 3 meter using broad band antennas, broadband amplifier, and spectrum analyzer 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 MHz using Loop Antenna (EMCO/6502) and from 30 to 1000 MHz using Biconical log Antenna(ARA, LPB-2520/A).
Above 1 GHz, Double Ridged Broadband Horn antenna (Schwarzbeck, BBHA 9120 D) was used.
Final Measurements were made indoors at 3 m using Loop Antenna (EMCO/6502) for measurement from 0.15 to 30 MHz with RBW 9 kHz & VBW 9 kHz and made indoors at 3 m using Trilog-Broadband Antenna (Shwarzbeck, VULB9166) for measurement from 30 MHz to 1000 MHz with RBW 100 kHz & VBW 100 kHz and made indoors at 3 m using Double Ridged Broadband Horn antenna (Schwarzbeck, BBHA 9120 D) for measurement from 1 GHz to 25 GHz with RBW 1 MHz & VBW 1 MHz.
Each frequency found during pre-scan measurements was reexamined and investigated using EMI test receiver. (FSP40)
The detector function were set to CISPR quasi peak mode and the bandwidth of the receiver were set to 9 kHz, 100 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.

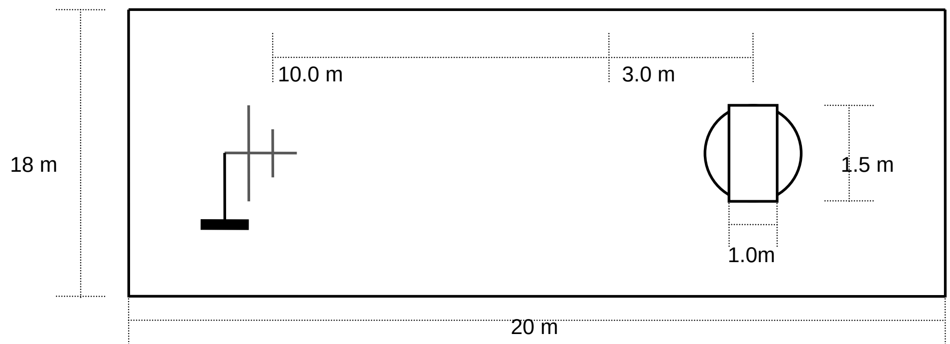


Fig. 3. Dimensions of Outdoor Test Site

TEST DATA

Radiation Hazard

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
A	0.25	1.00
B	0.22	1.00
C	0.20	1.00
D	0.20	1.00
All others	0.19	1.00

Input Power Measurement

Operation mode	P rated (W)	P (W)	dP (%)	Required dP (%)
Power Input	1350	1453	7.62	+ 15 %

RF Output Power Measurement

Quantity of Water [ml]	Starting Temperature [Centigrade]	Final Temperature [Centigrade]	Temp. Rise	Elapsed Time [seconds]	RF Power [watts]
1000	10.0	31.2	21.2	120	740

$$\text{RF Power} = \frac{\text{(4.187 Joules/Cal) x (Volume in ml) x (Temp. Rise)}}{\text{Time in seconds}}$$

Tested by : ***K. W. Kim***

TEST DATA

Operating Frequency measurements

▶ **Frequency vs Line Voltage Variation Test**

[Room Temperature : 24.0 ℃]

Line Voltage Variation (a.c. V)	*)Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
96 (80%)	H	Lower : 2420.0	Lower : 2400 MHz Upper : 2500 MHz
	H	Upper : 2466.8	
	V	Lower : 2418.2	
	V	Upper : 2468.6	
108 (90%)	H	Lower : 2418.8	
	H	Upper : 2470.4	
	V	Lower : 2424.8	
	V	Upper : 2466.8	
132 (110%)	H	Lower : 2428.4	
	H	Upper : 2467.4	
	V	Lower : 2435.0	
	V	Upper : 2465.0	
150 (125%)	H	Lower : 2426.6	
	H	Upper : 2465.6	
	V	Lower : 2438.0	
	V	Upper : 2469.2	

NOTE :

1. ****Pol. H = Horizontal V = Vertical***
2. ***Initial load : 1000 ml of water in the beaker.***
3. ***Line voltage varied from a.c. 96 V to a.c. 150 V.***
4. ***ISM Frequency : 2450 MHz, Tolerance : ± 50 MHz***

RESULT : Pass

Tested by : ***K. W. Kim***

TEST DATA

▶ **Frequency vs Load Variation Test**

[Room Temperature : 24.0 ℃]

Volume of water (ml)	*)Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
1000	H	Lower : 2426.0	Lower : 2400 MHz Upper : 2500 MHz
	H	Upper : 2470.4	
	V	Lower : 2417.0	
	V	Upper : 2473.4	
800	H	Lower : 2438.0	
	H	Upper : 2469.2	
	V	Lower : 2413.4	
	V	Upper : 2471.6	
600	H	Lower : 2418.8	
	H	Upper : 2472.2	
	V	Lower : 2412.8	
	V	Upper : 2468.0	
400	H	Lower : 2407.4	
	H	Upper : 2478.2	
	V	Lower : 2412.8	
	V	Upper : 2477.6	
200	H	Lower : 2418.8	
	H	Upper : 2465.0	
	V	Lower : 2434.4	
	V	Upper : 2475.2	

NOTE :

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

***2.* The water load was varied between 200 ml to 1000 ml.**

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

4. ISM Frequency : 2450 MHz, Tolerance : ± 50 MHz

RESULT : Pass

Tested by : ***K. W. Kim***

TEST DATA

Conducted Emissions

FCC ID : C5F7NF9GMO900N

[Room Temperature : 25.0 ℃]

Frequency	Level(dBμV)		Factor	Line	Limit(dBμV)		Margin(dB)	
(MHz)	Q-Peak	Average	(dB)		Q-Peak	Average	Q-Peak	Average
0.15	51.2	22.7	0.2	N	66.0	56.0	14.8	33.3
0.27	47.9	20.2	0.2	L	61.1	51.1	13.2	30.9
0.29	46.5	22.6	0.2	L	60.5	50.5	14.0	27.9
0.33	49.0	23.4	0.2	L	59.5	49.5	10.5	26.1
0.50	46.7	20.7	0.2	N	56.0	46.0	9.3	25.3
0.64	44.5	18.4	0.1	N	56.0	46.0	11.5	27.6

NOTES:

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

Tested by : ***K. W. Kim***

TEST DATA

Radiated Emissions

FCC ID : C5F7NF9GMO900N

▶ 0.15 MHz ~ 30 MHz

[Room Temperature : 25.0 ℃]

Frequency (MHz)	Reading (dBμV)	Pol* (H/V)	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
The level was under 20 dB below limit.						

<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 ml load was placed in the center of the oven.

6. See attached Plots.

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

Tested by : ***K. W. Kim***

TEST DATA

Radiated Emissions

FCC ID : C5F7NF9GMO900N

▶ **30 MHz ~ 1 GHz**

[Room Temperature : 23.0 ℃]

Frequency (MHz)	Reading (dB㎶/m)	Pol* (H/V)	Antena Heights(cm)	Turntable Angles (°)	AF+CL+Amp (dB)**	Result (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
160.95	57.1	V	130	120	-14.3	42.8	69.7	26.9
697.36	56.7	V	130	270	-7.4	49.3	69.7	20.4
731.31	54.9	H	130	270	-5.2	49.7	69.7	20.0
917.55	54.7	H	160	120	-2.0	52.7	69.7	17.0
952.47	55.1	H	160	330	-2.0	53.1	69.7	16.6
954.41	55.0	V	130	90	-2.0	53.0	69.7	16.7

<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 ml load was placed in the center of the oven.*
6. *If no frequencies are specified in the tables, no measurement for peak with RBW 120 kHz & VBW 10 Hz.*
7. *The limit for consumer device is on the FCC Part section 18.305.*

Tested by : ***K. W. Kim***

TEST DATA

Radiated Emissions

FCC ID : C5F7NF9GMO900N

▶ Above 1 GHz

[Room Temperature : 24.0 ℃]

Frequency (MHz)	Pol* (H/V)	Antena Heights (cm)	Turntable Angles (°)	Reading Level (dB㎶)	Total Loss** (dB)	Result at 3 m (dB㎶/m)	Result at 3 m (㎶/m)	K	Results at 300 m (dB㎶/m)	Limits at 300 m (dB㎶/m)
4931.37	V	130	0	35.2	8.6	43.8	154.9	0.01	1.5	29.7
7387.77	H	160	30	36.6	15.0	51.6	380.2	0.01	3.8	29.7
8452.95	H	160	210	43.8	16.3	60.1	1011.6	0.01	10.1	29.7
9855.30	V	160	300	32.1	19.0	51.1	358.9	0.01	3.6	29.7
14789.80	V	130	30	37.3	26.1	63.4	1479.1	0.01	14.8	29.7
17264.55	H	130	30	31.9	30.5	62.4	1318.3	0.01	13.2	29.7

<Radiated Measurements at 3 meters>

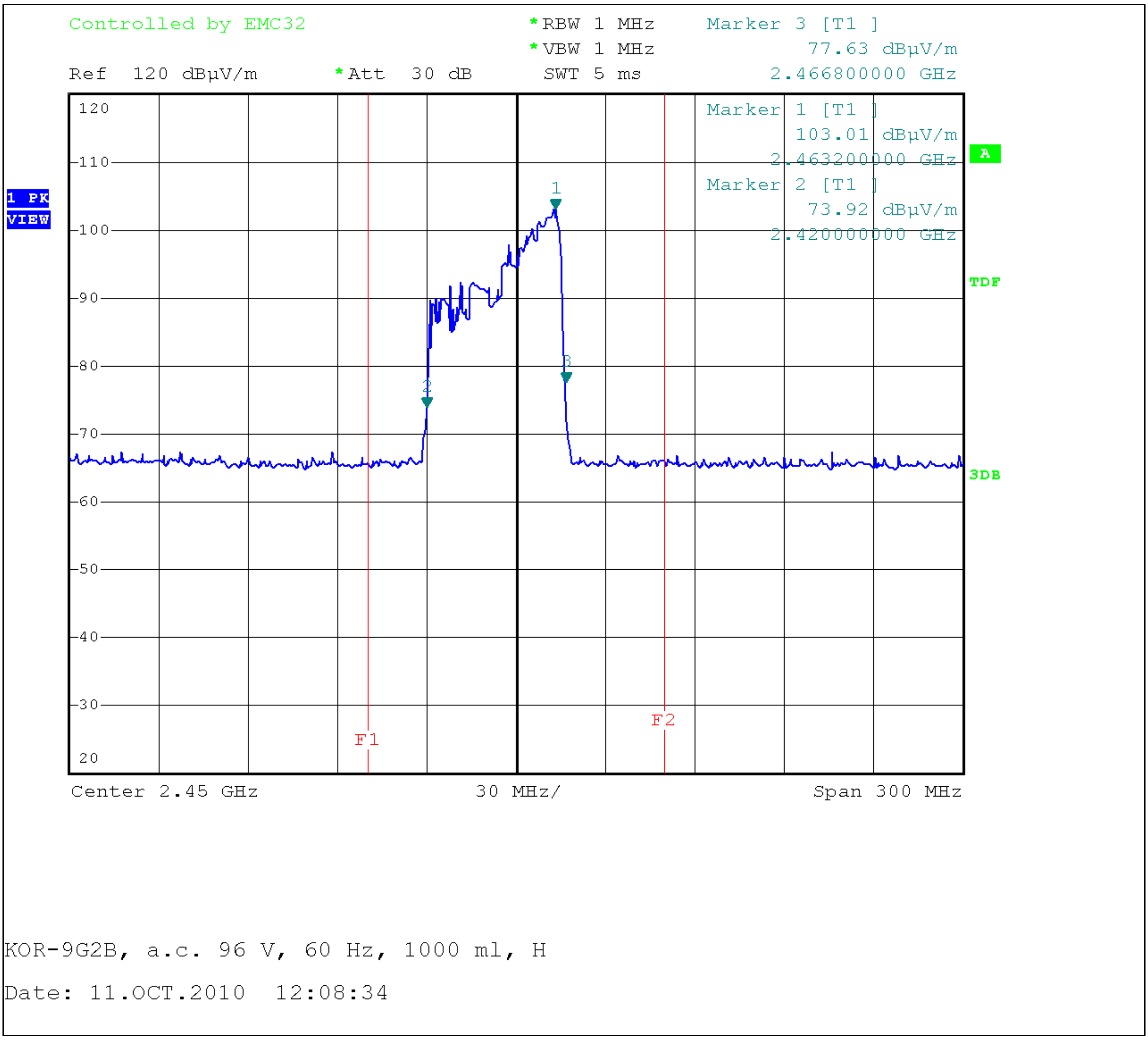
NOTES:

1. * Pol. H =Horizontal V=Vertical
2. ** Total Loss = Antenna Factor + Cable Loss + Amplifier + HPF (High Pass Filter)
3. Field Strength (at 300 m) (uV/m) = K * 10 $^{[\text{Fieldstrength at 3 m (dBuV/m) / 20}]}$
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 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.
6. The test was performed at peak detector mode with average.
7. If no frequencies are specified in the tables, no measurement for peak with RBW 1 MHz & VBW 10 Hz.
8. The limit for consumer device is on the FCC Part section 18.305.

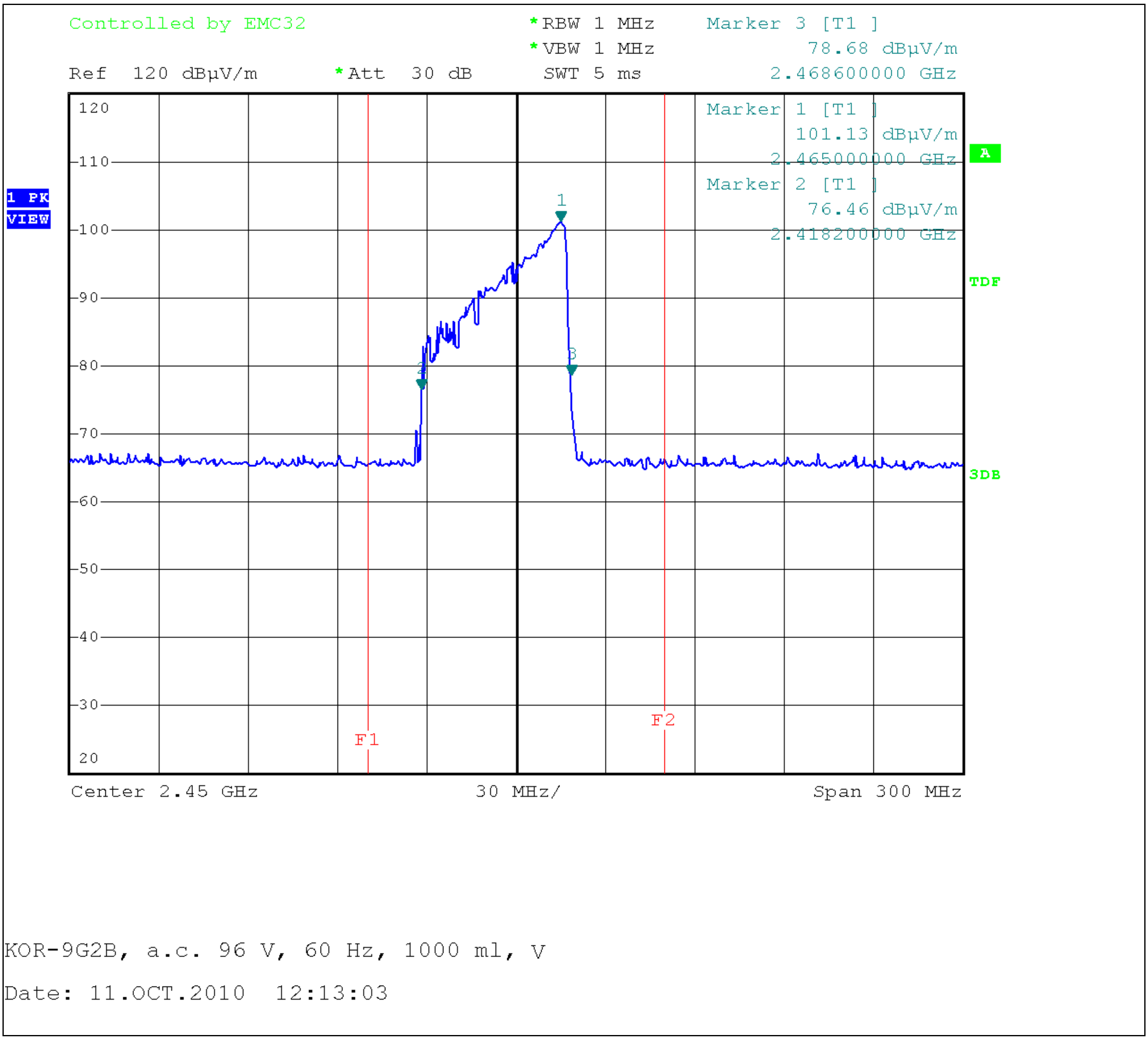
Tested by : ***K. W. Kim***

PLOTS OF EMISSIONS

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



Horizontal (96 V, 1000 ml)

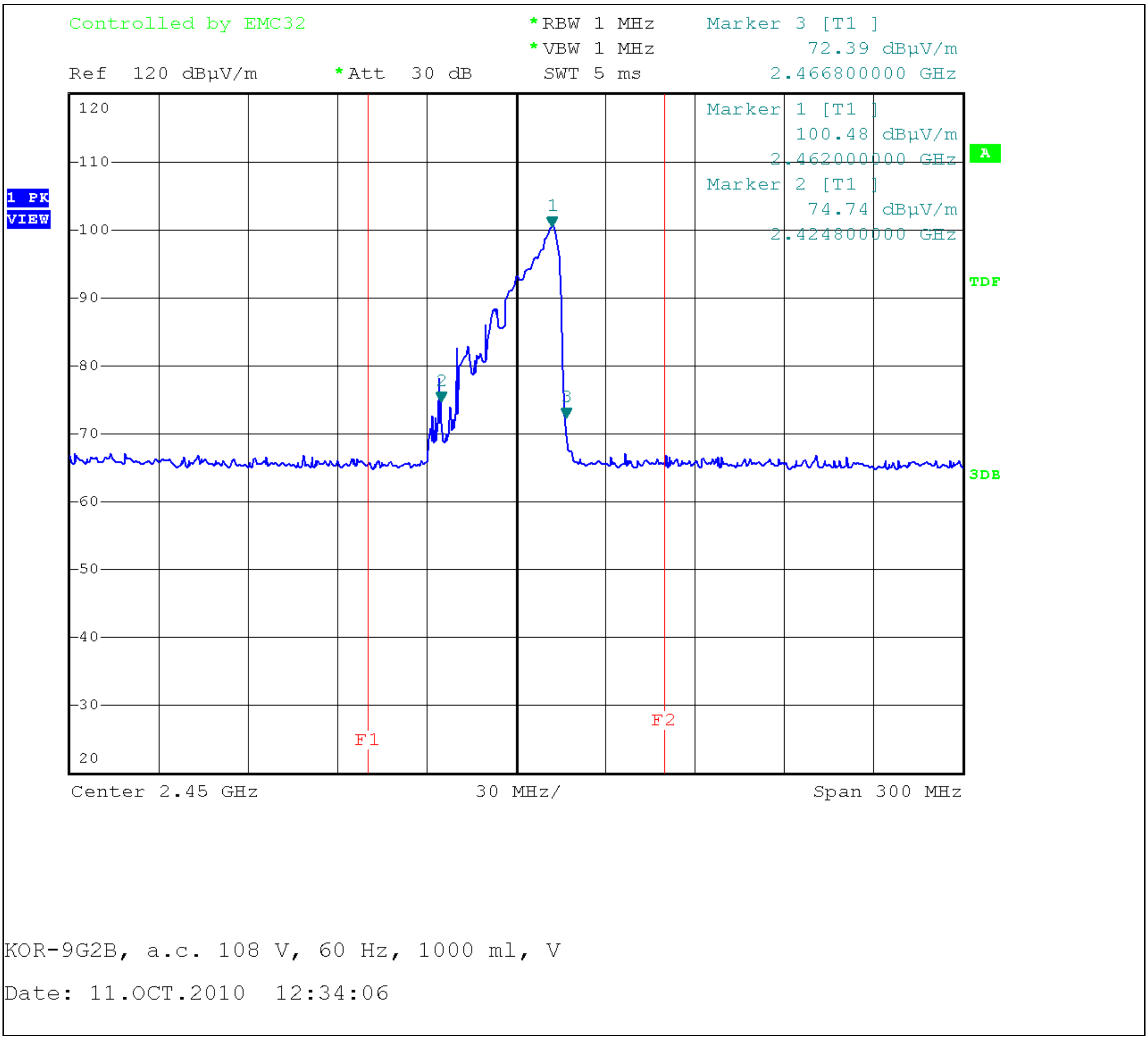


Vertical (96 V, 1000 ml)

PLOTS OF EMISSIONS

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

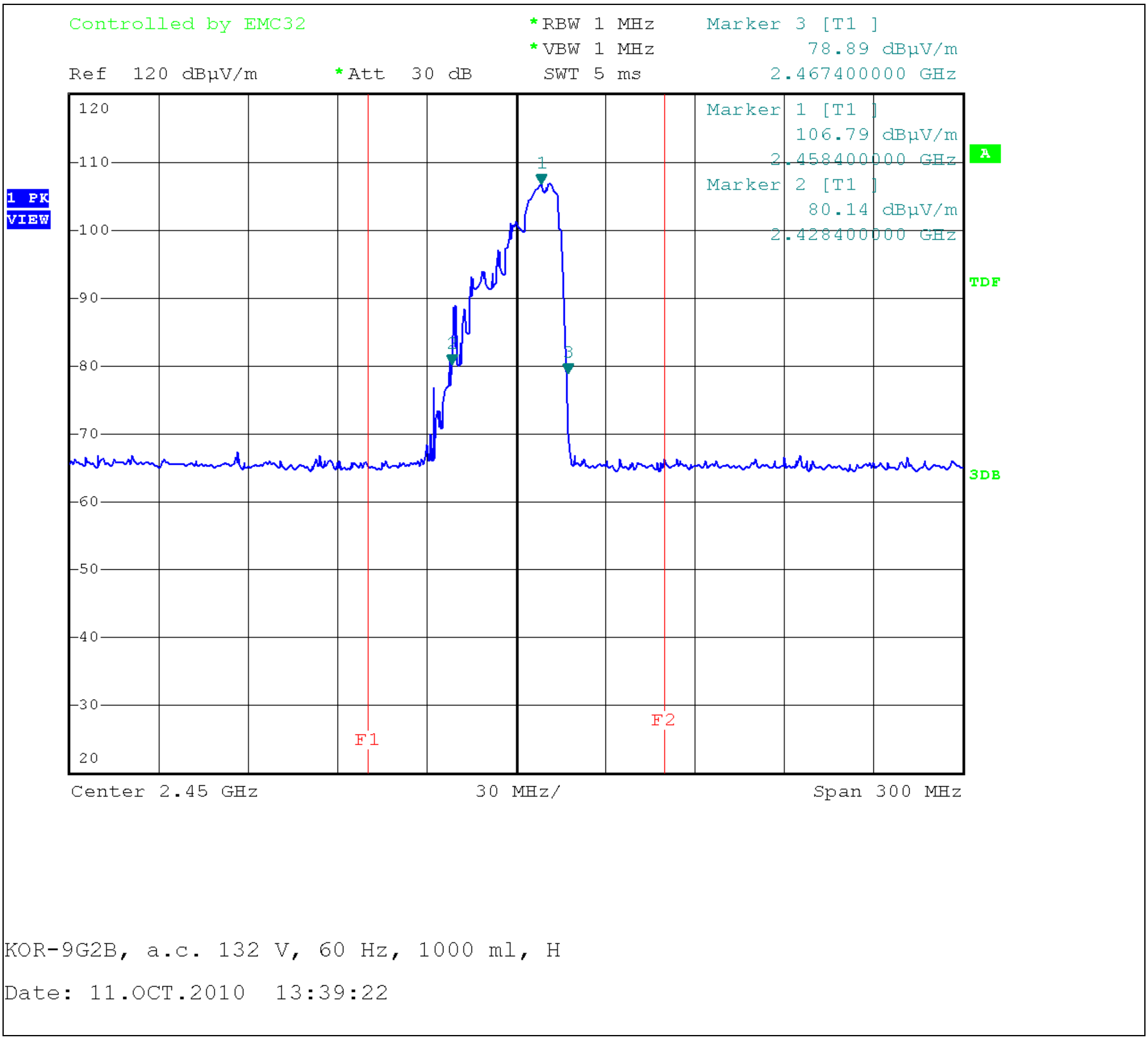
Horizontal (108 V, 1000 ml)



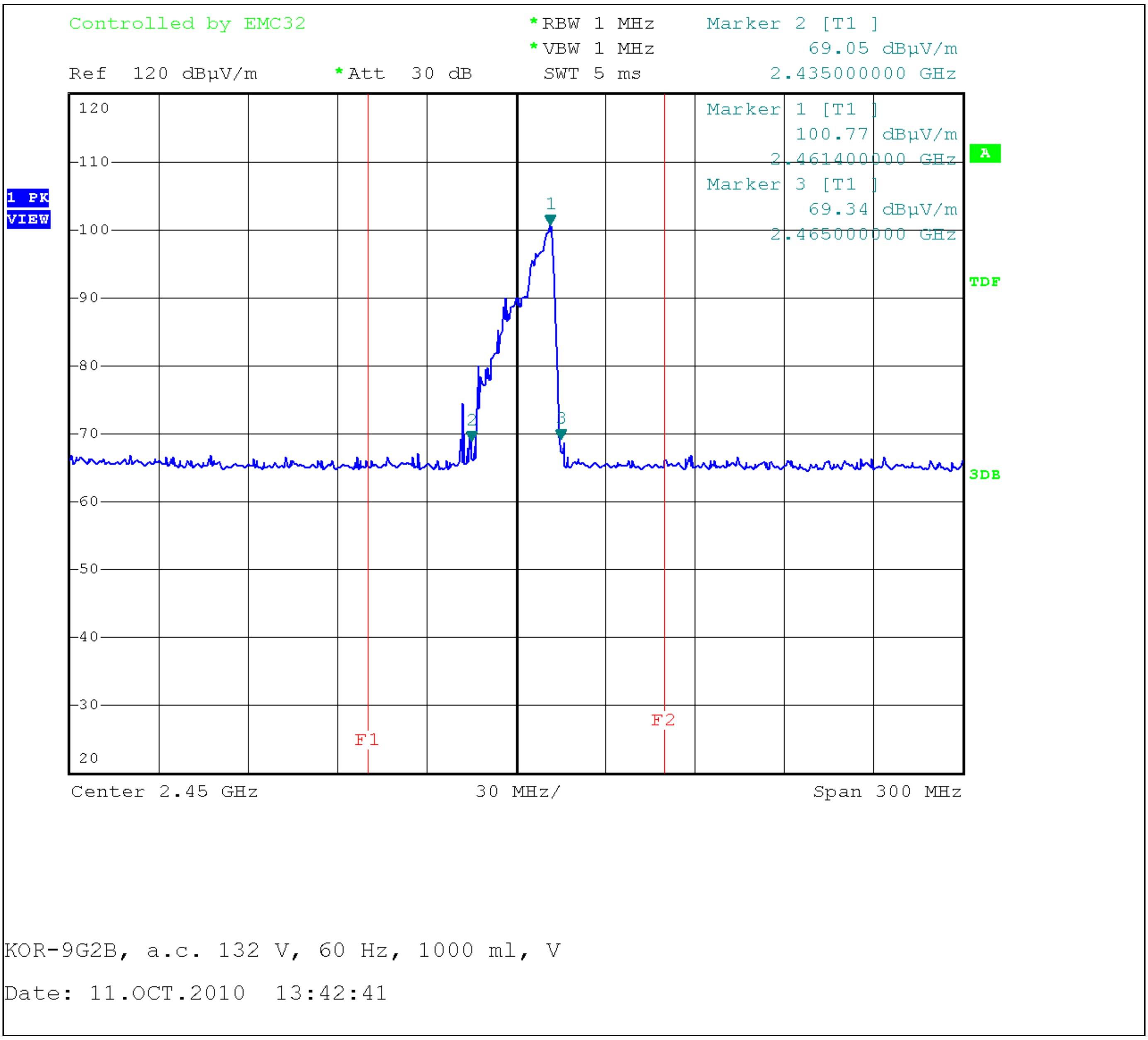
Vertical (108 V, 1000 ml)

PLOTS OF EMISSIONS

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



Horizontal (132 V, 1000 ml)

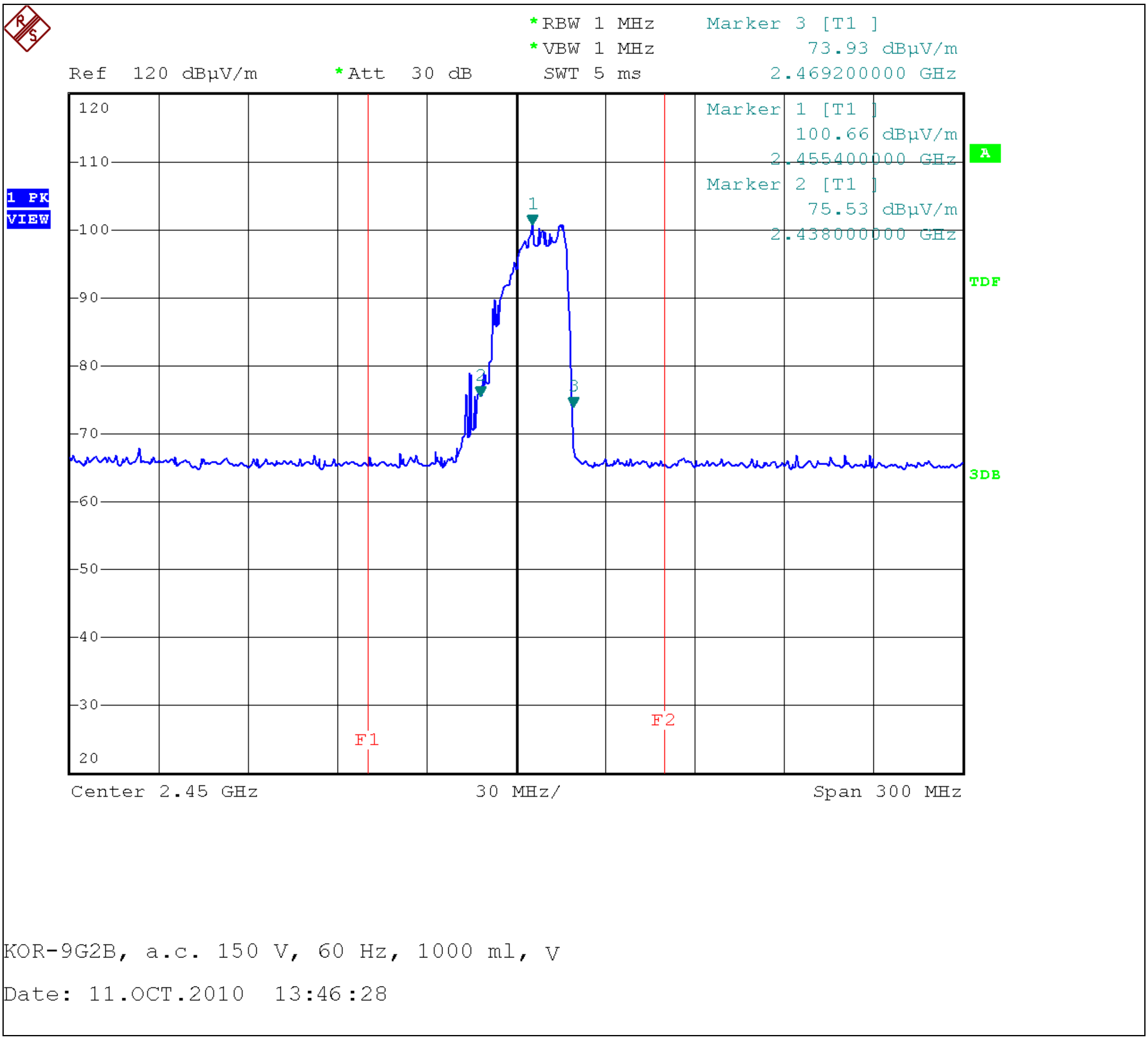


Vertical (132 V, 1000 ml)

PLOTS OF EMISSIONS

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

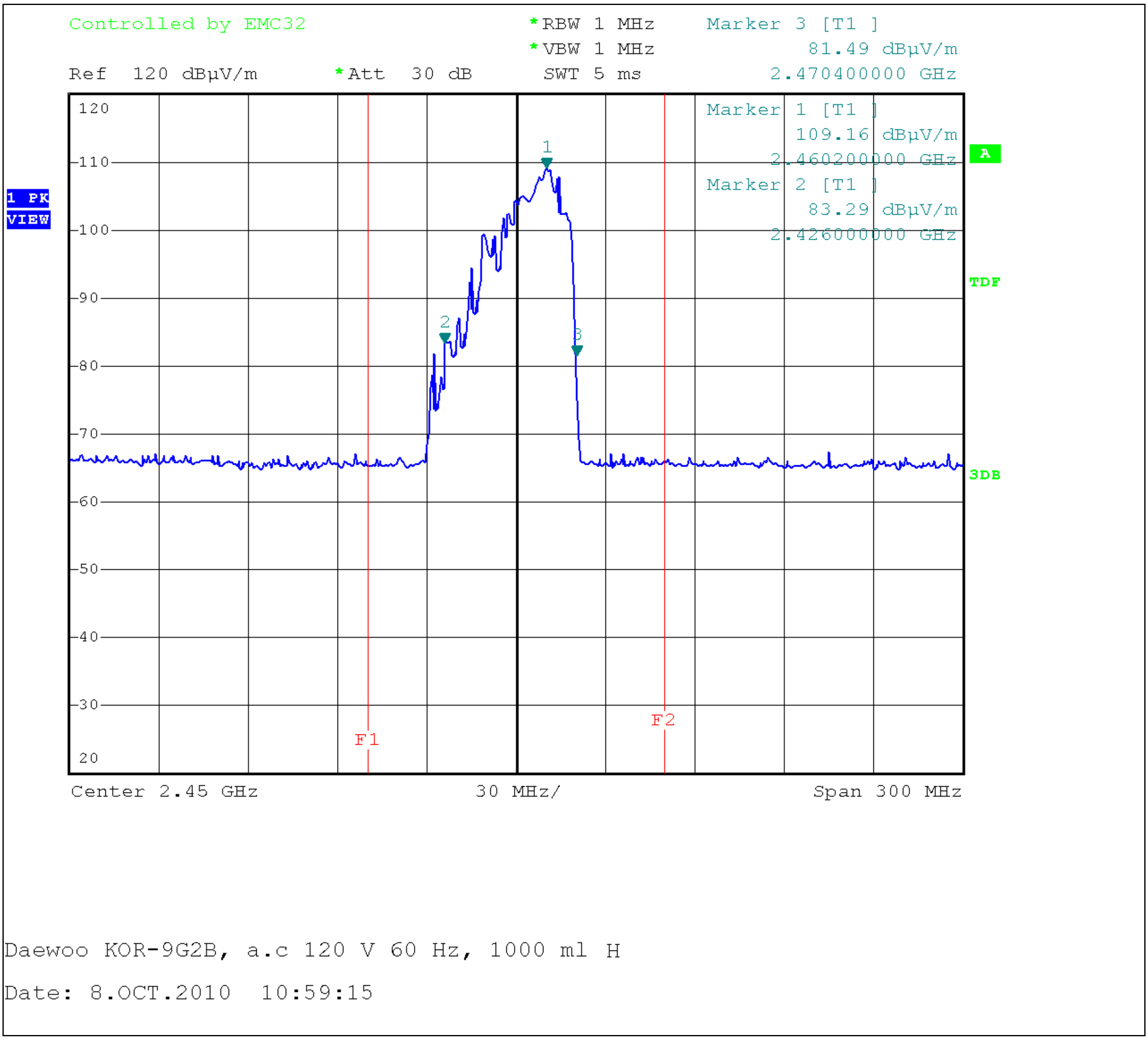
Horizontal (150 V, 1000 ml)



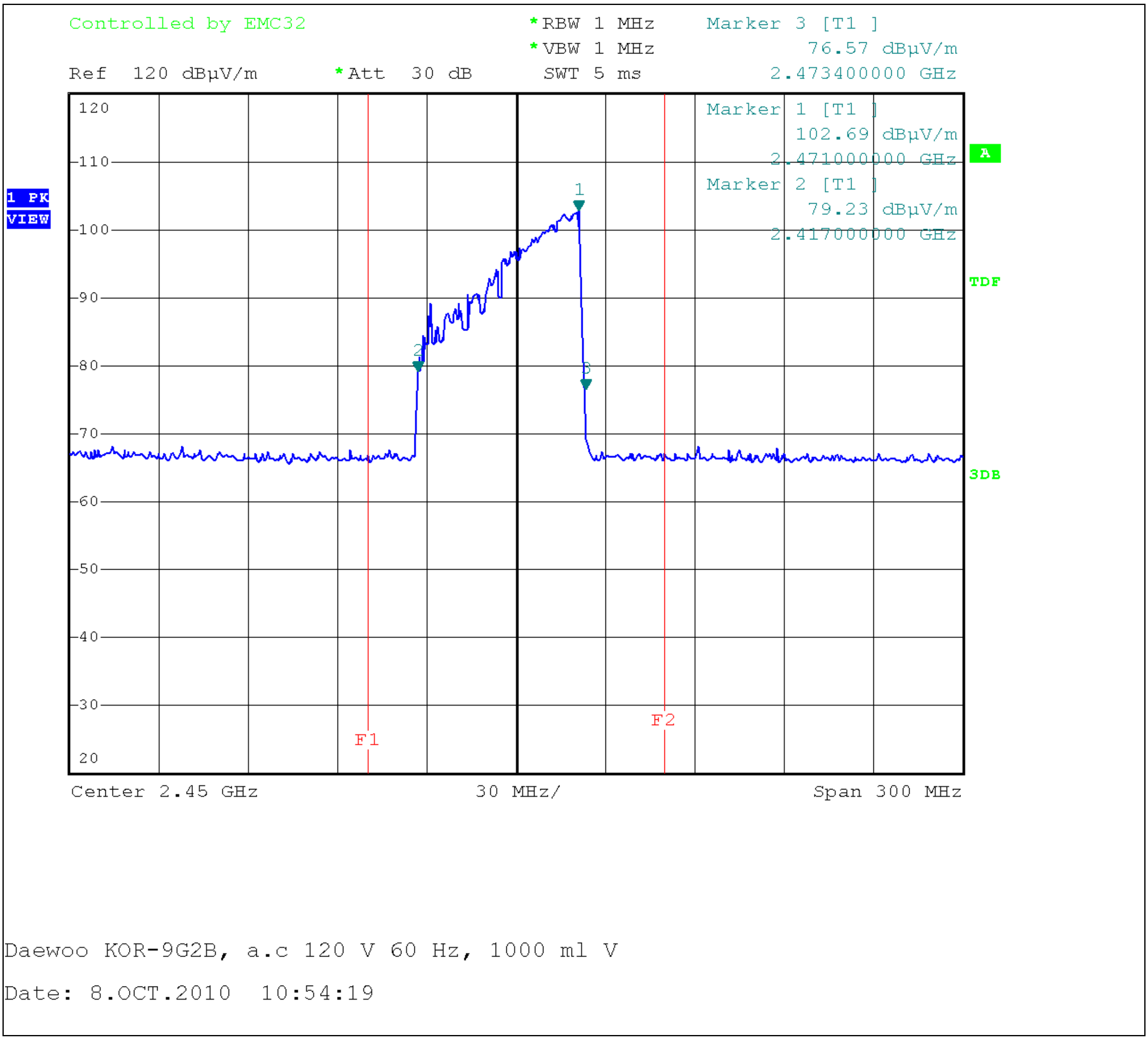
Vertical (150 V, 1000 ml)

PLOTS OF EMISSIONS

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



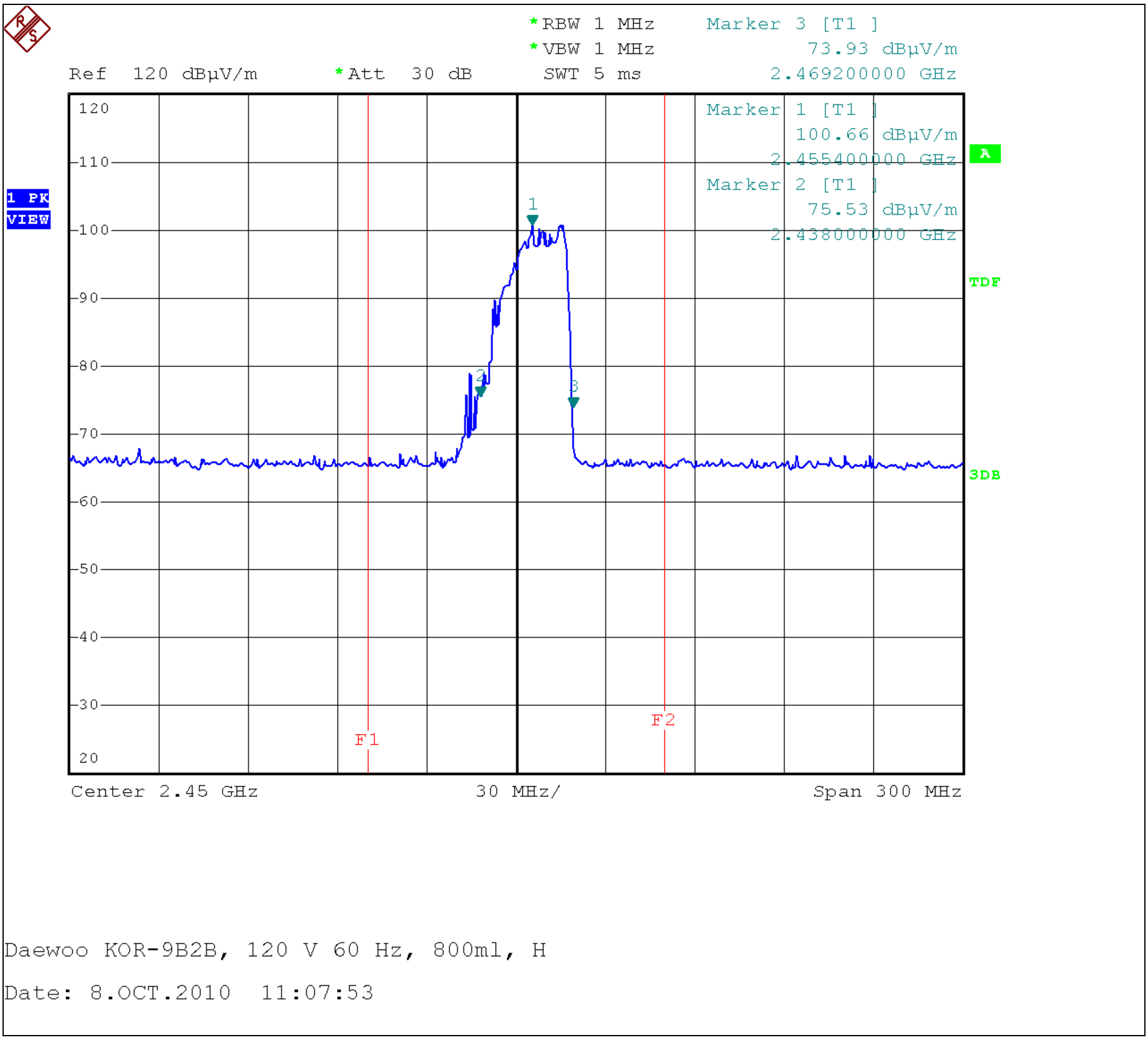
Horizontal (120 V, 1000 ml)



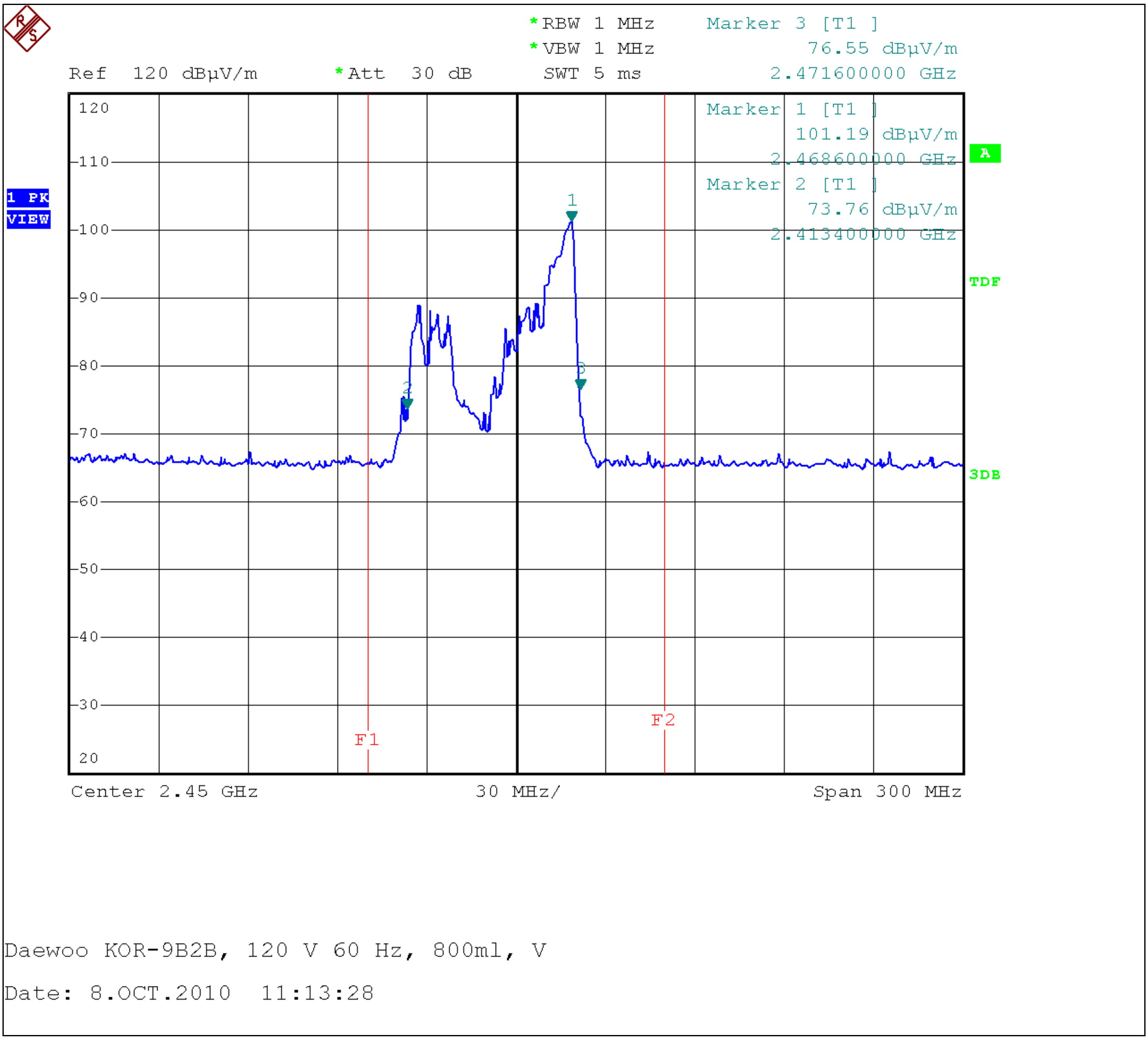
Vertical (120 V, 1000 ml)

PLOTS OF EMISSIONS

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



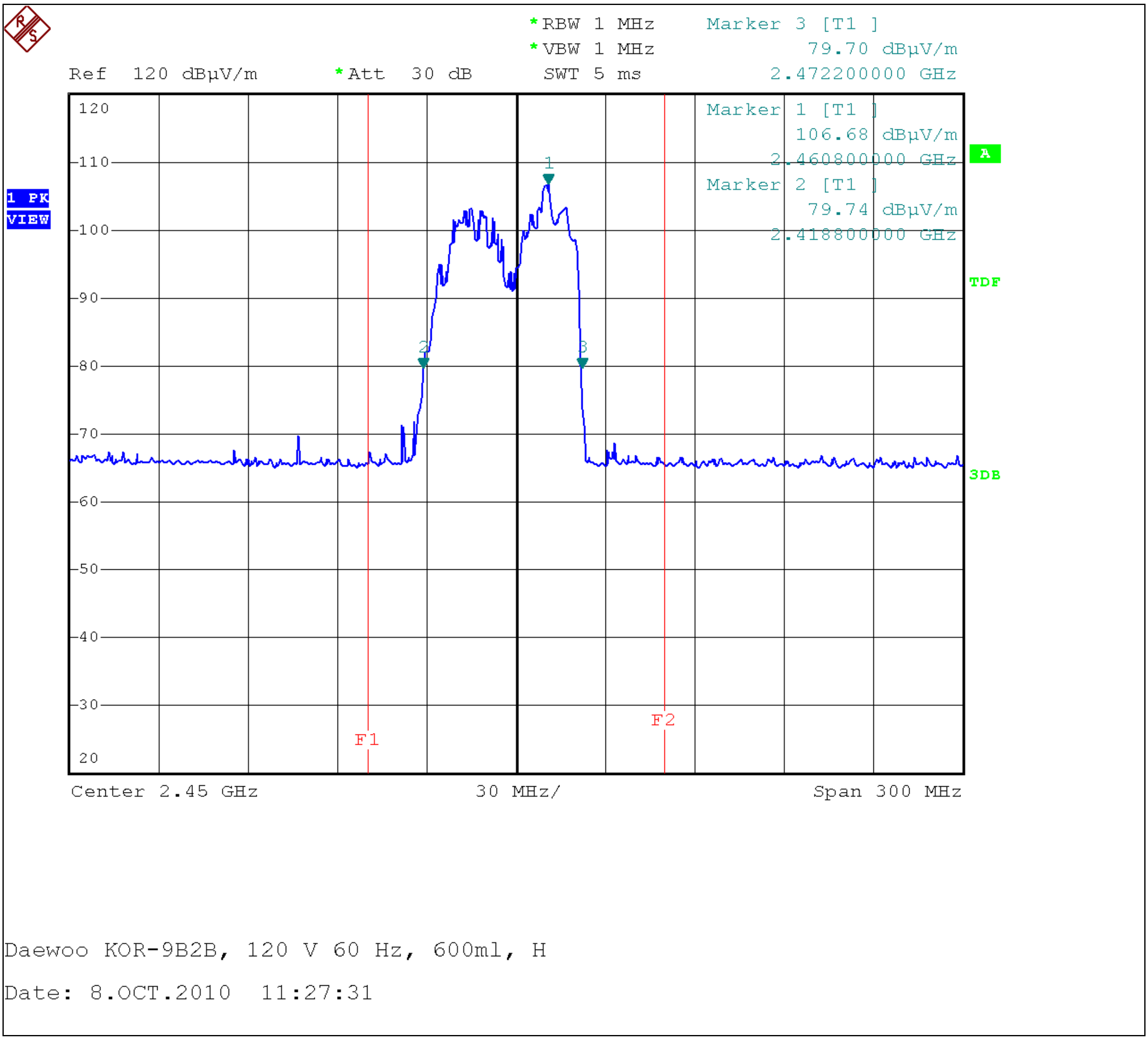
Horizontal (120 V, 800 ml)



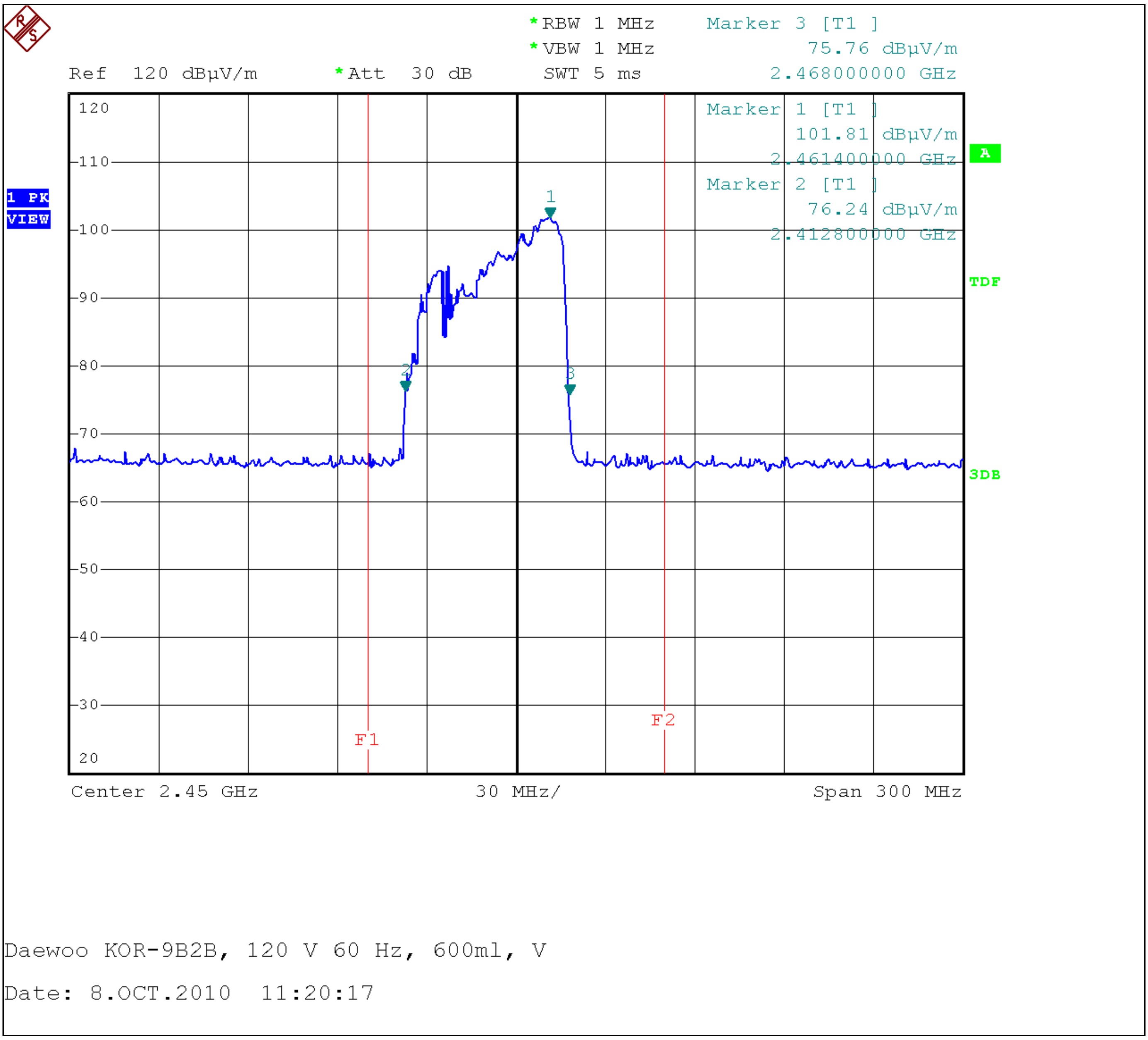
Vertical (120 V, 800 ml)

PLOTS OF EMISSIONS

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



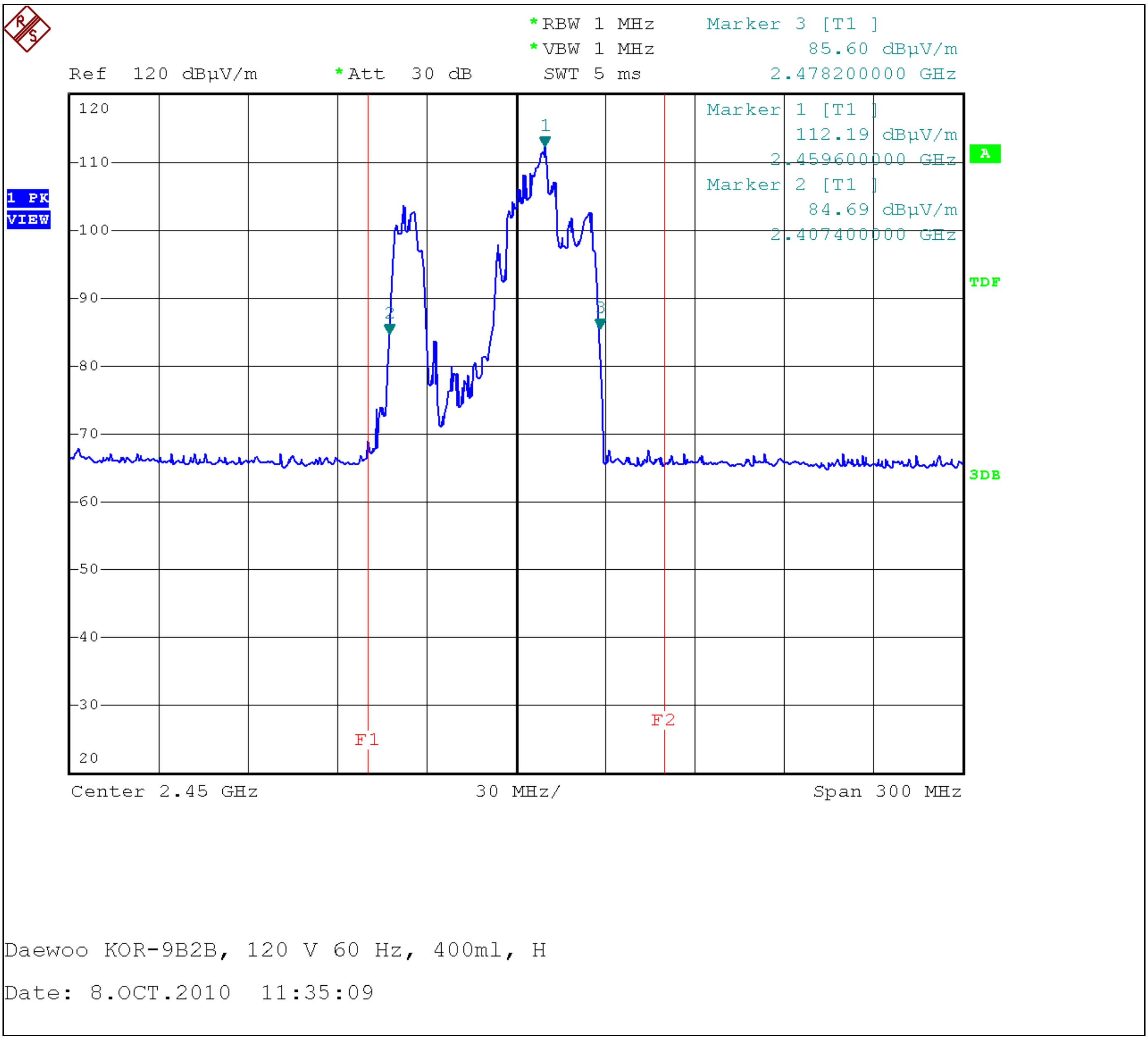
Horizontal (120 V, 600 ml)



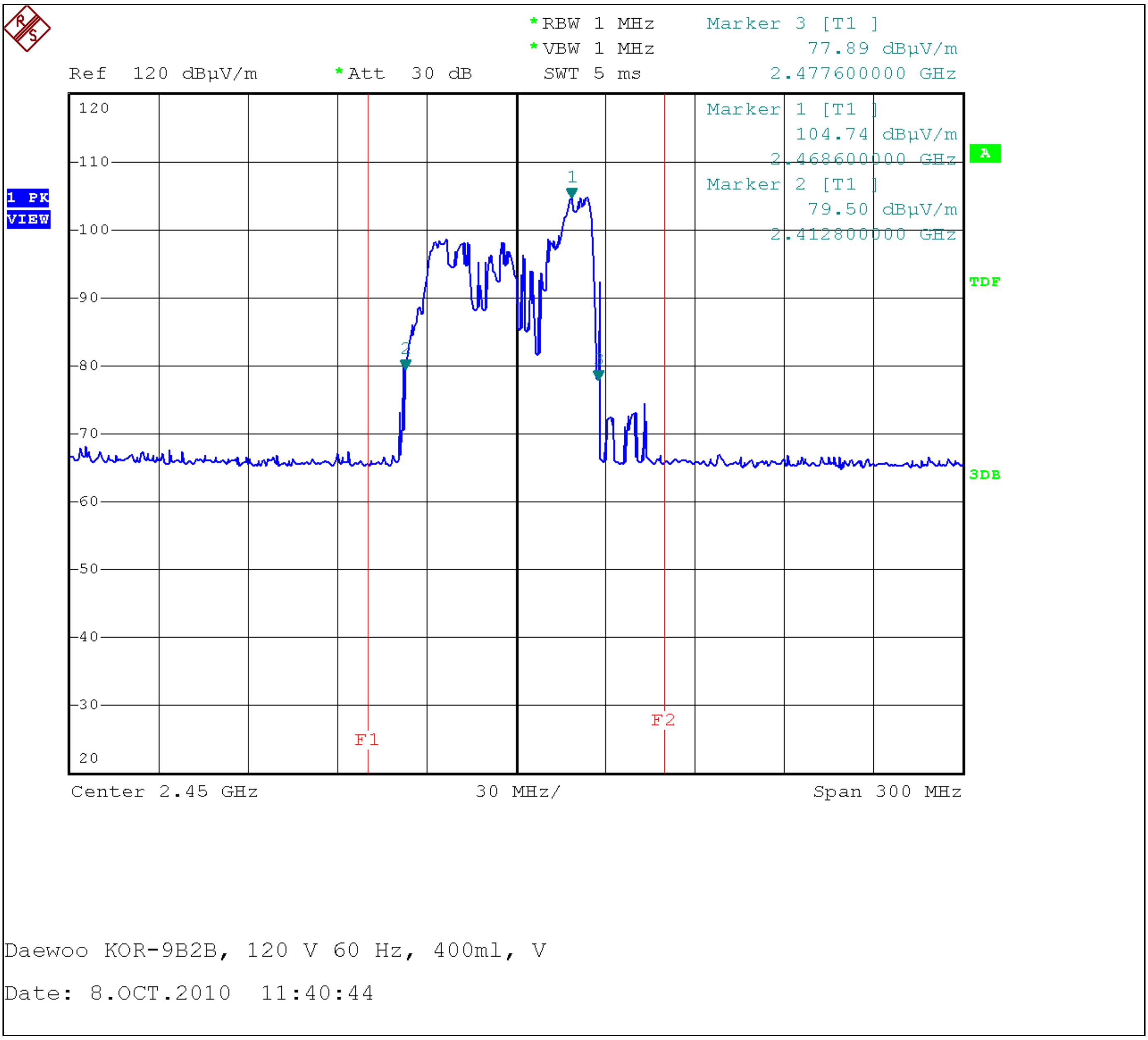
Vertical (120 V, 600 ml)

PLOTS OF EMISSIONS

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



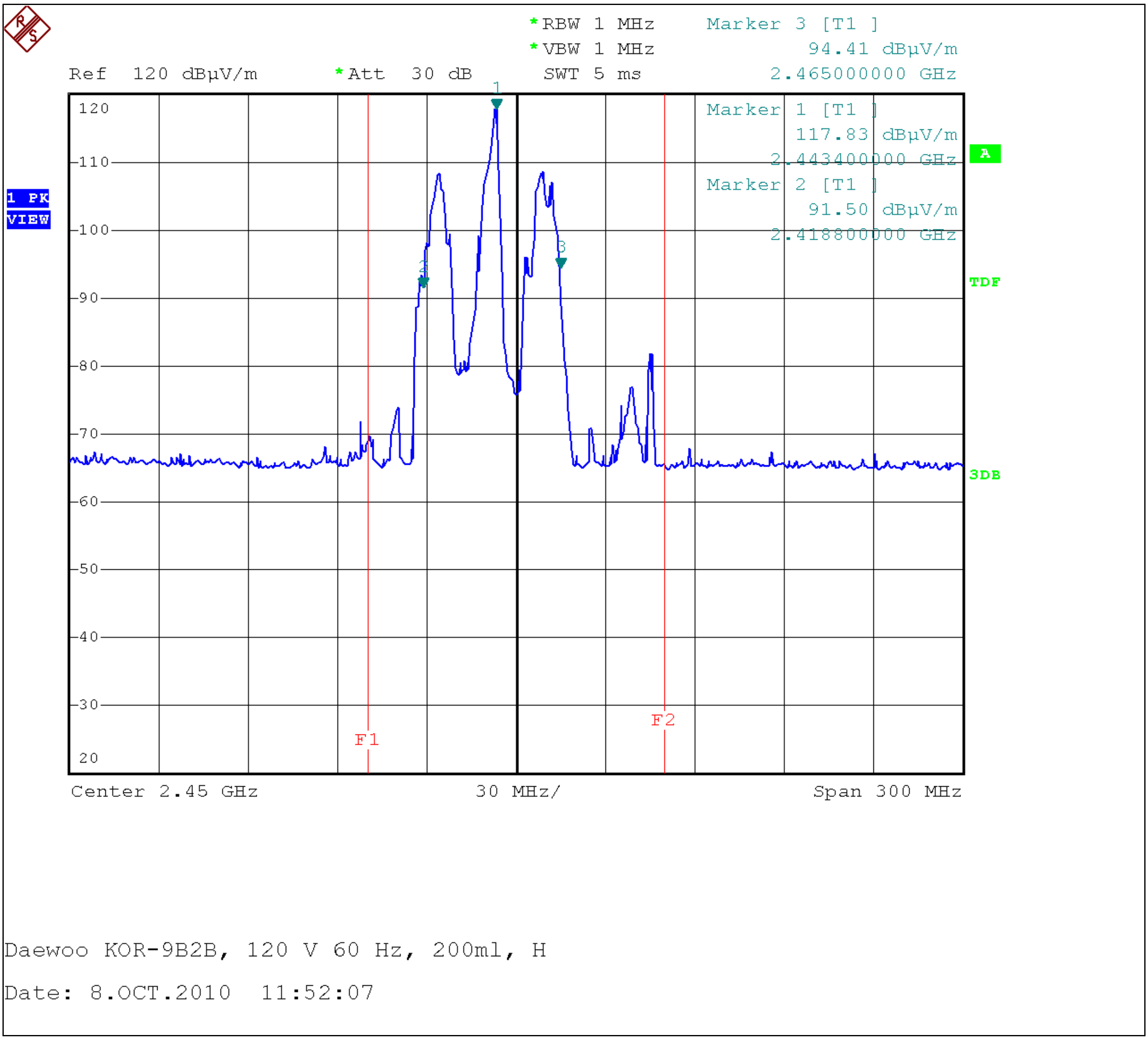
Horizontal (120 V, 400 ml)



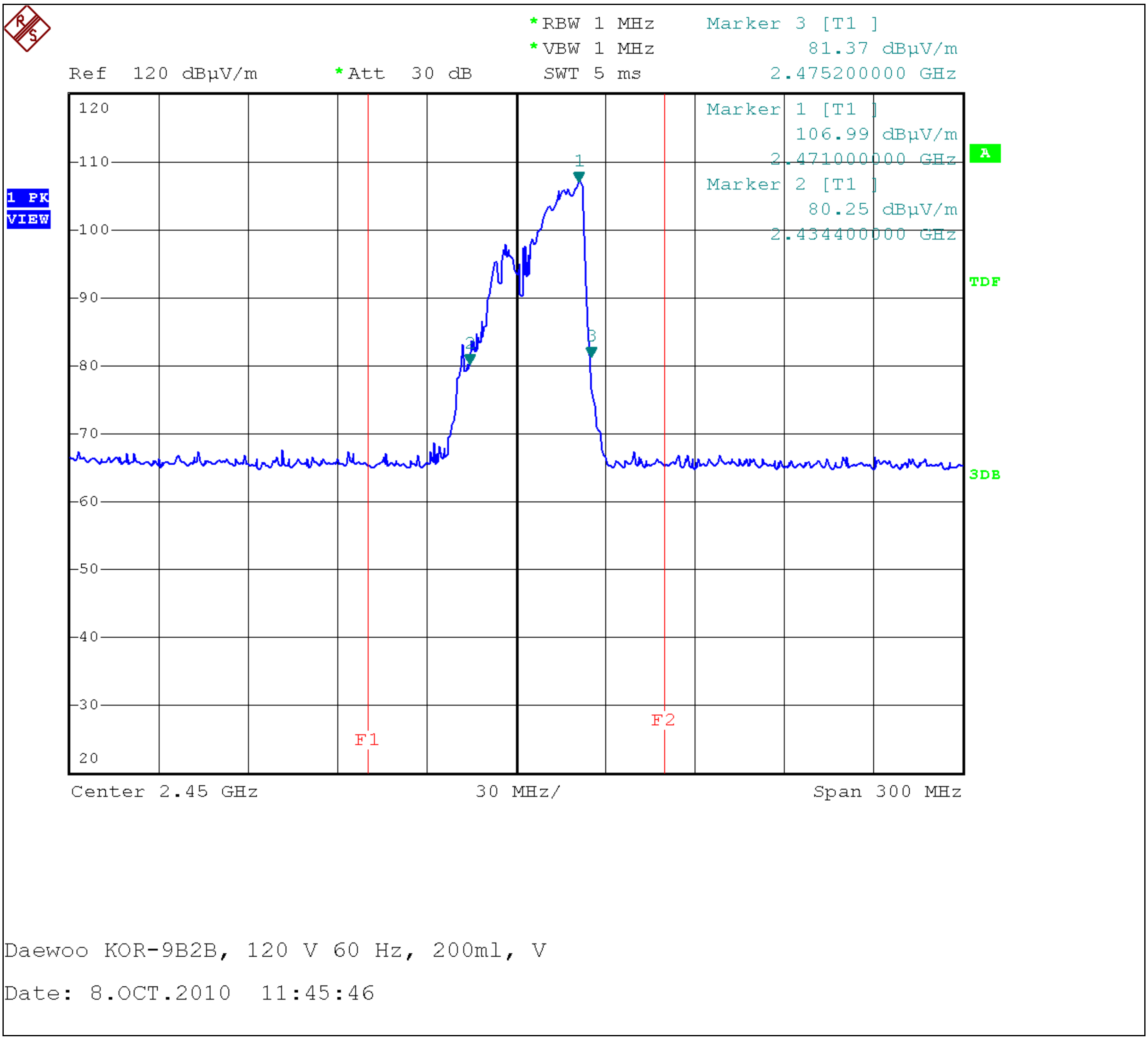
Vertical (120 V, 400 ml)

PLOTS OF EMISSIONS

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



Horizontal (120 V, 200 ml)



Vertical (120 V, 200 ml)

PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (Line)***

NEMKO KOREA (NK-10-E-786) 15 Oct 2010 14:49

Conducted Emissions

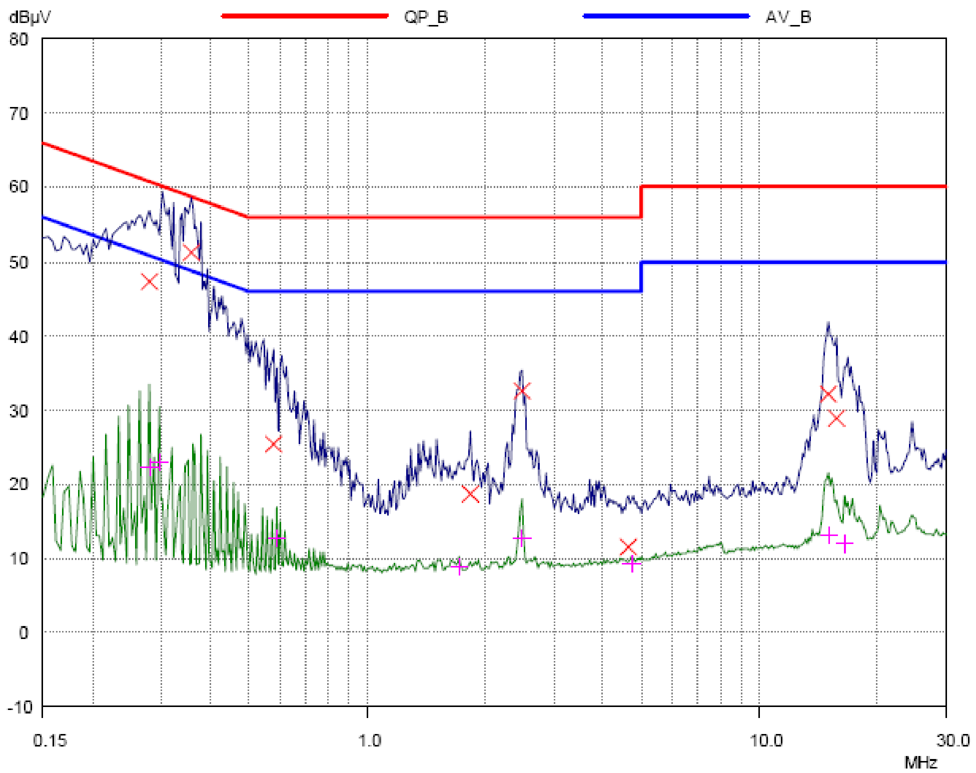
EUT:	Microwave Oven
Manuf:	Daewoo Electronics Corp.
Op Cond:	a.c. 120 V / 60 Hz
Operator:	Ki Wang, Kim
Test Spec:	FCC PART18
Comment:	MODEL : KOR-9G2B LINE : LINE-PE
Result File:	786l.dat : FCC PART18

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	Z5_LINE

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	60 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (Neutral)***

NEMKO KOREA (NK-10-E-786) 15 Oct 2010 15:10

Conducted Emissions

EUT:	Microwave Oven
Manuf:	Daewoo Electronics Corp.
Op Cond:	a.c. 120 V / 60 Hz
Operator:	Ki Wang, Kim
Test Spec:	FCC PART18
Comment:	MODEL : KOR-9G2B
	LINE : NEUTRAL-PE
Result File:	786n.dat : FCC PART18

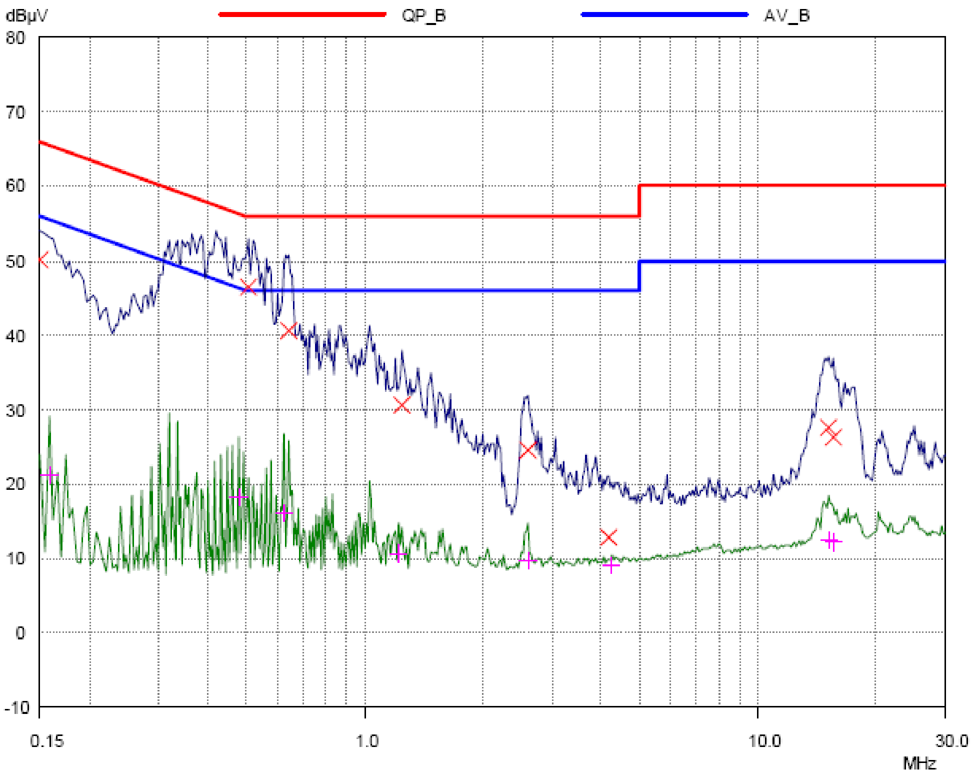
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	Z5_NEU

Final Measurement:

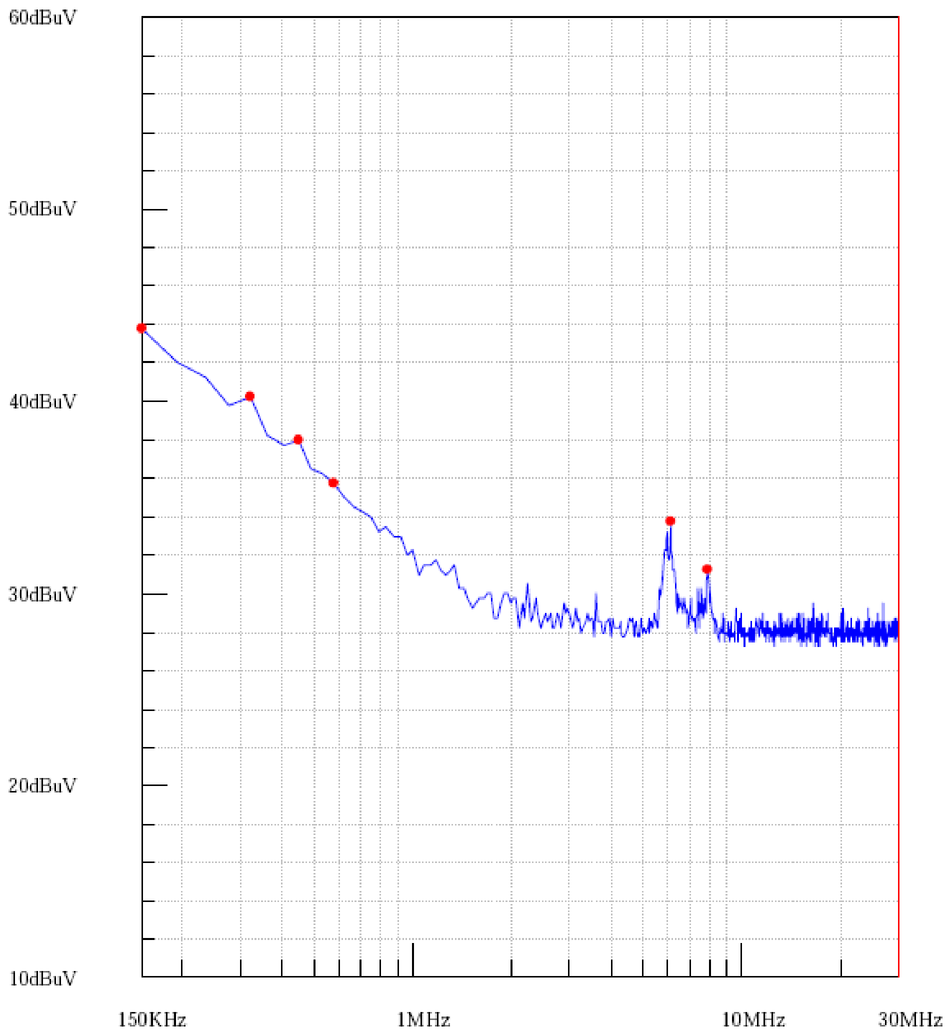
Detectors:	X QP / + AV
Meas Time:	1sec
Subranges:	8
Acc Margin:	60 dB



PLOTS OF EMISSIONS

- ***Radiated Emission (0.15 MHz ~ 30 MHz)***

COMPANY	: Daewoo Electronics Corp.	REPORT NO.	: NK-10-E-786
TRADE NAME	:	DATE	: Wed Oct 13 18:49:21 2010
EQUIPMENT	: Microwave Oven	REGULATION	: FCC PART 18
MODEL	: KOR-9G2B	CLASS	:
POWER	: a.c. 120 V / 60 Hz	DISTANCE	: 3m
DESCRIPTION	: HOR	FCC ID	:
REMARKS	:		
		ENGINEER	: tester



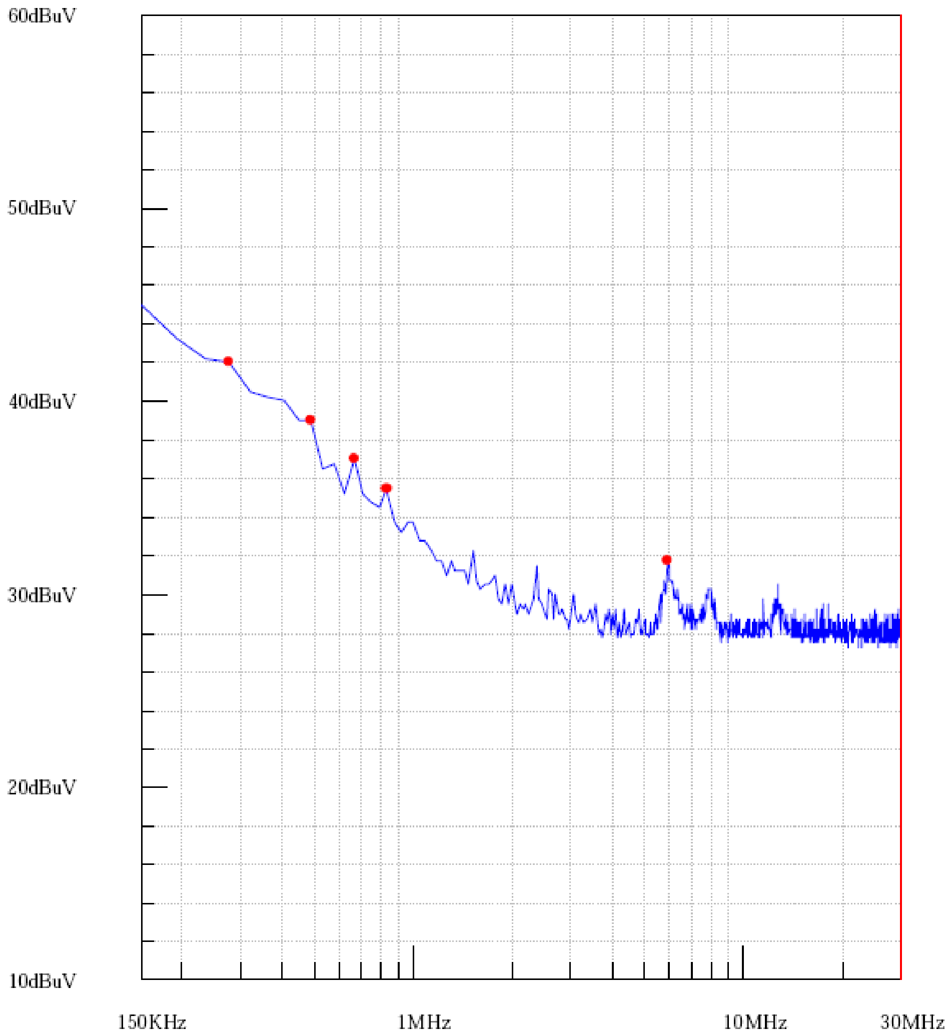
No	FREQ [MHz]	READING [dBuV]
1	0.15	43.8
2	0.32	40.2
3	0.45	38.0
4	0.58	35.8
5	6.08	33.8
6	7.91	31.3

(Horizontal)

PLOTS OF EMISSIONS

- ***Radiated Emission (0.15 MHz ~ 30 MHz)***

COMPANY	: Daewoo Electronics Corp.	REPORT NO.	: NK-10-E-786
TRADE NAME	:	DATE	: Wed Oct 13 19:32:23 2010
EQUIPMENT	: Microwave Oven	REGULATION	: FCC PART 18
MODEL	: KOR-9G2B	CLASS	:
POWER	: a.c. 120 V / 60 Hz	DISTANCE	: 3m
DESCRIPTION	: VER	FCC ID	:
REMARKS	:		
		ENGINEER	: tester

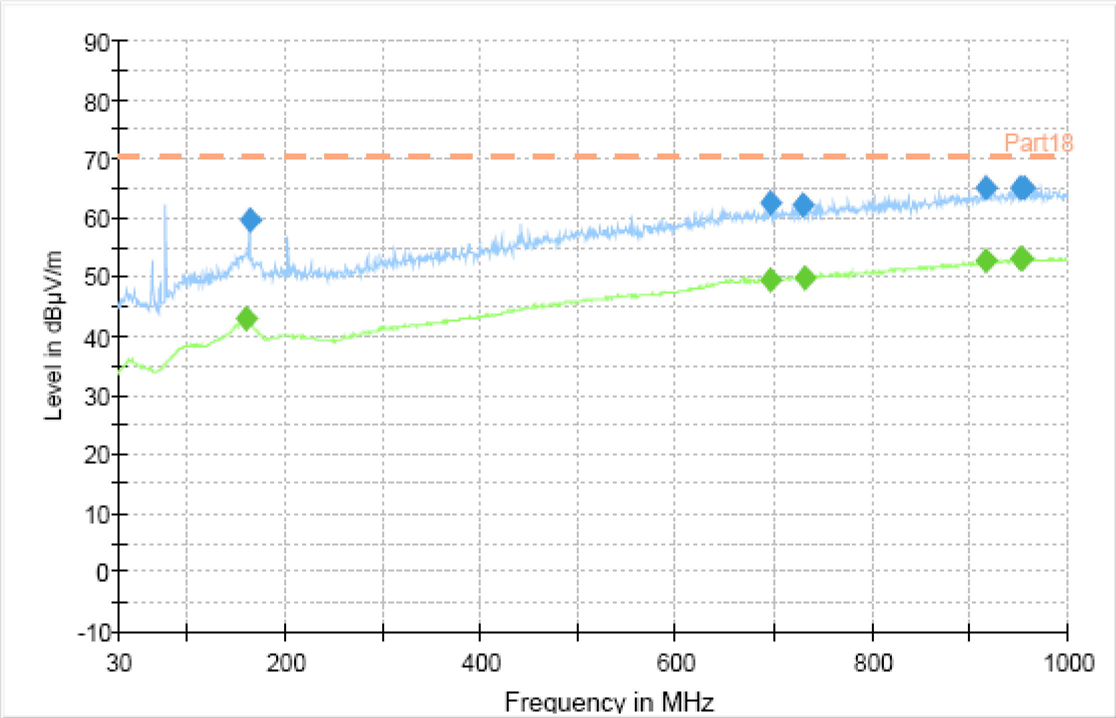


No	FREQ [MHz]	READING [dBuV]
1	0.28	42.0
2	0.49	39.0
3	0.66	37.0
4	0.83	35.5
5	5.91	31.8

(Vertical)

PLOTS OF EMISSIONS

- ***Radiated Emission (30 MHz ~ 1 GHz)***



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	*RI*	± 0.1	normal 1	1.000	0.1	1	0.1
Attenuation AMN-Receiver	*LC*	± 0.08	normal 2	2.000	0.04	1	0.04
AMN Voltage division factor	*LAMN*	± 0.8	normal 2	2.000	0.4	1	0.4
Sine wave voltage	*dVSW*	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	*dVPA*	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	*dVPR*	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	*dVNF*	± 0.00			0.00	1	0.00
AMN Impedance	*dZ*	± 1.80	triangular	2.449	0.73	1	0.73
ⓐ Mismatch	*M*	+ 0.70	U-Shaped	1.414	0.49	1	0.49
ⓑ Mismatch	*M*	− 0.80	U-Shaped	1.414	− 0.56	1	− 0.56
Measurement System Repeatability	*RS*	0.05	normal 1	1.000	0.05	1	0.05
Remark	ⓐ: AMN-Receiver Mismatch : + ⓑ: AMN-Receiver Mismatch : −						
Combined Standard Uncertainty	Normal			± 1.88			
Expended Uncertainty U	Normal (*k* = 2)			± 3.76			

2. Radiation 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	*RI*	± 0.10	normal 1	1.000	0.10	1	0.10
Sine wave voltage	*dVsw*	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	*dVpa*	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	*dVpr*	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	*dVnf*	± 0.50	normal 2	2.000	0.25	1	0.25
Antenna Factor Calibration	*AF*	± 1.50	normal 2	2.000	0.75	1	0.75
Attenuation Antenna-receiver	*CL*	± 0.52	normal 2	2.000	0.26	1	0.26
Antenna Directivity	*AD*	± 1.00	rectangular	1.732	0.58	1	0.58
Antenna Factor Height Dependence	*AH*	± 0.50	rectangular	1.732	0.29	1	0.29
Antenna Phase Centre Variation	*AP*	± 0.30	rectangular	1.732	0.17	1	0.17
Antenna Factor Frequency Interpolation	*AI*	± 0.30	rectangular	1.732	0.17	1	0.17
Site Imperfections	*SI*	± 4.00	triangular	2.449	1.63	1	1.63
Measurement Distance Variation	*DV*	± 0.10	rectangular	1.732	0.06	1	0.06
Antenna Balance	*Dbal*	± 0.90	rectangular	1.732	0.52	1	0.52
Cross Polarisation	*DCross*	± 0.90	rectangular	1.732	0.52	1	0.52
ⓐ Mismatch	*M*	+ 0.25	U-Shaped	1.414	0.18	1	0.18
ⓑ Mismatch	*M*	− 0.26	U-Shaped	1.414	− 0.18	1	− 0.18
ⓒ Mismatch	*M*	+ 0.98	U-Shaped	1.414	0.69	1	0.69
ⓓ Mismatch	*M*	− 1.11	U-Shaped	1.414	− 0.79	1	− 0.79

Measurement System Repeatability	*RS*	0.09	normal 1	1.000	0.09	1	0.09
Remark	ⓐ: Biconical Antenna-receiver Mismatch : + (< 200 MHz) ⓑ: Biconical Antenna-receiver Mismatch : - (< 200 MHz) ⓒ: Log Periodic Antenna-receiver Mismatch : + (≧ 200 MHz) ⓓ: Log Periodic Antenna-receiver Mismatch : - (≧ 200 MHz)						
Combined Standard Uncertainty	Normal			± 2.63 (< 200 MHz) ± 2.74 (≧200 MHz)			
Expended Uncertainty U	Normal (k = 2)			± 5.26 (< 200 MHz) ± 5.48 (≧200 MHz)			

LIST OF TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	*Test Receiver	R & S	ESCS 30	833364/020	Mar. 24 2010	1 year
2	*Test Receiver	R & S	ESCS 30	100302	Nov. 11 2009	1 year
3	*Amplifier	HP	8447F	2805A03351	Oct. 06 2010	1 year
4	*Amplifier	Sonoma Instrument	310N	291916	July 20 2010	1 year
5	*Pre Amplifier	HP	8449B	3008A00107	Feb. 03 2010	1 year
6	Spectrum Analyzer	ADVANTEST	R3265A	45060401	July 20 2010	1 year
7	*Spectrum Analyzer	R & S	FSP40	100361	Sep. 02 2010	1 year
8	PSA Series Spectrum Analyzer	Agilent	E4440A	MY44022567	June. 03 2010	1 year
9	*Microwave Survey Meter	ETS-LINDGEN	HI-1801	33549	Jan. 11 2010	1 years
10	*Loop Antenna	EMCO	EMCO/6502	8911-2436	Jan. 19 2010	2 years
11	*Biconical Log Antenna	ARA	LPB-2520/A	1209	Dec. 08 2008	2 years
12	*Logbicon Super Broadband Antenna	SCHWARZBECK	VULB 9166	1067	July 14 2010	2 years
13	*Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-474	July 14 2010	2 years
14	Signal Generater	R & S	SMP02	833286/003	July 20 2010	1 year
15	LISN	R & S	ESH3-Z5	833874/006	Nov. 11 2009	1 year
16	*LISN	R & S	ESH2-Z5	100227	Feb. 03 2010	1 year
17	*Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
18	*Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
19	*Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
20	*Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
21	*Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
22	*Anechoic Chamber	SY Corporation	N/A	N/A	N/A	N/A
23	Shielded Room	SY Corporation	N/A	N/A	N/A	N/A

) Test equipment used during the test

APPENDIX D – SCHEMATIC DIAGRAM

APPENDIX E – USER'S MANUAL

APPENDIX F – BLOCK DIAGRAM