EMC TEST REPORT

Project No.	LBE20126049	**Issue No.**	0
Applicant	**Name of organization**	Samsung Electronics Co., Ltd.	
	Address	(Maetan dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742, Republic of Korea	
	Date of application	December 18, 2012	
EUT	**Type of device**	☒ Class B personal computers and peripherals ☐ All other devices	
	Equipment authorization	☐ Declaration of Conformity ☒ Certification ☐ Verification	
	FCC ID	A3LSCHI739	
	Kind of product	Mobile Phone	
	Model No.	SCH-I739	
	Variant Model No.	Refer to clause 4.6	
	Manufacturer	SEHZ Samsung Telecommunication Co., Ltd. 516229 Chen jiang Town Huizhou City. Guangdong Province. China.	
Applied Standards		FCC Part 15, Subpart B, Class B / ANSI C63.4-2003	
Test Period		December 20, 2012 ~ December 26, 2012	
Issue date		December 28, 2012	

Test result : **Complied**

The equipment under test has found to be compliant with the applied standards.
(Refer to the attached test result for more detail.)

Tested by : Jong-Sup Jeong	**Reviewed by** : Tae-Young Jang

SAMSUNG

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1. Report Information

1.1 Revision history

No.	Revised detailed information
Issue 0	- LBE20126049 (SAMSUNG)

2. Summary of test results

1.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result
☒	Conducted Disturbance (Mains port)	FCC Part 15 Subpart B / ANSI C63.4-2003 (Class B)	Complied
☒	Radiated Disturbance		Complied

3. General Information

3.1 Test facility

The CS & Environment center is located on Samsung Electronics Co., Ltd. at (Maetan dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea.
All testing are performed in Semi-anechoic chambers conforming to the site attenuation characteristics defined by ANSI C63.4, CISPR 22, 16-1 and 16-2. and Shielded rooms.

The CS & Environment center is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

4. Test Setup configuration

4.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.
The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Mark	Description	Model No.	Serial No.	Manufacturer / Trademark	FCC ID / DoC
A	Mobile Phone	SCH-I739	-	SAMSUNG	A3LSCHI739
B	Battery	EB425161LU	AA1C717SS/2-B	SAMSUNG	-
C	Headset	EHS61ASFWE	-	SAMSUNG	-
D	Data Cable	APCBU20BBC		SAMSUNG	-
E	Micro SD Card	16GB	-	SANDISK	-
F	Desk-Top Computer	HP Compaq dx2200	CNG7060LW0	HP	DoC
G	LCD Monitor	GH15LS	N719HVELA11890L	SAMSUNG	DoC
H	Mouse	N3+Optical	K034729902	HP	DoC
I	Keyboard	SDM8500P	8M000131	SAMSUNG	DoC
J	Router	3CGS U08	AB/ 9XRQAC0024825	3COM	DoC
K	Power Supply	PW150	KA1203N03	AULT	DoC

4.2 EUT operating mode

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating Mode 1	USB Mode (Data Communication)

4.3 Details of Sampling

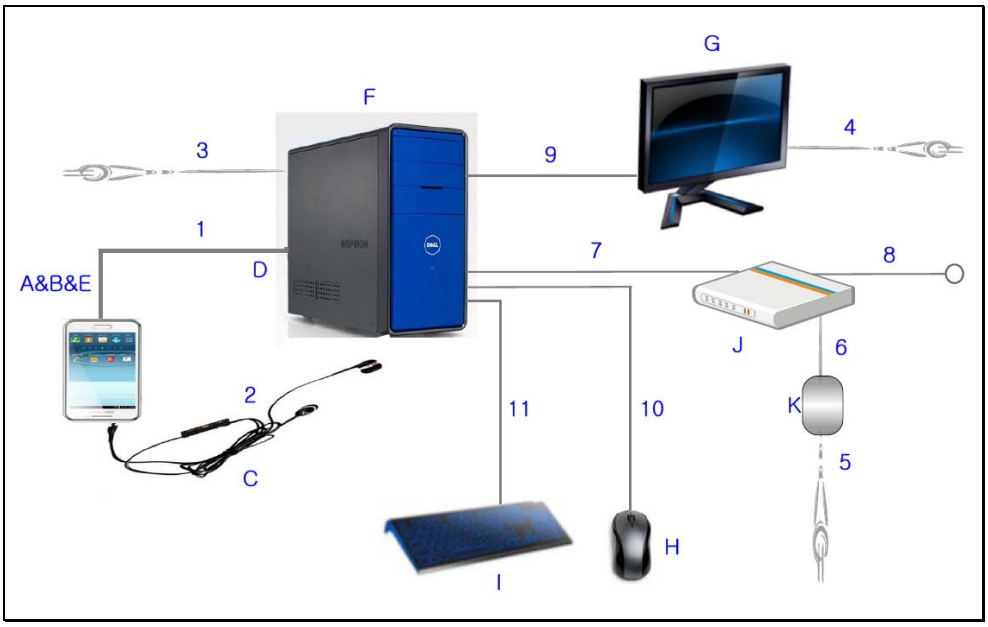
Customer selected, single unit.

4.4 Used cable description

The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected:

No.	Connected cable	Length [m]	Shielded [Y/N]	Note
1	USB Data Cable	1.2	Yes	From EUT to Desk-Top Computer
2	Headset	1.5	No	For EUT
3	Power	1.8	No	For Desk-Top Computer
4	Power	1.8	No	For LCD Monitor
5	Power	1.8	No	For Power Supply
6	Power	3.9	No	From Router to Power Supply
7	LAN	1.5	No	From Desk-Top Computer to Router
8	LAN	1.5	No	From Router to Local Area Network
9	RGB	1.8	Yes	From Desk-Top Computer to LCD Monitor
10	PS/2	1.8	Yes	From Desk-Top Computer to Mouse
11	PS/2	1.8	Yes	From Desk-Top Computer to Keyboard

4.5 Test arrangement



4.6 EUT Description

4.6.1 The following features describe EUT represented by this report:

Item	Specification	
Operating Temperature (℃)	-20 ~ +50	
Operating Humidity (%)	0 ~ 95	
Frequency Range	GSM 1 900	TX : 1 850.2 ~ 1 909.8 MHz RX : 1 930.2 ~ 1 989.8 MHz

4.6.2 The variant models

- None

4.7 Clock Frequencies

Kind of Clocks	Frequency [MHz]
CPU	1 200

4.8 Test configuration and condition

☐ The EUT exercise program which is the samsung standardized emission test program for Windows was used during all EMC measurements were tested. This program was contained on the PC hard disk drive. Once loaded, the program sequentially exercises each system component in turn.

☒ The EUT was exercised during the testing by data read and write cycles repeated with internal storage devices. At the end of the test, the copied back data was compared with original.

☐ The EUT was connected to the PC by using USB data cable to charge.

☒ The system was configured for testing in a typical fashion that a customer would normally use, and was tested while in an automated non-attendant mode.

Power source for the EUT operating was supplied by CVCF made by the Pacific Power Source Corp.

- Test Voltage : AC 120 V, 60 Hz

4.9 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4 and UKAS Lab 34.)

4.9.1 Emission

Test type		Measurement uncertainty (C.L. 95 %, k = 2)
Conducted disturbance	AC Mains	±3.24 dB
Radiated Disturbance (30 MHz ~ 1 GHz)	Horizontal	±4.59 dB
	Vertical	±4.75 dB
Radiated Disturbance (1 GHz ~ 6 GHz)	Horizontal	±4.18 dB
	Vertical	±4.15 dB

5. Results of individual test

5.1 Conducted disturbance

The EUT was connected to the Desk-Top Computer which was powered from one LISN for the measurements. The support equipment power cables were connected to a second LISN.
Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

Limits for conducted disturbance at the mains ports of Class B ITE

Frequency range Limits [MHz]	Resolution Bandwidth [kHz]	Limits [dB(μV)]	
		Quasi-peak	Average
0,15 to 0,50	9	66 to 56	56 to 46
0,50 to 5	9	56	46
5 to 30	9	60	50
NOTE 1 The lower limit shall apply at the transition frequency. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.			

5.1.1 Test instrumentation

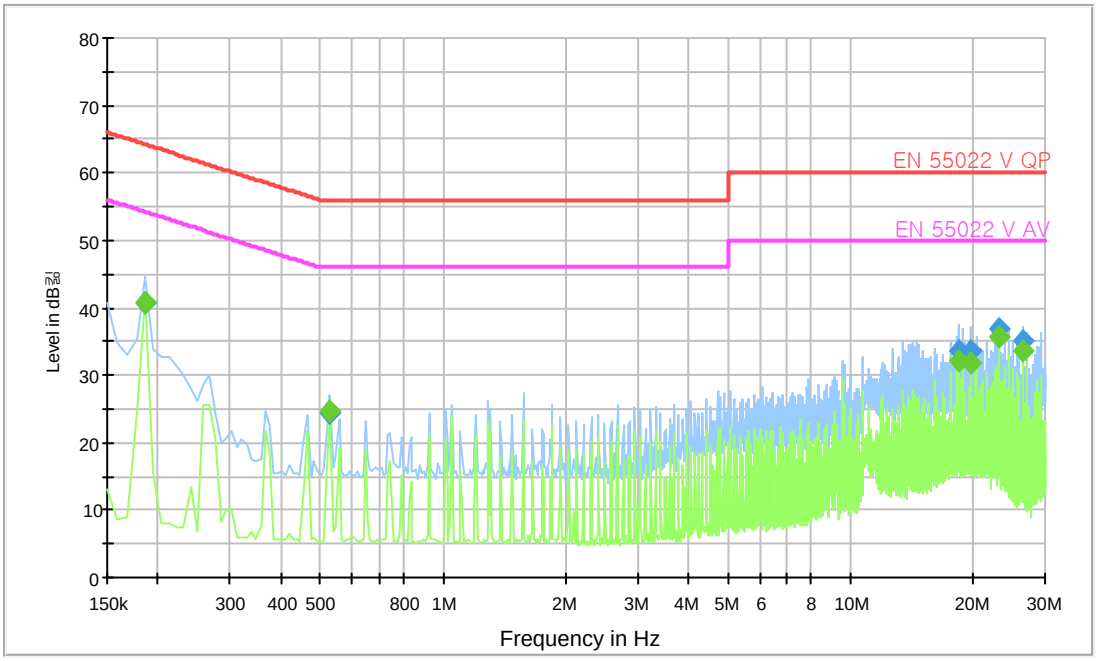
EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Calibration	
					Date	Interval (Month)
E3I-266	EMI Test Receiver	ESCI3	R&S	100086	2012-11-27	12
E3I-259	LISN	ENV216	R&S	101369	2012-12-07	12
E3I-260	LISN	ENV216	R&S	101366	2012-09-11	12

5.1.2 Temperature and humidity condition

Test date	2012-12-26	**Test engineer**	Jong-Sup Jeong
Climate condition	Ambient temperature	23.3 ℃	Limit (15.0 to 35.0) ℃
	elative humidity	37.3 % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	101.1 kPa	Limit (86.0 to 106.0) kPa
Test place	Shield Room (SR8)		

5.1.3 Test results

☐ Operating Mode 1: AC Mains



Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Quasi-peak final measurement results table:

Frequency (MHz)	Level (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186	40.6	L1	10.1	23.6	64.2
0.528	24.4	L1	10.0	31.6	56.0
18.366	33.7	L1	9.9	26.3	60.0
19.707	33.5	N	10.0	26.5	60.0
23.127	37.0	L1	9.9	23.0	60.0
26.610	35.0	N	10.1	25.0	60.0

Average final measurement results table:

Frequency (MHz)	Level (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186	40.7	L1	10.1	13.5	54.2
0.528	24.6	L1	10.0	21.4	46.0
18.366	32.0	L1	9.9	18.0	50.0
19.707	31.8	N	10.0	18.2	50.0
23.127	35.6	L1	9.9	14.4	50.0
26.610	33.5	N	10.1	16.5	50.0

Note 2) Level (QP and/or AV) = Meter Reading (QP and/or AV) + Corr. (LISN Insertion Loss + Cable Loss)
Margin (QP and/or AV) = Limit – Level (QP and/or AV)
QP = Quasi-Peak, AV = Average

5.2 Radiated disturbance

The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin.

Peak measurements were made over the changeable frequency range 30 MHz to 1 GHz at a measurement distance of 10 m for the following antenna and turntable arrangements:

Antenna Height [cm]	Antenna Polarisation	Resolution Bandwidth [kHz]	Video Bandwidth [kHz]	Turntable position [degrees]
100 ~ 400	Horizontal, Vertical	120	300	Continuous

Measurements within 6 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using quasi-peak detectors.

Peak/Average measurements were made over the changeable frequency range 1 GHz to 40 GHz or 5th harmonics of the highest frequency in accordance with internal maximum operating frequency at a measurement distance of 3 m for the following antenna and turntable arrangements:

Antenna Height [cm]	Antenna Polarisation	Resolution Bandwidth [MHz]	Video Bandwidth [MHz]	Turntable position [degrees]
100 ~ 400	Horizontal, Vertical	1 (PK / AV)	3 (PK) 10 Hz (AV)	Continuous

Measurements within 6 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using peak and average detectors.

Limits for radiated disturbance of Class B ITE at a measuring distance of 3 m and 10 m

Frequency range Limits [MHz]	Field Strength		
	3 m [μV/m]	3 m [dB(μV/m)]	10 m [dB(μV/m)]
30 to 88	100	40.0	29.5
88 to 216	150	43.5	33.0
216 to 960	200	46.0	35.5
Above 960	500	54.0	43.5

Results checked manually; and points close to the limit line were re-measured.

5.2.1 Test instrumentation

EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Calibration	
					Date	Interval (Month)
E3I-003	BILOG Antenna	CBL6112B	Schaffner	2805	2012-04-19	24
E3I-190	BILOG Antenna	CBL6112B	Schaffner	2804	2011-06-22	24
E3I-213	Preamplifier	317	SONOMA	282424	2012-11-14	12
E3I-214	Preamplifier	317	SONOMA	282425	2012-11-14	12
E3I-170	Horn Antenna	HF906	R&S	100028	2012-08-13	24
E3I-233	EMI TEST RECEIVER	ESU-26	R&S	100364	2012-10-26	12
E4I-014	EMI TEST RECEIVER	ESU-08	R&S	100084	2012-10-18	12

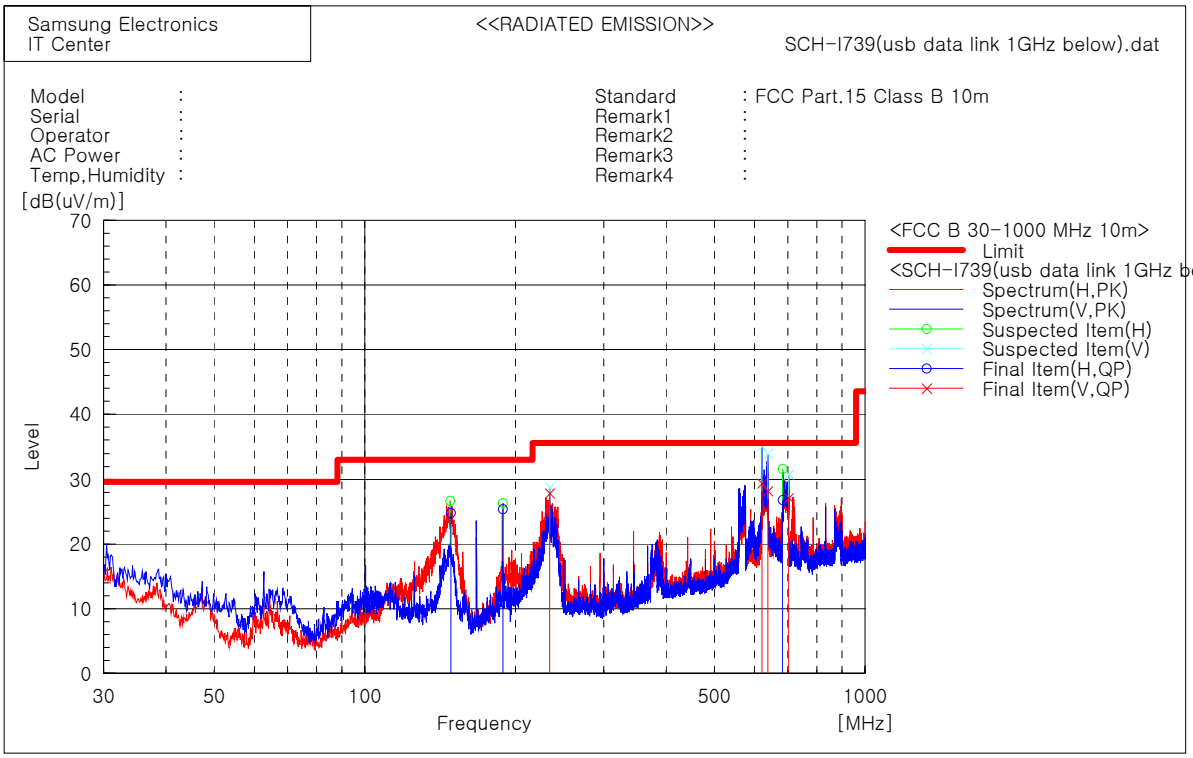
5.2.2 Temperature and humidity condition

Test date	2012-12-20	Test engineer	Jong-Sup Jeong
Climate condition	Ambient temperature	22.7 ℃	Limit (15.0 to 35.0) ℃
	Relative humidity	36.5 % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	101.6 kPa	Limit (86.0 to 106.0) kPa
Test place	Semi-Anechoic Chamber (SAC4)		

5.2.3 Test results

☐ Operating Mode 1

- Frequency range: 30 ~ 1 000 MHz



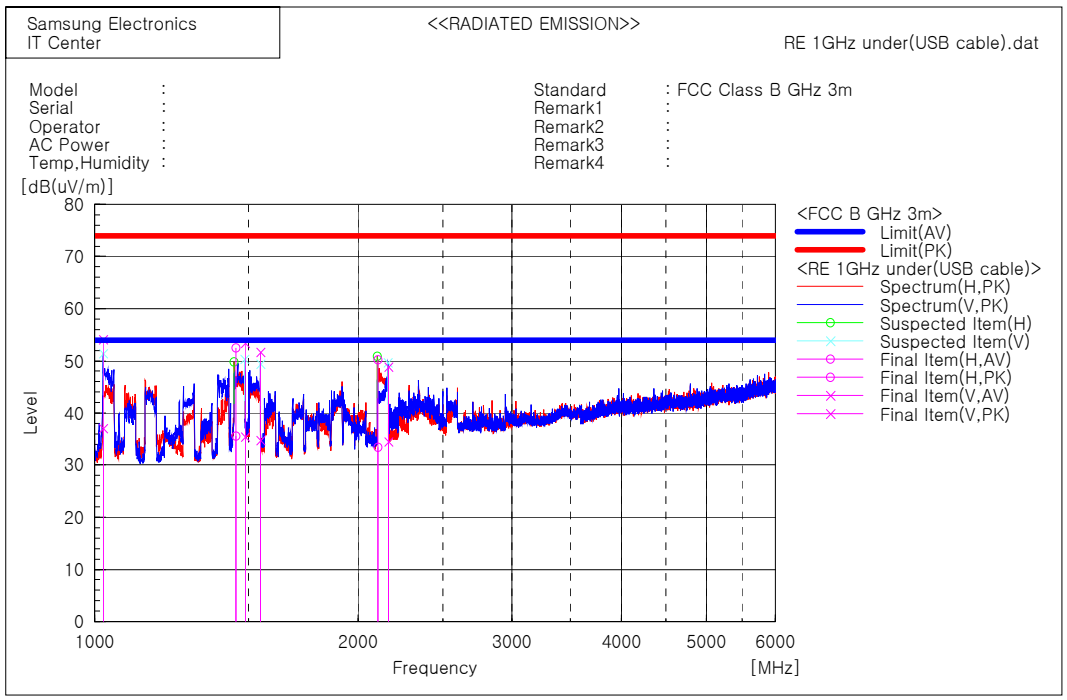
Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	System
1	148.419	H	49.3	-24.5	24.8	33.0	8.2	400.0	302.0	1
2	188.404	H	51.3	-25.9	25.4	33.0	7.6	398.0	284.0	1
3	233.821	V	53.3	-25.5	27.8	35.5	7.7	102.0	300.0	2
4	621.821	V	44.6	-15.3	29.3	35.5	6.2	197.0	142.0	2
5	638.433	V	43.0	-14.9	28.1	35.5	7.4	197.0	142.0	2
6	684.629	H	39.5	-12.7	26.8	35.5	8.7	100.0	169.0	1
7	703.301	V	42.0	-14.8	27.2	35.5	8.3	400.0	154.0	2

Note) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 10 m, Antenna Height : 1 to 4 meters
Level (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)
Margin (QP) = Limit – Level (QP)
QP = Quasi-Peak

☐ Operating Mode 1

- Frequency range: 1 000 ~ 6 000 MHz



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
1	1450.469	45.5	-9.9	35.6	54.0	18.4	100.0	324.0
2	2107.781	39.8	-6.4	33.4	54.0	20.6	100.0	20.0

--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
1	1450.469	62.4	-9.9	52.5	74.0	21.5	100.0	324.0
2	2107.781	56.6	-6.4	50.2	74.0	23.8	100.0	20.0

--- Vertical Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
1	1022.982	49.0	-12.0	37.0	54.0	17.0	100.0	196.0
2	1485.654	45.1	-9.7	35.4	54.0	18.6	100.0	15.0
3	1548.642	44.1	-9.4	34.7	54.0	19.3	100.0	41.0
4	2166.941	40.4	-5.9	34.5	54.0	19.5	100.0	215.0

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
1	1022.982	66.1	-12.0	54.1	74.0	19.9	100.0	196.0
2	1485.654	63.1	-9.7	53.4	74.0	20.6	100.0	15.0
3	1548.642	61.1	-9.4	51.7	74.0	22.3	100.0	41.0
4	2166.941	54.8	-5.9	48.9	74.0	25.1	100.0	215.0

Note 1) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 3 m, Antenna Height : 1 to 4 meters
Level (PK and/or AV) = Reading (PK and/or AV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)
Margin (PK and/or AV) = Limit – Level (PK and/or AV)
PK = Peak, AV = Average