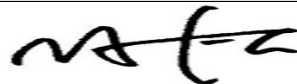
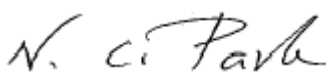
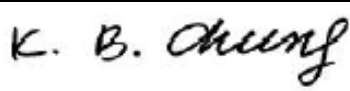


EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE041131
Equipment under Test	
Applicant	Samsung Electronics Co. Ltd; 416 Maetan-3 Dong, Yeoung tong-Ku, Suwon City, Gyeonggi-Do, Korea, 443-742
FCC ID	A3LSP30
Product Name	Note PC
Model Name	P35
Manufacturer	Samsung Electronics Co. Ltd
Date of Test	May 4, 2004 ~ May 7, 2004
Issued Date	May 22, 2004

	Name/Position	Signature
Tested by	Min Gon, Kim Test Engineer	
Reviewed by	No Cheon, Park Manager of EMC Lab.	
Authorized by	Kyu Baek, Chung Chief of EMC Lab.	

1. This test reports does not constitute an endorsement by NIST/NVLAP or U.S Government.
2. This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.
All tests necessary to show compliance to the requirements were and these results met the specifications requirement.

This laboratory is registered by the NIST/NVLAP, U.S.A.

The test reported herein have been performed in accordance with its terms of registration.



NVLAP LAB CODE 200623-0

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1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co. Ltd;
Model name	P35
Applicant Address	416 Maetan3- Dong, Yeoung tong-Ku, Suwon City, Gyeonggi-Do, Korea, 443-742
Contact Person	Min Gon, Kim
Kind of product	Note PC
Valiant list	P30 T2200
Manufacturer	Samsung Electronics Co.Ltd;
New / Alternative / Permissive change Information	Dothan CPU 2.0GHz

1.2 Justification for EUT Configuration

The EUT system tested was configured in a fashion that a customer would typically use. Cable were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. The mode of operation utilized for testing was selected to best simulate typical EUT use.

The system was tested using the below configurations of (A) ~ (C).

(A) LCD 15.0" SXGA+ , CPU 1.8GHz

(B) LCD 14.1" XGA , CPU 1.6GHz

(C) LCD 15.0" SXGA+ , Dothan CPU 2.0GHz

This report is for above (C) configuration. So the data of the maximum EUT operation was reported.

Further details of cabling and configuration are shown in the test system configuration.

1.3 Detail Information related Product

Specification

Item	Specification	Remark
CPU	Intel Dothan CPU 2.0GHz	
Main Memory	Samsung, M470L322DT0-CB3 direct DDR channel 64bit 64MB memory	DDR 333MHz, PC2700, 2GB
Graphic Contoller	ATI M11-CSP128 Integrated 128M DDR Graphics Memory Supports 4X AGP, CRT, S-VHS TV Port	
Flat Panel Dispay	SEC, LCD 15.0", LTN150P4-L02, SXGA+ 1400X1050,32BIT	
HDD	Hitachi, 40G, IC25N040ATMR04-0, 2.5"	
PCMCIA	Richo R5C593 (support SD/MMC/Memory Stick)	
DVD-MULTI	TEAC, DVD-MULTI, DV-W22E CD/DVD/CD-RW/DVD-R	
AC Adapter	AcBel, AD-6019, 60-Watts, 2 pin , 100-240V, 50/60Hz	
MODEM	ActionTec, MD560LMI-2, 56KBPS, MDC type	
LAN	RealTek 8101L Integrated 10/100Base T Ethernet	
Wireless LAN	Intel, WM3B2100, 802.11b Mini PCI, 11MBPS	FCC ID : PD9WM3B2100
Input Devices	Keyboard, 19mm pitch, 2.4mmH travel length Pointing Device, PS/2 Touchpad, Wheel Mouse	
Battery	8 CELL LION SMART BATTER, 14.8V	
Ports	2 USB, RJ-11, RJ-45, DC IN,EXT. MONITOR, S-VHS TV-out,MIC-out,HEADPHONE-OUT, 3in1Card slot, PCMCIA, IEEE1394, SIO, PIO	

Operating Frequency

2.0GHz for CPU speed, 100MHz for CPU clock, 66MHz for the MCH, 33MHz for all PCI clocks, 27MHz for ATI Video, 66 MHz for ICH4-M, 32.768 kHz XTAL for ICH4-M real time clock, 14.318MHz for Clock Generator, 24.576MHz XTAL for SIGMATEL_9750TLC5 Audio Codec, 24.576MHz XTAL for R5C593 1394/PCMCIA/Memory stick Controller, 25MHz XTAL for LF8423 LAN Controller, 8MHz XTAL for MICOM

1.4 Operating Mode and Condition

The EUT exercise program used during radiated and conducted emissions testing was the Samsung Standardized Emission Test Program for Windows. During the certification test, the LCD panel was open and video signals were simultaneously active on the LCD panel, and the VGA port.

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.

The program repetitively sends a screen of H to the display, reads and writes to the hard drive, and writes to all serial , parallel ports and modem.

Music is played from the CD player to the Line-In jack and ported out to the earphones.

A hard drive from the remote PC was mapped to the EUT and a data file was read and written over the network connection to provide continuous activity. The EUT was connected to a remote PC through the Ethernet port with Shielded Twisted Pair(STP) Ethernet cable and Modem portby using hyperterminal program.

Final testing was performed at 100 Mbps operation.

The system was configured for testing in typical fashion use. Cable were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables.

1.5 Test System Details

This section provide details of the equipment under test(EUT) and the peripheral assemblies attached during radiated and conducted emission testing.

For the LCD panel the SXGA resolution was set to its maximum value of 1400X1050.

The AC adapter was connected to notebook PC. All external peripherals were connected to the I/O ports to the EUT.

1.6 Equipment Modifications

No equipment modifications were required.

1.7 Test Procedure

1.6.1 Disturbance Voltage at Mains

EUT was placed on a platform nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop.

All other surfaces of tabletop was at least 80cm from any other grounded conducting surface. I/O cables and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT current-carrying power lead, except the ground(safety)lead, were individually connected through a LISN to the input power source.

All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

1.6.2 Radiated disturbance

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop.

I/O cables that were connected to the peripherals were bundle in center.

They were folded back and forth forming a bundle 30cm to 40cm long and were hanged 40cm height to the ground plane.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane and the run table azimuth was varied to obtain the maximum signal strength

The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found.

The spectrum was scanned from 30 to 1000 MHz using biconiLog antenna.

Also, the EMI TEST RECEIVER was scanned from 1000 to 18000MHz using linearly polarized double ridge horn antennas were used.

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
30 to 1000	Spectrum analyzer	Peak	1MHz	1MHz
	EMI Test receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Test receiver	Peak	1MHz	-

1.8 Test Configuration

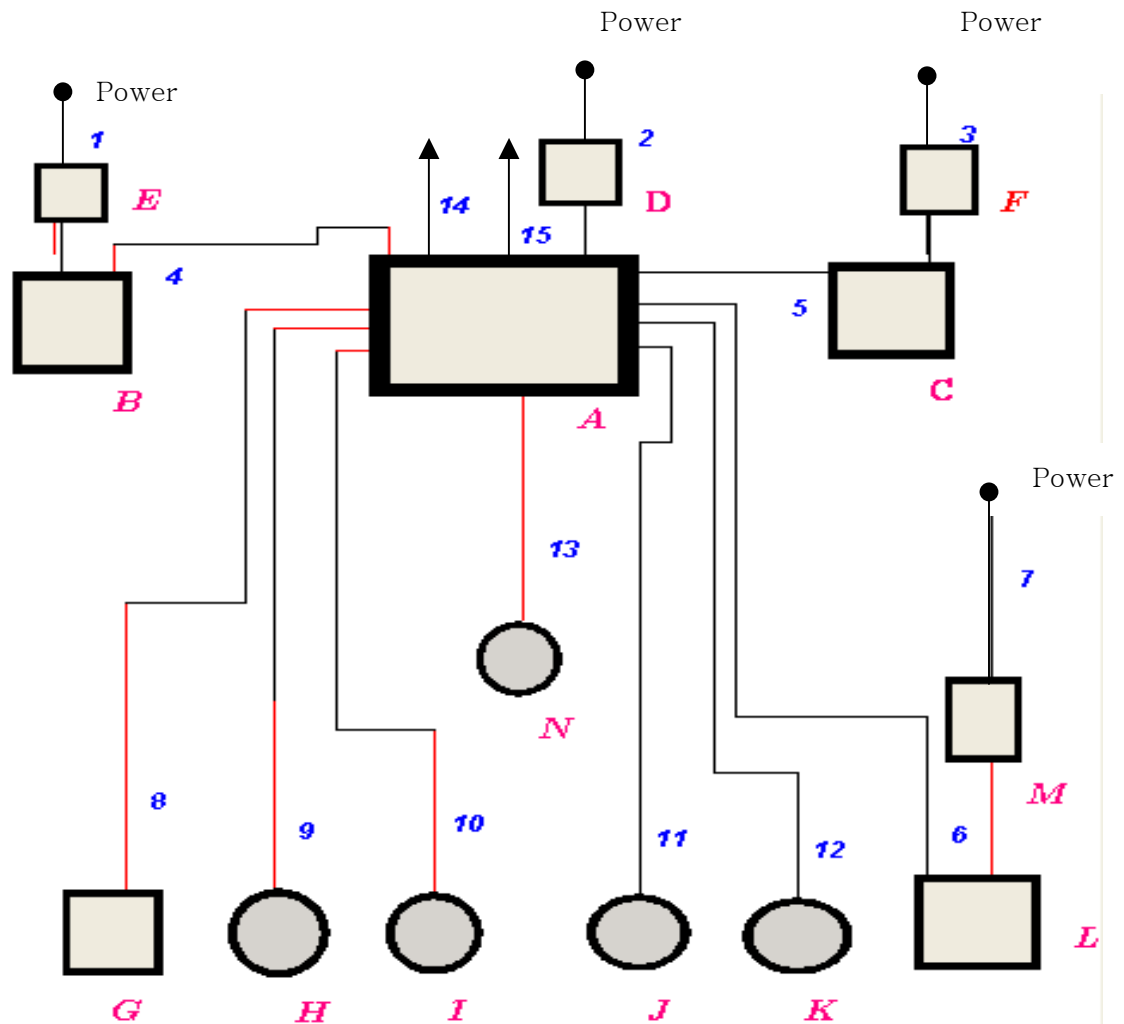
Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	Note
A	Note PC	P35	-	Samsung	FCC ID : A3LSP30
B	LCD Monitor	176T-DZ	N352H4KW400591	Samsung	DoC
C	Printer	BJC-50	CLG 010600307	Lotte Canon	DoC
D	Adapter	AD-6019	CNBA4400162ABJ6F 3B81410	ACBEL	For EUT
E	Adapter	AP6314-UV	0305001380AA	Anam Instrument	For Monitor
F	Adapter	K30088	CLG010600307	TABUCHI	For Printer
G	MP3 Player	M8541	U2237082MJ2	Inventec Application Corp	DoC
H	USB Mouse	M-UR69	HCA40801433	Logitech	DoC
I	USB Mouse	M-UR69	LNA24917787	Logitech	DoC
J	Serial Mouse	C3KMS1	0988577	Microsoft	FCC ID : C3KMS1
K	PS/2 Mouse	P801	01063726	Samsung	FCC ID : GJJS965M3
L	TV	CCM-054TE	54112098603	Commax	-
M	Adapter	RF-18B	-	Hyo Sung	For TV
N	Ear-phone	-	-	-	-

Used Cable Description

No	Item	Length[m]	Shielded(Y/N)	Remark
1	Power	1.5	No	
2	Power	1.5	No	
3	Power	1.7	No	
4	Monitor	1.5	Yes	
5	Parallel (Printer)	1.5	Yes	
6	S -Video Out	1.7	Yes	
7	Power	1.5	No	
8	1384	1.5	Yes	
9	USB	1.5	No	
10	USB	1.5	No	
11	Serial	1.5	No	
12	PS/2	1.5	No	
13	Sound Output	1.5	No	
14	LAN (RJ45)	3.0	No	
15	TEL (RJ11)	3.0	No	

Block Diagram



1.9 Applied Standards

List

Product or Generic Standards	Basic Standards
FCC Part15 Sub Part B	ANSI C63.4 : 2000

1.10 Test Facility

General Information

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22, 16-1, 16-2, 11.

This EMC Testing Lab. 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).

This Lab. is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:1998.

Accreditation and Listing



Uncertainty

(According to NAMAS Pub.NIS81)

Samsung IT EMC Test Lab.

Disturbance voltage at Mains : $\pm 1.9\text{dB}$

Radiated disturbance Bi-Log Antenna : $\pm 5.1\text{dB}$

2. Summary of Test Results

Result : PASS

The equipment under test(EUT) has been found to comply with the applied standards.

Section of the Product Standard		Applied Standard	Result
Electromagnetic Emission Test			
3.1	Conducted Emission	ANSI C63.4	Complied
3.2	Radiated Emission	ANSI C63.4	Complied

3.1 Conducted Emission

Test Information	
Test Engineer	Min Gon, Kim
Test Date	May 6, 2004
Climate Condition	Ambient Temperature : 23.5 °C Relative Humidity : 32%
	Atmospheric Pressure : 999mbar
Test Place	Shield Room

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
LISN	ESH3-Z5	R&S	100263	2004-07-16	12
EMI TEST RECEIVER	ESCS30	R&S	830986/004	2005-02-12	12
LISN	ESH3-Z5	R&S	831887/004	2004-10-01	12

Measurement Results	Passed The Measured emissions of the EUT have found to be below the specified limits.
----------------------------	---

Test Data & Graph

The Initial step in collecting conducted data was to perform a peak and average scan over the measurement range using a receiver

The find data represents worst-case emissions.

* QP : Quasi-peak, AV: Average

* Result = Meter Reading(QP or AV) + Total Loss(LISN Insertion loss + Cable loss)

* Margin = Limit – Result

1. TEST DATA & GRAPH

1. Average Table

MEASUREMENT RESULT: "SP30_07_0506_fin AV"

5/6/2004 11:21AM

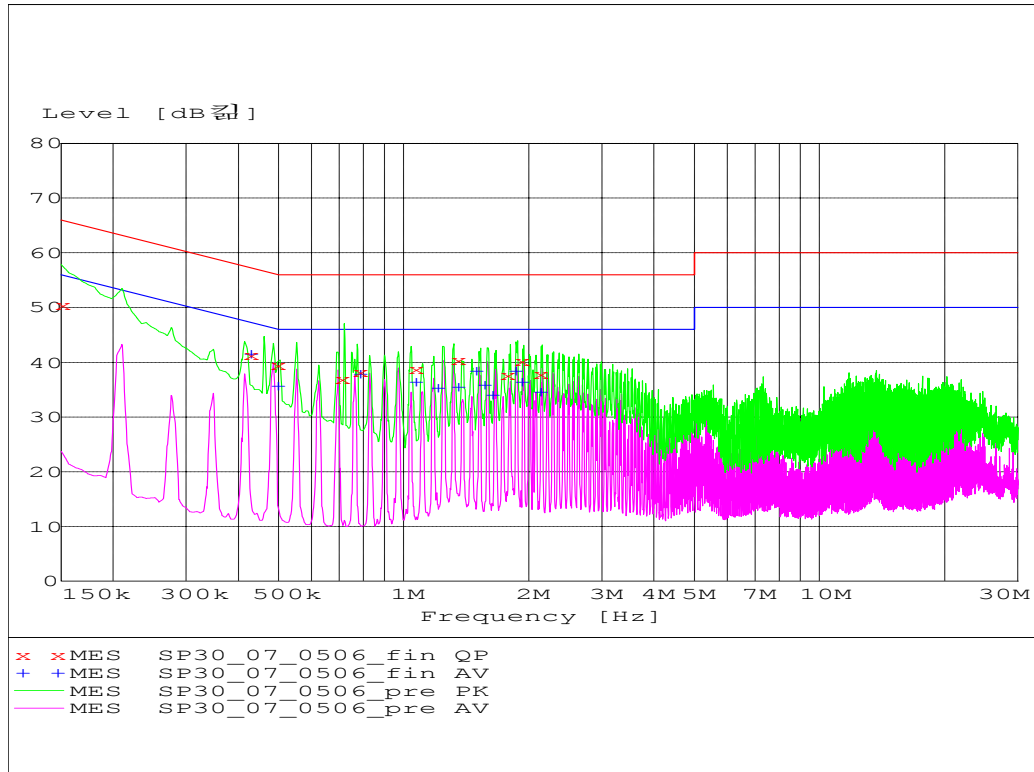
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.425000	41.50	0.5	47	5.9	L1	FLO
0.495000	35.70	0.6	46	10.4	L1	FLO
0.780000	37.90	0.5	46	8.1	L1	FLO
1.060000	36.40	0.6	46	9.6	L1	FLO
1.200000	35.40	0.6	46	10.6	L1	FLO
1.345000	35.50	0.6	46	10.5	L1	FLO
1.485000	38.50	0.6	46	7.5	L1	FLO
1.555000	35.90	0.6	46	10.1	N	FLO
1.625000	34.00	0.6	46	12.0	L1	FLO
1.840000	38.50	0.6	46	7.5	L1	FLO
1.910000	36.50	0.6	46	9.5	L1	FLO
2.120000	34.60	0.5	46	11.4	L1	FLO

2. Quasi Peak Table*MEASUREMENT RESULT: "SP30_07_0506_fin QP"*

5/6/2004 11:21AM

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB μ V	dB	dB μ V	dB		
0.150000	50.40	0.6	66	15.7	L1	FLO
0.425000	41.40	0.5	57	16.0	L1	FLO
0.495000	39.40	0.6	56	16.7	L1	FLO
0.705000	37.00	0.5	56	19.0	L1	FLO
0.780000	38.20	0.5	56	17.8	L1	FLO
1.060000	38.80	0.6	56	17.2	N	FLO
1.345000	40.40	0.6	56	15.6	L1	FLO
1.765000	37.60	0.6	56	18.4	L1	FLO
1.910000	40.20	0.6	56	15.8	L1	FLO
2.120000	37.90	0.5	56	18.1	L1	FLO

- Graph -



3.2 Radiated Emission

Test Information	
Test Engineer	Min Gon, Kim
Test Date	May 4, 2004
Climate Condition	Ambient Temperature : 24 °C Relative Humidity : 34%
	Atmospheric Pressure 1002mbar
Test Place	10m RF Semi Anechoic Chamber

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Horn Antenna	HF906	R&S	100027	2003-08-19	12
Turn Table	DT430	HD	430/691/01	N/A	N/A
Antenna Mast	MA240	HD	240/678 BJ:01	N/A	N/A
Controller	HD100	HD	100/723	N/A	N/A
BILOG Antenna	CBL6112B	Schaffner	2804	2004-06-26	12
Test Receiver	ESI26	R&S	100019	2005-02-16	12

Measurement Results	Passed The measured emissions of the EUT have found to be below the specified limits.
----------------------------	---

Test Data & Graph

The initial step in collecting radiated data was to perform a peak scan over the measurement range using a receiver. All modes of operation were investigated and the worst-case emission are reported

The minimum margin to the limit is as follows:

All other emission are non-significant.

* Receiving Antenna Mode : Horizontal, Vertical

* Test distance :

- Below 1000MHz: 10m(Quasi-peak)

- Above 1000MHz: 3m(Peak)

* Result = Meter Reading + Total Loss(Antenna factor + Cable loss)

* Margin = Limit – Result

1. TEST DATA & GRAPH

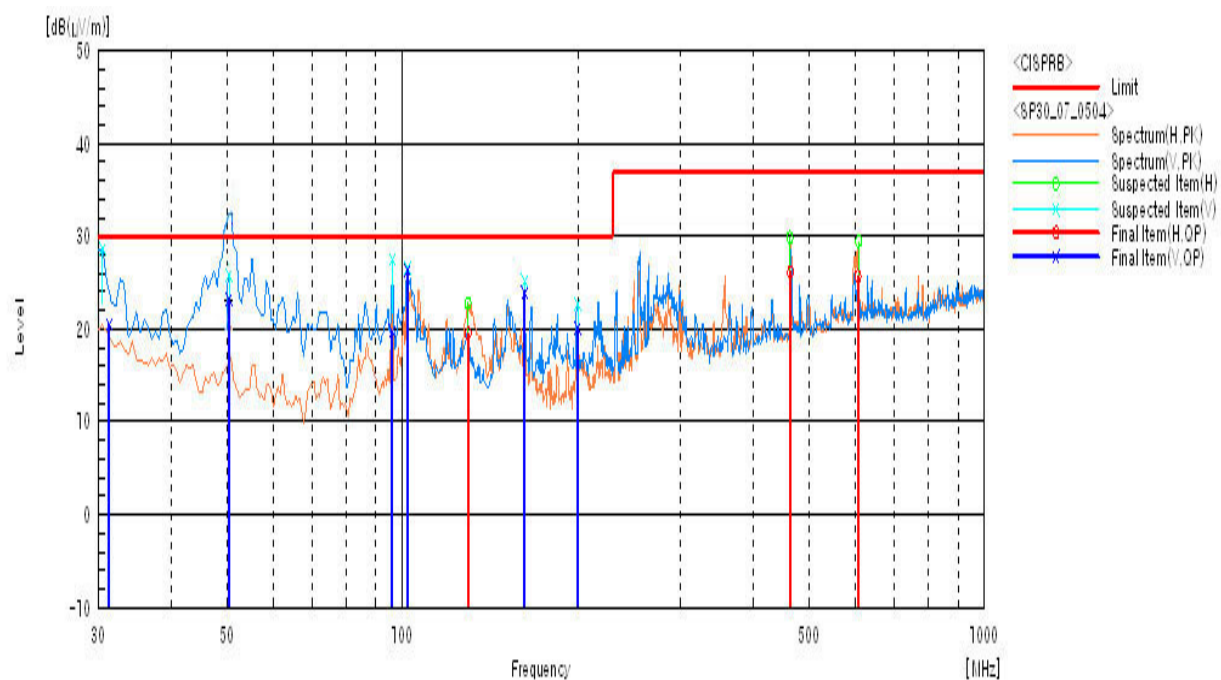
■ Test Data (30MHz~1GHz)

No.	Frequency [MHz]	(P)	S.C	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]	Remark
1	50.429	V	S	35.6	-11.6	24.0	30.0	6.0	124.0	224.0	
2	96.004	V	S	29.6	-9.8	19.8	30.0	10.2	121.0	244.0	
3	101.902	V	S	35.4	-9.0	26.4	30.0	3.6	113.0	328.0	
4	129.708	H	S	27.3	-7.7	19.6	30.0	10.4	363.0	135.0	
5	162.287	V	S	33.6	-9.6	24.0	30.0	6.0	113.0	329.0	
6	199.800	V	S	31.0	-10.9	20.1	30.0	9.9	113.0	51.0	
7	463.981	H	S	26.2	0.0	26.2	37.0	10.8	185.0	44.0	
8	605.664	H	S	23.2	2.5	25.7	37.0	11.3	113.0	331.0	
9	31.355	V	S	23.7	-3.2	20.5	30.0	9.5	119.0	107.0	

■ Test Data (1GHz~10GHz)

No.	Frequency [MHz]	(P)	S.C	Reading Peak [dB(μV)]	c.f [dB(1/m)]	Result Peak [dB(μV/m)]	Limit [dB(μV/m)]	Margin Peak [dB]	Height [cm]	Angle [°]	Remark
10	1089.235	V	S	58.6	-8.1	50.5	74.0	23.5	100.0	110.0	

- Graph



4. Appendix

4.1 Test Photography



Pic. 1 Conducted Emission (Front)



Pic. 2 Conducted Emission (Rear)



Pic. 3 Radiated Emission (Front)



Pic. 4 Radiated Emission (Rear)

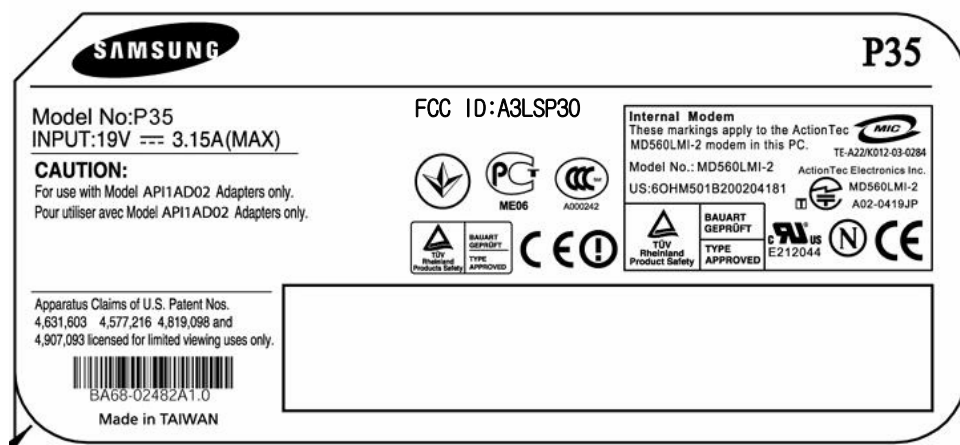
4.2 EUT Photography



Pic. 5 EUT (Front)



Pic. 6 EUT (Rear)



Pic. 7 EUT (Label)



Pic. 8 Label location