

EMC TEST REPORT

According to FCC Part 15 Subpart B

Project No. : LBE020770

Product : Refrigerator

Model No. : RH2777AT

Date of test: September 12 - 16, 2002

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1. General Information

1.1 Description for Equipment Authorization

Type of Device : Refrigerator

Kind of Equipment Authorization : Verification

1.2 Measuring Standards

Applied Standard : FCC Part 15 Subpart B

Measuring Procedure : ANSI C63.4-1992

1.3 Manufacturer Information

Name of manufacturer : SAMSUNG ELECTRONICS Co., Ltd.

Address of manufacturer : 416 Maetan-3 Dong, Paldal-Ku, Suwon City,
Kyungki-Do, Korea,442-742

1.4 EUT Description

Operating Frequency : 133MHz, 33MHz, 48MHz, 24.57MHz

Power supply : 120V, 60Hz

1.5 Operation Environment

	Conduction	Radiation
Temperature [C] :	21	22
Humidity [%] :	44	48

1.6 Measuring instrument setup

The explanation of measuring instrument setup when respective function is used in any frequency band is as following:

Frequency Band [MHz]	Instrument	Detector function	Resolution Bandwidth	Video Bandwidth
0.45 to 30	EMI Test receiver	Quasi-Peak	9kHz	-
30 to 1000	Spectrum analyzer	Peak	100kHz	1MHz
	EMI Test receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Test receiver	Average	1MHz	-

1.7 Test facility

The EMI/EMS measurement facilities used to collect the tested data are located at 416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1 & 16-2.

In addition, the test facilities are listed with Federal Communications Commission (Registration Number:98856, Anechoic Chamber #1).

Also, SAMSUNG Electronics Co.,Ltd is accredited by Korea Laboratory Accreditation Scheme(KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

1.8 Accreditation and Listing



Reg. No. 124



Reg. No. KR0004



Acc. No.13294



No.189



App. No.001



LAB CODE 200447-0



Reg. No.98856



R-1221,C-1095



H9354285

2. Accuracy of Measurement

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994).

2.1 AC Powerline Conducted Emission Measurement

Contribution	Probability Distribution	Uncertainty(+/- dB)	
		9 kHz-150 kHz	150 kHz-30 MHz
Receiver specification	Rectangular	1.0	1
LISN coupling specification	Rectangular	1.4	1.4
Cable and input attenuator calibration	Normal (k=2)	0.3	0.3
Mismatch Receiver VRC: $G_1 = 0.03$ LISN VRC: $G_g = 0.8$ (9 kHz) 0.2 (30 MHz) Uncertainty limits $20\text{Log}(1 \pm G_1 G_g)$	U-shaped	0.2	0.05
System repeatability (previous assessment of $s(q_k)$ from 10 repeats, 1 reading on EUT)	Standard deviation	0.2	0.35
Repeatability of EUT		-	-
Combined standard uncertainty $u_c(y)$	normal	1.04	1.06
Expanded uncertainty $U = 2u_c(y)$	normal (k = 2)	2.09	2.13

2.2 Radiated emission Measurement

Contribution	Probability Distribution	Uncertainty(+/- dB)	
		3m	
Ambient signals		-	-
Antenna factor calibration	Normal (k=2)	+1	-1
Cable loss calibration	Normal (k=2)	+0.5	-0.5
Receiver specification	Rectangular	+1.5	-1.5
Antenna directivity	Rectangular	+0.5	-0
Antenna factor variation with height	Rectangular	+2	-2
Antenna phase center variation	Rectangular	+0	-0
Antenna factor frequency interpolation	Rectangular	+0.25	-0.25
Measurement distance variation	Rectangular	+0.6	-0.6
Site imperfections	Rectangular	+2	-2
Mismatch Receiver VRC: $G_1 = 0.2$ Antenna VRC: $G_g = 0.67$ (Bi) 0.3 (Lp) Uncertainty limits $20\text{Log}(1 \pm G_1 G_g)$	U-shaped	+1.1	-1.25
System repeatability (previous assessment of $s(q_k)$ from 5 repeats, 1 reading on EUT)	Standard deviation	+0.5	-0.5
Repeatability of EUT		-	-
Combined standard uncertainty $u_c(y)$	Normal	2.19	2.21
Expanded uncertainty $U = 2u_c(y)$	Normal (k=2)	4.39	4.43

3. Test Results

3.1 AC Powerline Conducted Emission Measurement

1) Reference Rule and Specification

FCC Part 15, Subpart B Section 15.107(a)

2) Test Procedure

2-1) All input terminals are terminated in the proper impedance.

The output ports are connected to the cable provided with the device and the ending port are terminated in the proper impedance.

2-2) Connect the EUT's AC line cord to the EUT port of LISN.

Configuration the EUT system in accordance with ANSI C63.4-1992.

2-3) Using a calibrated coaxial cable, the Test Receiver is connected to the measuring port of the LISN for EUT.

2-4) Activates the EUT system.

2-5) The network allows the measuring receiver to be switched between the neutral to ground and live to ground lines in turn.

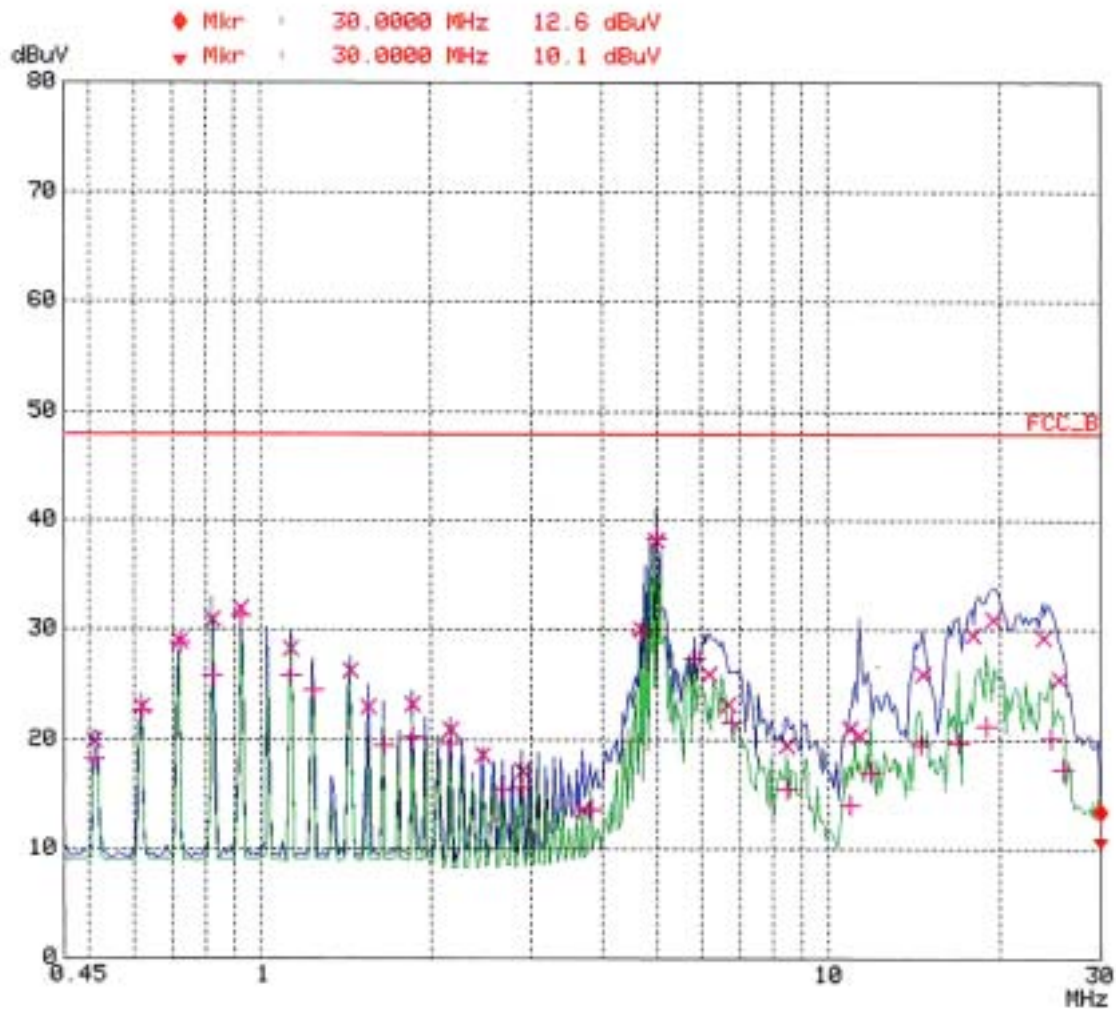
2-6) To find out an EUT condition procedures the maximum emission, the position of cables, EUT operations mode are checked under normal usage of EUT. Then, the emission are scanned from 0.45MHz to 30MHz relative to the limit are recorded.

3) Test Data

AMN Mode : Live to Earth

Scan Settings (1 Range)			Receiver Settings				
Frequencies			IF BW	Detector	M-Time	Atten	Preamp
Start	Stop	Step					
450k	30M	6k	9k	PK+AV	1ms	10dB	BLN OFF

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 30dB

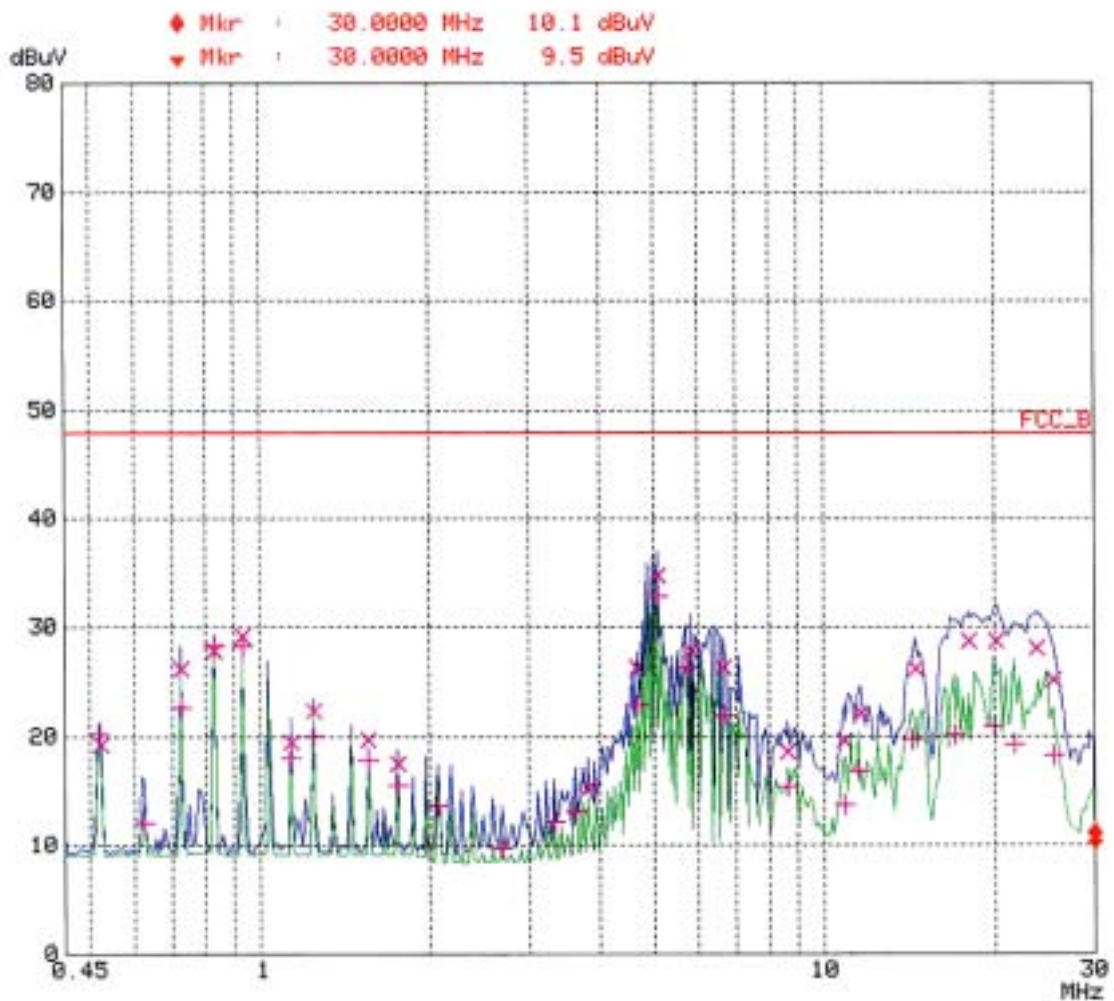


AMN Mode : Neutral to Earth

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
450k	30M	6k	9k	PK+AV	1ms	10dB	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 30dB



3.2 Radiated emission Measurement

1) Reference Rule and Specification

FCC Part 15, Section 15.109(a) and (c)

2) Test Procedure

2-1) Configuration the EUT System in accordance with ANSI C63.4-1992.

2-2) The AV ports are connected to the cable and its ending ports are terminated in the proper impedance.

2-3) Activates the EUT system.

2-4) Varied antenna by 4m in 1m to look for the highest result.
Also, EUT circumvolved from 0 degree to 360 degree.

2-5) To determine the EUT condition produces the maximum emission,
the cable positions are checked under normal usage.

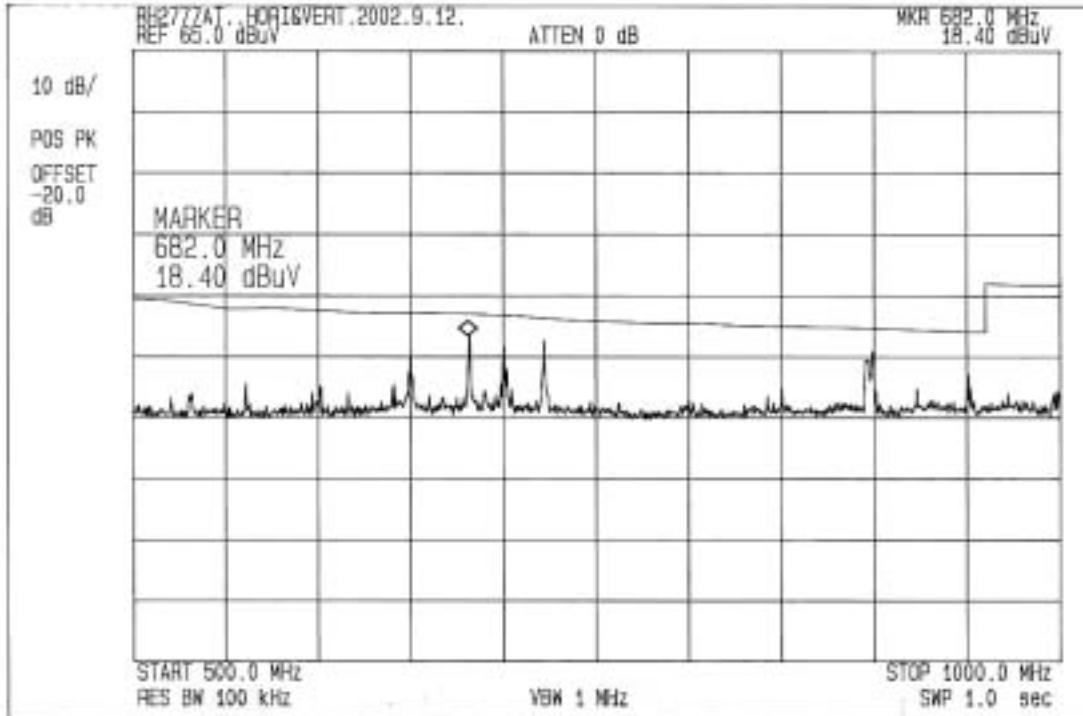
2-6) Measure in spectrum analyzer results got final result in test receiver's
quasi-peak detecting mode.

3) Test Results

Test range : 30 - 500MHz



Test range : 500 - 1000MHz



4. List of Test Instrument

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Spectrum analyzer	8566B	2611A02672	H.P	01/10/09, 12Months
	Firmware versions : Rev.29.9.86			
Quasi-peak adapter	85650A	2521A00687	H.P	01/10/09, 12Months
RF Preselector	85685A	2602A00224	H.P	01/10/09, 12Months
Field strength meter	ESCS30	839809/022	R & S	01/ 6/27, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI 26	832692/002	R & S	01/12/22, 12Months
	Firmware versions : BIOS 3.3, Analyzer 2.09.2			
Field strength meter	ESVP	860688/015	R & S	02/02/28, 12Months
L.I.S.N	3825-2	9208-1981	EMCO	02/03/23, 12Months
Bi-Log Antenna	CBL6112B	2766	SCHAFFNER	02/04/26, 12Months