

PCTEST ENGINEERING LABORATORY, INC

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CERTIFICATE OF COMPLIANCE

MANUFACTURER NAME & ADDRESS:

SAMSUNG ELECTRONICS CO., LTD.
416 Maetan-3 Dong, Paldal-Ku
Suwon City, Kyungki-Do 441-742, Korea

Attn: Steve Kim, Engineering Manager
Samsung Electronics America (QA Lab)

DATE & LOCATION OF TESTING:

Date(s) of Tests: August 21-25, 2006
Test Report S/N: 0608090661
Test Site: PCTEST Lab, Columbia, MD USA

TRADE NAME/MODEL:

Applicant:

Address:

Contact Person:

SAMSUNG / RFID-COUPLER

SAMSUNG ELECTRONICS CO., LTD.

American QA Lab

18600 Broadwick St.

Rancho Dominguez, CA 90220

Steve Kim, Engineering Manager

SUMMARY:

FCC ID

A3LPRSE0609

Equipment EUT Type:

Multifunction Printer w/ RFID Transmitter

FCC Rule Part(s):

§15.225 / Part 15C

IC Standard

RSS-210 Issue 6 – Sept 2005

Freq. of Operation

13.56 MHz

FCC Classification:

Low Power Communication Device - Transmitter (DXX)

Application Type

Original Equipment

Test Procedure(s):

ANSI C63.4-2003

This device bearing the FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 (See Test Report). These measurements were performed with no deviation from the standards.

I authorize and attest to the accuracy of data. 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.

NVLAP accreditation does not constitute any product endorsement by NVLAP or any agency of the United States Government. PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.


Randy Ortanez
President

NVLAP[®]
Lab Code 100431-0



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MEASUREMENT REPORT

A. General Information

APPLICANT: SAMSUNG ELECTRONICS CO., LTD.
APPLICANT ADDRESS: 416 Maetan-3 Dong, Paldal-Ku
Suwon City, Kyungki-Do, KOREA 441-742
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): §15.225 - RFID
IC Standard RSS-210 Issue 6
MODEL NAME: RFID-COUPLER
EUT TYPE: Multifunction Printer w/ RFID Transmitter
TEST DEVICE S/N: none
SAMPLE: ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION: Scope A1 – DXX RFID Transmitter – Multifunction Printer
DATE(S) OF TEST: August 21-25, 2006

A.1 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-2003 and FCC Part 15.225. Radiated testing was performed at an antenna to EUT distance of 10 meters using Active Loop Antenna for frequencies below 30 MHz.

A.2 Test Facility / NVLAP Accreditation

Conducted, Radiated, RF tests were performed at PCTEST Engineering Lab in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (IC 2451).
- PCTEST Lab is accredited by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) in EMC, Telecommunication, and FCC for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. (NVLAP Lab code: 100431-0).
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and all Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (IC-2451) test laboratory with the site description on file at Industry Canada.

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1.0 INTRODUCTION

1.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) and Part 15.225/RSS-210 were used in determining radiated and conducted emissions emanating from **SAMSUNG Multifunction Printer w/ RFID Transmitter**.

1.2 Scope

Measurement & determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and Industry Canada.

1.3 PCTEST Test Location

The map at the right shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington International (BWI) airport, the city of Baltimore and the Washington, DC area. (see Figure 1.3-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level.

The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5

miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. 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 January 27, 2006 and Industry Canada.

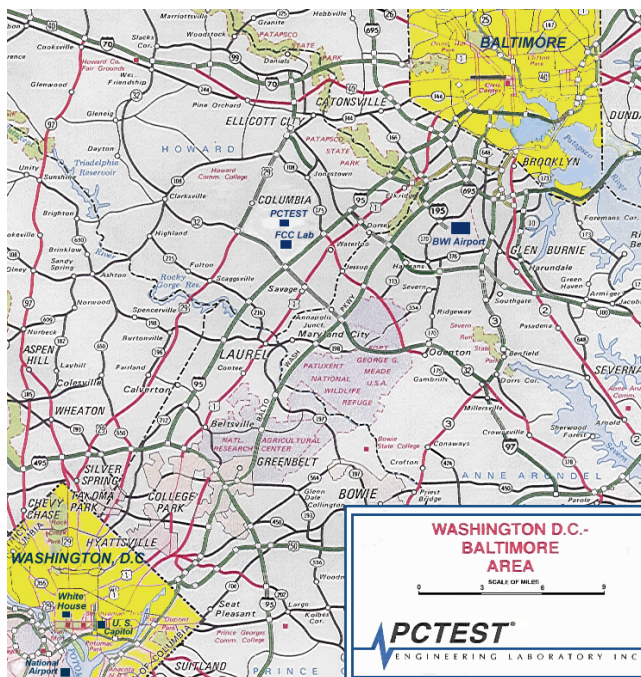


Figure 1.3-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the SAMSUNG Multifunction Printer w/ RFID Transmitter. The RFID is used for getting Toner and OPC drum information wirelessly.

Operating Freq.	13.56 MHz
Input Power:	110-127VAC, 50-60Hz, 9A

2.2 Operation Mode

The Samsung RFID was tested with the RFID transmitter installed in Samsung printer Model: RFID-COUPLER and the RFID tag was connected to the toner and OPC drum. Please see block diagram and technical description for more information.

2.3 EMI Suppression Device(s)

EMI suppression device(s) added and/or modifications made during testing.

- none

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3.0 DESCRIPTION OF TEST

3.1 Conducted Emissions

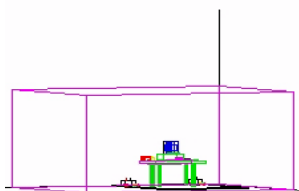


Figure 3.1-1. Shielded Enclosure Line-Conducted Test Facility

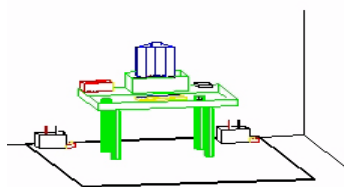


Figure 3.1-2. Line Conducted Emission Test Set-Up

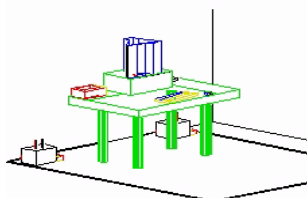


Figure 3.1-3. Wooden Table & Bonded LISNs

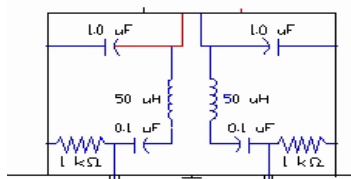


Figure 3.1-4. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure. It is manufactured by Ray Proof Series 81 (see Figure 3.1-1). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the sidewall of the shielded room (see Figure 3.1-2). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (See Figure 3.1-3). The EUT is powered from the Solar LISN and the support equipment is powered from the EMCO LISN. Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filters (100dB 14Hz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with an inner diameter of ½". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the Solar LISN. The LISN schematic diagram is shown (See Figure 3.1-4). All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length. Sufficient time for the 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 150kHz to 30MHz with a 20msec. sweep time. The frequencies producing the maximum level were re-examined using an EMI/Field Intensity Meter and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode and average mode. The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Attachment B. Each EME reported was calibrated using the HP8640D signal generator.

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3.2 Radiated Emissions

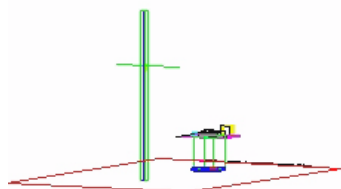


Figure 3.2-1. 10-Meter Test Site

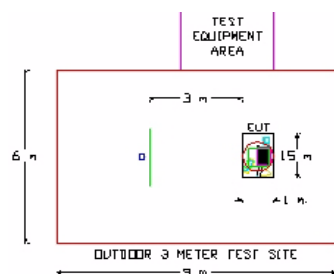


Figure 3.2-2. Dimensions of Outdoor Test Site

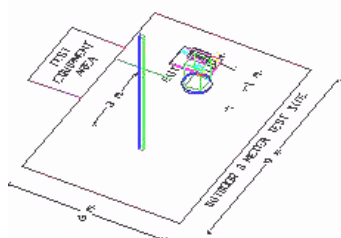


Figure 3.2-3. Turntable and System Setup

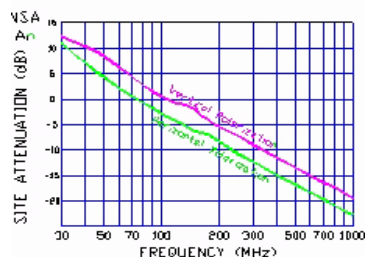


Figure 3.2-4. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1 meter using broadband 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 system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using biconical antenna and from 200 to 1000 MHz using log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 10-meter test range using active loop antenna for frequencies below 30 MHz and Roberts™ Dipole antennas or horn antenna (see Figure 3.2-1) for frequencies above 30 MHz. The test equipment was placed on a wooden and plastic bench situated on a 1.5 x 2 meter area adjacent to the measurement area (see Figure 3.2-2). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter and Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100kHz or 1 MHz depending on the frequency or type of signal. Above 1GHz the detector function was set to CISPR average mode (RBW = 1MHz, VBW = 10Hz).

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 3.2-3). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Attachment B. Each EME reported was calibrated using the HP8640D signal generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3.2-4.

For RFID transmitter, final measurements were made using Active Loop Antenna for frequencies below 30 MHz and Roberts Dipole for frequencies 30-1000 MHz.

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4.0 SAMPLE CALCULATIONS

4.1 Conducted Emission Measurement Sample Calculation:

@ 20.3 MHz

Part 15 limit = 250 μ V = 47.96 dB μ V
 Reading = - 67.8 dBm (calibrated level)
 Convert to dB μ V = - 67.8 + 107 = 39.2 dB μ V
 $10^{(39.2/20)}$ = 91.2 μ V

Margin = 39.2 - 47.96 = - 8.76
 = **8.8 dB below limit**

4.2 Radiated Emission Measurement Sample Calculation:

@ 27.12 MHz

Part 15.209 limit = 30 μ V/m @ 30 m = 29.54 dB μ V/m @ 30m
 Conversion 30m to 10m = 20dB/decade = 49.54 dB μ V/m @ 10m
 Reading = - 90.0 dBm (calibrated level)
 Convert to dB μ V = - 90.0 + 107 = 17.0 dB μ V
 Antenna Factor + Cable Loss = 8.3 dB μ V /m
 Total = 25.3 dB μ V/m

Margin = 25.3 - 49.54 = - 24.20
 = **24.2 dB below limit**

$$\text{dB}\mu\text{V} = 20 \log_{10} (\mu\text{V/m})$$

$$\text{dB}\mu\text{V} = \text{dBm} + 107$$

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5.0 UNCERTAINTY OF MEASUREMENT

5.1 Line Conducted Measurement Uncertainty Calculations

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

Table 5.1-1. Line Conducted Measurement Uncertainty Calculations

Contribution (Line Conducted)	Probability Distribution	Uncertainty ($\pm$ dB)	
		9kHz-150kHz	150-30MHz
Receiver specification	Rectangular	1.5	1.5
LISN coupling specification	Rectangular	1.5	1.5
Cable and input attenuator calibration	Normal (k=2)	0.3	0.5
Mismatch: Receiver VRC $\Gamma_L = 0.03$ LISN VRC $\Gamma_R = 0.8$ (9kHz) 0.2 (30MHz) Uncertainty limits $20\text{Log}(1 \pm \Gamma_L \Gamma_R)$	U-Shaped	0.2	0.35
System repeatability	Std. deviation	0.2	0.05
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	1.26	1.30
Expanded uncertainty	Normal (k=2)	2.5	2.6

Calculations for 150kHz to 30MHz:

$$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)} = \pm \sqrt{\frac{1.5^2 + 1.5^2}{3} + \left(\frac{0.5}{2}\right)^2 + 0.35^2} = \pm 1.298\text{dB}$$

$$U = 2U_c(y) = \pm 2.6\text{dB}$$

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5.2 Radiated Emissions Measurement Uncertainty Calculations

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

Table 5.2-1. Radiated Emissions Measurement Uncertainty Calculations

Contribution (Radiated Emissions)	Probability Distribution	Uncertainties ($\pm$ dB)	
		3 m	10 m
Ambient Signals		-	-
Antenna factor calibration	Normal (k=2)	± 1.0	± 1.0
Cable loss calibration	Normal (k=2)	± 0.5	± 0.5
Receiver specification	Rectangular	± 1.5	± 1.5
Antenna directivity	Rectangular	+ 0.5 / - 0	+ 0.5
Antenna factor variation with height	Rectangular	± 2.0	± 0.5
Antenna phase centre variation	Rectangular	0.0	± 0.2
Antenna factor frequency interpolation	Rectangular	± 0.25	± 0.25
Measurement distance variation	Rectangular	± 0.6	± 0.4
Site imperfections	Rectangular	± 2.0	± 2.0
Mismatch: Receiver VRC $\Gamma_I = 0.2$ Antenna VRC $\Gamma_R = 0.67$ (Bi) 0.3 (Lp) Uncertainty limits $20\text{Log}(1 \pm \Gamma_I \Gamma_R)$	U-Shaped	+ 1.1 - 1.25	± 0.5
System repeatability	Std. Deviation	± 0.5	± 0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+ 2.19 / - 2.21	+ 1.74 / - 1.72
Expanded uncertainty	Normal (k=2)	+ 4.38 / - 4.42	+ 3.48 / - 3.44

Note: Calculations for 3m-biconical antenna. Coverage factor of k=2 will ensure that the level of confidence will be approximately 95%, therefore:

$$U=2u_c(y) = 2 \times \pm 2.19 = \pm 4.38\text{dB}$$

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6.0 TEST EQUIPMENT LIST

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

TYPE	MODEL	CAL. DUE DATE	CAL. INTERVAL	SERIAL No.
Spectrum Analyzer	HP 8566B (100Hz-22GHz)	12/22/06	Annual	3638A08713
Quasi-Peak Adapter	HP 85650A	12/22/06	Annual	2043A00301
Preamplifier	HP 8449B	12/22/06	Annual	3008A00985
Spectrum Analyzer/Tracking Generator	HP 8591A (9kHz-1.8GHz)	09/12/06	Annual	3144A02458
Spectrum Analyzer	HP E4407B (9kHz-26.5GHz)	04/20/07	Annual	PCT697
Spectrum Analyzer	HP 8594A (9kHz-2.9GHz)	11/02/06	Annual	3051A00187
PSG Signal Generator	Agilent 8257D (250kHz-20GHz)	11/02/07	Annual	MY45470194
Microwave Spectrum Analyzer	Agilent E4448A (3Hz – 50 GHz)	08/16/06	Annual	PCT 682
ESG Digital Signal Generator	Agilent E4432B (250kHz-3GHz)	12/19/06	Annual	PCT 626
Broadband Amplifier	Amplifier Research Model5S1G4	12/22/06	Annual	PCT 530
Attenuation/Switch Driver	HP 11713A	12/22/06	Annual	N/A
Preselector	HP 85685A (20Hz-2GHz)	12/22/06	Annual	N/A
6dB Res BW Spec. Analyzer Display	OPT 462	12/22/06	Annual	3701A22204
Ailtech/Eaton Adapter	CCA-7 CISPR/ANSI QP Adapter	12/19/06	Annual	0194-04082
Ailtech/Eaton EMI/Field Intensity Meter	NM 37/57A-SL (30MHz – 1GHz)	06/07/07	Annual	0805-03334
Broadband Amplifier (2)	HP 8447D (0.1 – 1300MHz)	N/A	N/A	2443A01900, 1937A03348
Horn Antenna	EMCO Model 3115 (1-18GHz)	08/25/07	Bi-Annual	9704-5182
Roberts Dipoles	Compliance Design (1 set) A100	08/31/06	Bi-Annual	5118
Active Loop Antenna	EMCO Model 6502	05/08/07	Annual	PCT267
EMCO LISN (3)	3816/2, 3816/2, 3725/2	10/26/06	Annual	1077, 1079, 2099
SOLAR LISN (2)	8012-50	11/18/07	Annual	0313233, 0310234
Microwave Preamp 40dB Gain	HP 83017A (0.5-26.5GHz)	N/A	N/A	3123A00181
Coax Cable	RG58	N/A	Quarterly	N/A
Microwave Cables	MicroCoax (1.0-26.5GHz)	02/26/07	Annual	N/A
Shielded Screen Room	RF Lindgren Model 26-2/2-0	N/A	N/A	6710 (PCT270)
Shielded Semi-Anechoic Chamber	Ray Proof Model S81	N/A	N/A	R2437 (PCT278)
Temperature & Humidity Chamber	ESPEC SCP-220	06/08/07	Annual	017620
OATS	N/A	12/31/2006	Annual	N/A

Table 6-1. Annual Test Equipment Calibration Schedule

Note: All calibrations are traceable to U.S. NIST.

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7.0 ENVIRONMENTAL CONDITIONS

The temperature is controlled within range of 15°C to 35°C.

The relative humidity is controlled within range of 10% to 75%.

The atmospheric pressure is controlled within the range 86-106kPa (860-1060mbar).

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **SAMSUNG FCC ID: A3LPRSE0609 Multifunction Printer w/ RFID Transmitter** has been tested to comply with Part 15.225 of the FCC Rules and RSS-210 of Industry Canada.

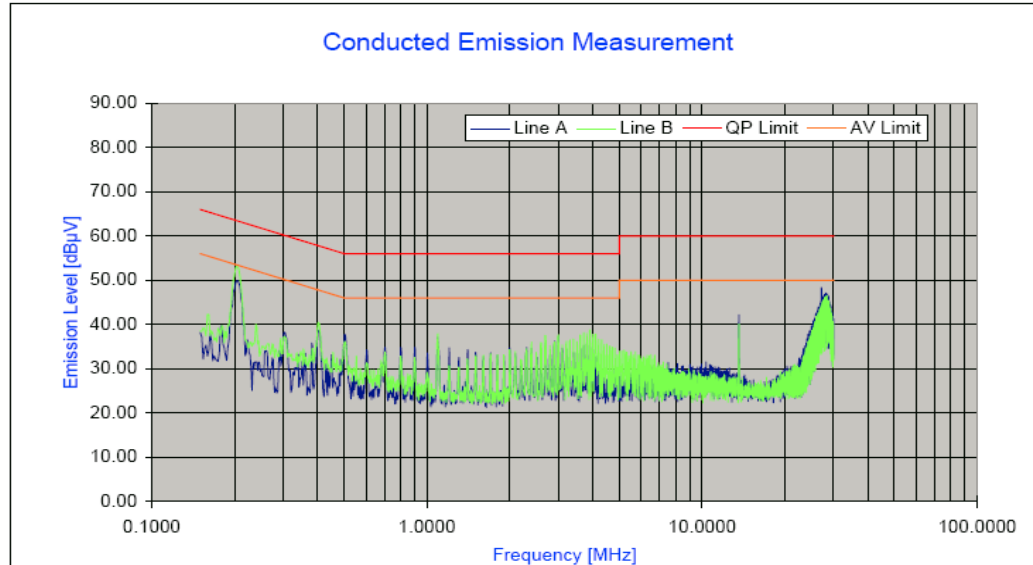
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ATTACHMENT A – Test Data

PCTEST Engineering Laboratory Inc.

Company : SAMSUNG Electronics
FCC ID : A3LPRSE0609
Standard : FCC Part 15B class B

Power Source : AC120V/60Hz
Tested Date : 08/18/2006
Test Engineer : Joel San Buenaventura



No.	Line	Frequency [MHz]	Factor [dB]	QP [dBμV]	Limit [dBμV]	Margin [dB]	Average [dBμV]	Limit [dBμV]	Margin [dB]
1	A	27.130	8.47	46.10	60.00	-13.90	39.48	50.00	-10.52
2	A	28.129	8.52	45.47	60.00	-14.53	34.48	50.00	-15.52
3	A	28.432	8.53	45.15	60.00	-14.85	38.01	50.00	-11.99
4	A	28.235	8.52	45.43	60.00	-14.57	38.60	50.00	-11.40
5	A	27.930	8.51	45.53	60.00	-14.47	37.55	50.00	-12.45
6	A	28.035	8.51	45.42	60.00	-14.58	38.89	50.00	-11.11
7	A	28.331	8.53	45.25	60.00	-14.75	37.82	50.00	-12.18
8	A	27.835	8.50	45.11	60.00	-14.89	38.69	50.00	-11.31
9	A	28.635	8.54	44.83	60.00	-15.17	37.50	50.00	-12.50
10	A	0.203	7.92	48.81	63.48	-14.67	43.61	53.48	-9.87
11	B	0.203	7.92	52.38	63.49	-11.11	47.45	53.49	-6.04
12	B	28.405	8.53	44.16	60.00	-15.84	36.99	50.00	-13.01
13	B	28.116	8.52	44.30	60.00	-15.70	33.97	50.00	-16.03
14	B	28.306	8.53	44.14	60.00	-15.86	33.92	50.00	-16.08
15	B	27.813	8.50	44.19	60.00	-15.81	36.61	50.00	-13.39
16	B	27.914	8.51	44.32	60.00	-15.68	34.22	50.00	-15.78
17	B	28.021	8.51	44.28	60.00	-15.72	33.01	50.00	-16.99
18	B	28.212	8.52	44.29	60.00	-15.71	36.81	50.00	-13.19
19	B	27.912	8.51	44.23	60.00	-15.77	36.35	50.00	-13.65
20	B	27.623	8.49	43.88	60.00	-16.12	35.98	50.00	-14.02

Manufacturer: SAMSUNG ELECTRONICS	MEASUREMENT REPORT FCC Part 15.225 - RFID Certification			Reviewed by: Quality Manager
Filename: 0608090661	Test Dates: August 21-25, 2006	EUT: SAMSUNG Multifunction Printer w/ RFID Transmitter	FCC ID: A3LPRSE0609	Page 12 of 17

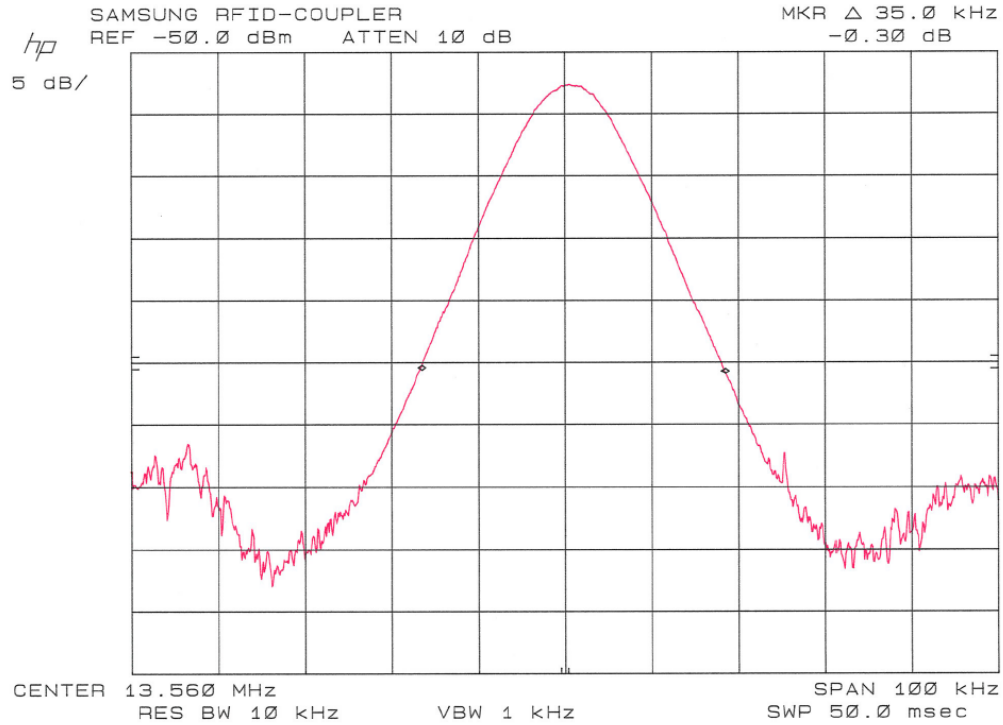
Radiated Measurements at 10-meters

FREQ (MHz)	Level (dBuv)	AFCL (dB)	POL (H/V)	Height (m)	Azimuth (° angle)	F/S (dBuV/M)	Margin (dB)
13.56	56.00	8.20	H	2.20	10.00	64.20	-39.80
13.56	55.50	8.20	V	2.50	20.00	63.70	-40.30
27.12	17.00	8.30	H	2.00	10.00	25.30	-24.20
40.68	22.08	1.33	V	3.50	10.00	23.41	-6.60
54.24	17.64	3.86	H	2.30	110.00	21.51	-8.50
67.80	13.01	5.99	H	2.20	190.00	19.01	-11.00
81.36	14.06	7.65	H	2.20	10.00	21.71	-8.30
122.04	12.90	11.64	V	1.90	180.00	24.54	-8.96
135.60	13.00	12.65	H	1.90	20.00	25.65	-7.85

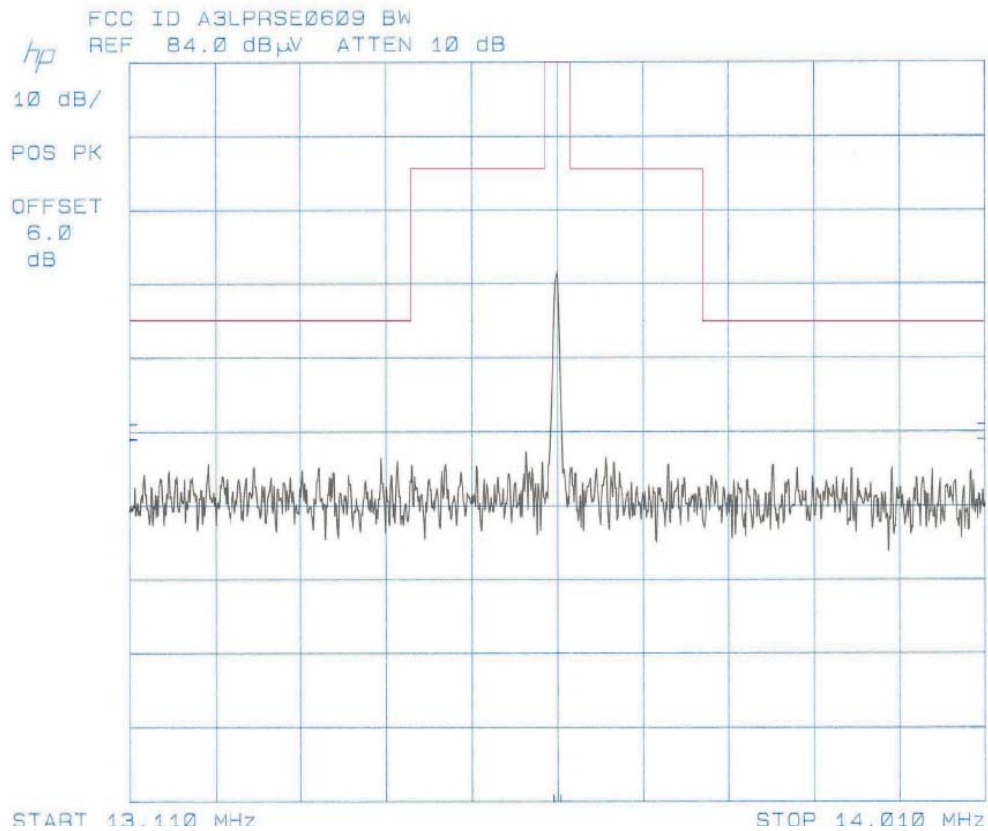
Note: Active loop antenna was used for frequencies below 30 MHz.

Manufacturer: SAMSUNG ELECTRONICS	 MEASUREMENT REPORT FCC Part 15.225 - RFID Certification 			Reviewed by: Quality Manager
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26dB Bandwidth Measurement



Manufacturer: SAMSUNG ELECTRONICS	MEASUREMENT REPORT FCC Part 15.225 - RFID Certification			Reviewed by: Quality Manager
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Manufacturer: SAMSUNG ELECTRONICS	PCTEST Complete Wireless Lab™ www.pctestlab.com MEASUREMENT REPORT FCC Part 15.225 - RFID Certification 			Reviewed by: Quality Manager
Filename: 0608090661	Test Dates: August 21-25, 2006	EUT: SAMSUNG Multifunction Printer w/ RFID Transmitter	FCC ID: A3LPRSE0609	Page 15 of 17

Frequency Stability

OPERATING
FREQUENCY: 13,560,331 Hz
REFERENCE
VOLTAGE: 5 VDC

DEVIATION LIMIT: $\pm 0.01\%$ or 100 ppm
Part
STANDARD 15.225(e)

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	5.00	+ 20 (Ref)	13,560,331	0.00	0.000000
100 %		- 30	13,560,568	-237.31	-0.001750
100 %		- 20	13,560,521	-189.84	-0.001400
100 %		- 10	13,560,548	-216.97	-0.001600
100 %		0	13,560,562	-230.53	-0.001700
100 %		+ 10	13,560,507	-176.28	-0.001300
100 %		+ 20	13,560,343	-12.20	-0.000090
100 %		+ 25	13,560,575	-244.09	-0.001800
100 %		+ 30	13,560,548	-216.97	-0.001600
100 %		+ 40	13,560,589	-257.65	-0.001900
100 %		+ 50	13,560,629	-298.33	-0.002200
100 %		+ 60	13,560,656	-325.45	-0.002400
85 %	3.17	+ 20	13,560,399	-67.80	-0.000500
115 %	5.75	+ 20	13,560,412	-81.36	-0.000600
BATT. ENDPOINT	2.50	+ 20	13,560,496	-165.44	-0.001220

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ATTACHMENT B – Test Setup Photographs

The Line-Conducted and Radiated Test Pictures show the worst-case configuration and cable placement with a minimum margin to the specifications.

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Filename: 0608090661	Test Dates: August 21-25, 2006	EUT: SAMSUNG Multifunction Printer w/ RFID Transmitter	FCC ID: A3LPRSE0609	Page 17 of 17