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CERTIFICATION OF COMPLIANCE

Date of Issue : Aug. 7, 1998

Test Report No : 00431-4521-F8087

Applicant : Korea Nisshin Co., LTD.
 Regulation : FCC Part 18
 Test procedure : MP-5 : 1985
 Equipment Class : Industrial, Scientific, and Medical equipment
 EUT Type : Microwave oven
 Trade Name(s) : Nisshin
 Model No. : JM-5535

• MGT : 4/4 21-213-240GF
 • H.V.T : DPC YOB60U-NA

600W

This device has been verified to comply with the applicable requirements in the FCC Part 18 and was tested in accordance with the measurement procedures specified in MP-5 : 1985.

I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.


 Pan-Hwan, Byeon/ General Manager
 Quality and Reliability Center

29-99
 EXHIBIT "B"
 FCC ID: JHU1655


 NVLAP
 NVLAP Lab Code:200040-0

NISSHIN IND. CO., LTD. (USA)
 645 Dauphine Ct., Suite D
 Elk Grove, IL 60007

REPORT FOR A MICROWAVE OVEN

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.

Applicant : Korea Nisshin Co., LTD.
 973-3 Yangduk-dong, Hwoiwon-ku, Masan City
 Kyoungsangnam-do, 630-728, Korea

Manufacturer : Korea Nisshin Co., LTD.

EUT Type : Microwave oven

Trade Name : Nisshin

Model No. : JM-5535

Rule Part : FCC Part 18

Test Procedure : MP-5 : 1985

Date of Test : Aug. 5, 1998

Date of Receipt of EUT : Aug. 4, 1998

Date of Issue : Aug. 7, 1998

Test Report No. : 00431-4521-F8087

Test Result : Positive

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The Quality and Reliability Center was accredited by National Voluntary Laboratory Accreditation Program for the FCC Part15 : Digital device of accreditation under Lab Code : 200040-0.

Tested by :

Jae Cheon Lee

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Quality and Reliability Center

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Pan Ilwan, Byeon

Pan-Ilwan, Byeon/ General Manger
Quality and Reliability Center

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APPENDIX : TEST GRAPHS (3 Pages)

1. TEST SITE

1.1 Semi-anechoic chamber

Measurement of radiated emissions from EUT was made at semi-anechoic chamber that has been in compliance with Federal Communications Commissions(FCC) requirements of clause 2.948 according to ANSI C63.4-1992 on April 21, 1998.

2. CALIBRATIONS OF MEASURING INSTRUMENTS

All measurements were made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and power line conducted emissions were made with instruments conforming to American National Standard Specification, ANSI C63.4-1992. The calibration of measuring instrument, including any accessories that may affect test results, was performed according to the recommendation by manufacturer.

3. DESCRIPTION OF TEST CONDITION

3.1 Radiated emissions measurements

3.1.1 Test site

Measurements were made in semi-anechoic chamber as described at 3.1 in this report.

3.1.2 Detector function selection and bandwidth

In radiated emissions measurement, field strength meters that have CISPR quasi-peak and average detector were used. The 6 dB bandwidth of the detector of instrument is 120 KHz over frequency range of 30 to 1000 MHz. Emissions to be scanned above 1000 MHz are detected in average mode.

3.1.3 Unit of measurement.

Test results of radiated emissions measurement are reported in microvolts per meter at the specific distance. Using the unit of $\text{dB}\mu\text{V}$ on the test instrument, the indication unit was converted to field strength unit of $\mu\text{V}/\text{m}$ as following method;

$$F (\mu\text{V}/\text{m}) = 10^{\frac{(R+CL+AF)/20}{10}} (\mu\text{V}/\text{m})$$

here,

F : Field Strength in $\mu\text{V}/\text{m}$,

R : Meter Reading Level in $\text{dB}(\mu\text{V})$,

CL : Cable Loss from antenna to meter in dB,

AF : Antenna Factor of receiving antenna in $\text{dB}(\text{/m})$

3.1.4 Antennas

Measurements were made using calibrated biconical antenna in range of 30 to 300 MHz, log-periodic antenna in range of 300 to 1000 MHz and horn antenna in range of 1 to 18GHz to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the closest periphery of the EUT was 3 meters.

3.1.5 Frequency range to be scanned

For radiated emissions measurements, the spectrum in the range of 30 to 1000 MHz and above, if found, was investigated.

3.1.6 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum RF energy generated from EUT.

The power was furnished with rated (normal) AC 120 volts, as specified in the Owner's manual of EUT. The EUT was placed on a 80 Cm high non metallic 1m \times 1.5 m table. The turn table containing the system was rotated and the antenna height was varied 4 m to find the maximum RF energy generated from EUT.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

3.1.7 Measurement uncertainty

Radiated emissions measurements, biconical antenna : $\pm 4.4\text{dB}$

Radiated emissions measurements, log-periodic antenna : $\pm 5.0\text{dB}$

Radiated emissions measurements, horn antenna : $\pm 5.0\text{dB}$

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurement uncertainty was calculated in accordance with NAMAS NIS 81 : "The treatment of uncertainty in EMC measurement."

The measurement uncertainty was given with a confidence of 95%.

4. MEASURING INSTRUMENTS AND SET-UP

4.1 Radiated emissions

4.1.1 Test receiver

a) Rohde & Schwarz, Model E835P (20 MHz to 1300 MHz)

Detector function : Average

IF Bandwidth : 120 KHz

b) Rohde & Schwarz, Model E835M (1 GHz to 18 GHz)

Detector function : Average

IF Bandwidth : 1 MHz

4.1.2 Receiving Antennas

a) Schwarzbeck, Model VHA9103 : Biconical antenna (30 to 300 MHz)

b) Schwarzbeck, Model UHAL9107 : Log-periodic antenna (300 to 1000MHz)

c) EMCO, Model 3115 : Horn antenna (1 GHz to 18GHz)

4.1.3 Preamplifier

a) H/P, Model 8449B : 1 GHz to 26.5GHz

4.2 Frequency measurements

4.2.1 Test receiver

a) Rohde & Schwarz, Model ESMI (1 GHz to 18 GHz)

Detector function : Average

IF Bandwidth : 1 MHz

4.2.2 Receiving Antennas

a) EMCO, Model 3115 : Horn antenna (1 GHz to 18GHz)

5. TEST DATA

5-1. Radiated emissions (§ 18.305)

Product : Microwave oven
 Model : JM-5535 (with 2M213-240GF)
 Serial No. : N/A
 Test Date : Aug. 5, 1998

Freq. (MHz)	Reading at 3m (dBuV/m)	AF (dB/m)	CL (dB)	Pol.	K-Factor	Test distance : 3m	
						F/S at 300m (uV/m)	Limit at 300m (uV/m)
4454.0	45.5	32.8	2.6	V	0.01	1.9	27.4
4929.7	51.2	33.2	2.8	H	0.01	3.6	27.4
4935.5	57.8	33.2	2.8	H	0.01	7.8	27.4
4945.5	51.2	33.2	2.8	V	0.01	3.5	27.4

- RF Power : 600W
- Limit : $25 \times (\text{RF Power}/500)^{1/2} = 25 \times (600/500)^{1/2} = 27.4 \text{ uV/m}$

Result : Positive

* Field Strength below 1000 MHz @ 300m (uV/m) = 10 [(Field strength at 3m(dBuV/m)-40)/20]

* Field Strength above 1000 MHz @ 300m (uV/m) = K * 10 [Field strength at 3m(dBuV/m)/20]

NOTES:

1. Two representative modes(Full power and defrost) of operation were investigated.
2. A glass beaker was used as the container and the test was made with a shelf in its initial normal position.
3. Load for measurement of radiation on second and third harmonic : Two loads, one of 700 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 right front corner.
4. Load for all other measurements : 700ml of water, with the beaker located in the center of the oven
5. All other emissions are non-significant.
6. AF = Antenna factor CL = Cable loss E/S = Field Strength
7. The tests were made with average detector.

5-2. Frequency measurements

Product : Microwave oven
 Model : JM-5535 (with 2M213-240GF)
 Serial No. : N/A
 Test Date : Aug. 6, 1998

(1) Frequency vs Line Voltage Variation Test

[Room Temperature : 26°C]

Line Voltage Variation(V)	Frequency (MHz)	Deviation for ISM Frequency (MHz)
150(125%)	2466	16
135(112.5%)	2465	15
120(Nominal)	2468	18
108(90%)	2468	18
96(80%)	2467	17

Note : Load was used 1000 cc water in the 1.2 liter glass beaker.

Result : Positive

(2) Frequency vs Load Variation Test

[Room Temperature : 26°C]

Volume of Water (cc)	Frequency (MHz)	Deviation for ISM Frequency (MHz)
1000	2468	18
800	2469	19
600	2470	20
400	2468	18
200	2466	16

Note : Frequency was measured by using nominal voltage(AC 120V).

Result : Positive

6. LIST OF INSTRUMENTS USED

Type	Maker	Model	Cal.Date	N Date	Control No.
Test receiver	R&S	ESVP	05/08/98	05/08/99	F0000194AAZL
Test receiver	R&S	ESMI	02/06/98	02/06/99	F0034898AAZL
Pre amplifier	H/P	8449B	07/06/98	07/06/99	F0000239AAZL
Biconical antenna	S/B	VHA9103	05/08/98	05/08/99	F0000401AAZB
Log-periodic antenna	S/B	UHAL9107	05/08/98	05/08/99	F0000404AAZB
Horn antenna	EMCO	3115	02/11/98	02/11/00	F0000392AAZB

Note : H/P : Hewlett-packard

R&S : Rohde & Schwarz

S/B : Schwarzbeck

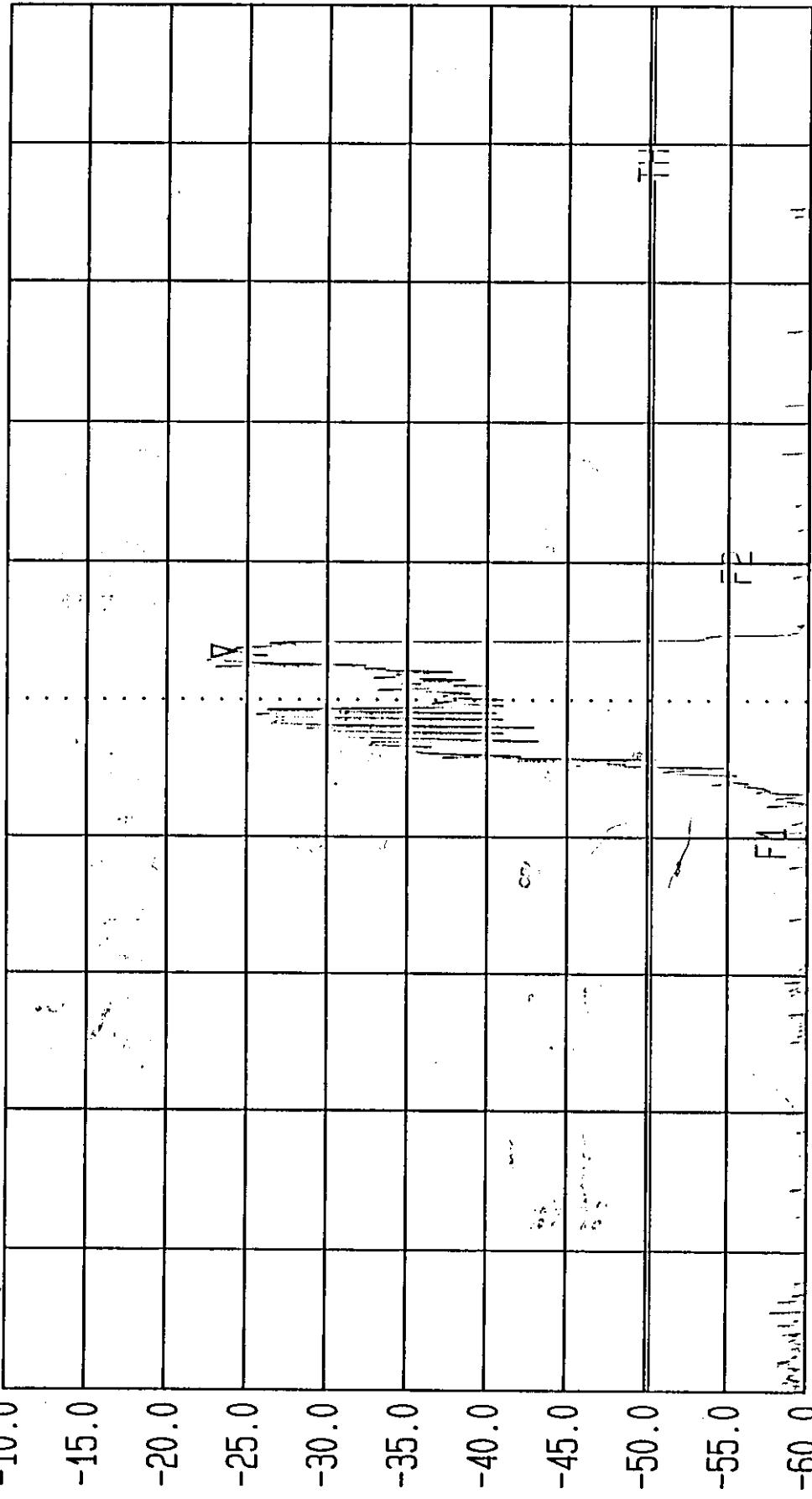
Cal.Date : Calibration date

N Date : Next calibration date



Date 06.Aug.'98 Time 11:24:44
Ref. LV1 Marker -24.19 dBm
-10.00 dBm 2.4677 GHz

Res. BW 1 MHz [imp]
TG.Lv1 off 1 MHz
CF.Slp 50.000 MHz RF.Att
Thresh -50.22 dBm 20 dB
[dBm]



Start 2.2 GHz Span 500 MHz Center 2.45 GHz Variation 1.12 s Load 120V 1000m_l (100%) Stop 2.7 GHz
Freq. Measurement EUT: JM-5535 with 2M213-240GF
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Q&R Center / J.C.Lee

