Nemko Korea Co., Ltd.

155 & 159, Osan-Ro, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 449-852 KOREA, REPUBLIC OF
TEL : + 82 31 330 1700 FAX : + 82 31 322 2332

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant :
Daewoo Electronics Corporation
Kitchen Appliances Div. R&D Center,
412-2, Cheongcheon2-Dong, Bupyeong-Gu,
Incheon, 403-032, Korea
Attn : Mr. Seongok Kim

Dates of Issue : January 15, 2013
Test Report No. : NK-12-E-928
Test Site : Nemko Korea Co., Ltd.
EMC site, Korea

FCC ID	***C5F7NF22MO110N***
Brand Name	***DAEWOO, GE***
Contact Person	**Daewoo Electronics Corporation** **Kitchen Appliances Div. 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.

Jan 15, 2013

Tested By : Kyounghoon Lee
Engineer

Jan 15. 2013

Reviewed By : Deokha Ryu
Technical Manager

TABLE OF CONTENTS

SCOPE

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

Responsible Party :	Daewoo Electronics Corporation
Contact Person :	Mr. Seongok Kim Tel No.: + 82 32 510 7919
Manufacturer :	Daewoo Electronics Corporation Kitchen Appliances Div. R&D Center, 412-2, Cheongcheon2-Dong, Bupyeong-Gu, Incheon, 403-032, Korea
Factory :	Daewoo Microwave Oven Co., Ltd. Development Area, Binhai New Area Tianjjin China

- FCC ID: C5F7NF22MO110N
- Model: KOR-226S
- Variant Model: KOR-223S
  PEB7226DF*WW
  PEB7226DF*BB
  PEB7226SF*SS
  Note) "*" May or may not include number from 0 to 9
- Brand Name: DAEWOO, GE
- EUT Type: Microwave Oven
- Applied Standard: FCC Part 18 & Part 2
- Test Procedure(s): MP-5:1986
- Dates of Test: December 11, 2012 to January 04, 2012
- Place of Tests: Nemko Korea Co., Ltd. EMC Site
- Test Report No.: NK-12-E-928

※ **The model KOR-226S was tested and was recorded the data in test report.**

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 : **C5F7NF22MO110N, Microwave Oven.**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory***.
The site address is 155 & 159, Osan-Ro, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 449-852 KOREA, REPUBLIC OF
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.
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 on 2003.

Nemko Korea Co., Ltd.
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Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. EMC Lab and Incheon Airport.

EUT INFORMATION

EUT Information

Electric Rating :	a.c. 120 V, 60 Hz
Clock :	4 MHz
Magnetron Type :	RM269 (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 m sec 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.

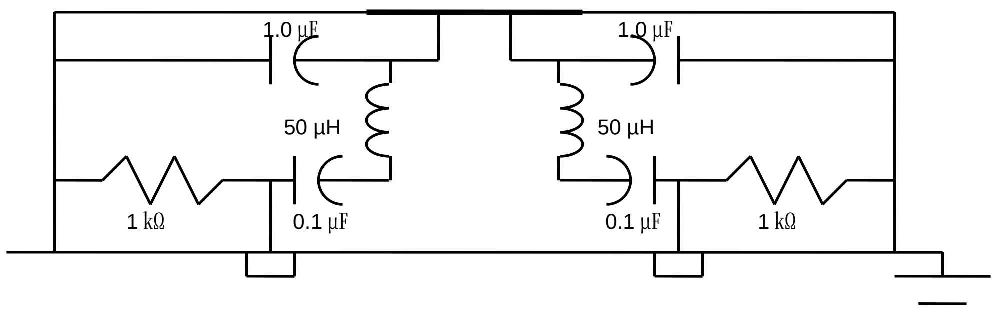


Fig. 2. LISN Schematic Diagram

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 (R&S/HFH2-Z2) 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 (R&S/HFH2-Z2) for measurement from 0.15 to 30 MHz with RBW 9 kHz & VBW 9 kHz and made outdoor at 3 m using Trilog-Broadband Antenna (Shwarzbeck, VULB9168) 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 10 Hz.
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.

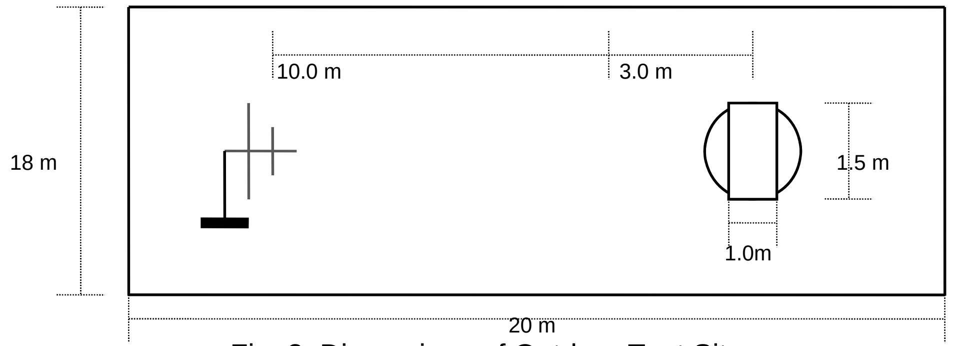


Fig. 3. Dimensions of Outdoor Test Site

TEST DATA

Radiation Hazard

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
A	0.12	1.00
B	0.10	1.00
C	0.09	1.00
D	0.08	1.00
All others	0.06	1.00

Input Power Measurement

Operation mode	P rated (W)	P (W)	dP (%)	Required dP (%)
Power Input	1600	1615	0.9	+ 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	38.3	28.3	120	987

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

Tested by : ***Kyounghoon Lee***

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	H	Lower : 2450.0	Lower : 2400 MHz Upper : 2500 MHz
	H	Upper : 2471.0	
	V	Lower : 2446.4	
	V	Upper : 2469.2	
108	H	Lower : 2445.8	
	H	Upper : 2472.8	
	V	Lower : 2436.8	
	V	Upper : 2469.2	
132	H	Lower : 2475.8	
	H	Upper : 2450.0	
	V	Lower : 2477.0	
	V	Upper : 2450.0	
150	H	Lower : 2450.6	
	H	Upper : 2472.8	
	V	Lower : 2473.4	
	V	Upper : 2456.6	

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 : ***Kyounghoon Lee***

TEST DATA

▶Frequency vs Load Variation Test

[Room Temperature : 24.0 ℃]

Volume of water (ml)	*)Pole	Frequency [MHz]	Allowed Tolerance for the ISM Band
200	H	Lower : 2449.4	Lower : 2400 MHz Upper : 2500 MHz
	H	Upper : 2478.2	
	V	Lower : 2448.2	
	V	Upper : 2477.0	
400	H	Lower : 2475.8	
	H	Upper : 2448.2	
	V	Lower : 2478.2	
	V	Upper : 2456.0	
600	H	Lower : 2453.0	
	H	Upper : 2469.2	
	V	Lower : 2468.6	
	V	Upper : 2455.4	
800	H	Lower : 2485.4	
	H	Upper : 2454.2	
	V	Lower : 2456.0	
	V	Upper : 2469.8	
1000	H	Lower : 2481.2	
	H	Upper : 2448.8	
	V	Lower : 2451.8	
	V	Upper : 2469.8	

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 : ***Kyounghoon Lee***

TEST DATA

Conducted Emissions

FCC ID : C5F7NF22MO110N

[Room Temperature : 22.4 ℃]

Frequency	Level (dBuV)		*) Factor	**) Line	Limit (dBuV)		Margin (dB)	
(MHz)	Q-Peak	Average	(dB)		Q-Peak	Average	Q-Peak	Average
0.15	51.4	29.8	0.2	L	66.0	56.0	14.6	26.2
0.17	47.4	29.7	0.2	L	65.0	55.0	17.6	25.3
0.29	48.6	27.5	0.2	L	60.5	50.5	11.9	23.0
0.37	47.7	29.6	0.1	L	58.5	48.5	10.8	18.9
0.40	45.2	32.3	0.8	L	57.9	47.9	12.7	15.6
0.57	45.7	16.1	2.0	L	56.0	46.0	10.3	29.9

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 : ***Kyounghoon Lee***

TEST DATA

Radiated Emissions

FCC ID : C5F7NF22MO110N

▶ 0.15 MHz ~ 30 MHz

[Room Temperature : 22.4 ℃]

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 : ***Kyounghoon Lee***

TEST DATA

Radiated Emissions

FCC ID : C5F7NF22MO110N

▶ 30 MHz ~ 1 GHz

[Room Temperature : 23.0 ℃]

Frequency (MHz)	Reading (dBµV/m)	Pol* (H/V)	Antenna Heights (cm)	Turntable Angles (°)	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
258.67	50.1	H	400	27	-15.5	34.6	70.9	36.3
492.61	47.3	V	100	125	-11.3	36.0	70.9	34.9
508.15	49.2	H	351	75	-8.9	40.3	70.9	30.6
543.81	42.6	V	100	105	-8.9	33.7	70.9	37.2
593.08	45.7	V	100	225	-8.9	36.8	70.9	34.1
834.35	40.2	V	100	361	-4.2	36.0	70.9	34.9

<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 dB µV/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. The limit for consumer device is on the FCC Part section 18.305.

Tested by : ***Kyounghoon Lee***

TEST DATA

Radiated Emissions

FCC ID : C5F7NF22MO110N

▶ Above 1 GHz

[Room Temperature : 23.0 ± 2.0 ℃]

Frequency	Pol*	Antenna Heights	Turntable Angles	Reading Level	Total Loss**	Result at 3 m		K	Results at 300 m	Limits at 300 m
(MHz)	(H/V)	(cm)	(°)	(dBµV)	(dB)	(dBµV/m)	(µV/m)		(µV/m)	(µV/m)
4918.65	H	160	15	53.1	-1.1	52.0	398.11	0.01	4.0	35.1
7385.01	H	130	300	45.3	6.4	51.7	384.59	0.01	3.8	35.1
8373.60	H	160	330	31.9	10.1	42.0	125.89	0.01	1.3	35.1
9835.22	H	160	60	45.1	13.3	58.4	831.76	0.01	8.3	35.1
14758.61	V	130	345	41.4	15.9	57.3	732.82	0.01	7.3	35.1
17240.92	H	160	180	38.3	20.3	58.6	851.14	0.01	8.5	35.1

<Radiated Measurements at 3 meters>

NOTES:

1. * Pol.   H =Horizontal   V=Vertical

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

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

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

5. Load for measurement of radiation on second and third harmonic : Two loads, one of 700 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.

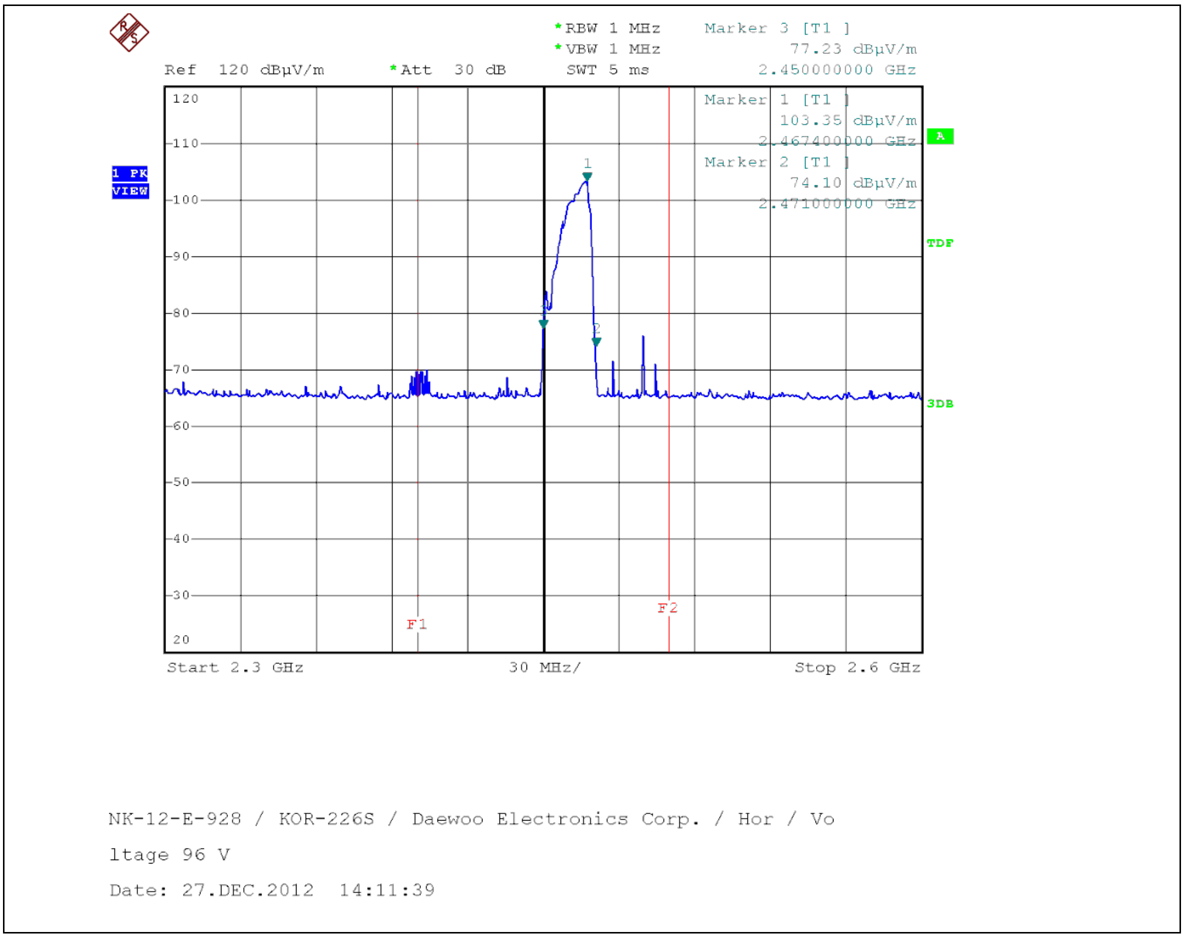
6. The test was performed at peak detector mode with average.

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

Tested by : ***Kyounghoon Lee***

PLOTS OF EMISSIONS

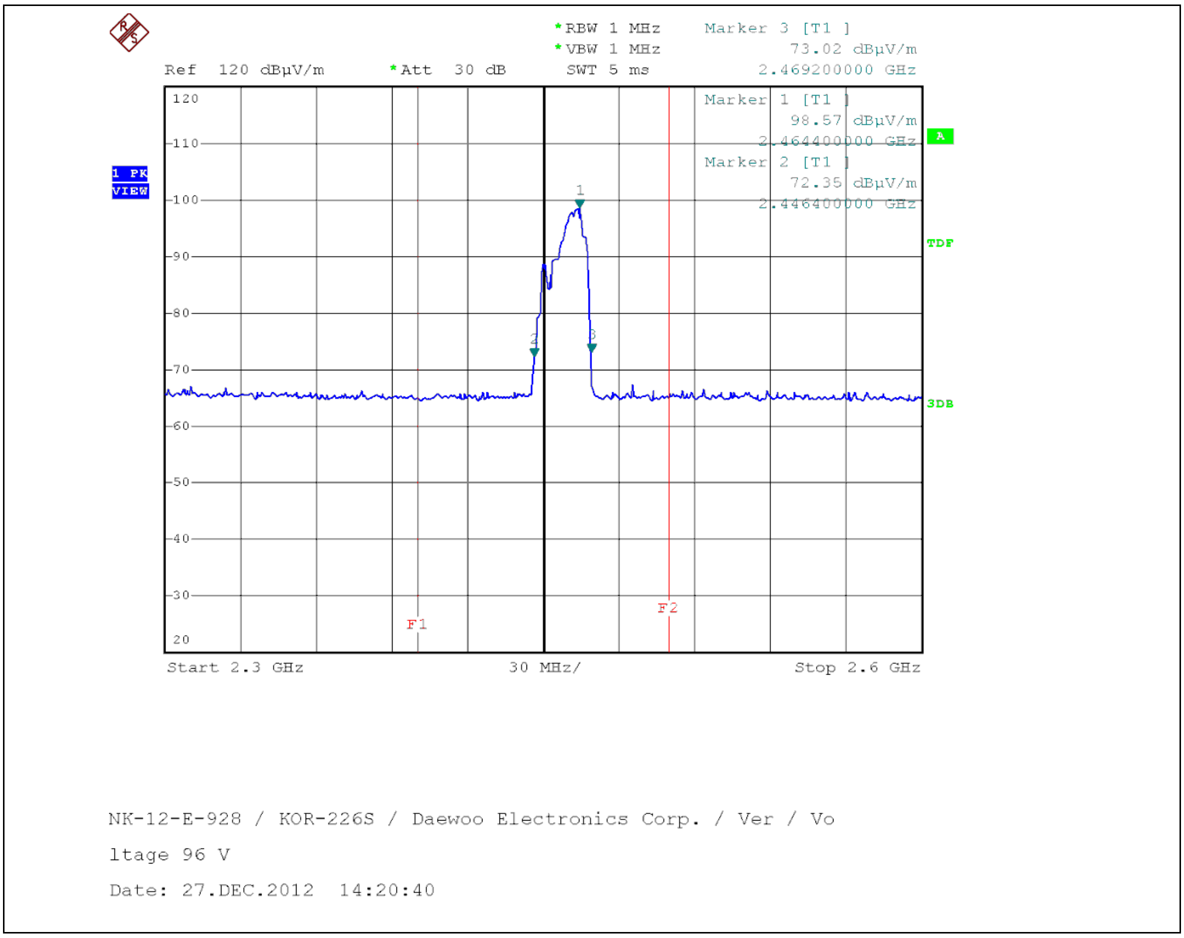
- ***Frequency vs Line Voltage Variation Test***



Horizontal (96 V, 1000 ml)

PLOTS OF EMISSIONS

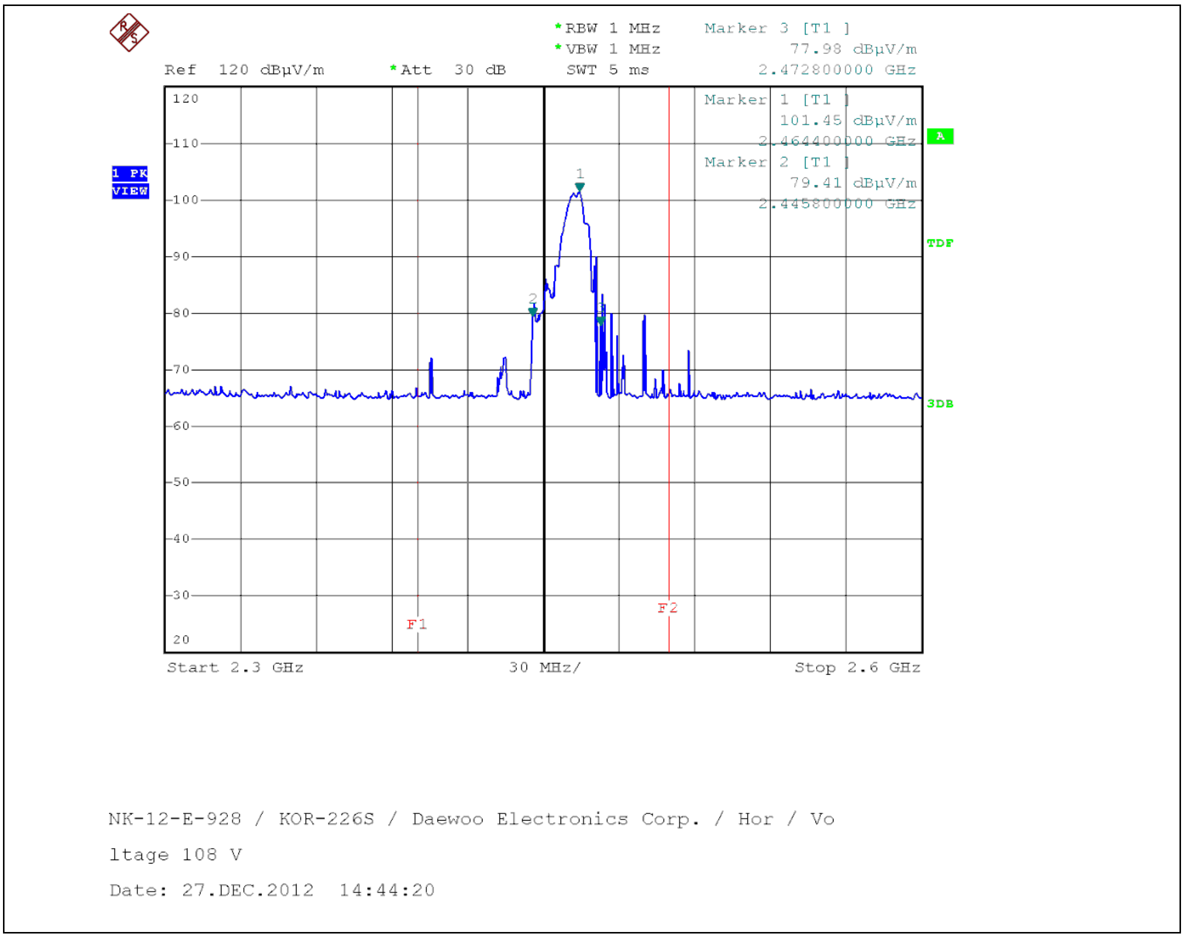
- ***Frequency vs Line Voltage Variation Test***



Vertical (96 V, 1000 ml)

PLOTS OF EMISSIONS

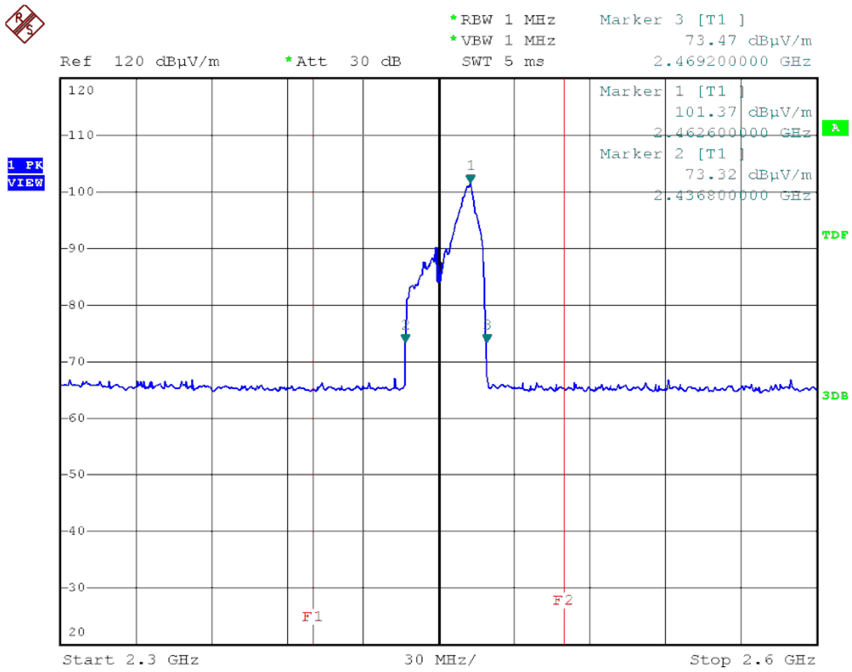
- ***Frequency vs Line Voltage Variation Test***



Horizontal (108 V, 1000 ml)

PLOTS OF EMISSIONS

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

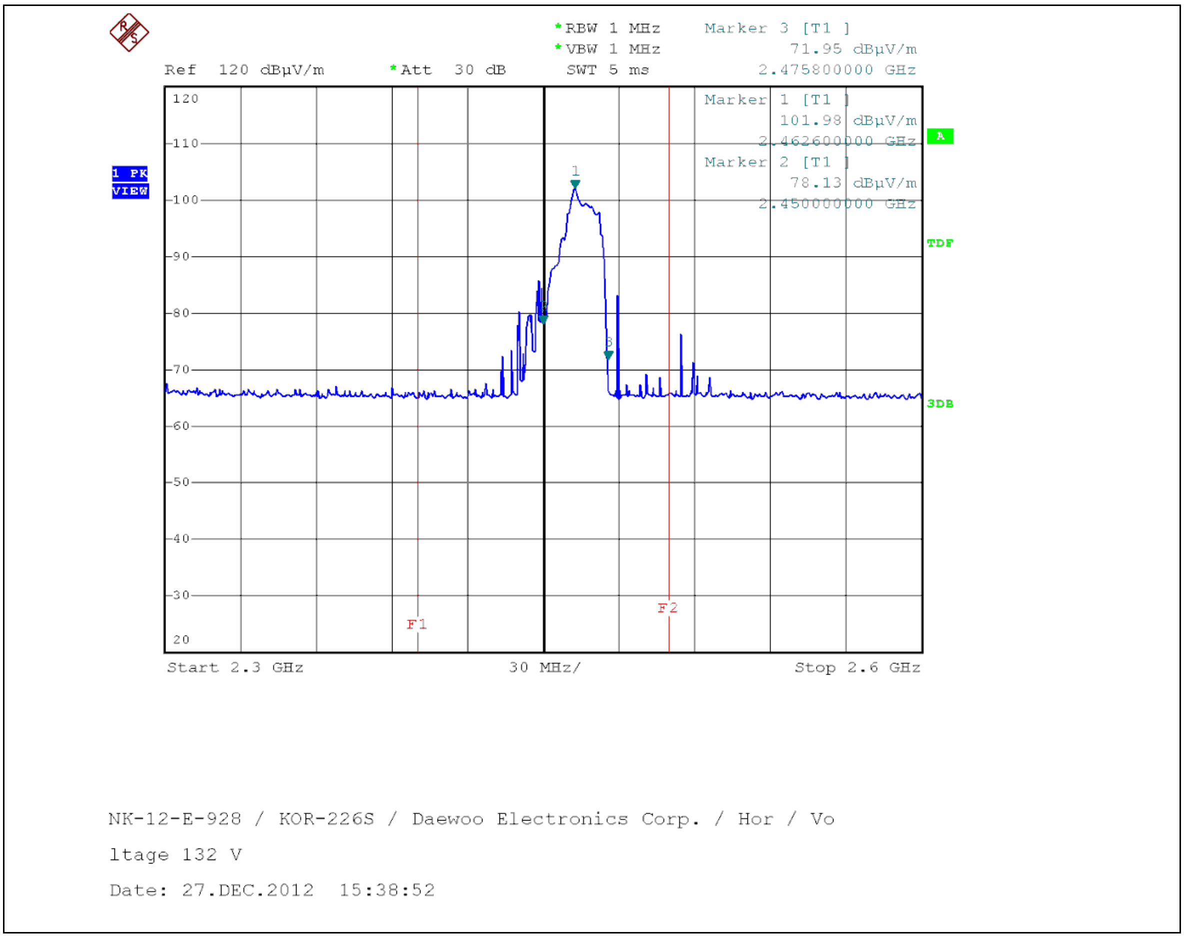


NK-12-E-928 / KOR-226S / Daewoo Electronics Corp. / Ver / Vo
ltage 108 V
Date: 27.DEC.2012 14:31:07

Vertical (108 V, 1000 ml)

PLOTS OF EMISSIONS

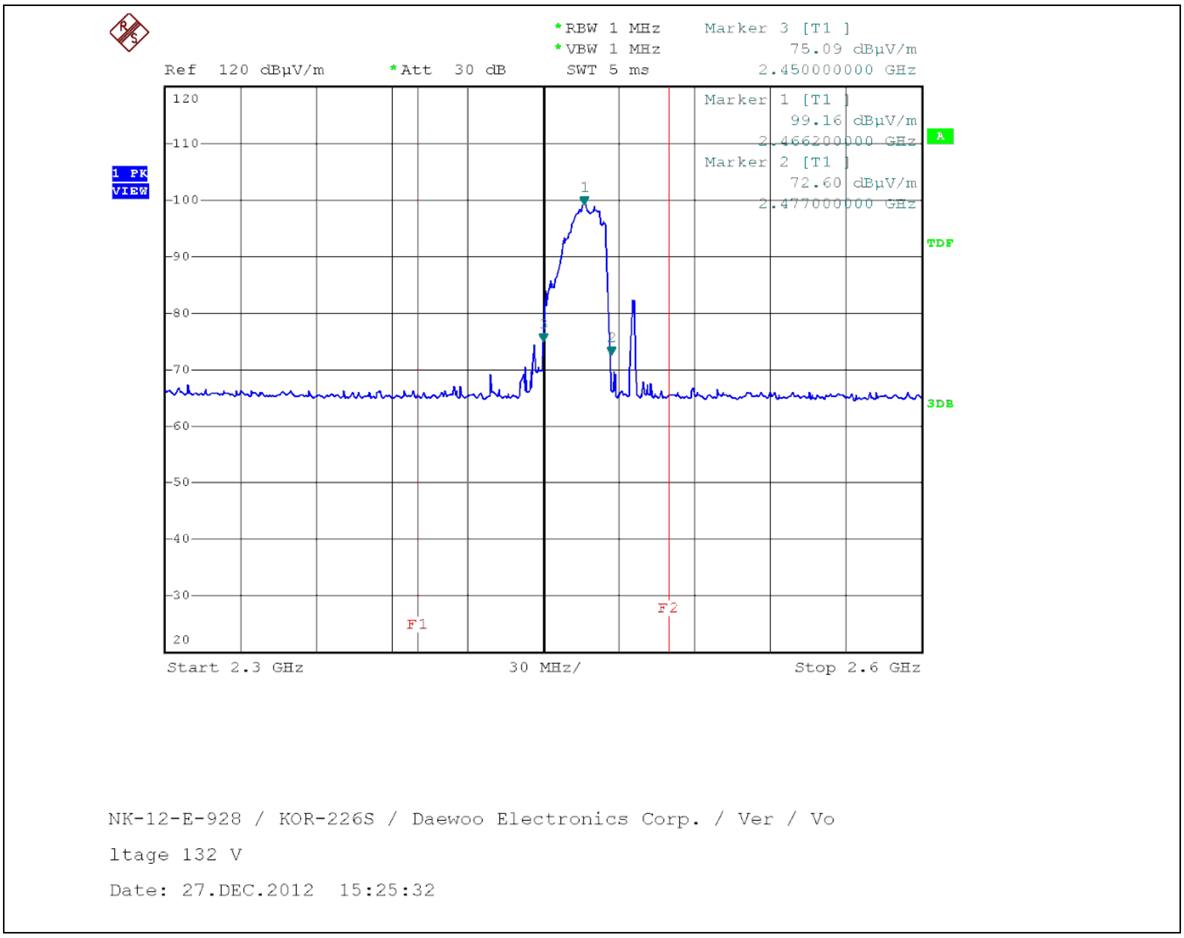
- ***Frequency vs Line Voltage Variation Test***



Horizontal (132 V, 1000 ml)

PLOTS OF EMISSIONS

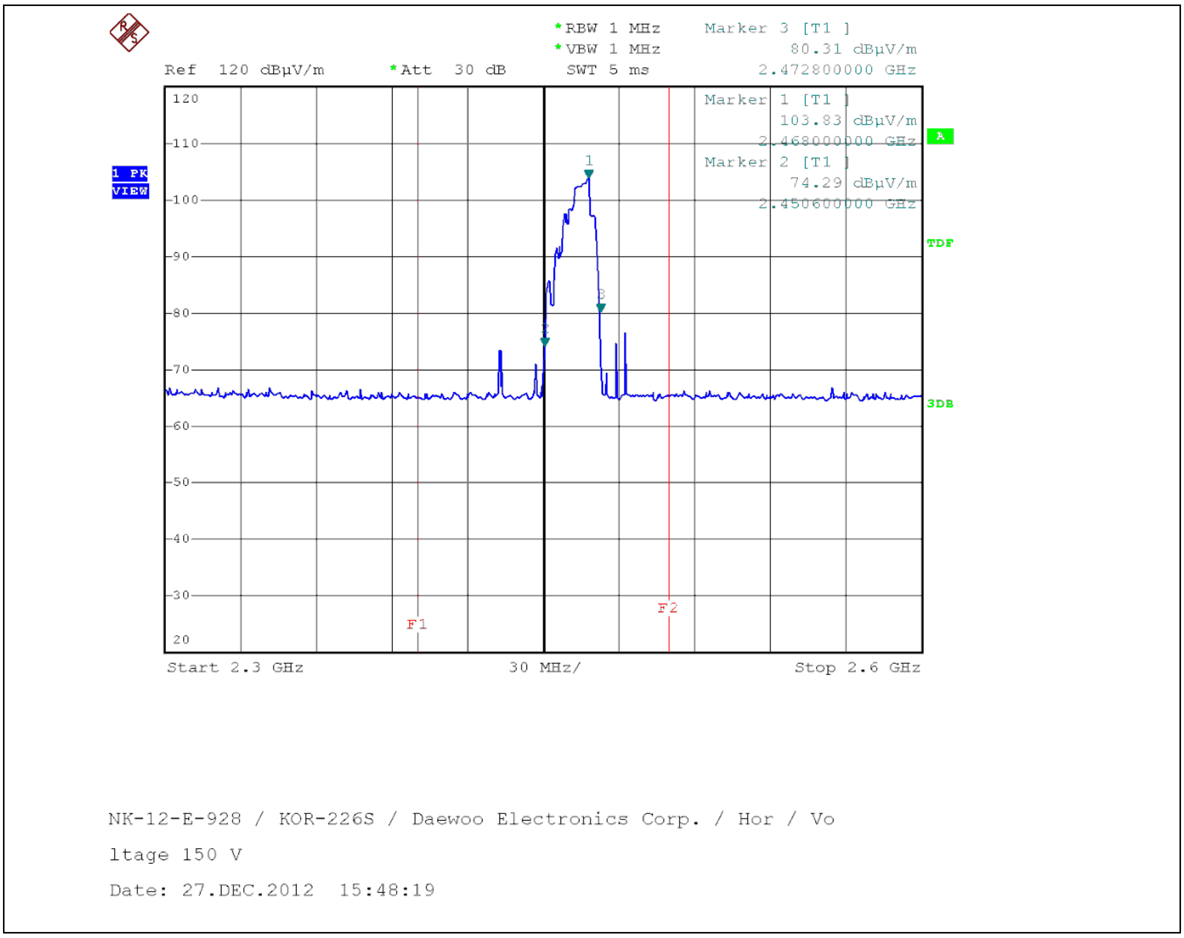
- ***Frequency vs Line Voltage Variation Test***



Vertical (132 V, 1000 ml)

PLOTS OF EMISSIONS

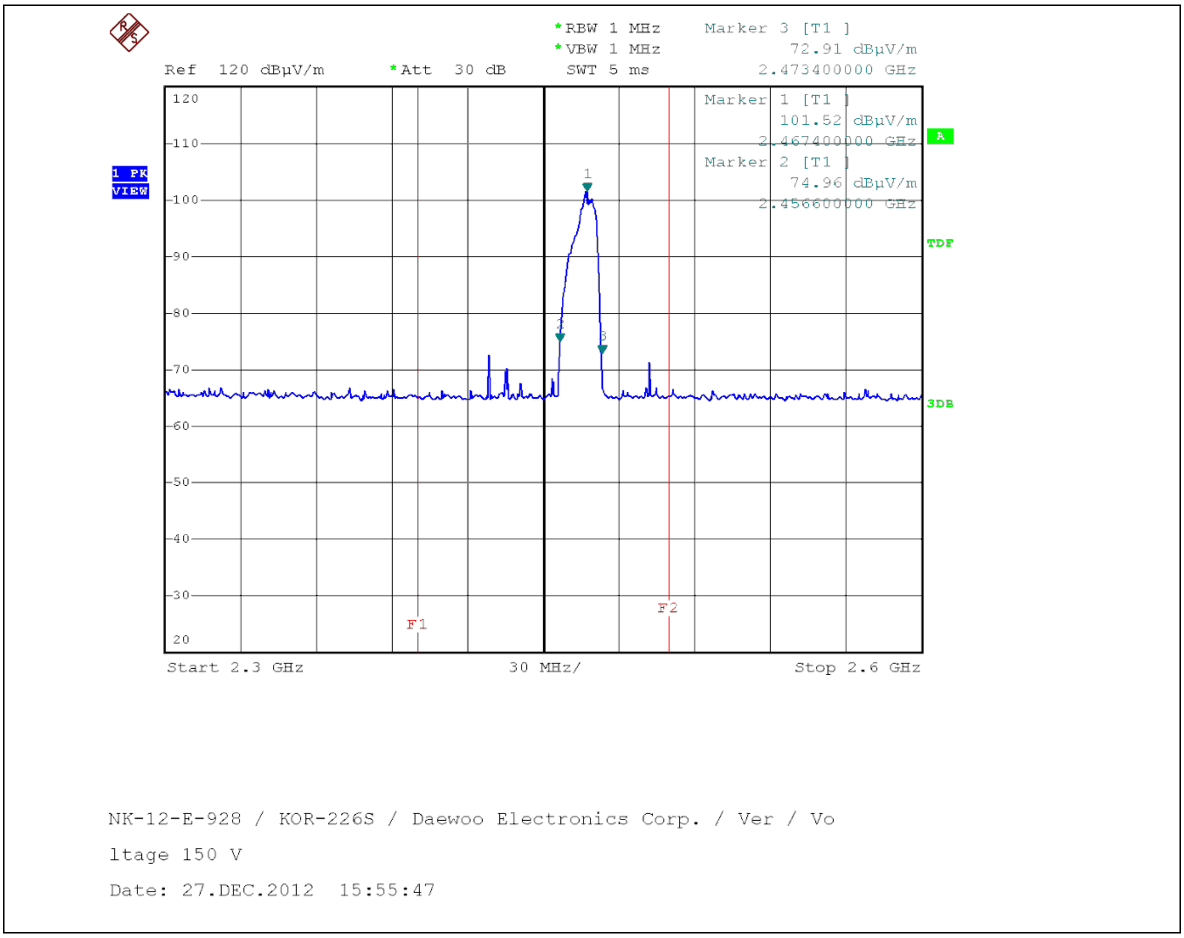
- ***Frequency vs Line Voltage Variation Test***



Horizontal (150 V, 1000 ml)

PLOTS OF EMISSIONS

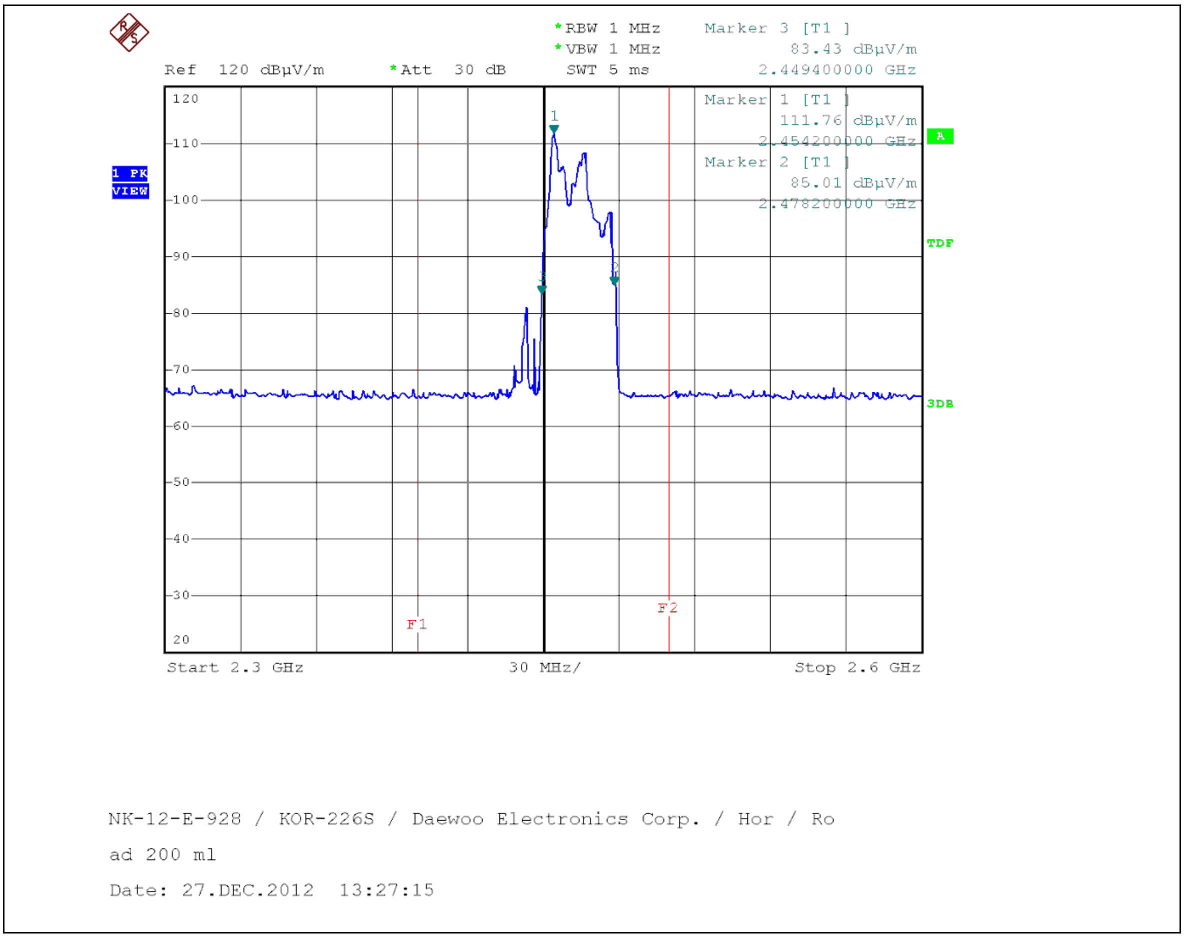
- ***Frequency vs Line Voltage Variation Test***



Vertical (150 V, 1000 ml)

PLOTS OF EMISSIONS

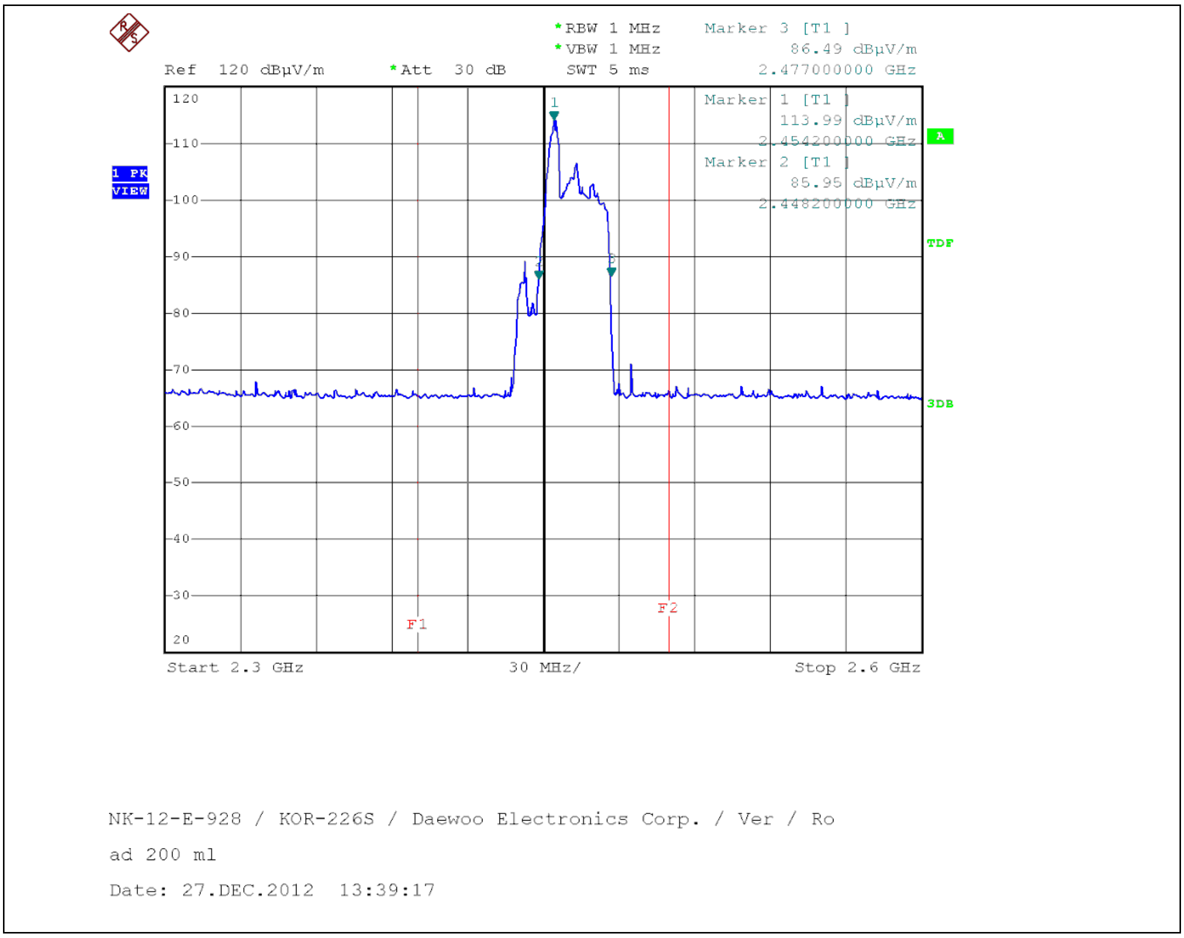
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 200 ml)

PLOTS OF EMISSIONS

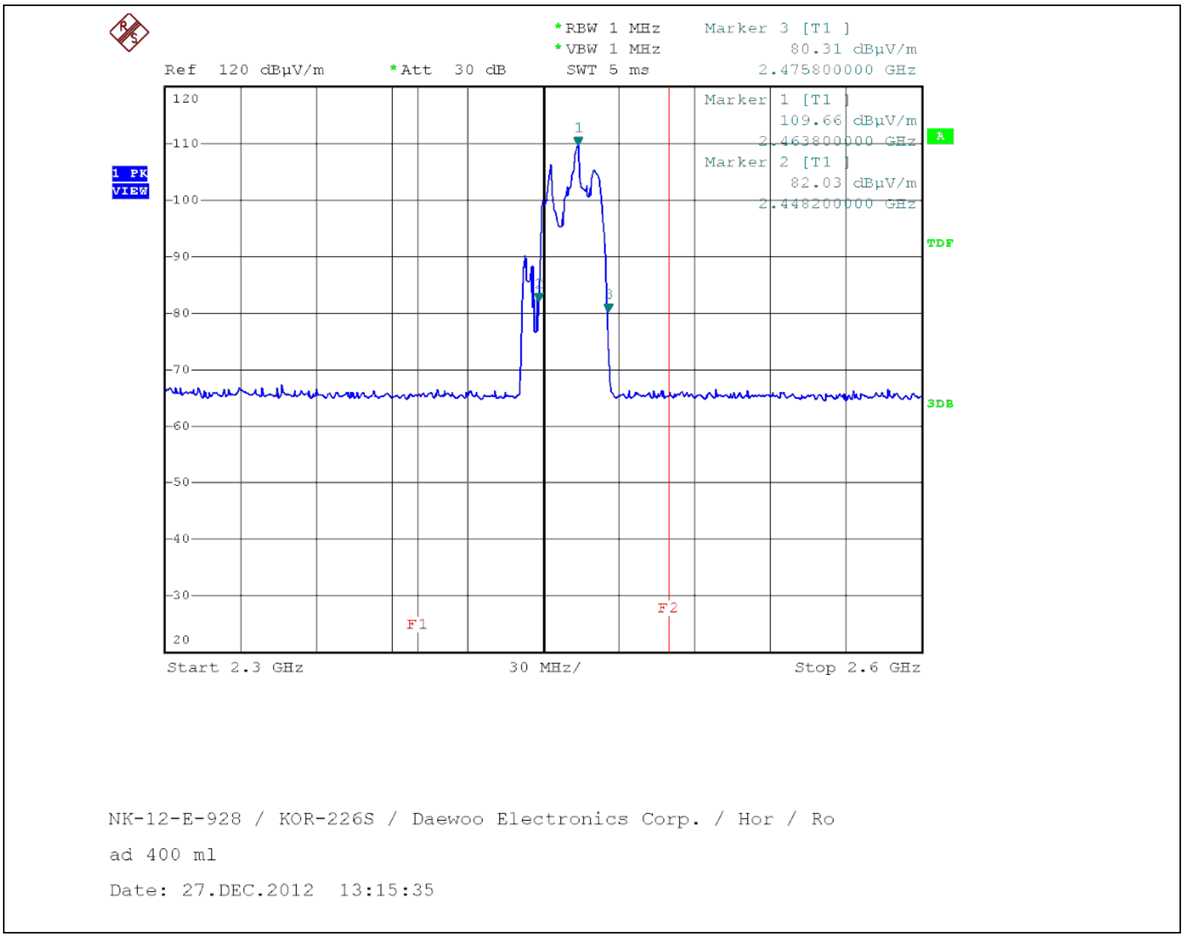
- ***Frequency vs Load Variation Test***



Vertical (120 V, 200 ml)

PLOTS OF EMISSIONS

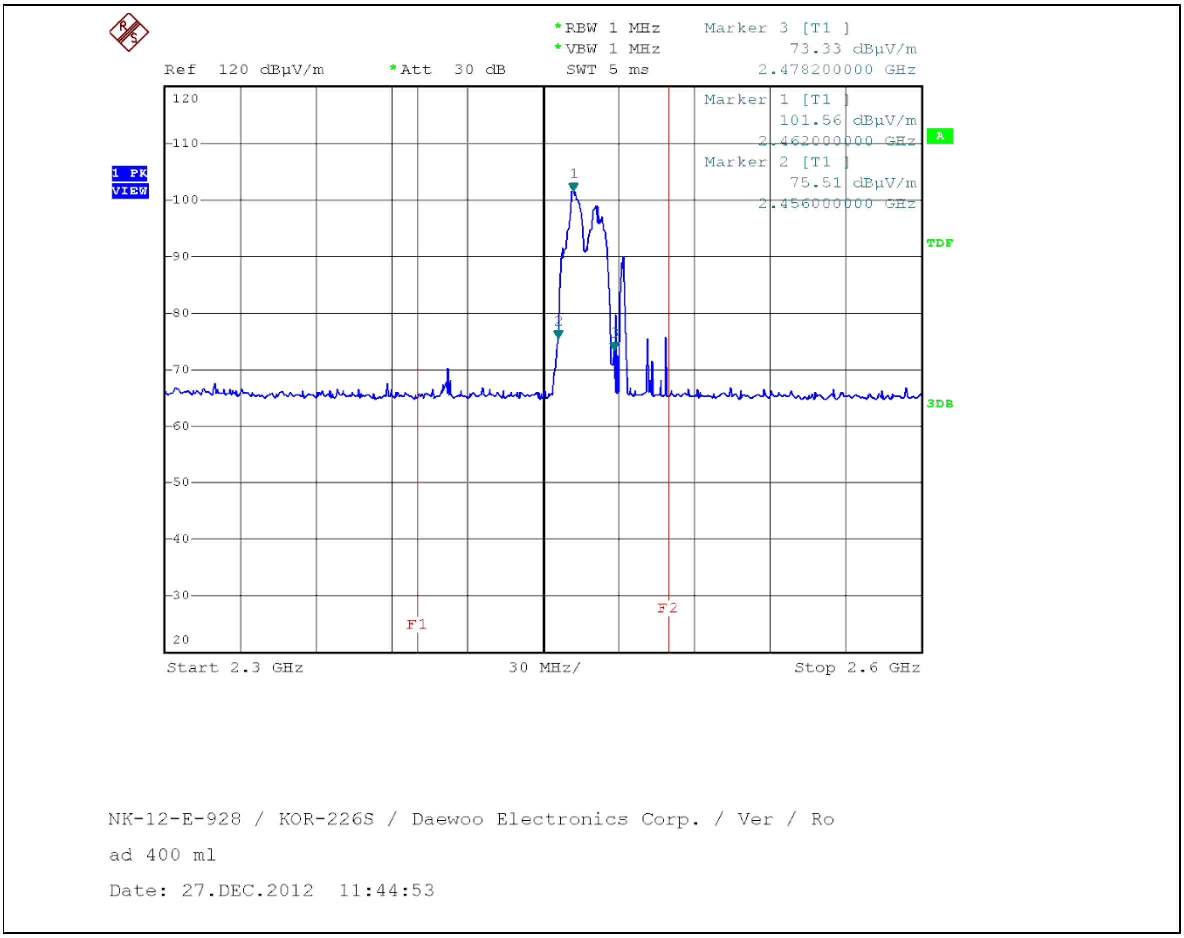
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 400 ml)

PLOTS OF EMISSIONS

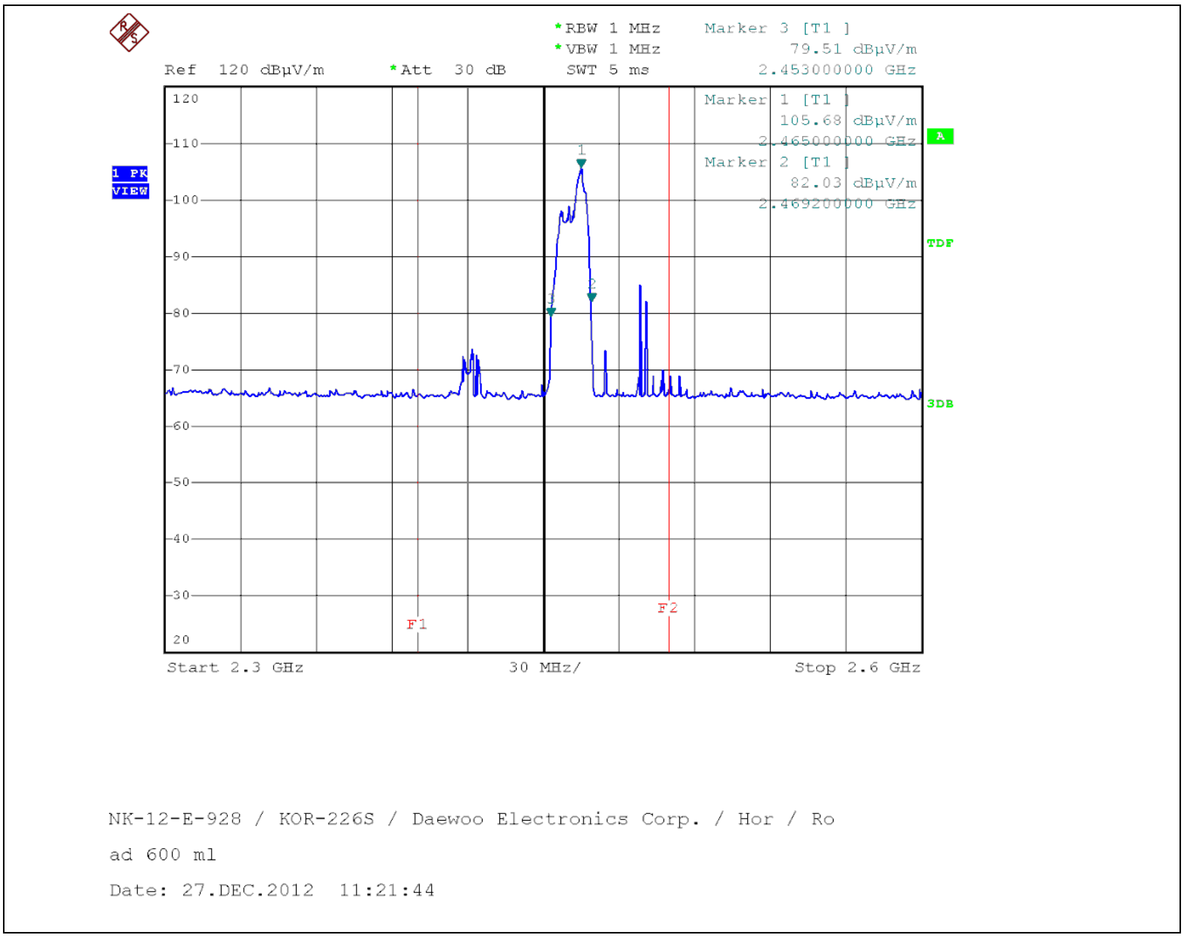
- ***Frequency vs Load Variation Test***



Vertical (120 V, 400 ml)

PLOTS OF EMISSIONS

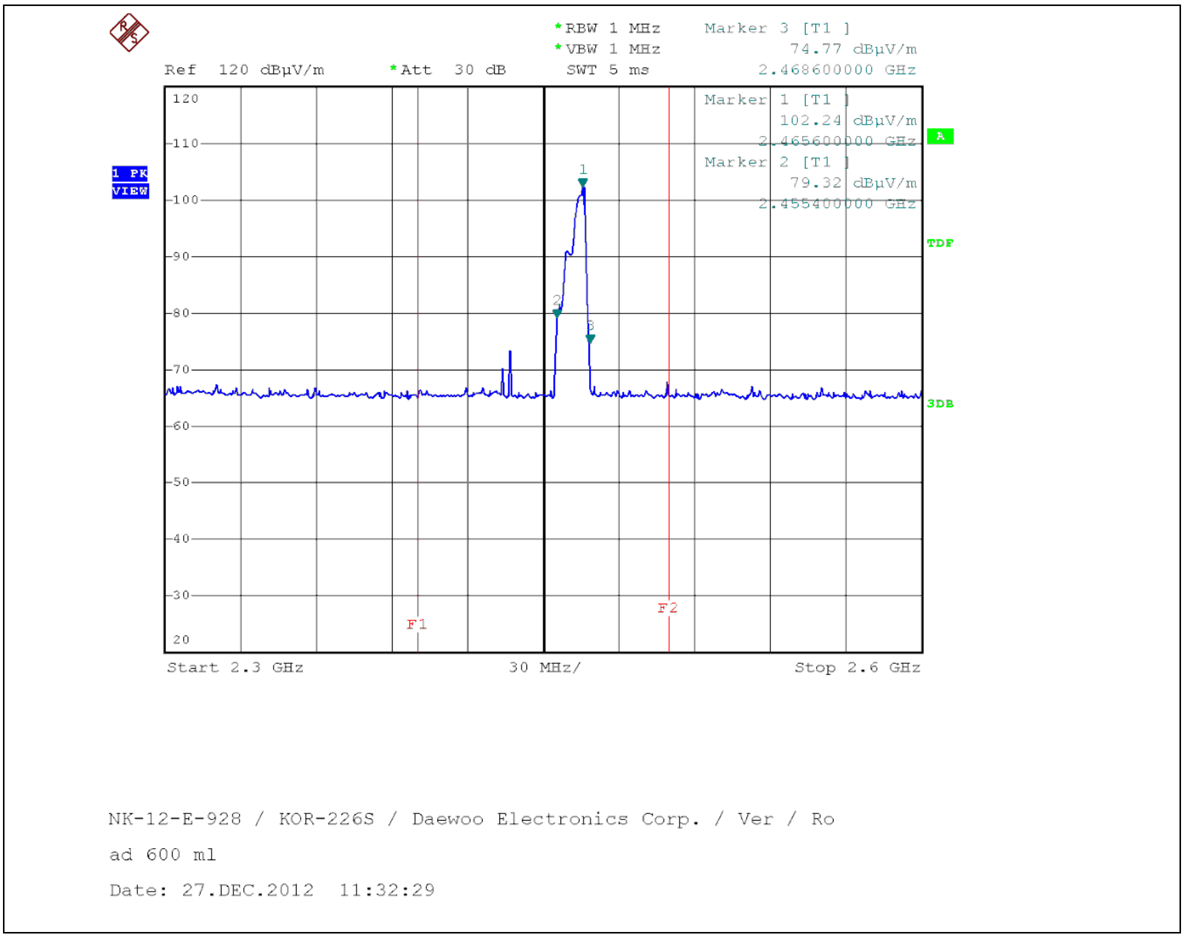
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 600 ml)

PLOTS OF EMISSIONS

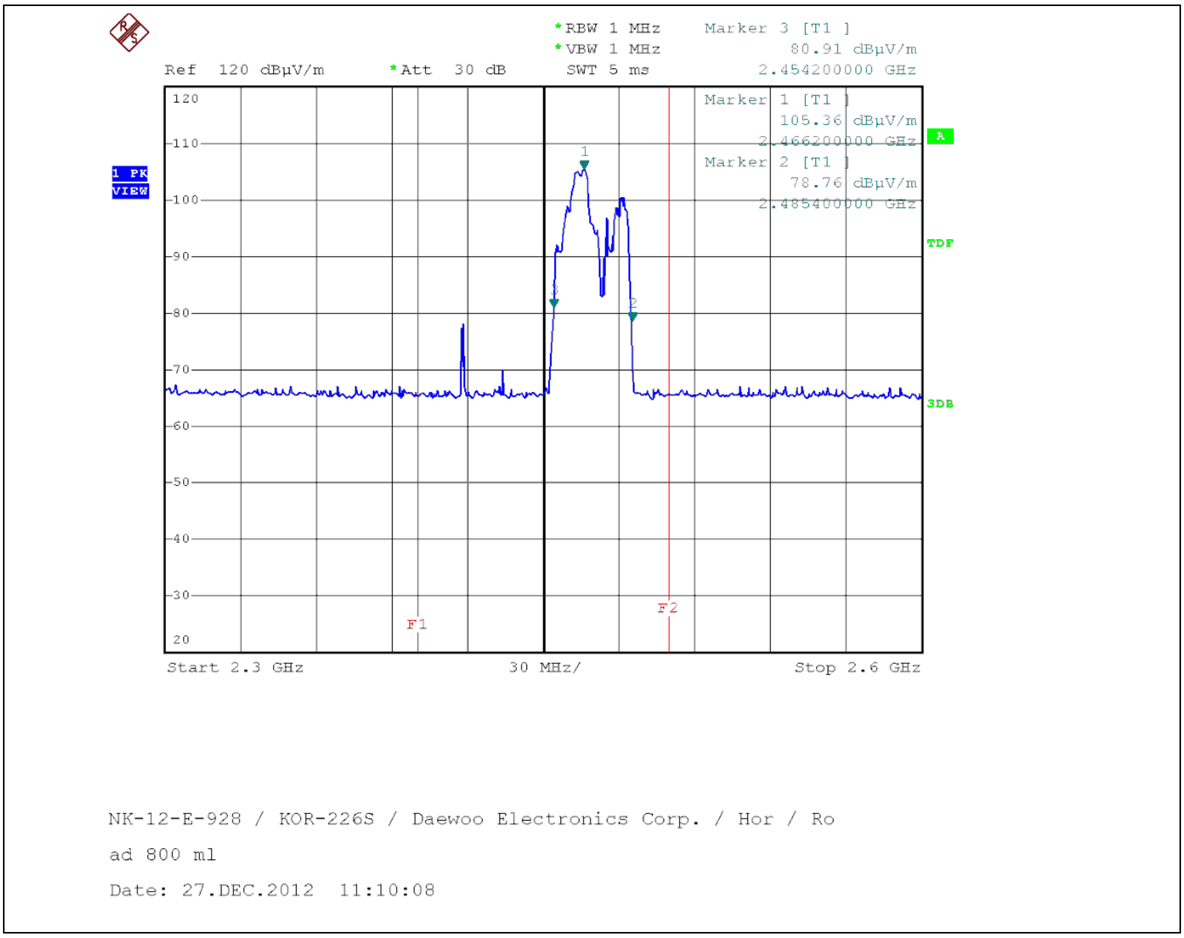
- ***Frequency vs Load Variation Test***



Vertical (120 V, 600 ml)

PLOTS OF EMISSIONS

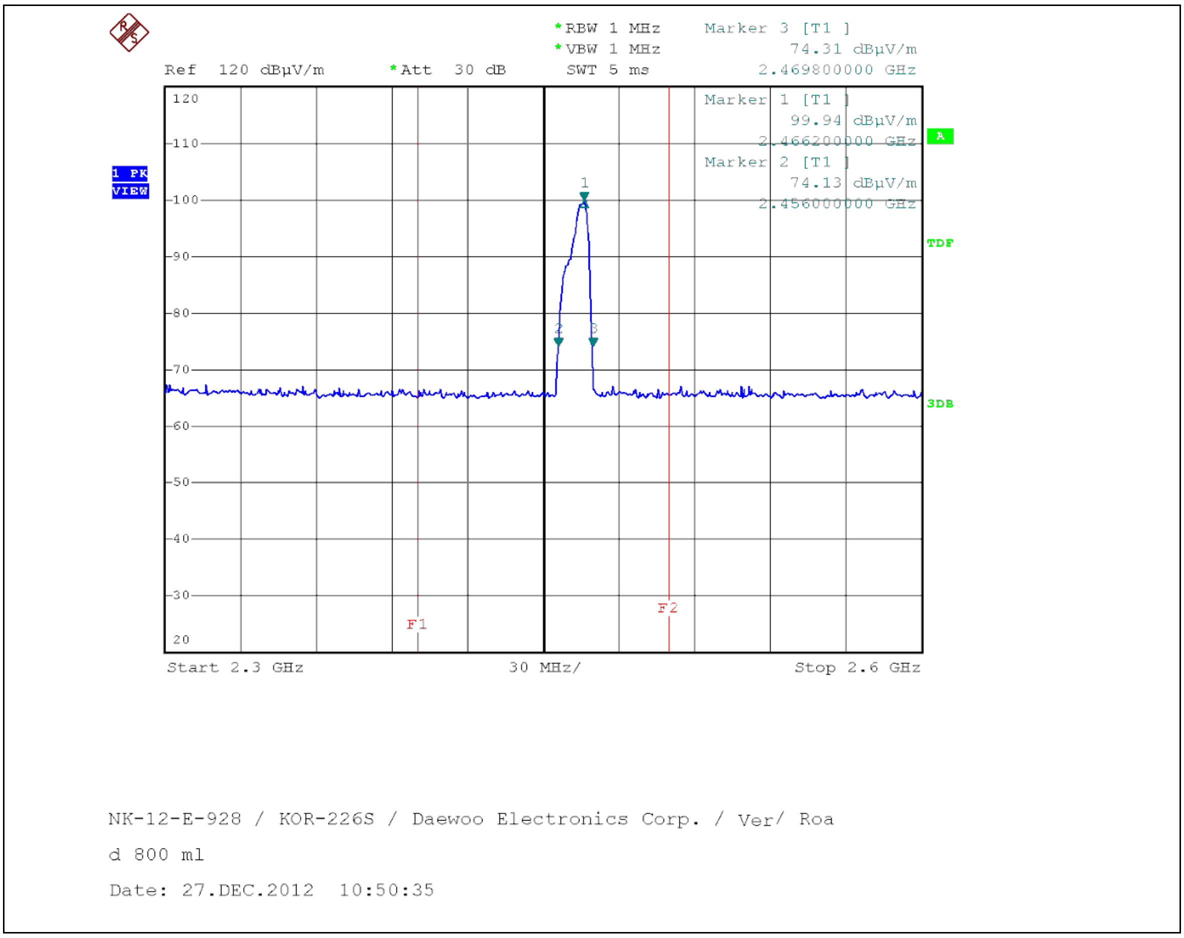
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 800 ml)

PLOTS OF EMISSIONS

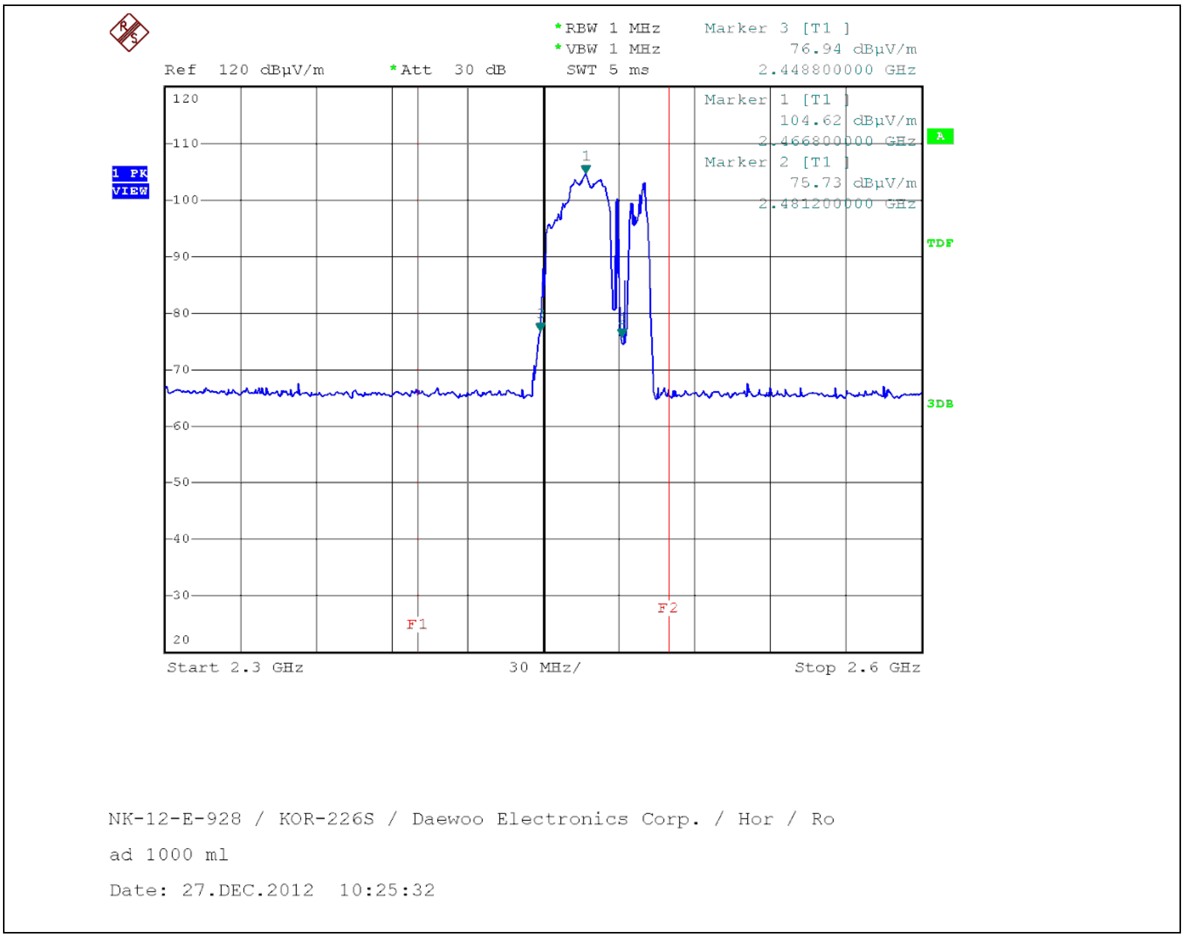
- ***Frequency vs Load Variation Test***



Vertical (120 V, 800 ml)

PLOTS OF EMISSIONS

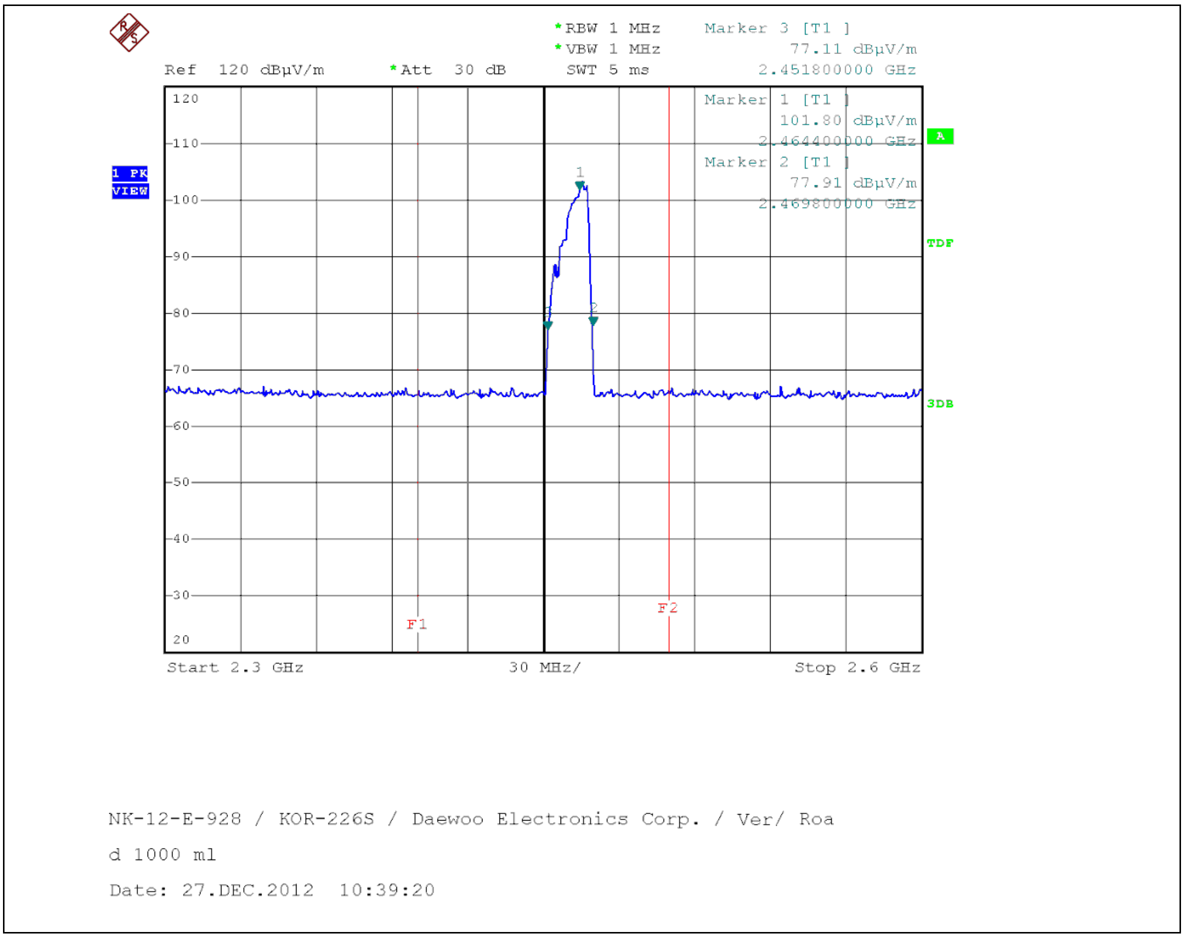
- ***Frequency vs Load Variation Test***



Horizontal (120 V, 1000 ml)

PLOTS OF EMISSIONS

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



Vertical (120 V, 1000 ml)

PLOTS OF EMISSIONS

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

NEMKO KOREA(NK-12-E-928)　　26 Dec 2012　14:09

Conducted Emissions

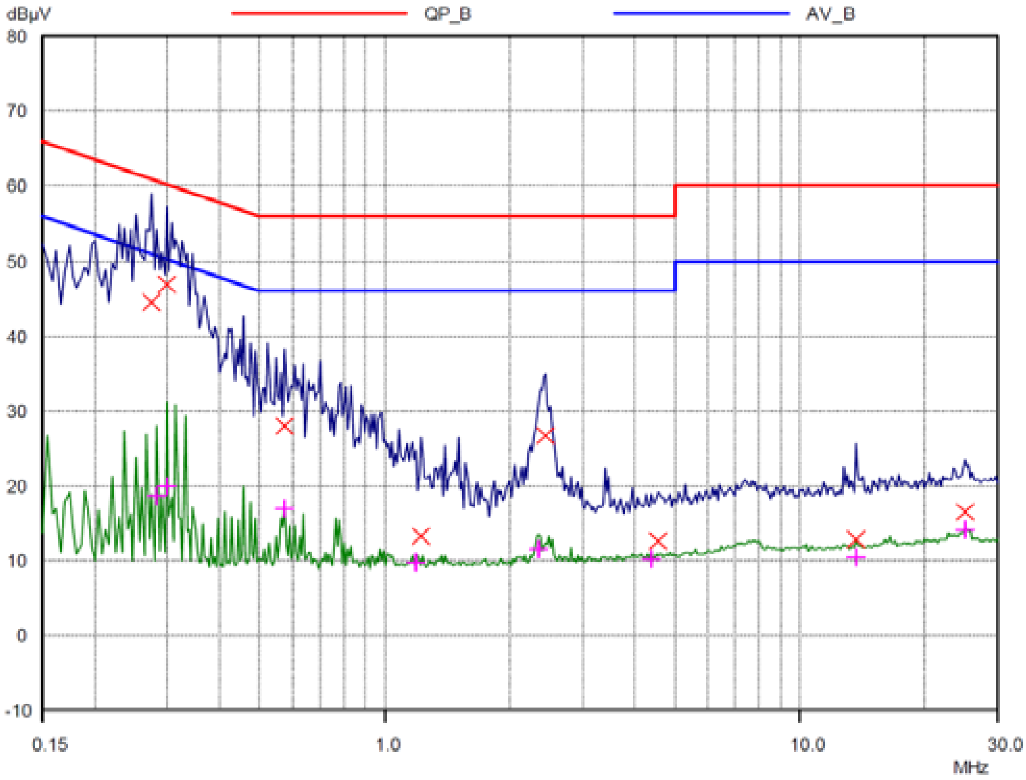
EUT:	EUT
Manuf:	Daewoo Electronics Corp.
Op Cond:	a.c. 120 V / 60 Hz
Operator:	Kyoung-Hoon, Lee
Test Spec:	FCC PART 18
Comment:	MODEL : KOR-226S
	LINE : LINE-PE
Result File:	LINE.dat :

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	ESH2_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-12-E-928) 26 Dec 2012 13:55

Conducted Emissions

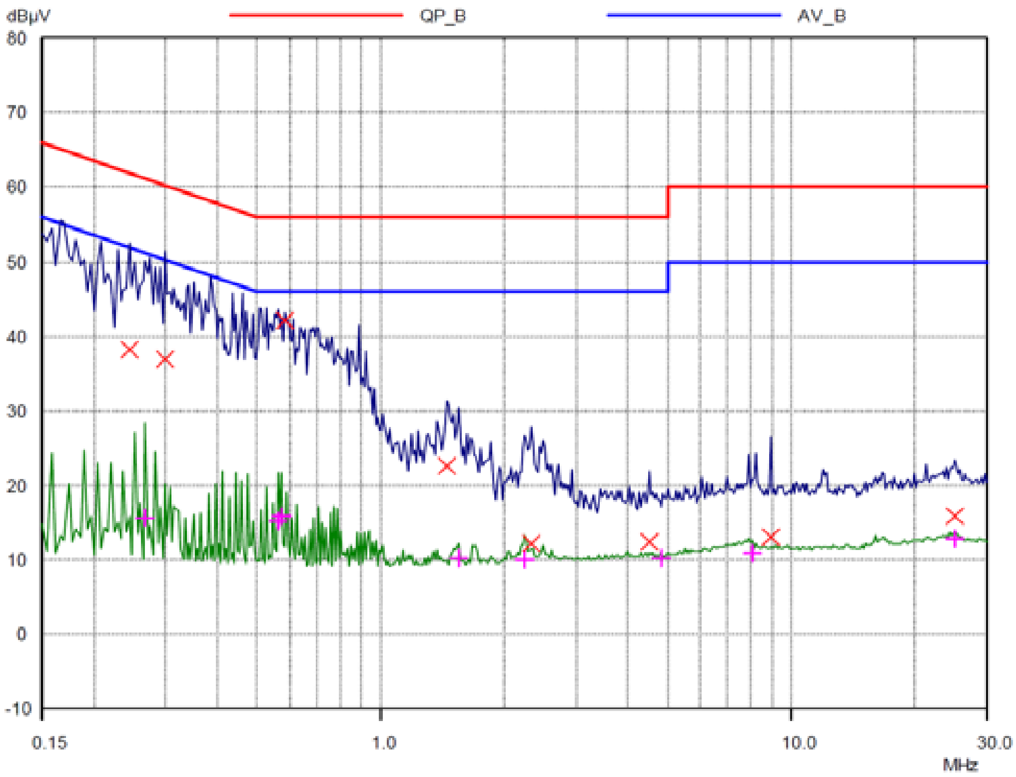
EUT:	EUT
Manuf:	Daewoo Electronics Corp.
Op Cond:	a.c. 120 V / 60 Hz
Operator:	Kyoung-Hoon, Lee
Test Spec:	FCC PART 18
Comment:	MODEL : KOR-226S LINE : NEUTRAL-PE
Result File:	NEUTRAL.dat :

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	ESH2_Z5_Neutral

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)***

EMI Auto Test(2) 1 / 2

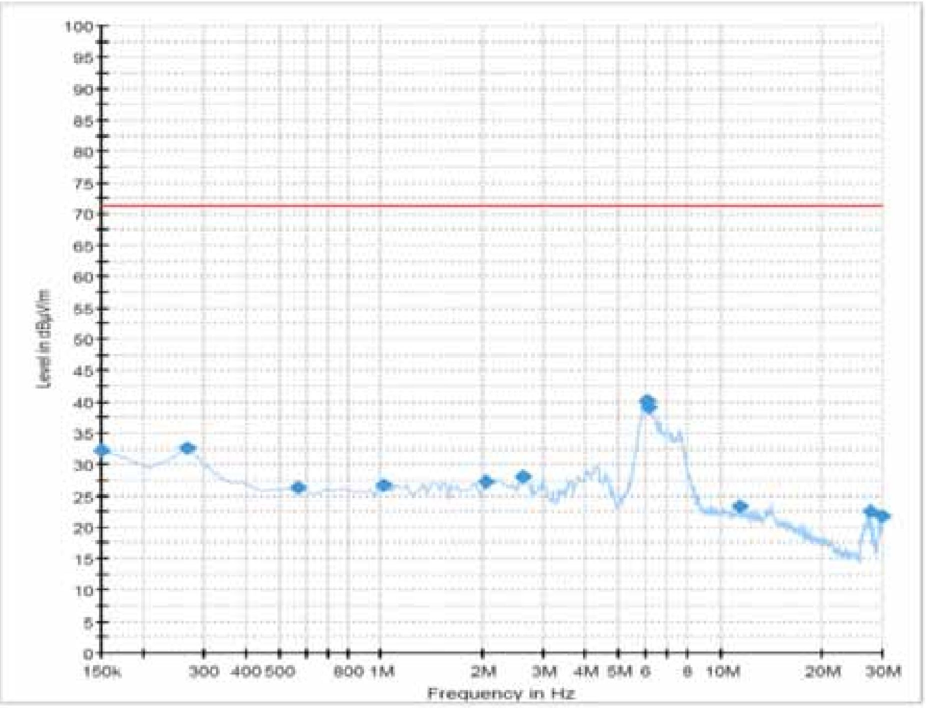
Test Report

Common Information

Test Description:	Radiated Emission(NK-12-E-928)
Test Site:	Nemko 3 m Chamber
Test Standard:	FCC Part 18 Class B
Environment Conditions:	a.c. 120 V / 60 Hz
Operator Name:	Kyoung-Hoon, Lee
Comment:	Model : KOR-226S

6. Electric Field Strength (9K-30M)

6. Electric Field Strength (9K-30M)



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
0.150000	32.2	H	250.0	-12.2	39.2	70.9	
0.269400	32.5	H	320.0	-12.2	38.9	70.9	
0.567900	26.4	H	250.0	-12.3	45.0	70.9	
1.015650	26.8	H	250.0	-12.1	44.6	70.9	
2.030550	27.3	H	250.0	-12.1	44.1	70.9	
2.627550	28.0	H	250.0	-12.1	43.4	70.9	
6.090150	40.2	H	49.0	-12.0	31.2	70.9	
6.179700	39.1	H	49.0	-12.0	32.3	70.9	
11.433300	23.3	H	265.0	-11.8	48.1	70.9	
27.582150	22.6	H	155.0	-10.7	48.8	70.9	
29.940300	21.8	H	155.0	-10.7	49.6	70.9	

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(Horizontal)

PLOTS OF EMISSIONS

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

EMI Auto Test(2) 1 / 1

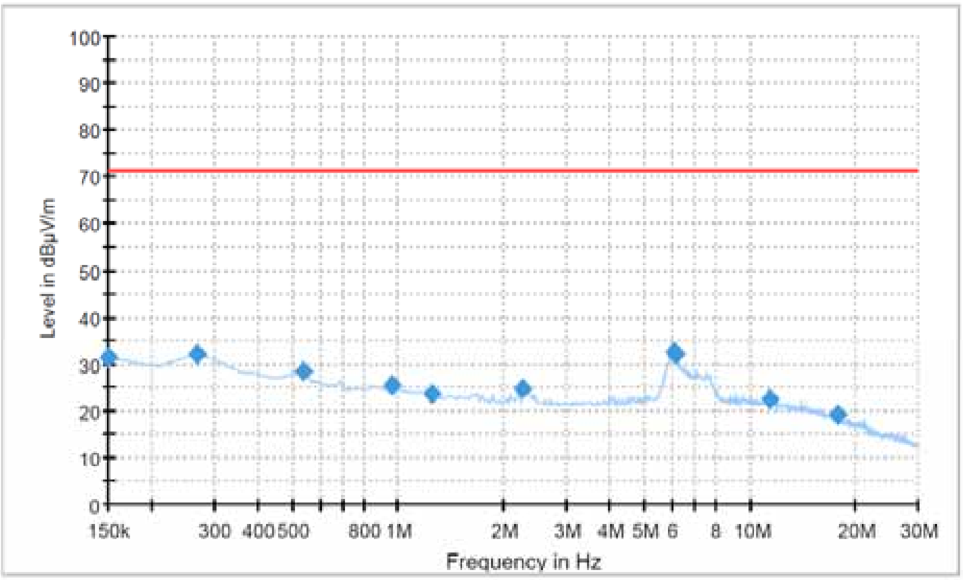
EMC32 Report

Common Information

Test Description:	Radiated Emission(NK-12-E-928)
Test Site:	Nemko 3 m Chamber
Test Standard:	FCC Part 18 Class B
Environment Conditions:	a.c. 120 V / 60 Hz
Operator Name:	Kyoung-Hoon, Lee
Comment:	Model : KOR-226S

6. Electric Field Strength (9K-30M)

6. Electric Field Strength (9K-30M)



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
0.150000	31.3	V	31.0	-12.2	40.1	70.9	
0.269400	32.0	V	312.0	-12.2	39.4	70.9	
0.538050	28.4	V	18.0	-12.3	43.0	70.9	
0.955950	25.3	V	13.0	-12.1	46.1	70.9	
1.254450	23.6	V	9.0	-12.1	47.8	70.9	
2.269350	24.9	V	9.0	-12.1	46.5	70.9	
6.120000	32.3	V	281.0	-12.0	39.1	70.9	
6.149850	32.1	V	281.0	-12.0	39.3	70.9	
11.433300	22.6	V	190.0	-11.8	48.8	70.9	
17.821200	19.3	V	159.0	-11.6	52.1	70.9	

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(Vertical)

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	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Attenuation AMN-Receiver	L_C	± 1.00	normal 2	2.00	0.50	1	0.50
AMN Voltage division factor	L_{AMN}	± 0.09	rectangular	$\sqrt{3}$	0.05	1	0.05
Sine wave voltage	dV_{SW}	± 0.17	rectangular	$\sqrt{3}$	0.10	1	0.10
Pulse amplitude response	dV_{PA}	± 0.92	rectangular	$\sqrt{3}$	0.53	1	0.53
Pulse repetition rate response	dV_{PR}	± 0.35	rectangular	$\sqrt{3}$	0.20	1	0.20
Noise floor proximity	dV_{NF}	± 0.00			0.00	1	0.00
AMN Impedance	dZ	± 2.0	rectangular	$\sqrt{3}$	1.15	1	1.15
ⓐ Mismatch	M	+0.70	U-Shaped	$\sqrt{2}$	0.49	1	0.49
ⓑ Mismatch	M	-0.80	U-Shaped	$\sqrt{2}$	- 0.56	1	- 0.56
Measurement System Repeatability	R_S	0.05	normal 1	1.00	0.05	1	0.05
Remark	ⓐ: AMN-Receiver Mismatch : + ⓑ: AMN-Receiver Mismatch : -						
Combined Standard Uncertainty	Normal			Mismatch + 0.70, u_c = 1.86 dB Mismatch – 0.80, u_c = 1.88 dB			
Expended Uncertainty U	Normal (k = 2)			U = ± 3.0 dB (CL is 95 %)			

2. Radiation Uncertainty Calculation (Below 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	R_I	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Sine wave voltage	dV_{sw}	± 0.17	rectangular	$\sqrt{3}$	0.10	1	0.10
Pulse amplitude response	dV_{pa}	± 0.92	rectangular	$\sqrt{3}$	0.53	1	0.53
Pulse repetition rate response	dV_{pr}	± 0.35	rectangular	$\sqrt{3}$	0.20	1	0.20
Noise floor proximity	dV_{nf}	± 0.50	normal 2	2.00	0.25	1	0.25
Antenna Factor Calibration	A_F	± 2.0	rectangular	$\sqrt{3}$	1.15	1	1.15
Cable Loss	C_L	± 1.00	normal 2	2.00	0.50	1	0.50
Antenna Directivity	A_D	± 1.00	rectangular	$\sqrt{3}$	0.58	1	0.58
Antenna Factor Height Dependence	A_H	± 0.50	rectangular	$\sqrt{3}$	0.29	1	0.29
Antenna Phase Centre Variation	A_P	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Antenna Factor Frequency Interpolation	A_I	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	S_I	± 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 Polarization	D_{Cross}	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.00
ⓐ Mismatch	*M*	+0.26	U-Shaped	$\sqrt{2}$	0.18	1	0.18
ⓑ Mismatch	*M*	-0.26	U-Shaped	$\sqrt{2}$	- 0.18	1	-0.18
ⓒ Mismatch	*M*	+0.98	U-Shaped	$\sqrt{2}$	0.69	1	0.69
ⓓ Mismatch	*M*	-1.11	U-Shaped	$\sqrt{2}$	- 0.78	1	-0.79
Measurement System Repeatability	R_S	0.09	normal 1	1.00	0.09	1	0.09

Remark	ⓐ: Antenna-receiver Mismatch : + 일 때(< 200 MHz) ⓑ: Antenna-receiver Mismatch : - 일 때(< 200 MHz) ⓒ: Antenna-receiver Mismatch : + 일 때(≧ 200 MHz) ⓓ: Antenna-receiver Mismatch : - 일 때(≧ 200 MHz)	
Combined Standard Uncertainty	Normal	< 200 MHz *U* Mismatch + 0.26, uc = 2.33 dB Mismatch – 0.26, uc = 2.33 dB ≧ 200 MHz *U* Mismatch + 0.98, uc = 2.42 dB Mismatch – 1.11, uc = 2.45 dB
Expended Uncertainty U	Normal (k = 2)	U = ± 4.9 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	R_I	± 0.58	rectangular	$\sqrt{3}$	0.33	1	0.33
Sine wave voltage	dV_{sw}	± 0.13	rectangular	$\sqrt{3}$	0.08	1	0.08
Pulse amplitude response	dV_{pa}	± 0.12	rectangular	$\sqrt{3}$	0.07	1	0.07
Pulse repetition rate response	dV_{pr}	± 0.13	rectangular	$\sqrt{3}$	0.08	1	0.08
Noise floor proximity	dV_{nf}	± 0.50	normal 2	2.00	0.25	1	0.25
Antenna Factor Calibration	A_F	± 1.50	rectangular	$\sqrt{3}$	0.87	1	0.87
Cable Loss	C_L	± 1.00	normal 2	2.00	0.50	1	0.50
Antenna Directivity	A_D	± 1.00	rectangular	$\sqrt{3}$	0.58	1	0.58
Antenna Factor Height Dependence	A_H	± 0.40	rectangular	$\sqrt{3}$	0.23	1	0.23
Antenna Phase Centre Variation	A_P	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Antenna Factor Frequency Interpolation	A_I	± 0.30	rectangular	$\sqrt{3}$	0.17	1	0.17
Site Imperfections	S_I	± 4.00	triangular	$\sqrt{6}$	1.63	1	1.63
Measurement Distance Variation	D_V	± 0.50	rectangular	$\sqrt{3}$	0.29	1	0.29
Antenna Balance	D_{bal}	± 1.00	rectangular	$\sqrt{3}$	0.58	1	0.58
Cross Polarization	D_{Cross}	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.00
Frequency step error	F_{STEP}	± 0.49	rectangular	$\sqrt{3}$	0.28	1	0.28
Mismatch (+)	*M*	+ 0.98	U-Shaped	$\sqrt{2}$	0.69	1	0.69
Mismatch (-)	*M*	-1.11	U-Shaped	$\sqrt{2}$	-0.78	1	-0.78
Measurement System Repeatability	R_S	± 0.36	normal 1	1.00	0.36	1	0.36
Remark	Mismatch						

	Receiver VRC : 0.3 Antenna + Cable VRC : 0.4	
Combined Standard Uncertainty	Normal	Mismatch + 0.98, *uc* = 2.28 dB Mismatch – 1.11, *uc* = 2.31 dB
Expended Uncertainty U	Normal (*k* = 2)	*U* = ± 4.6 dB (CL is 95 %)

LIST OF TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	Test Receiver	R&S	ESCS 30	833364/020	Jan. 09 2012	1 year
2	Test Receiver	R&S	ESCS 30	100302	Oct. 08 2012	1 year
3	Signal Conditioning Unit	R&S	SCU 01	10029	Apr. 05 2012	1 year
4	Pre Amplifier	HP	8449B	3008A00107	Jan. 09 2013	1 year
5	Signal Conditioning Unit	R&S	SCU 18	10065	Apr. 05 2012	1 year
6	ATTENUATOR	FAIRVIEW	SA3N5W-06	N/A	Apr. 05 2012	
7	Microwave Survey Meter	ETS-LINDGEN	HI-1801	33549	Mar. 05 2012	2 years
8	Loop Antenna	R&S	HFH2-Z2	N/A	Feb. 21 2012	2 years
9	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-257	Apr. 26 2012	2 years
10	LISN	R&S	ESH2-Z5	100227	Apr. 04 2012	1 year
11	Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
12	Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
13	Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
14	Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
15	Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
16	Anechoic Chamber	SY Corporation	N/A	N/A	N/A	N/A
17	Double Ridged Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-474	Aug. 13 2012	2 years

APPENDIX D – SCHEMATIC DIAGRAM

APPENDIX E – USER'S MANUAL

APPENDIX F – BLOCK DIAGRAM