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FCC NFC REPORT

FCC Certification

Applicant Name:
SAMSUNG Electronics Co.,Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
February 26, 2016
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-R-1602-F040
HCT FRN: 0005866421
IC Recognition No.: 5944A-5

FCC ID	**: A3LSMA9100**
APPLICANT	**: SAMSUNG Electronics Co.,Ltd.**
FCC Model(s):	SM-A9100
EUT Type:	Mobile Phone
RF Output Field Strength:	12.76 dBuV/m @30 m
Frequency of Operation:	13.5600 MHz
Modulation type:	ASK
FCC Classification:	Low Power Communication Device – Transmitter
FCC Rule Part(s):	FCC Part 15.225 Subpart C

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by
: Seul Ki Lee
Test Engineer of RF Team

Approved by
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Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1602-F040	February 26, 2016	- First Approval Report

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1. GENERAL INFORMATION

Applicant:	SAMSUNG Electronics Co.,Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMA9100
EUT Type:	Mobile Phone
Model name(s):	SM-A9100
Date(s) of Tests:	February 04 ~ February 26, 2016
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea (IC Recognition No. : 5944A-5)

2. EUT DESCRIPTION

FCC Model Name	SM-A9100
EUT Type	Mobile Phone
Power Supply	DC 3.85 V
Battery Infomation	Model: EB-BA910ABE Type: Li-ion Battery
Frequency of Operation	13.5600 MHz
Transmit Power	12.76 dBuV/m @30 m
Modulation Type	ASK
Antenna Specification	Manufacturer: RFTech Co., LTD. Antenna type: FPCB Antenna

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10:2013).

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.225 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.3 of ANSI C63.10. (Version: 2013).

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3.5 STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance With
FCC Part 15.Subpart C

Regulation	Measurement standard	Range
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(a)	ANSI C63.10:2013	13.553MHz to 13.567MHz
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(d)	ANSI C63.10:2013	outside of the 13.110-14.010 MHz band
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209	ANSI C63.10:2013	9kHz to 30MHz
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209	ANSI C63.10:2013	30MHz to 1GHz
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.207	ANSI C63.10:2013	150kHz to 30MHz
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(e)	ANSI C63.10:2013	0.01% of nominal
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.215(c)	ANSI C63.10:2013	-

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The 10 m semi anechoic chamber used to collect the Conducted and Radiated data is located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4 (Version: 2014). Detailed description of test facilities was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned loop, dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

7. TEST SUMMARY

The results in this report apply only to sample tested

Regulation	Test Type	Range	Result
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(a)	Radiated Electric Field Emissions	13.553MHz to 13.567MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(b)	Radiated Electric Field Emissions	13.410MHz to 13.553MHz and 13.567MHz to 13.710MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(c)	Radiated Electric Field Emission	13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209 (d)	Radiated Electric Field Emissions	9kHz to 30MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209	Radiated Electric Field Emissions	30MHz to 1GHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.207	AC power conducted emissions	150kHz to 30MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(e)	Frequency Stability	0.01% of nominal	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.215(c)	20 dB Bandwidth	-	Pass

8. RADIATED EMISSION MEASUREMENT

Requirement(s): 15.209, 15.225

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Minimum Standard: FCC Part 15.225 / 15.209

Rule Part	Frequency (MHz)	Limit
Part 15.209	0.009 ~ 0.490	2400/F(kHz) uV/m@300 m
	0.490 ~1.705	24000/F(kHz) uV/m@30 m
	1.705 ~ 30	30 uV/m@30 m
	30 ~ 88	100 ** uV/m@3 m
	88 ~ 216	150 ** uV/m@3 m
	216 ~ 960	200 ** uV/m@3 m
	Above 960	500 uV/m@3 m

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

15.225 Operation within the band 13.110 – 14.010 MHz.

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dBuV/m) at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

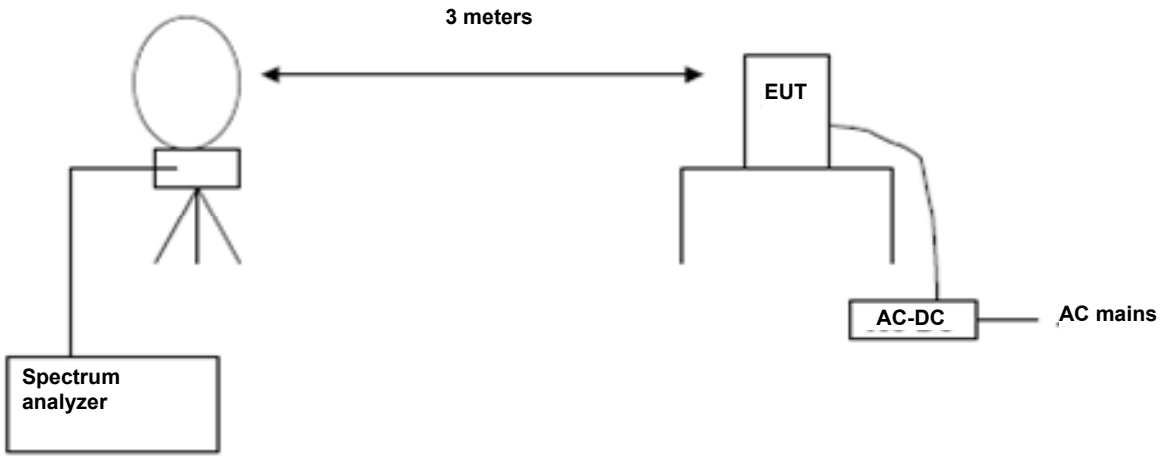
(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

8.1. RADIATED EMISSION 9 kHz – 30 MHz

Test Set-up



Test Procedure

The EUT was placed on a non-conductive table located on a large open test site.
The loop antenna was placed at a location 3m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna and with x, y, z planes in EUT.

The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:

Corrected Amplitude = Raw Amplitude(dBµV/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

The spectrum analyzer is set to:
Frequency Range = 9 kHz ~ 1 GHz
RBW = 9 kHz (9 kHz ~ 30 MHz)
= 120 kHz (30 MHz ~ 1 GHz)

Trace Mode = max hold
Detector Mode = peak / Quasi-peak
Sweep time = auto

▣ Test Results

13.553 MHz-13.567 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5600(H)	32.39	18.58	-40	10.97	84	73.03
13.5605(V)	28.72	18.58	-40	7.3	84	76.7

13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.553	19.84	18.58	-40	-1.58	50.47	52.05
13.567	20.19	18.58	-40	-1.23	50.47	51.7

13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.3530	13.01	18.58	-40	-8.41	40.51	48.92
13.7742	12.81	18.58	-40	-8.61	40.51	49.12

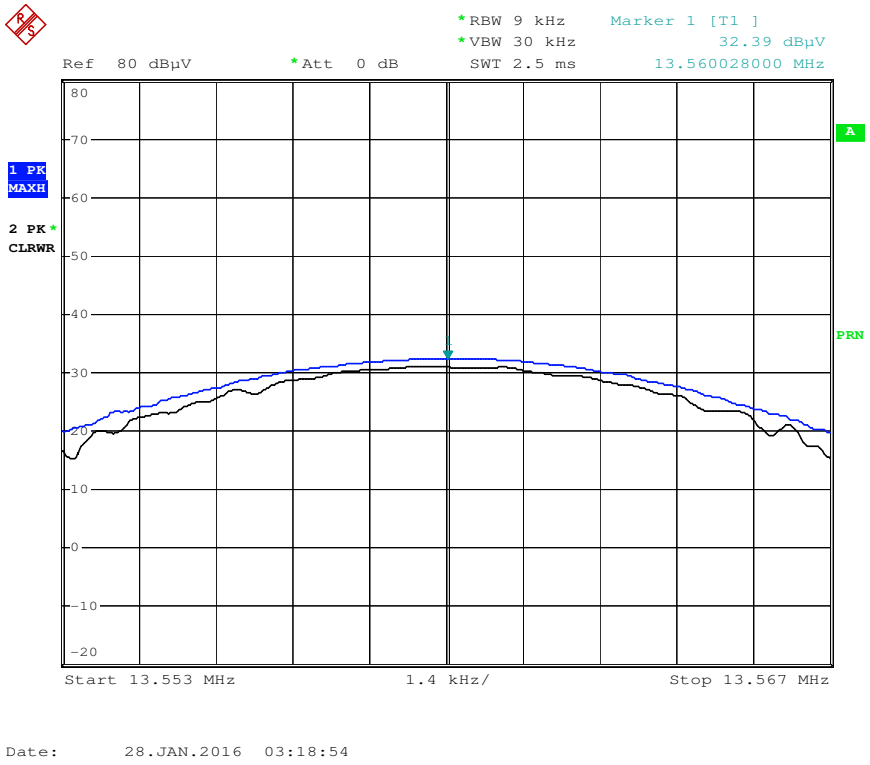
9 kHz -30 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
11.9047	11.45	18.58	-40	-9.97	29.54	39.51
16.0247	13.63	18.58	-40	-7.79	29.54	37.33
27.1211	12.89	18.2	-40	-8.91	29.54	38.45
27.1207	12.60	18.2	-40	-9.2	29.54	38.74

Note :

1. Distance Correction Below 30MHz = 40log(3m/30m) = - 40 dB
   Measurement Distance : 3 m (Below 30 MHz)
2. Factor = Antenna Factor + Cable Loss
3. Result Level = Read Level + Factor + Distance Correction
4. Margin = Limit – Result Level
5. We have done x, y, z planes in EUT
6. Antenna rotated about its vertical/horizontal axis for maximum response at each azimuth position around the EUT.
7. Worst case of operating mode is type A, analog mode and 106 kbps.

▣ RESULT PLOTS

Radiated Emissions (9kHz~30MHz) plot



Note : Only the worst case plots for Radiated Emissions.

▣ Test Results (Open site)

13.553 MHz-13.567 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5600(H)	38.89	18.58	-40	17.47	84	66.53
13.5605(V)	35.22	18.58	-40	13.8	84	70.2

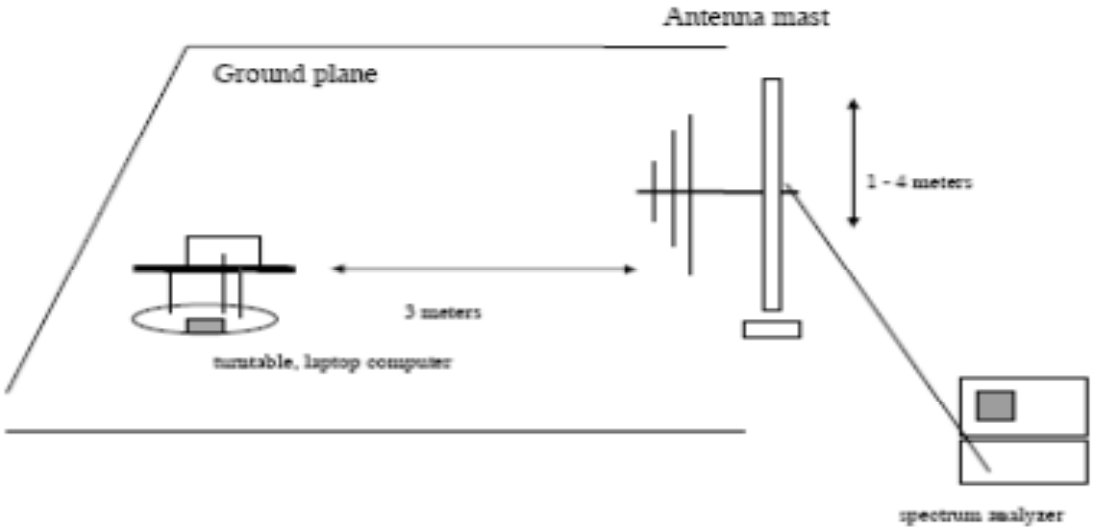
13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.553	25.84	18.58	-40	4.42	50.47	46.05
13.567	26.19	18.58	-40	4.77	50.47	45.7

13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.3530	13.01	18.58	-40	-8.41	40.51	48.92
13.7742	12.81	18.58	-40	-8.61	40.51	49.12

9 kHz -30 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
11.9047	11.45	18.58	-40	-9.97	29.54	39.51
16.0247	13.63	18.58	-40	-7.79	29.54	37.33
27.1211	12.89	18.2	-40	-8.91	29.54	38.45
27.1207	12.60	18.2	-40	-9.2	29.54	38.74

8.2. RADIATED EMISSION 30 MHz – 1000 MHz

Test Set-up



Test Procedures: Radiated emissions were measured according to ANSI C63.10.

The EUT was set to transmit at the highest output power.

The EUT was set 3 meter away from the measuring antenna.

▣ Test Results

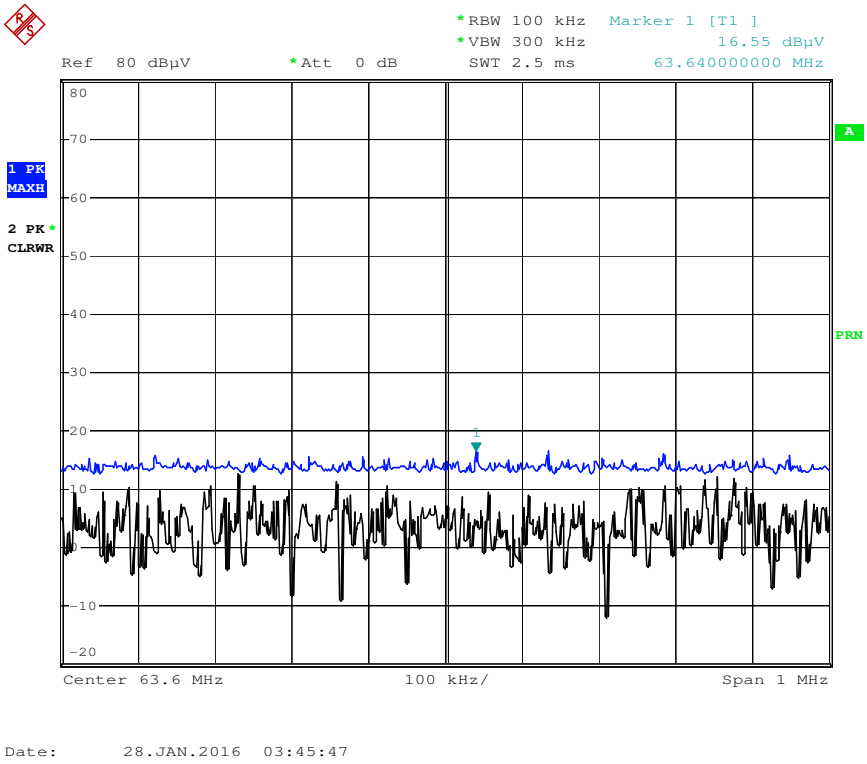
Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBμV	dB /m	dB	(H/V)	dBμV/m	dBμV/m	dB
42.11	15.74	11.95	0.66	H	28.35	40	11.65
63.64	16.55	11.82	0.74	H	29.11	40	10.89
81.75	16.10	8.19	0.78	V	25.07	40	14.93
*110.88	15.12	10.46	0.97	H	26.55	43.5	16.95
*124.71	15.33	11.64	0.96	H	27.93	43.5	15.57
145.78	16.05	12.84	1.05	V	29.94	43.5	13.56

Remark

1. Result Level = Read Level + (Antenna Factor+ Cable Loss)
2. Margin = Limit – Result Level
3. '*' is the result for restricted band.

▣ RESULT PLOTS

Radiated Emissions (30MHz~1000MHz) plot



Note : Only the worst case plots for Radiated Emissions.

9. EMISSION BANDWIDTH PLOT.

Requirement(s):

Test Set-up: The EUT was connected to a spectrum analyzer.

Test Procedure: The 20 dB bandwidth was measured by using a spectrum analyzer.

RBW = Auto

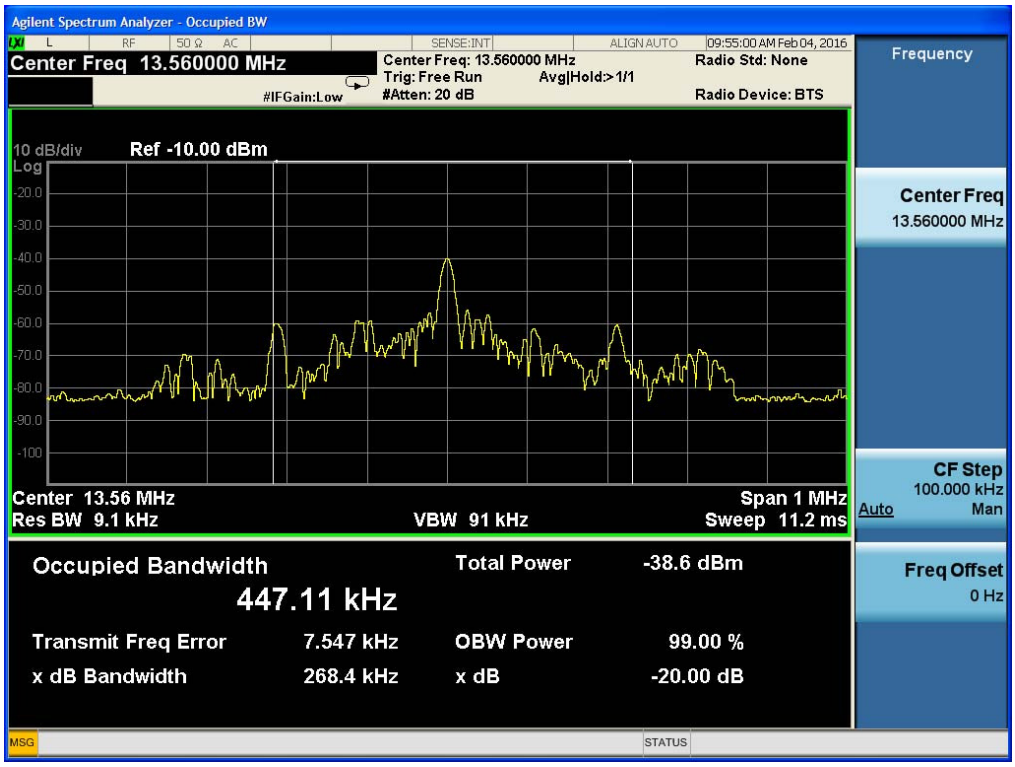
VBW = Auto

Span = Adequately in the operating Tx.

Detector = Peak

Trace mode = Max hold

Allow the trace to stabilize



10. FREQUENCY TOLERANCE

Procedure: Part 15.225, ANSI 63.10

If required, the operating or transmitting frequency of an intentional radiator should be measured in accordance with the following procedure to ensure that the device operates outside certain precluded frequency bands and within the frequency range. No modulation needs to be supplied to the intentional radiator during these tests, unless modulation is required to produce an output, e.g., single-sideband suppressed carrier transmitters.

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -20°C to + 50°C using an environmental chamber.

b) For battery operated equipment, the equipment tests shall be performed using a new battery.

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Measurement Result:

PERATING FREQUENCY: 13.56 MHz
REFERENCE VOLTAGE: 3.85 VDC
DEVIATION LIMIT: 0.01% = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.85	-20	13.560168	168	0.0012389
100%		-10	13.560174	174	0.0012832
100%		0	13.560181	181	0.0013348
100%		+10	13.560185	185	0.0013643
100%		+20(Ref.)	13.560189	189	0.0013938
100%		+30	13.560202	202	0.0014897
100%		+40	13.560215	215	0.0015855
100%		+50	13.560223	223	0.0016445
115%	4.2	+20	13.560210	210	0.0015487
85%	3.4	+20	13.560208	208	0.0015339

11. POWERLINE CONDUCTE EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. The EUT is the device operating below 30 MHz.
   - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
   - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

Test Plots

Unterminate the Antenna

Conducted Emissions (Line 1)

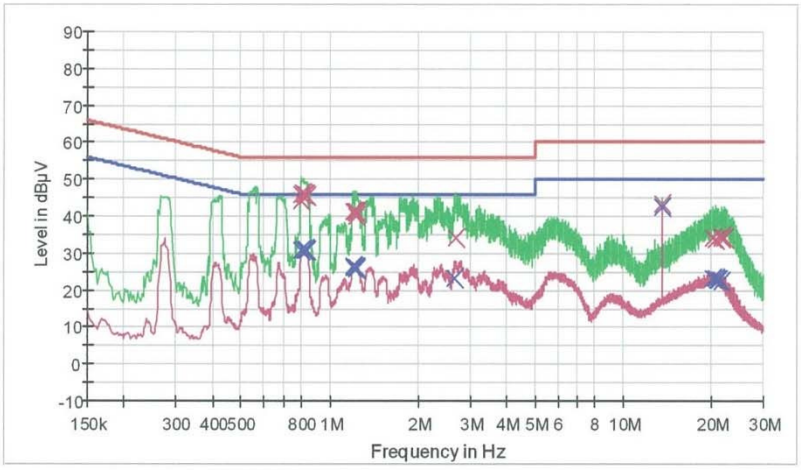
NFC_H 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A9100
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC MODE (UNTERMINATION)

FCC CLASS B



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_ AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.798000	44.3	9.000	Off	L1	9.7	11.7	56.0
0.804000	45.9	9.000	Off	L1	9.7	10.1	56.0
0.810000	46.1	9.000	Off	L1	9.7	9.9	56.0
0.818000	46.1	9.000	Off	L1	9.7	9.9	56.0
0.830000	45.9	9.000	Off	L1	9.7	10.1	56.0
0.834000	45.4	9.000	Off	L1	9.7	10.6	56.0
1.202000	41.1	9.000	Off	L1	9.7	14.9	56.0
1.216000	41.3	9.000	Off	L1	9.7	14.7	56.0
1.226000	41.4	9.000	Off	L1	9.7	14.6	56.0
1.230000	40.2	9.000	Off	L1	9.7	15.8	56.0
1.236000	41.0	9.000	Off	L1	9.7	15.0	56.0
2.684000	34.3	9.000	Off	L1	9.8	21.7	56.0
13.560000	43.5	9.000	Off	L1	10.1	16.5	60.0
20.178000	34.0	9.000	Off	L1	10.3	26.0	60.0
20.556000	33.9	9.000	Off	L1	10.3	26.1	60.0
21.572000	34.0	9.000	Off	L1	10.3	26.0	60.0
21.702000	34.6	9.000	Off	L1	10.3	25.4	60.0
22.154000	34.2	9.000	Off	L1	10.3	25.8	60.0

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NFC_H 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.802000	30.8	9.000	Off	L1	9.7	15.2	46.0
0.810000	31.3	9.000	Off	L1	9.7	14.7	46.0
0.818000	30.7	9.000	Off	L1	9.7	15.3	46.0
0.826000	30.9	9.000	Off	L1	9.7	15.1	46.0
0.830000	31.1	9.000	Off	L1	9.7	14.9	46.0
0.834000	31.0	9.000	Off	L1	9.7	15.0	46.0
1.204000	26.4	9.000	Off	L1	9.7	19.6	46.0
1.210000	26.2	9.000	Off	L1	9.7	19.8	46.0
1.214000	26.2	9.000	Off	L1	9.7	19.8	46.0
1.226000	26.3	9.000	Off	L1	9.7	19.7	46.0
1.236000	25.8	9.000	Off	L1	9.7	20.2	46.0
2.664000	23.1	9.000	Off	L1	9.8	22.9	46.0
13.560000	42.5	9.000	Off	L1	10.1	7.5	50.0
20.178000	23.4	9.000	Off	L1	10.3	26.6	50.0
20.556000	23.3	9.000	Off	L1	10.3	26.7	50.0
20.812000	22.9	9.000	Off	L1	10.3	27.1	50.0
21.132000	22.8	9.000	Off	L1	10.3	27.2	50.0
21.702000	22.4	9.000	Off	L1	10.3	27.6	50.0

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Conducted Emissions (Line 2)

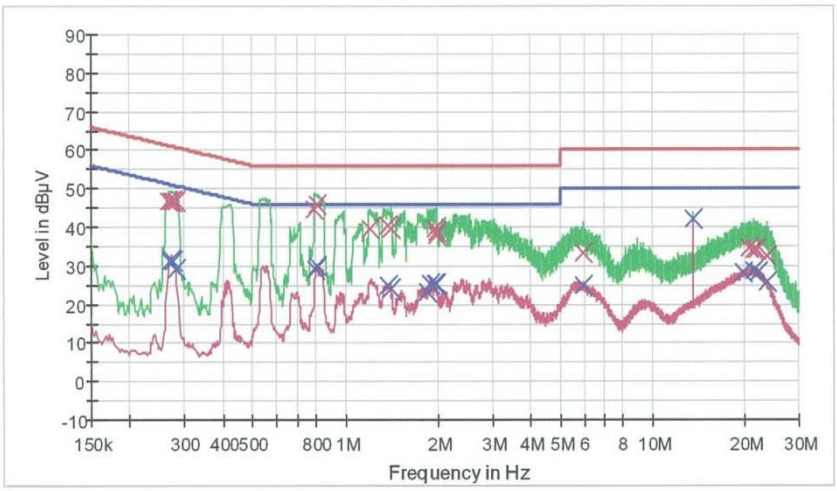
NFC_N 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A9100
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC MODE (UNTERMINATION)

FCC CLASS B



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_ AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.268000	46.7	9.000	Off	N	9.6	14.5	61.2
0.274000	46.7	9.000	Off	N	9.6	14.3	61.0
0.278000	46.8	9.000	Off	N	9.6	14.1	60.9
0.282000	46.6	9.000	Off	N	9.6	14.2	60.8
0.796000	44.5	9.000	Off	N	9.7	11.5	56.0
0.808000	45.8	9.000	Off	N	9.7	10.2	56.0
1.200000	39.8	9.000	Off	N	9.7	16.2	56.0
1.384000	40.5	9.000	Off	N	9.7	15.5	56.0
1.406000	39.5	9.000	Off	N	9.7	16.5	56.0
1.970000	39.6	9.000	Off	N	9.7	16.4	56.0
1.974000	38.9	9.000	Off	N	9.7	17.1	56.0
1.984000	38.1	9.000	Off	N	9.7	17.9	56.0
5.934000	33.3	9.000	Off	N	9.9	26.7	60.0
13.560000	42.3	9.000	Off	N	10.1	17.7	60.0
20.710000	34.6	9.000	Off	N	10.3	25.4	60.0
21.382000	34.3	9.000	Off	N	10.3	25.7	60.0
21.778000	34.3	9.000	Off	N	10.3	25.7	60.0
23.612000	32.2	9.000	Off	N	10.4	27.8	60.0

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NFC_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.270000	31.2	9.000	Off	N	9.6	19.9	51.1
0.274000	31.6	9.000	Off	N	9.6	19.4	51.0
0.278000	31.3	9.000	Off	N	9.6	19.6	50.9
0.282000	29.2	9.000	Off	N	9.6	21.6	50.8
0.800000	29.0	9.000	Off	N	9.7	17.0	46.0
0.808000	29.8	9.000	Off	N	9.7	16.2	46.0
1.386000	24.7	9.000	Off	N	9.7	21.3	46.0
1.408000	24.2	9.000	Off	N	9.7	21.8	46.0
1.858000	23.2	9.000	Off	N	9.7	22.8	46.0
1.902000	25.2	9.000	Off	N	9.7	20.8	46.0
1.970000	25.2	9.000	Off	N	9.7	20.8	46.0
1.974000	25.4	9.000	Off	N	9.7	20.6	46.0
5.934000	24.9	9.000	Off	N	9.9	25.1	50.0
13.560000	42.0	9.000	Off	N	10.1	8.0	50.0
19.684000	28.0	9.000	Off	N	10.3	22.0	50.0
21.382000	28.5	9.000	Off	N	10.3	21.5	50.0
22.218000	28.0	9.000	Off	N	10.3	22.0	50.0
23.612000	25.5	9.000	Off	N	10.4	24.5	50.0

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Terminate the Antenna

Conducted Emissions (Line 1)

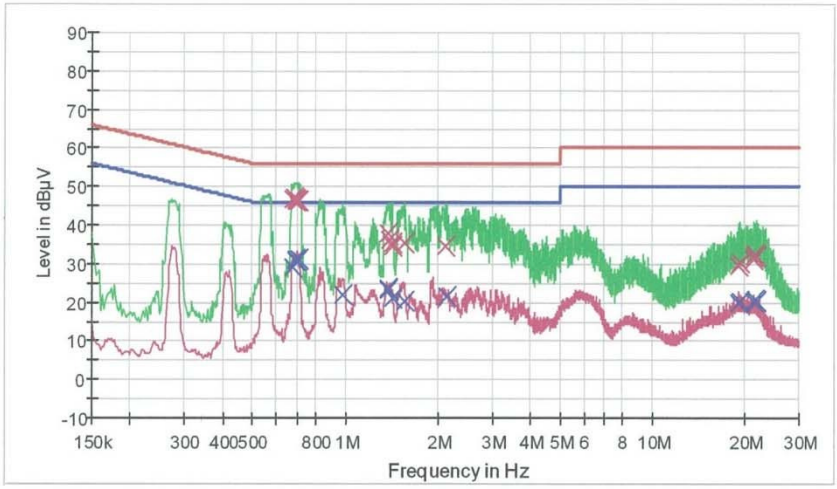
NFC_H (TERM) 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A9100
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC MODE (TERMINATION)

FCC CLASS B



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_ AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.674000	46.6	9.000	Off	L1	9.7	9.4	56.0
0.684000	47.1	9.000	Off	L1	9.7	8.9	56.0
0.688000	46.6	9.000	Off	L1	9.7	9.4	56.0
0.692000	46.5	9.000	Off	L1	9.7	9.5	56.0
0.696000	46.4	9.000	Off	L1	9.7	9.6	56.0
0.704000	46.3	9.000	Off	L1	9.7	9.7	56.0
1.382000	37.9	9.000	Off	L1	9.7	18.1	56.0
1.396000	36.3	9.000	Off	L1	9.7	19.7	56.0
1.422000	35.5	9.000	Off	L1	9.7	20.5	56.0
1.426000	34.5	9.000	Off	L1	9.7	21.5	56.0
1.570000	35.3	9.000	Off	L1	9.7	20.7	56.0
2.122000	34.4	9.000	Off	L1	9.8	21.6	56.0
18.970000	29.6	9.000	Off	L1	10.2	30.4	60.0
19.358000	30.3	9.000	Off	L1	10.2	29.7	60.0
21.402000	31.8	9.000	Off	L1	10.3	28.2	60.0
21.414000	31.3	9.000	Off	L1	10.3	28.7	60.0
21.596000	32.4	9.000	Off	L1	10.3	27.6	60.0
21.838000	31.8	9.000	Off	L1	10.3	28.2	60.0

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NFC_H (TERM) 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.674000	29.2	9.000	Off	L1	9.7	16.8	46.0
0.688000	31.4	9.000	Off	L1	9.7	14.6	46.0
0.692000	30.7	9.000	Off	L1	9.7	15.3	46.0
0.696000	30.9	9.000	Off	L1	9.7	15.1	46.0
0.700000	30.7	9.000	Off	L1	9.7	15.3	46.0
0.704000	31.1	9.000	Off	L1	9.7	14.9	46.0
0.984000	22.0	9.000	Off	L1	9.7	24.0	46.0
1.382000	23.8	9.000	Off	L1	9.7	22.2	46.0
1.386000	23.0	9.000	Off	L1	9.7	23.0	46.0
1.426000	21.1	9.000	Off	L1	9.7	24.9	46.0
1.554000	20.4	9.000	Off	L1	9.7	25.6	46.0
2.140000	21.6	9.000	Off	L1	9.8	24.4	46.0
18.970000	19.8	9.000	Off	L1	10.2	30.2	50.0
19.358000	20.1	9.000	Off	L1	10.2	29.9	50.0
21.402000	20.2	9.000	Off	L1	10.3	29.8	50.0
21.414000	20.1	9.000	Off	L1	10.3	29.9	50.0
21.596000	20.6	9.000	Off	L1	10.3	29.4	50.0
21.838000	20.1	9.000	Off	L1	10.3	29.9	50.0

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Conducted Emissions (Line 2)

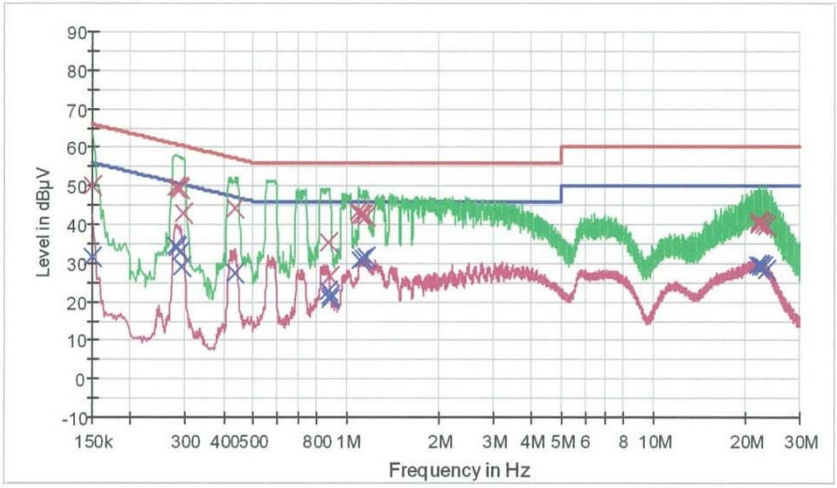
EMI Auto Test(16) 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A9100
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC MODE (TERMINATION)

FCC CLASS B



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_ AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	49.9	9.000	Off	N	9.6	16.1	66.0
0.280000	49.7	9.000	Off	N	9.6	11.1	60.8
0.286000	49.6	9.000	Off	N	9.6	11.0	60.6
0.290000	49.2	9.000	Off	N	9.6	11.3	60.5
0.296000	42.9	9.000	Off	N	9.6	17.5	60.4
0.436000	44.2	9.000	Off	N	9.6	12.9	57.1
0.882000	35.2	9.000	Off	N	9.7	20.8	56.0
0.890000	26.7	9.000	Off	N	9.7	29.3	56.0
1.106000	43.2	9.000	Off	N	9.7	12.8	56.0
1.114000	42.5	9.000	Off	N	9.7	13.5	56.0
1.144000	42.5	9.000	Off	N	9.7	13.5	56.0
1.164000	41.9	9.000	Off	N	9.7	14.1	56.0
22.020000	40.8	9.000	Off	N	10.3	19.2	60.0
22.132000	40.4	9.000	Off	N	10.3	19.6	60.0
22.184000	40.1	9.000	Off	N	10.3	19.9	60.0
22.302000	40.6	9.000	Off	N	10.3	19.4	60.0
22.786000	40.0	9.000	Off	N	10.3	20.0	60.0
23.394000	39.7	9.000	Off	N	10.4	20.3	60.0

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EMI Auto Test(16) 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	31.4	9.000	Off	N	9.6	24.6	56.0
0.280000	34.4	9.000	Off	N	9.6	16.4	50.8
0.284000	34.0	9.000	Off	N	9.6	16.7	50.7
0.288000	32.9	9.000	Off	N	9.6	17.7	50.6
0.292000	29.1	9.000	Off	N	9.6	21.4	50.5
0.436000	27.3	9.000	Off	N	9.6	19.8	47.1
0.880000	22.7	9.000	Off	N	9.7	23.3	46.0
0.884000	21.5	9.000	Off	N	9.7	24.5	46.0
0.888000	20.5	9.000	Off	N	9.7	25.5	46.0
1.112000	30.7	9.000	Off	N	9.7	15.3	46.0
1.144000	31.3	9.000	Off	N	9.7	14.7	46.0
1.164000	31.6	9.000	Off	N	9.7	14.4	46.0
21.852000	29.6	9.000	Off	N	10.3	20.4	50.0
22.302000	29.5	9.000	Off	N	10.3	20.5	50.0
22.390000	29.4	9.000	Off	N	10.3	20.6	50.0
22.474000	29.2	9.000	Off	N	10.3	20.8	50.0
22.786000	29.0	9.000	Off	N	10.3	21.0	50.0
23.394000	28.2	9.000	Off	N	10.4	21.8	50.0

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12. LIST OF TEST EQUIPMENT

12.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216/ LISN	12/28/2015	Annual	100073
Agilent	E4440A/ Spectrum Analyzer	03/18/2015	Annual	US45303008
Agilent	N9020A / SIGNAL ANALYZER	06/30/2015	Annual	MY51110085
Agilent	N9020A / SIGNAL ANALYZER	07/02/2015	Annual	MY50510304
Agilent	N1911A/Power Meter	07/09/2015	Annual	MY45100523
Agilent	N1921A /POWER SENSOR	07/09/2015	Annual	MY45241059
Agilent	87300B/Directional Coupler	11/30/2015	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/15/2015	Annual	5001
Hewlett Packard	E3632A / DC POWER SUPPLY	03/11/2015	Annual	KR75303962
Agilent	8493C / Attenuator(10 dB)	07/23/2015	Annual	07560

12.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Schwarzbeck	VULB 9160/ TRILOG Antenna	10/10/2014	Biennial	3368
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
CERNEX	CBL18265035 / POWER AMP	07/27/2015	Annual	22966
Schwarzbeck	BBHA 9120D/ Horn Antenna	05/07/2015	Biennial	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	04/30/2015	Biennial	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	01/15/2016	Annual	839117/011
Rohde & Schwarz	LOOP ANTENNA	02/04/2016	Biennial	100179
CERNEX	CBL06185030 / POWER AMP	07/21/2015	Annual	22965
CERNEX	CBLU1183540 / POWER AMP	07/21/2015	Annual	22964